MEMORANDUM

To: Ron Paananen, HDR

From: Joseph Sawdey, LG, LHG
Meg Strong, LG, LHG
Shannon & Wilson

Date: January 9, 2023

Copies To: Robyn Boyd
Dave Becher
Margaret Kucharski

Contract & Task Order: DA Deliverable 4.1.15

File Code:

Subject: Groundwater Monitoring Memorandum – Quarter No. 3, Voluntary Cleanup Program NW3242, Montlake Gas Station, Seattle, Washington

Background

In 2019, the Washington State Department of Transportation (WSDOT) entered the Former Montlake Gas Station property located in Seattle, Washington (site), into the Washington State Department of Ecology (Ecology) Voluntary Cleanup Program (VCP).

As part of the VCP application, Shannon & Wilson submitted a Remedial Investigation (RI) work plan and a subsequent RI report to Ecology, on behalf of WSDOT. The RI report included investigation data that was used to characterize the nature and extent of petroleum hydrocarbon contamination in soil and groundwater associated with historic fueling operations at the site (Shannon & Wilson, 2020).

In 2021, PBS Engineering and Environmental prepared and submitted to Ecology a Remedial Action Plan detailing the proposed remediation excavation activities (PBS, 2021a). In August and September 2021, PBS oversaw the closure and removal of the former gas station underground storage tanks and piping, as well as the excavation of the associated petroleum contaminated soil source zone (source zone), as documented in the Remedial Action Completion Report (PBS, 2021b). Soil compliance has been achieved at the site as documented by confirmation sampling performed by PBS during the remedial excavation.

Groundwater compliance is currently being evaluated. On April 19 and 20, 2022, Shannon & Wilson installed additional compliance groundwater monitoring (CGM) wells at the site following Ecology recommendations (Shannon & Wilson, 2022a). The CGM well network

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Seattle, WA 98104
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Fax: 206-770-3569

for the site consists of six monitoring wells: MW-2-19, MW-3-19, MW-6-22, MW-7-22, MW-8-22, and MW-9-22. The monitoring wells have been surveyed and locations are depicted in Exhibit 1. This memorandum presents the results of Quarter No. 3 CGM and documents the continued effect(s) of the source zone removal on site groundwater quality. Results of the Quarter Nos. 1 and 2 CGM have been presented previously under a separate cover (Shannon & Wilson, 2022b, and 2022c).

Quarter No. 3 Groundwater Monitoring Activities

Well Gauging

On November 15, 2022, Shannon & Wilson gauged each of the CGM wells to monitor for the presence of free product and to measure groundwater elevations. Measurable free product (0.02 foot thick) was encountered at MW-3-19. Measurable free product was not encountered at the other five CGM wells.

Groundwater Sampling

On November 15, 2022, Shannon & Wilson purged each of the CGM wells using a peristaltic pump with a flow-through cell and water quality meter to measure the following field parameters: temperature, oxidation-reduction potential, pH, conductivity, dissolved oxygen, turbidity, salinity, and total dissolved solids. Field parameters collected during purging of the CGM wells can be found in Attachment 1 – Groundwater Sampling Field Forms. As is common industry practice, groundwater from MW-3-19 was not purged or sampled because measurable free product was encountered in the well and groundwater contaminant concentrations can be assumed to be near or equal to the contaminant aqueous solubility limit.

Upon stabilization of the field parameters during well purging (indicating steady groundwater flow to the well), groundwater samples were collected from five CGM wells by discharging groundwater from the end of the peristaltic tubing into clean, laboratory-supplied containers. Collected groundwater samples were immediately put on ice and stored within an insulated cooler. Groundwater samples from each of the CGM wells, except for MW-3-19 as discussed above, were delivered to Onsite Environmental Inc., of Redmond, Washington, under standard chain-of-custody procedures and analyzed for:

- Gasoline-range petroleum hydrocarbons using Ecology's Northwest Total Petroleum Hydrocarbon (NWTPH)-Gasoline Extended Method;
- Benzene, toluene, ethylbenzene, and xylene (BTEX) by U.S. Environmental Protection Agency (EPA) 8260 Method;
- Diesel- and oil-range petroleum hydrocarbons using Ecology's NWTPH-Diesel Extended Method; and
- Total and dissolved arsenic by EPA Method 200.8.

For complete details on the groundwater sampling methodology, refer to the Sample Collection and Chemical Testing sections of the Work Plan (Shannon & Wilson, 2019).

Quarter No. 3 Results and Interpretation

Groundwater Elevation and Flow Directions

Measured groundwater elevations for Quarter No. 3 are reported in Exhibit 2 and displayed in Exhibit 1. Groundwater elevations in North American Vertical Datum (of 1988) during November 2022 ranged from as low as 41.5 feet (MW-3-19) to as high as 48.2 feet above mean sea level (MW-2-19). Using the measured groundwater elevations, a groundwater potentiometric surface was interpolated with associated groundwater flow directions inferred to occur perpendicular to the equipotentials comprising the potentiometric surface (see Exhibit 1). Note that, due to the presence of free product in MW-3-19, we excluded the groundwater elevation measurements from that well when creating the potentiometric surface. Further, the groundwater elevation measured at MW-3-19 was again significantly lower with less seasonal fluctuation compared to the other CGM wells (see Exhibit 2). The much lower and static nature of the groundwater elevations monitored at MW-3-19 is suggestive of hydraulic isolation from the more uniform groundwater flow regime encountered across the former Gas Station property.

The groundwater setting at the site observed during Quarter No. 3 is consistent with that observed during the RI and previous quarterly CGM events (Shannon & Wilson, 2020, 2022b, and 2022c). In general, groundwater elevations measured in Quarter No. 3 were lower by approximately 1 foot, compared to groundwater elevations measured during Quarter 2. Lower groundwater elevations observed likely reflect the local dry season that extended from summer into fall 2022. As the wet season progresses, it is expected that groundwater elevations will begin to rise.

The groundwater elevation observed at MW-3-19 only decreased 0.1 feet between Quarter Nos. 2 and 3 of the groundwater monitoring (August to November 2022). This relatively low fluctuation in groundwater elevation, as discussed above, suggests a groundwater flow regime in the vicinity of MW-3-19 that is hydraulically isolated from the other CGM wells.

The estimated groundwater flow direction for Quarter No. 3 is uniformly northeast to north-northeast, consistent with previous monitoring events (Shannon & Wilson, 2022b and 2022c). The northwesterly component documented in previous reports is not depicted due to exclusion of MW-3-19 as a potentiometric surface interpolation point.

Groundwater Sampling Results

The laboratory analytical results for collected groundwater samples are summarized in Exhibit 3. The laboratory report is included as Attachment 2. Exhibit 1 indicates which monitoring wells (if any) had groundwater sample contaminant concentrations that exceed applicable Cleanup Levels (CULs) during the November 2022 sampling event.

Groundwater Sampling Interpretation

Gasoline-range petroleum hydrocarbons and BTEX are the primary contaminants of concern for the site. During this quarter of groundwater sampling, none of the five wells sampled within the CGM well network had detections of gasoline or BTEX in the groundwater samples. Because groundwater contaminant concentrations collected during Quarter No. 3 from the five CGM

wells were non-detectable for the primary contaminants (gasoline and BTEX), these five wells document continued groundwater quality improvement following the remedial excavation. The concentration of gasoline-range petroleum hydrocarbons measured in the CGM wells have been summarized in trend plots, included as Exhibit 4.

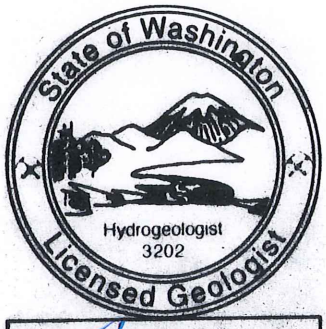
Neither diesel- nor oil-range petroleum hydrocarbons were detected in the five wells sampled within the CGM network during Quarter No. 3. During Quarter No. 2, MW-9-22 recorded diesel-and oil-range petroleum hydrocarbons above applicable CULs; concentrations measured at MW-9-22 were non-detectable during Quarter No. 3, recording an improvement in groundwater quality in a very short time span. The concentration of diesel-range plus oil-range petroleum hydrocarbons measured in the CGM wells have been summarized in trend plots, included as Exhibit 5.

Free product was observed in one well, MW-3-19. The free product observed in MW-3-19 may be related to the observed degree of hydraulic isolation in the vicinity of MW-3-19, which would impact timing for the remedial action to manifest near the well.

We appreciate this opportunity to provide environmental services to you for this project. If you have questions regarding this letter, please contact the undersigned at (206) 632-8020.

Sincerely,

Shannon & Wilson



Joseph Sawdey, LG, LHG
Senior Hydrogeologist

Meg Strong, LG, LHG
Senior Consultant

JXS:CL:MJS/jxs:mrh

References

PBS Engineering and Environmental, 2021a, Remedial action plan, Montlake Gas Station, State Route 520 Montlake to Lake Washington Interchange and Bridge Replacement Project, Seattle, Washington: Report prepared by PBS, Seattle, Wash., project no. 41221.003, for Graham Contracting Ltd, Bellevue, Wash., March Seattle, Wash., March 2021.

PBS Engineering and Environmental, 2021b, Remedial action completion report, Montlake Gas Station, State Route 520 Montlake to Lake Washington Interchange and Bridge Replacement Project, Seattle, Washington: Report prepared by PBS, Seattle, Wash., 41221.003, for Graham Contracting Ltd., Bellevue, Wash., December.

Shannon & Wilson, 2019, Data gaps investigation work plan/sampling and analysis plan for Montlake Gas Station, SR 520 Bridge Replacement and HOV Program, Seattle, Washington: Workplan prepared by Shannon & Wilson, Seattle, Wash., 21-1-22242-101, for Washington State Department of Transportation, July.

Shannon & Wilson, 2020, Remedial investigation report for Montlake Gas Station, SR 520 Bridge Replacement and HOV Program, Seattle, Washington: Report prepared by Shannon & Wilson, Seattle, Wash., 21-1-22242-104, for Washington State Department of Transportation, 1 v., March.

Shannon & Wilson, 2022a, Compliance groundwater monitoring well installation exhibit for Montlake Gas Station, SR 520 Bridge Replacement and HOV Program, Seattle, Washington: Exhibit prepared by Shannon & Wilson, Seattle, Wash., 21-1-22242-104, for Washington State Department of Transportation, May 2022.

Shannon & Wilson, 2022b, Groundwater monitoring memorandum – quarter no. 1, voluntary cleanup program NW3242, Montlake Gas Station, SR 520 Bridge Replacement and HOV Program, Seattle, Washington: Memorandum from Joseph Sawdey and Meg Strong, Shannon & Wilson, Seattle, Wash., 21-1-22242-104, to Ron Paananen, HDR, June 27.

Shannon & Wilson, 2022c, Groundwater monitoring memorandum – quarter no. 2, voluntary cleanup program NW3242, Montlake Gas Station, SR 520 Bridge Replacement and HOV Program, Seattle, Washington: Memorandum from Joseph Sawdey and Meg Strong, Shannon & Wilson, Seattle, Wash., 21-1-22242-104, to Ron Paananen, HDR, October 6.

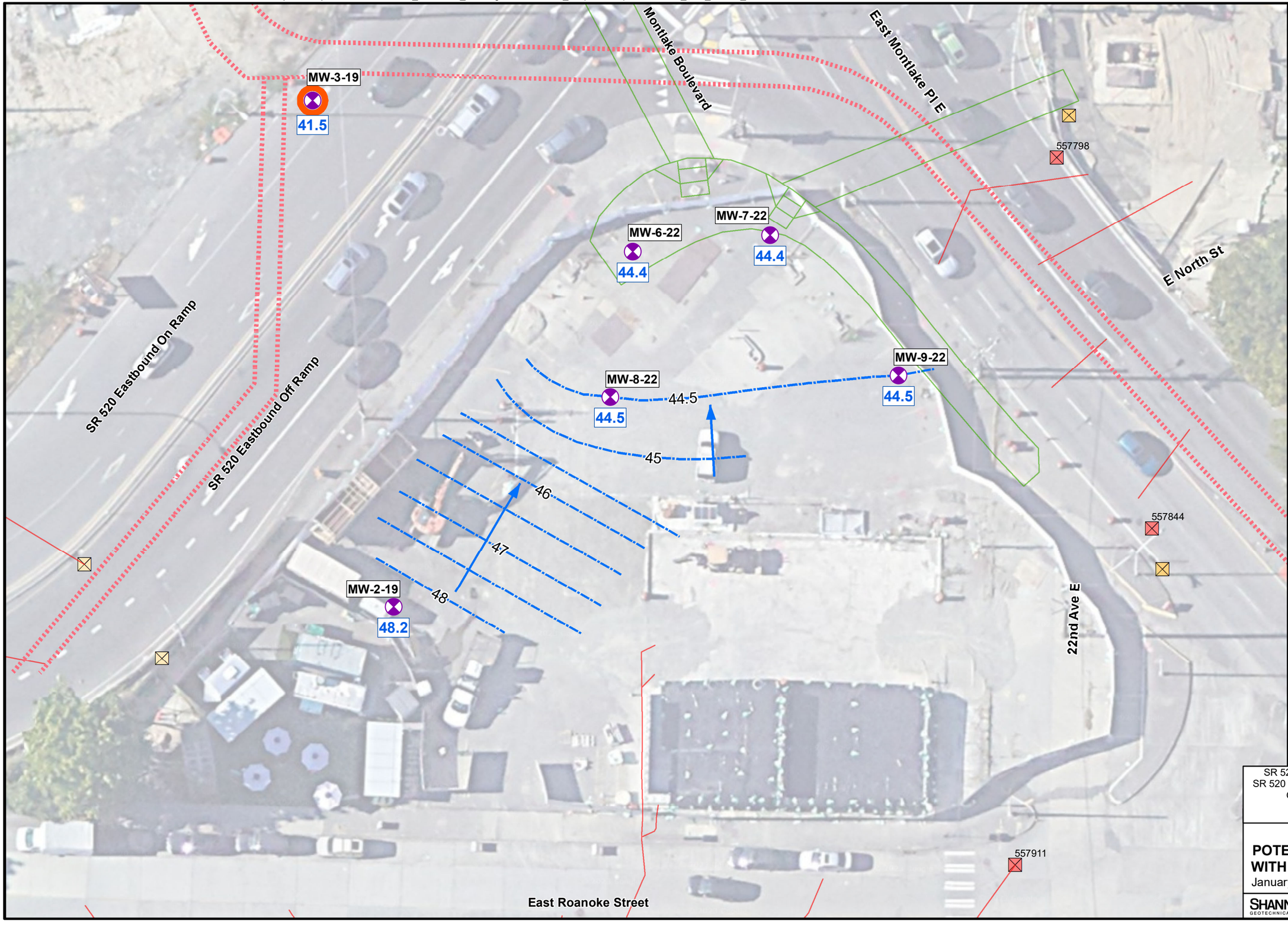
Exhibits

Exhibit 1 – Groundwater Potentiometric Surface Map with Groundwater Elevation
Exhibit 2 – Groundwater Level Measurements
Exhibit 3 – Summary of Groundwater Analytical Results
Exhibit 4 – Groundwater Concentration Trend Plots – Gasoline
Exhibit 5 – Groundwater Concentration Trend Plots – Diesel Plus Oil

Attachments

Attachment 1 – Groundwater Sampling Field Forms
Attachment 2 – Laboratory Report and Chain-of-Custody Form

Document Path: P:\GIS\SEA\21-1 SEA\22200s\22242 SR 520 (Y-11848)\TO DR PBBRL\104_Remedial_Investigation\MXD\ML_ProposedExplorationPlan_UTL_JAN23_v3.mxd



LEGEND

Monitoring Well Location and Designation

Monitoring Well With Measurable Free Product (November 2022)

Interpolated Groundwater Elevation (Feet, NAVD 88)

Interpolated Groundwater Flowline

Groundwater Elevation at Monitoring Well (November 2022)
44.4

Existing Utility - Catch Basin

Existing Utility - Inlet

Existing Utility - Wastewater Pipe

Existing Utility - Sewer or Combined-Sewer Line

Approximate Post Construction Crosswalk/Sidewalk Configuration

NOTE:
All Existing Utility data should be considered approximate.
City of Seattle, 2019.

N
W E
S

0 40
Feet

SR 520 Bridge Replacement and HOV Program
SR 520 I-5 to Montlake -I/C and Bridge Replacement
Groundwater Monitoring Report No. 3
2625 East Montlake Place East
Seattle, WA

GROUNDWATER POTENTIOMETRIC SURFACE MAP WITH GROUNDWATER ELEVATION

January 2023 21-1-22242-104

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

EXHIBIT 1

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Montlake Gas Station Monitoring Well	Screened Interval (feet bgs)	Surveyed Monitoring Well Elevation[1] (feet)	TOC Elevation (feet)	Date	Depth to Water (feet below TOC)	Groundwater Elevation (feet)
MW-2-19	10 to 20	58.87	58.12	10/17/2019	10.1	48.0
				5/2/2022	8.3	49.8
				8/16/2022	9.4	48.7
				11/15/2022	9.9	48.2
MW-3-19	10 to 25	59.29	59.01	10/17/2019	17.4	41.6
				5/2/2022	17.3	41.8
				8/16/2022	17.4	41.6
				11/15/2022	17.5	41.5
MW-6-22	11 to 26	59.71	59.36	5/2/2022	12.2	47.2
				8/16/2022	13.9	45.5
				11/15/2022	14.9	44.4
MW-7-22	10.5 to 25.5	59.68	59.18	5/2/2022	12.1	47.1
				8/17/2022	13.8	45.4
				11/15/2022	14.8	44.4
MW-8-22	10.5 to 25.5	58.90	58.55	5/2/2022	11.3	47.2
				8/16/2022	13.0	45.6
				11/15/2022	14.0	44.5
MW-9-22	10 to 25	59.93	59.58	5/2/2022	12.4	47.2
				8/17/2022	14.1	45.5
				11/15/2022	15.1	44.5

NOTES:

1 Monitoring well elevation was surveyed from the center of the well monument lid.
The reference vertical datum is the North American Vertical Datum (of 1988).
bgs = below ground surface; TOC = top of casing

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EXHIBIT 3
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

		Petroleum Hydrocarbons (µg/L)			Volatile Organic Compounds (µg/L)[3]					Metals (µg/L)[4]	
Montlake Gas Station Monitoring Well:	Sample Date:	Gasoline Range Organics[1]	Diesel Range Organics[2]	Lube Oil Range Organics[2]	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene	Total Arsenic	Dissolved Arsenic
MW-2-19	10/17/2019	<100	<260	<420	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	5/2/2022	<100	<180	<240	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	8/16/2022	<100	<130	210	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	11/15/2022	<100	<210	<210	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
MW-3-19	10/17/2019	**1400**	**630**	**660**	**98**	<4	**24**	**9.3**	**1.1**	**17**	**7.4**
	5/2/2022	**5800**	**1300 M**	**500**	**170**	<10	**190**	**220**	**3.2**	**16**	**11**
MW-6-22	5/2/2022	<100	**210**	**330**	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	8/16/2022	<100	<130	**290**	<0.20	<1.0	<0.20	<0.40	<0.20	**6.3**	**4.5**
	11/15/2022	<100	<200	<200	<0.20	<1.0	<0.20	<0.40	<0.20	**7.3**	**4.6**
MW-7-22	5/2/2022	<100	<170	<230	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	8/17/2022	<100	<130	**250**	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	11/15/2022	<100	<210	<210	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	11/15/2022	<100	<210	<210	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
MW-8-22	5/2/2022	<100	<170	<220	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	5/2/2022	<100	<170	**240**	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	8/16/2022	<100	<130	**360**	<0.20	<1.0	<0.20	<0.40	<0.20	**6.6**	**3.8**
	8/16/2022	<100	<140	**340**	<0.20	<1.0	<0.20	<0.40	<0.20	**6.5**	**4.3**
	11/15/2022	<100	<200	<200	<0.20	<1.0	<0.20	<0.40	<0.20	**6**	**5.7**
MW-9-22	5/2/2022	<100	<160	<220	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	8/17/2022	<100	**1900**	<300	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	11/15/2022	<100	<210	<210	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
Trip Blank	5/2/2022	<100	--	--	<0.20	<1.0	<0.20	<0.40	<0.20	--	--
	8/18/2022	<100	--	--	<0.20	<1.0	<0.20	<0.40	<0.20	--	--
	11/15/2022	<100	--	--	<0.20	<1.0	<0.20	<0.40	<0.20	--	--
MTCA Method A CUL for Unrestricted Land Use		**1000/800***	**500**	**500**	**5.00**	**1000**	**700**	**1000†**	**1000†**	**20§**	**20§**

NOTES:
1 Gasoline-range petroleum hydrocarbons using Ecology's NWTPH-Gasoline Extended Method
2 Diesel- and oil-range petroleum hydrocarbons using Ecology's NWTPH-Diesel Extended Method
3 Volatile organic compounds by EPA Method 8260D
4 Total and dissolved arsenic by EPA Method 200.8
5 In August and November 2022, MW-3-19 had measurable free product and was not sampled.
Highlighted text indicates the analyte was detected above the MTCA Method A cleanup level.
Bold text indicates the analyte was detected above laboratory practical quantitation limit.
M flag indicates hydrocarbons in the gasoline range are impacting the diesel range result.
* Cleanup level (CUL) for gasoline-range organics is 1,000 micrograms (µg) without the presence of benzene and 800 µg with the presence of benzene.
† MTCA Method A CUL for total xylenes is used because a MTCA Method A CUL is not established for the isomers of m-, p-, or o-xylene.
§ Site specific CUL for arsenic (total and dissolved) based on statistical analysis of natural background levels of arsenic in groundwater.
-- = not analyzed; < = not detected above laboratory reporting limit; µg/L = micrograms per liter; CUL = cleanup level; EPA = U.S. Environmental Protection Agency; MTCA = Model Toxics Control Act; NWTPH = Northwest Total Petroleum Hydrocarbon

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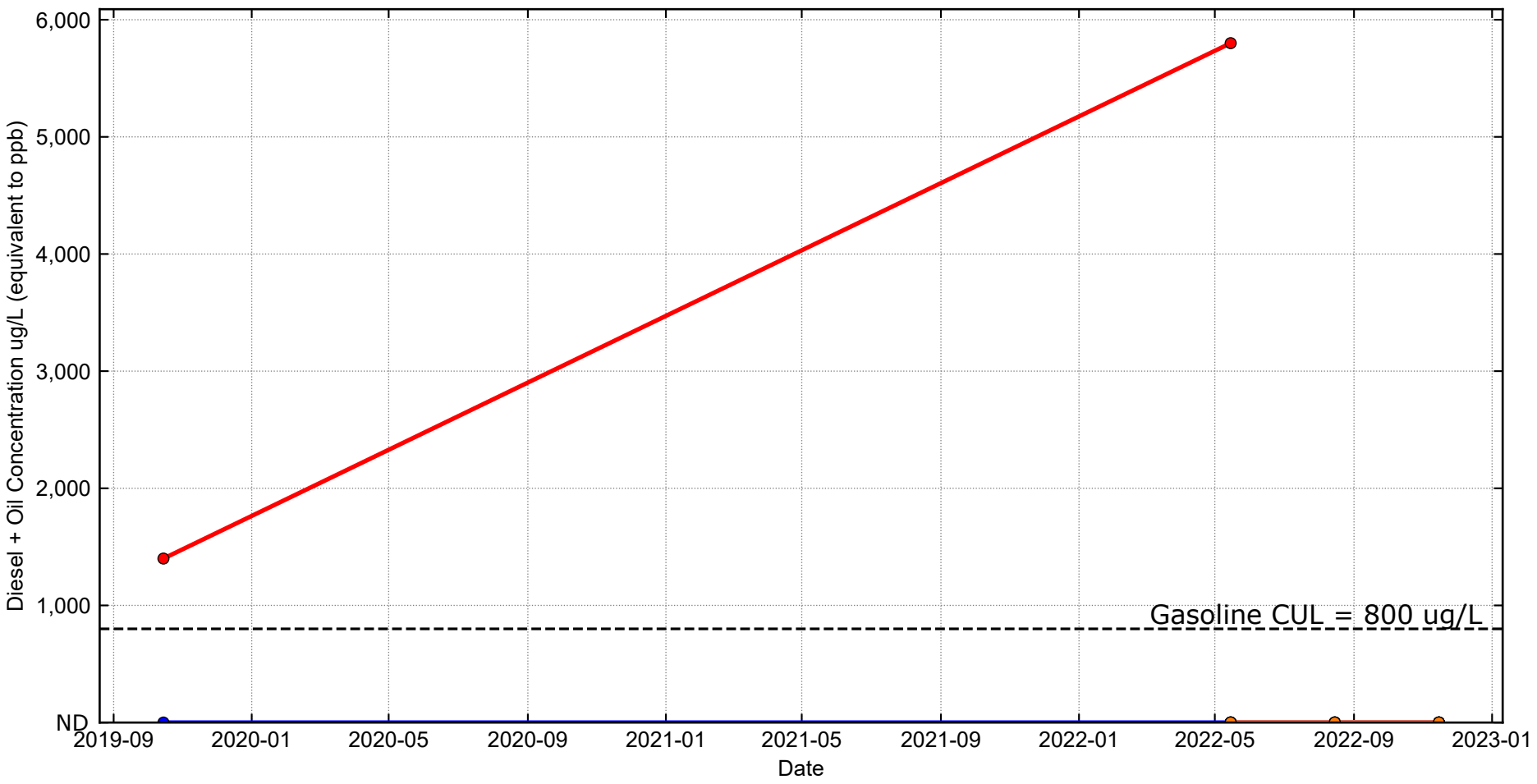


MW-2-19 MW-7-22
MW-3-19 MW-8-22
MW-6-22 MW-9-22

Note: Gasoline concentrations not detected in MW-2-19, MW-6-22, MW-7-22, MW-8-22, or MW-9-22

SR 520 Bridge Replacement and HOV Program
I-5 to Montlake - I/C and Bridge Replacement
Groundwater Monitoring Report - Quarter No. 3

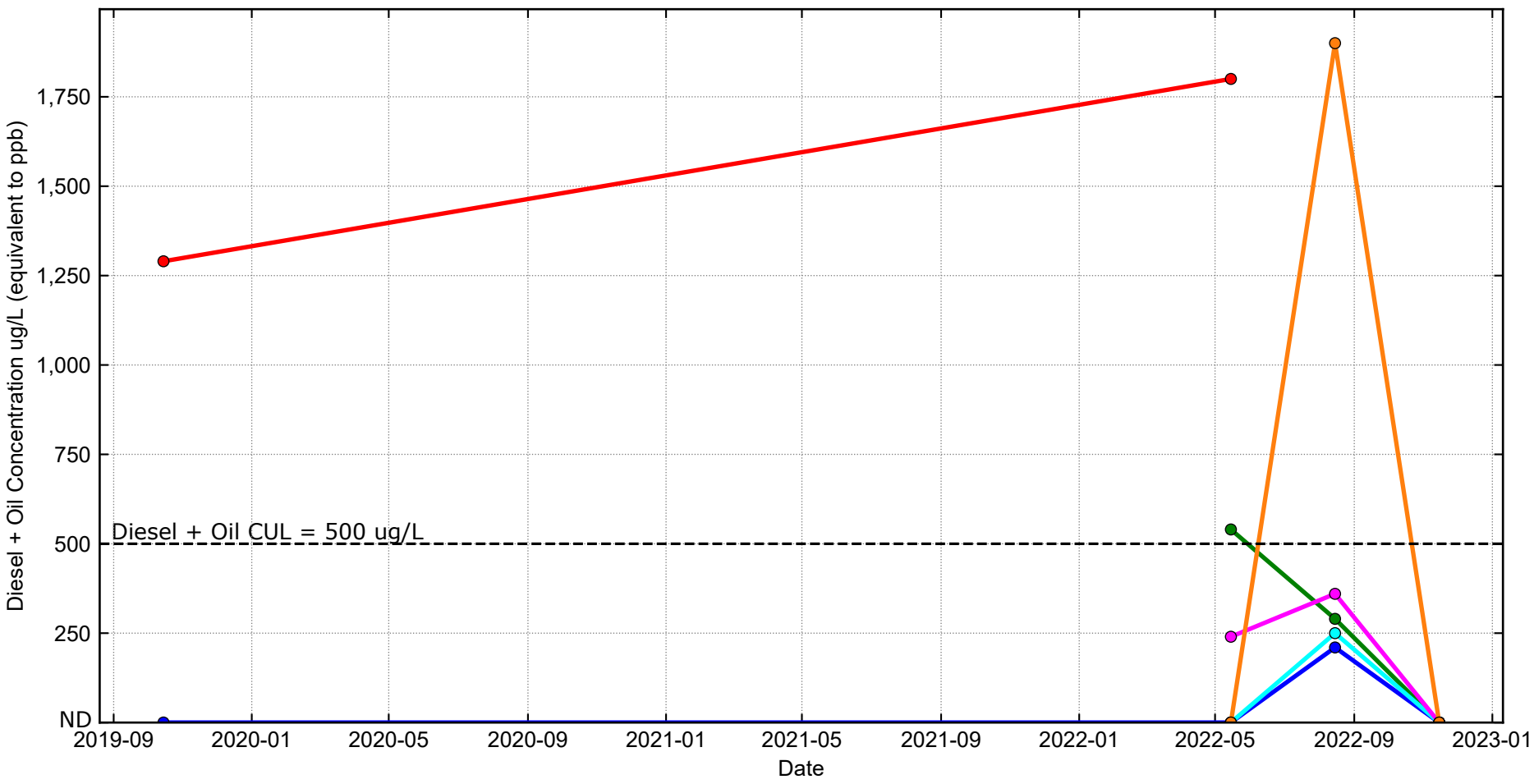
Groundwater Concentration Trend Plots - Gasoline

January 2023 21-1-22242-104

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

Exh. 4

Exh. 4



SR 520 Bridge Replacement and HOV Program
I-5 to Montlake - I/C and Bridge Replacement
Groundwater Monitoring Report - Quarter No. 3

Groundwater Concentration Trend Plots - Diesel Plus Oil

January 2023 21-1-22242-104

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Exh. 5

Exh. 5

Attachment 1

Contents:

Groundwater Sampling Field Forms (6 Sheets)

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SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

JOB NO.: 21-1-22242-112

Project: Montlake Gas Station (Former)

Conducted by: MRH

Weather: Sunny, Low 40s

WATER LEVEL MEASUREMENTS

Location ID	Date	Time	Measuring Point (MP)	Depth to Water from MP (feet)	VWP Reading LNAPL Digits	VWP Reading LNAPL °C	Comments (i.e. pressure change when opend, inaccesibility, etc.)
MW-3-19	11/15/2022	0855	NTOC	17.53	17.51	–	BLT 987
MW-2-19	↓	0915	↓	9.92	–	–	BLT 996
MW-7-22		1010		14.90	–	–	BNV 408
MW-8-22		1013		14.04	–	–	BNV 406
MW-6-22		1016		14.93	–	–	BNV 407
MW-9-22	↓	1019	↓	15.06	–	–	BNV 409

Comments: _____

Checked By: _____ Date: _____

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

WATER SAMPLING LOG

JOB NO. 21-1-22242-112
PAGE 1 OF 1

OWNER / LOCATION: Montlake 76 Gas Station
DATE: 11/15/2022
WELL NO: MW-2-19 SAMPLE NO: MW-2-19:11152022 ECOLOGY TAG NO: BLT 996
DUPLICATE NO: —
WEATHER: Sunny, Low 40s
MS / MSD? Yes ☐ No ☒
WELL SITE CONDITIONS / MP DEFINITION: North PVC rim
(MP is typically the north PVC rim)

SAMPLING DATA

TIME STARTED: 0900
PID HEAD SPACE: 0.1 ppm
MP DISTANCE ABOVE / BELOW GROUND SURFACE: 0.8 ft.
TOTAL DEPTH OF WELL BELOW MP: 19.26 ft.
DTW BELOW MP: 9.92 ft.
WATER COLUMN IN WELL: 9.34 ft.
CASING DIAMETER: 2 in.
GALLONS PER FOOT: 0.16
GALLONS IN WELL: 1.49 x3=4.48
TIME PURGING STARTED: 0945

LNAPL THICKNESS: — ft. Sample ☐
DNAPL THICKNESS: — ft. Sample ☐

SAMPLE CONTAINERS

Number	Size	Type	Pres.

FIELD PARAMETERS

GALLONS REMOVED	TEMP. (C°)	ORP Eh (mV)	pH	COND. (µmhos/cm)	D.O. (mg/L)	TURBIDITY (NTU)	SALINITY (%) PPT	TDS (g/L)	COLOR	TIME
Initial	14.9	-363.1	6.46	578.1	1.01	10.94	0.27	0.3608	clear	0946
0.4	15.4	-371.3	5.59	501.9	0.60	14.5	0.24	0.3263	clear	0957
0.75	16.6	-423.5	5.55	506.5	0.57	11.7	0.25	0.3296	clear	1002
1.0	16.7	-447.8	5.53	511.9	0.47	6.38	0.25	0.3328	clear	1005
1.3	16.6	-421.3	5.52	536.6	0.44	5.91	0.26	0.3490	clear	1010
1.75	16.6	-368.1	5.52	543.3	0.46	7.05	0.26	0.3536	clear	1015
2.0	16.6	-393.5	5.52	549.5	0.43	6.80	0.27	0.3569	clear	1020
2.2	16.6	-403.2	5.51	555.3	0.43	5.49	0.27	0.3608	clear	1023
2.4	16.6	-458.1	5.51	564.1	0.44	5.22	0.28	0.3679	clear	1026
~~After Sampling~~ 2.64	16.6	-437.7	5.51	572.3	0.43	5.09	0.28	0.3725	clear	1029

Paused sampling. Turbidity meter battery dead

EVACUATION METHOD: Peri - Pump
PUMP INTAKE DEPTH (if applicable): Mid - screen
PURGE WATER DISPOSITION (e.g., drum #): Drum on site
WATER QUALITY (e.g., sheen, odor): No odor or sheen
WATER QUALITY METER(S) USED; CALIBRATION DATE / TIME: YSI Pro Plus
SAMPLING METHOD: EPA Low Flow
SAMPLE TIME: 1045
SAMPLING PERSONNEL: MRH
DUPLICATE TIME: —
REMARKS (e.g., recovery rate):

TIME COMPLETED: 1100

WELL CASING VOLUMES

Gal / ft 1-1/4" = 0.077 2" = 0.16 3" = 0.37 4" = 0.65
1-1/2" = 0.10 2-1/2" = 0.24 3-1/2" = 0.50 6" = 1.46

Filename: J:\Support\Library\FIELD AND LAB FORMS\AutoCAD_Water Sampling Log.dwg Date: 02-10-2011 Login: sac

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

WATER SAMPLING LOG

JOB NO. 21-1-22242-112
PAGE 1 OF 1

OWNER / LOCATION: Montlake 76 Gas Station
DATE: 11/15/2022
WELL NO: MW-6-22 SAMPLE NO: MW-6-22-11152022 ECOLOGY TAG NO: BNV 407
DUPLICATE NO: —
WEATHER: Sunny, high 40s
MS / MSD? Yes ☐ No ☑
WELL SITE CONDITIONS / MP DEFINITION: North TOC
(MP is typically the north PVC rim)

SAMPLING DATA

TIME STARTED: 1330
PID HEAD SPACE: _____ ppm
MP DISTANCE ABOVE / BELOW GROUND SURFACE: 0.35 ft.
TOTAL DEPTH OF WELL BELOW MP: 25.98 ft.
DTW BELOW MP: 14.93 ft.
WATER COLUMN IN WELL: 11.05 ft.
CASING DIAMETER: 2 in.
GALLONS PER FOOT: 0.16
GALLONS IN WELL: 1.77 x3 = 5.3
TIME PURGING STARTED: 13:39

LNAPL THICKNESS: — ft. Sample ☐
DNAPL THICKNESS: — ft. Sample ☐

SAMPLE CONTAINERS

Number	Size	Type	Pres.

FIELD PARAMETERS

GALLONS REMOVED	TEMP. (C°)	ORP Eh (mV)	pH	COND. (µmhos/cm)	D.O. (mg/L)	TURBIDITY (NTU)	SALINITY (%) PPT	TDS (g/L)	COLOR	TIME
Initial	17.5	-380.3	6.78	731	4.14	6.48	0.36	0.4745	clear	1340
0.5	17.4	-322.0	6.71	743	2.29	6.00	0.37	0.4875	clear	1344
0.75	16.7	-318.7	6.71	799	0.98	5.72	0.39	0.5200	clear	1348
1.0	16.8	-324.2	6.71	794	0.56	4.47	0.39	0.5200	clear	1351
1.25	17.0	-304.7	6.66	776	1.15	4.90	0.38	0.5070	clear	1354
1.5	17.0	-314.7	6.66	775	1.18	4.79	0.38	0.5005	clear	1357
1.75	17.0	-313.5	6.66	782	1.13	4.09	0.38	0.5070	clear	1400
After Sampling										

EVACUATION METHOD: Peri Pump
PUMP INTAKE DEPTH (if applicable): Mid-Screen
PURGE WATER DISPOSITION (e.g., drum #): Drum on site
WATER QUALITY (e.g., sheen, odor): No odor or sheen
WATER QUALITY METER(S) USED; CALIBRATION DATE / TIME: YSI Pro PWS
SAMPLING METHOD: EPA Low Flow
SAMPLE TIME: 1415
SAMPLING PERSONNEL: MRH
DUPLICATE "TIME": —
REMARKS (e.g., recovery rate):

TIME COMPLETED: 1425

WELL CASING VOLUMES

Gal / ft 1-1/4" = 0.077 2" = 0.16 3" = 0.37 4" = 0.65
1-1/2" = 0.10 2-1/2" = 0.24 3-1/2" = 0.50 6" = 1.46

Filename: J:\Support\Library\FIELD AND LAB FORMS\AutoCAD_Water Sampling Log.dwg Date: 02-10-2011 Login: sac

SHANNON & WILSON, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

WATER SAMPLING LOG

JOB NO. 21-1-22242-112
PAGE 1 OF 1

OWNER / LOCATION: Montlake 76 Gas Station
DATE: 11/15/2022
WELL NO: MW-7-22 SAMPLE NO: MW-7-22-11152022 ECOLOGY TAG NO: BNV 408
DUPLICATE NO: MW-100-11152022
WEATHER: Sunny, Low-Mid 40s
MS / MSD? Yes ☐ No ☐
WELL SITE CONDITIONS / MP DEFINITION: North TOC
(MP is typically the north PVC rim)

SAMPLING DATA

TIME STARTED: 1105
PID HEAD SPACE: ppm
MP DISTANCE ABOVE / BELOW GROUND SURFACE: 0.5 ft.
TOTAL DEPTH OF WELL BELOW MP: 25.37 ft.
DTW BELOW MP: 14.80 ft.
WATER COLUMN IN WELL: 10.57 ft.
CASING DIAMETER: 2 in.
GALLONS PER FOOT: 0.16
GALLONS IN WELL: 1.69 x3 = 5.07
TIME PURGING STARTED: 1110

LNAPL THICKNESS: — ft. Sample ☐
DNAPL THICKNESS: — ft. Sample ☐

SAMPLE CONTAINERS

Number	Size	Type	Pres.

FIELD PARAMETERS

GALLONS REMOVED	TEMP. (C°)	~~Eh~~ ORP (mV)	pH	COND. (µmhos/cm)	D.O. (mg/L)	TURBIDITY (NTU)	SALINITY (%) ~~PPT~~	TDS (g/L)	COLOR	TIME
Initial	16.3	-325.6	6.23	709	2.03	12.2	0.35	0.4615	clear	1112
0.5	16.5	-417.0	6.33	728	0.58	2.31	0.36	0.4745	clear	1116
0.75	16.5	-466.3	6.36	729	0.57	3.31	0.36	0.4745	clear	1120
1.0	16.4	-457.6	6.39	727	0.48	3.21	0.36	0.4745	clear	1123
1.25	16.4	-447.2	6.40	724	0.45	0.84	0.36	0.4680	clear	1126
1.5	16.5	-439.7	6.41	724	0.43	0.42	0.36	0.4680	clear	1129
After Sampling										

EVACUATION METHOD: Peri Pump
PUMP INTAKE DEPTH (if applicable): Mid-Screen
PURGE WATER DISPOSITION (e.g., drum #): Drum on-site
WATER QUALITY (e.g., sheen, odor): No sheen or odor
WATER QUALITY METER(S) USED; CALIBRATION DATE / TIME: YSI Pro. Plus
SAMPLING METHOD: EPA Low Flow
SAMPLE TIME: 1145
SAMPLING PERSONNEL: MRH
DUPLICATE "TIME": 1630
REMARKS (e.g., recovery rate):

TIME COMPLETED: 1210

WELL CASING VOLUMES

Gal / ft 1-1/4" = 0.077 2" = 0.16 3" = 0.37 4" = 0.65
1-1/2" = 0.10 2-1/2" = 0.24 3-1/2" = 0.50 6" = 1.46

Filename: J:\Support\library\FIELD AND LAB FORMS\AutoCAD_Water Sampling Log.dwg Date: 02-10-2011 Login: sac

SHANNON & WILSON, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

WATER SAMPLING LOG

JOB NO. 21-1-22242-112
PAGE 1 OF 1

OWNER / LOCATION: Montlake 76 Gas Station
DATE: 11/15/2022
WELL NO: MW-8-22 SAMPLE NO: MW-8-22-11152022 ECOLOGY TAG NO: BNV 406
DUPLICATE NO:
WEATHER: Sunny, high 40s
MS / MSD? Yes ☐ No ☑
WELL SITE CONDITIONS / MP DEFINITION: North PVC Rim
(MP is typically the north PVC rim)

SAMPLING DATA

TIME STARTED: 1215
PID HEAD SPACE: — ppm
MP DISTANCE ABOVE / BELOW GROUND SURFACE: 0.3 ft.
TOTAL DEPTH OF WELL BELOW MP: 26.05 ft.
DTW BELOW MP: 14.04 ft.
WATER COLUMN IN WELL: 12.01 ft.
CASING DIAMETER: 2 in.
GALLONS PER FOOT: 0.16
GALLONS IN WELL: 1.92 ×3=5.77
TIME PURGING STARTED: 1220

LNAPL THICKNESS: — ft. Sample ☐
DNAPL THICKNESS: — ft. Sample ☐

SAMPLE CONTAINERS

Number	Size	Type	Pres.

FIELD PARAMETERS

GALLONS REMOVED	TEMP. (C°)	ORP Eh (mV)	pH	COND. (µmhos / cm)	D.O. (mg / L)	TURBIDITY (NTU)	SALINITY (%) ppt	TDS (g / L)	COLOR	TIME
Initial	16.5	-840.3	6.61	730	1.39	2.53	0.36	0.4745	clear	1221
0.5	16.9	-896.6	6.57	737	0.74	12.00	0.36	0.4810	clear	1225
1.0	16.8	-942.3	6.56	736	0.61	7.57	0.36	0.4810	clear	1228
1.25	16.8	-904.8	6.54	738	0.61	5.25	0.36	0.4810	clear	1231
1.5	16.6	-930.9	6.56	736	0.54	1.43	0.36	0.4810	clear	1234
1.75	16.6	-760.3	6.56	735	0.52	1.84	0.36	0.4745	clear	1237
2.0	16.5	-729.1	6.57	734	0.47	1.02	0.36	0.4745	clear	1240
After Sampling										

EVACUATION METHOD: Peri Pump
PUMP INTAKE DEPTH (if applicable): Mid-Screen
PURGE WATER DISPOSITION (e.g., drum #): Drum on site
WATER QUALITY (e.g., sheen, odor): No odor or sheen
WATER QUALITY METER(S) USED; CALIBRATION DATE / TIME: YSI Pro plus
SAMPLING METHOD: EPA Low flow
SAMPLE TIME: 1250
SAMPLING PERSONNEL: MKH
DUPLICATE "TIME":
REMARKS (e.g., recovery rate):

TIME COMPLETED: 1315

WELL CASING VOLUMES

Gal / ft 1-1/4" = 0.077 2" = 0.16 3" = 0.37 4" = 0.65
1-1/2" = 0.10 2-1/2" = 0.24 3-1/2" = 0.50 6" = 1.46

Filename: J:\Support\Library\FIELD AND LAB FORMS\AutoCAD_Water Sampling Log.dwg Date: 02-10-2011 Login: sac

SHANNON & WILSON, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

WATER SAMPLING LOG

JOB NO. 21-1-22242-112
PAGE 1 OF 1

OWNER / LOCATION: Montlake 76 Gas Station
DATE: 11/15/2022
WELL NO: MW-9-22 SAMPLE NO: MW-9-22-11152022 ECOLOGY TAG NO: BNV 409
DUPLICATE NO: —
WEATHER: Sunny, high 40s
MS / MSD? Yes ☐ No ☑
WELL SITE CONDITIONS / MP DEFINITION: North TOC
(MP is typically the north PVC rim)

SAMPLING DATA

TIME STARTED: 1430
PID HEAD SPACE: ____ ppm
MP DISTANCE ABOVE / BELOW GROUND SURFACE: ____ ft.
TOTAL DEPTH OF WELL BELOW MP: 25.15 ft.
DTW BELOW MP: 15.06 ft.
WATER COLUMN IN WELL: 10.09 ft.
CASING DIAMETER: 2 in.
GALLONS PER FOOT: 0.16
GALLONS IN WELL: 1.61 x 3 = 4.9
TIME PURGING STARTED: 1435

LNAPL THICKNESS: — ft. Sample ☐
DNAPL THICKNESS: — ft. Sample ☐

SAMPLE CONTAINERS

Number	Size	Type	Pres.

FIELD PARAMETERS

GALLONS REMOVED	TEMP. (C°)	ORP Eh (mV)	pH	COND. (µmhos/cm)	D.O. (mg/L)	TURBIDITY (NTU)	SALINITY (%) PPT	TDS (g/L)	COLOR	TIME
Initial	16.3	-292.1	6.71	629	1.91	9.99	0.31	0.4095	clear	1436
0.5	16.5	-305.9	6.39	623	0.65	7.42	0.30	0.4030	clear	1439
0.75	16.7	-301.1	6.27	621	0.57	17.0	0.30	0.4030	clear	1443
1.0	16.7	-292.3	6.23	620	0.60	19.5	0.30	0.4030	clear	1446
1.4	16.7	-290.0	6.18	621	0.51	9.15	0.30	0.4030	clear	1450
1.75	16.8	-286.9	6.16	629	0.45	7.63	0.31	0.4095	clear	1453
2.1	16.8	-292.8	6.14	632	0.45	7.24	0.31	0.4095	clear	1456
2.4	16.7	-289.4	6.14	632	0.44	7.07	0.31	0.4095	clear	1459
After Sampling										

EVACUATION METHOD: Peri Pump
PUMP INTAKE DEPTH (if applicable): Mid-screen
PURGE WATER DISPOSITION (e.g., drum #): Drum on site
WATER QUALITY (e.g., sheen, odor): No odor or sheen
WATER QUALITY METER(S) USED; CALIBRATION DATE / TIME: YSI Pro Plus
SAMPLING METHOD: EPA Low Flow
SAMPLE TIME: 1515
SAMPLING PERSONNEL: MRH.
DUPLICATE "TIME": —
REMARKS (e.g., recovery rate):

TIME COMPLETED: 1530

WELL CASING VOLUMES

Gal / ft 1-1/4" = 0.077 2" = 0.16 3" = 0.37 4" = 0.65
1-1/2" = 0.10 2-1/2" = 0.24 3-1/2" = 0.50 6" = 1.46

Filename: J:\Support\Library\FIELD AND LAB FORMS\AutoCAD_Water Sampling Log.dwg Date: 02-10-2011 Login: sac

Attachment 2

Contents:

Laboratory Report and Chain-of-Custody Form (16 Sheets)

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OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

November 23, 2022

Joseph Sawdey
Shannon & Wilson, Inc.
400 N 34th Street, Suite 100
Seattle, WA 98103

Re: Analytical Data for Project 21-1-22242-112
Laboratory Reference No. 2211-232

Dear Joseph:

Enclosed are the analytical results and associated quality control data for samples submitted on November 16, 2022.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: November 23, 2022
Samples Submitted: November 16, 2022
Laboratory Reference: 2211-232
Project: 21-1-22242-112

Case Narrative

Samples were collected on November 15, 2022 and received by the laboratory on November 16, 2022. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: November 23, 2022
Samples Submitted: November 16, 2022
Laboratory Reference: 2211-232
Project: 21-1-22242-112

GASOLINE RANGE ORGANICS
NWTPH-Gx

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**Trip Blanks**					
Laboratory ID:	11-232-01					
Gasoline	**ND**	100	NWTPH-Gx	11-18-22	11-18-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*99*	*65-122*				
Client ID:	**MW-2-19:11152022**					
Laboratory ID:	11-232-02					
Gasoline	**ND**	100	NWTPH-Gx	11-18-22	11-18-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*94*	*65-122*				
Client ID:	**MW-7-22:11152022**					
Laboratory ID:	11-232-03					
Gasoline	**ND**	100	NWTPH-Gx	11-18-22	11-18-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*94*	*65-122*				
Client ID:	**MW-8-22:11152022**					
Laboratory ID:	11-232-04					
Gasoline	**ND**	100	NWTPH-Gx	11-18-22	11-18-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*92*	*65-122*				
Client ID:	**MW-6-22:11152022**					
Laboratory ID:	11-232-05					
Gasoline	**ND**	100	NWTPH-Gx	11-18-22	11-18-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*96*	*65-122*				
Client ID:	**MW-9-22:11152022**					
Laboratory ID:	11-232-06					
Gasoline	**ND**	100	NWTPH-Gx	11-18-22	11-18-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*91*	*65-122*				
Client ID:	**MW-100:11152022**					
Laboratory ID:	11-232-07					
Gasoline	**ND**	100	NWTPH-Gx	11-18-22	11-18-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*90*	*65-122*				

Date of Report: November 23, 2022
Samples Submitted: November 16, 2022
Laboratory Reference: 2211-232
Project: 21-1-22242-112

GASOLINE RANGE ORGANICS
NWTPH-Gx
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1118W1					
Gasoline	**ND**	100	NWTPH-Gx	11-18-22	11-18-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*100*	*65-122*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	11-208-04										
	ORIG	DUP									
Gasoline	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Surrogate:											
Fluorobenzene						*99*	*99*	*65-122*			

Date of Report: November 23, 2022
Samples Submitted: November 16, 2022
Laboratory Reference: 2211-232
Project: 21-1-22242-112

VOLATILE ORGANICS EPA 8260D

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**Trip Blanks**					
Laboratory ID:	11-232-01					
Benzene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
Toluene	ND	1.0	EPA 8260D	11-17-22	11-17-22	
Ethylbenzene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
m,p-Xylene	ND	0.40	EPA 8260D	11-17-22	11-17-22	
o-Xylene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Dibromofluoromethane	*108*	*75-127*				
Toluene-d8	*102*	*80-127*				
4-Bromofluorobenzene	*99*	*78-125*				
Client ID:	**MW-2-19:11152022**					
Laboratory ID:	11-232-02					
Benzene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
Toluene	ND	1.0	EPA 8260D	11-17-22	11-17-22	
Ethylbenzene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
m,p-Xylene	ND	0.40	EPA 8260D	11-17-22	11-17-22	
o-Xylene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Dibromofluoromethane	*107*	*75-127*				
Toluene-d8	*103*	*80-127*				
4-Bromofluorobenzene	*98*	*78-125*				
Client ID:	**MW-7-22:11152022**					
Laboratory ID:	11-232-03					
Benzene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
Toluene	ND	1.0	EPA 8260D	11-17-22	11-17-22	
Ethylbenzene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
m,p-Xylene	ND	0.40	EPA 8260D	11-17-22	11-17-22	
o-Xylene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Dibromofluoromethane	*106*	*75-127*				
Toluene-d8	*102*	*80-127*				
4-Bromofluorobenzene	*97*	*78-125*				

Date of Report: November 23, 2022
Samples Submitted: November 16, 2022
Laboratory Reference: 2211-232
Project: 21-1-22242-112

VOLATILE ORGANICS EPA 8260D

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-8-22:11152022**					
Laboratory ID:	11-232-04					
Benzene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
Toluene	ND	1.0	EPA 8260D	11-17-22	11-17-22	
Ethylbenzene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
m,p-Xylene	ND	0.40	EPA 8260D	11-17-22	11-17-22	
o-Xylene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Dibromofluoromethane	*104*	*75-127*				
Toluene-d8	*103*	*80-127*				
4-Bromofluorobenzene	*97*	*78-125*				
Client ID:	**MW-6-22:11152022**					
Laboratory ID:	11-232-05					
Benzene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
Toluene	ND	1.0	EPA 8260D	11-17-22	11-17-22	
Ethylbenzene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
m,p-Xylene	ND	0.40	EPA 8260D	11-17-22	11-17-22	
o-Xylene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Dibromofluoromethane	*105*	*75-127*				
Toluene-d8	*104*	*80-127*				
4-Bromofluorobenzene	*100*	*78-125*				
Client ID:	**MW-9-22:11152022**					
Laboratory ID:	11-232-06					
Benzene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
Toluene	ND	1.0	EPA 8260D	11-17-22	11-17-22	
Ethylbenzene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
m,p-Xylene	ND	0.40	EPA 8260D	11-17-22	11-17-22	
o-Xylene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Dibromofluoromethane	*107*	*75-127*				
Toluene-d8	*103*	*80-127*				
4-Bromofluorobenzene	*98*	*78-125*				

Date of Report: November 23, 2022
Samples Submitted: November 16, 2022
Laboratory Reference: 2211-232
Project: 21-1-22242-112

VOLATILE ORGANICS EPA 8260D

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-100:11152022**					
Laboratory ID:	11-232-07					
Benzene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
Toluene	ND	1.0	EPA 8260D	11-17-22	11-17-22	
Ethylbenzene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
m,p-Xylene	ND	0.40	EPA 8260D	11-17-22	11-17-22	
o-Xylene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Dibromofluoromethane	*106*	*75-127*				
Toluene-d8	*103*	*80-127*				
4-Bromofluorobenzene	*96*	*78-125*				

Date of Report: November 23, 2022
Samples Submitted: November 16, 2022
Laboratory Reference: 2211-232
Project: 21-1-22242-112

VOLATILE ORGANICS EPA 8260D
QUALITY CONTROL

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1117W1					
Benzene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
Toluene	ND	1.0	EPA 8260D	11-17-22	11-17-22	
Ethylbenzene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
m,p-Xylene	ND	0.40	EPA 8260D	11-17-22	11-17-22	
o-Xylene	ND	0.20	EPA 8260D	11-17-22	11-17-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Dibromofluoromethane	*107*	*75-127*				
Toluene-d8	*103*	*80-127*				
4-Bromofluorobenzene	*99*	*78-125*				

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB1117W1									
	SB	SBD	SB	SBD	SB	SBD				
Benzene	**10.7**	**10.5**	10.0	10.0	107	105	80-121	2	16	
Toluene	**10.4**	**10.1**	10.0	10.0	104	101	80-120	3	18	
Ethylbenzene	**11.1**	**11.0**	10.0	10.0	111	110	80-125	1	18	
m,p-Xylene	**21.8**	**21.6**	20.0	20.0	109	108	80-127	1	18	
o-Xylene	**11.0**	**10.9**	10.0	10.0	110	109	80-126	1	18	
Surrogate:										
Dibromofluoromethane					*105*	*105*	*75-127*			
Toluene-d8					*104*	*104*	*80-127*			
4-Bromofluorobenzene					*107*	*109*	*78-125*			

Date of Report: November 23, 2022
Samples Submitted: November 16, 2022
Laboratory Reference: 2211-232
Project: 21-1-22242-112

DIESEL AND HEAVY OIL RANGE ORGANICS
NWTPH-Dx

Matrix: Water
Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-2-19:11152022**					
Laboratory ID:	11-232-02					
Diesel Range Organics	**ND**	0.21	NWTPH-Dx	11-21-22	11-21-22	
Lube Oil Range Organics	**ND**	0.21	NWTPH-Dx	11-21-22	11-21-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*124*	*50-150*				
Client ID:	**MW-7-22:11152022**					
Laboratory ID:	11-232-03					
Diesel Range Organics	**ND**	0.21	NWTPH-Dx	11-21-22	11-21-22	
Lube Oil Range Organics	**0.22**	0.21	NWTPH-Dx	11-21-22	11-21-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*121*	*50-150*				
Client ID:	**MW-8-22:11152022**					
Laboratory ID:	11-232-04					
Diesel Range Organics	**ND**	0.20	NWTPH-Dx	11-21-22	11-21-22	
Lube Oil Range Organics	**ND**	0.20	NWTPH-Dx	11-21-22	11-21-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*100*	*50-150*				
Client ID:	**MW-6-22:11152022**					
Laboratory ID:	11-232-05					
Diesel Range Organics	**ND**	0.20	NWTPH-Dx	11-21-22	11-21-22	
Lube Oil Range Organics	**ND**	0.20	NWTPH-Dx	11-21-22	11-21-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*109*	*50-150*				
Client ID:	**MW-9-22:11152022**					
Laboratory ID:	11-232-06					
Diesel Range Organics	**ND**	0.21	NWTPH-Dx	11-21-22	11-21-22	
Lube Oil Range Organics	**ND**	0.21	NWTPH-Dx	11-21-22	11-21-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*94*	*50-150*				
Client ID:	**MW-100:11152022**					
Laboratory ID:	11-232-07					
Diesel Range Organics	**ND**	0.21	NWTPH-Dx	11-21-22	11-21-22	
Lube Oil Range Organics	**ND**	0.21	NWTPH-Dx	11-21-22	11-21-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*78*	*50-150*				

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DIESEL AND HEAVY OIL RANGE ORGANICS
NWTPH-Dx
QUALITY CONTROL

Matrix: Water
Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1121W1					
Diesel Range Organics	**ND**	0.20	NWTPH-Dx	11-21-22	11-21-22	
Lube Oil Range Organics	**ND**	0.20	NWTPH-Dx	11-21-22	11-21-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*111*	*50-150*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	11-232-02										
	ORIG	DUP									
Diesel Range	**ND**	**ND**	NA	NA		NA		NA	NA	NA	
Lube Oil Range	**ND**	**ND**	NA	NA		NA		NA	NA	NA	
Surrogate:											
o-Terphenyl						*124*	*120*	*50-150*			

Date of Report: November 23, 2022
Samples Submitted: November 16, 2022
Laboratory Reference: 2211-232
Project: 21-1-22242-112

TOTAL ARSENIC
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-2-19:11152022**					
Laboratory ID:	11-232-02					
Arsenic	**ND**	3.3	EPA 200.8	11-18-22	11-18-22	
Client ID:	**MW-7-22:11152022**					
Laboratory ID:	11-232-03					
Arsenic	**ND**	3.3	EPA 200.8	11-18-22	11-18-22	
Client ID:	**MW-8-22:11152022**					
Laboratory ID:	11-232-04					
Arsenic	**6.0**	3.3	EPA 200.8	11-18-22	11-18-22	
Client ID:	**MW-6-22:11152022**					
Laboratory ID:	11-232-05					
Arsenic	**7.3**	3.3	EPA 200.8	11-18-22	11-18-22	
Client ID:	**MW-9-22:11152022**					
Laboratory ID:	11-232-06					
Arsenic	**ND**	3.3	EPA 200.8	11-18-22	11-18-22	
Client ID:	**MW-100:11152022**					
Laboratory ID:	11-232-07					
Arsenic	**ND**	3.3	EPA 200.8	11-18-22	11-18-22	

Date of Report: November 23, 2022
Samples Submitted: November 16, 2022
Laboratory Reference: 2211-232
Project: 21-1-22242-112

TOTAL ARSENIC
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1118WM1					
Arsenic	**ND**	3.3	EPA 200.8	MB	2-7-22	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	11-203-02										
	ORIG	DUP									
Arsenic	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	11-203-02										
	MS	MSD	MS	MSD		MS	MSD				
Arsenic	**117**	**112**	111	111	ND	**105**	**101**	75-125	4	20	

Date of Report: November 23, 2022
Samples Submitted: November 16, 2022
Laboratory Reference: 2211-232
Project: 21-1-22242-112

DISSOLVED ARSENIC
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-2-19:11152022**					
Laboratory ID:	11-232-02					
Arsenic	**ND**	3.0	EPA 200.8	11-16-22	11-18-22	
Client ID:	**MW-7-22:11152022**					
Laboratory ID:	11-232-03					
Arsenic	**ND**	3.0	EPA 200.8	11-16-22	11-18-22	
Client ID:	**MW-8-22:11152022**					
Laboratory ID:	11-232-04					
Arsenic	**5.7**	3.0	EPA 200.8	11-16-22	11-18-22	
Client ID:	**MW-6-22:11152022**					
Laboratory ID:	11-232-05					
Arsenic	**4.6**	3.0	EPA 200.8	11-16-22	11-18-22	
Client ID:	**MW-9-22:11152022**					
Laboratory ID:	11-232-06					
Arsenic	**ND**	3.0	EPA 200.8	11-16-22	11-18-22	
Client ID:	**MW-100:11152022**					
Laboratory ID:	11-232-07					
Arsenic	**ND**	3.0	EPA 200.8	11-16-22	11-18-22	

Date of Report: November 23, 2022
Samples Submitted: November 16, 2022
Laboratory Reference: 2211-232
Project: 21-1-22242-112

DISSOLVED ARSENIC
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1116F1					
Arsenic	**ND**	3.0	EPA 200.8	11-16-22	11-18-22	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	11-232-07										
	ORIG	DUP									
Arsenic	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	11-232-07										
	MS	MSD	MS	MSD		MS	MSD				
Arsenic	**83.8**	**83.8**	80.0	80.0	ND	**105**	**105**	75-125	0	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.

X2 - Sample extract treated with a silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in methods 8260 & 8270, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Y1 - Negative effects of the matrix from this sample on the instrument caused values for this analyte in the bracketing continuing calibration verification standard (CCVs) to be outside of 20% acceptance criteria. Because of this, quantitation limits and sample concentrations should be considered estimates.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Chain of Custody

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: Shannon & Wilson
Project Number: 21-1-22242-112
Project Name: Former Montlake 76 Gas Station
Project Manager: Joseph Sawdey
Sampled by: Mitchell Harfield

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☑ Standard (7 Days)
☐ _____ (other)

Laboratory Number: 11-232

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX (8021 ☐ 8260 ☑)	NWTPH-Gx	NWTPH-Dx (Acid / SG Clean-up ☐) *	Volatiles 8260	Halogenated Volatiles 8260	EDB EPA 8011 (Waters Only)	Semivolatiles 8270/SIM (with low-level PAHs)	PAHs 8270/SIM (low-level)	PCBs 8082	Organochlorine Pesticides 8081	Organophosphorus Pesticides 8270/SIM	Chlorinated Acid Herbicides 8151	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664	Total & dissolved Arsenic by 6020 7471				% Moisture
1	Trip Blanks	11/15/22	0800	water	9		X																				
2	MW-2-19:11152022		1045		9		X		X														X				
3	MW-7-22:11152022		1145		9		X		X														X				
4	MW-8-22:11152022		1250		9		X		X														X				
5	MW-6-22:11152022		1415		9		X		X														X				
6	MW-9-22:1115 2022		1515		9		X		X														X				
7	MW-100:11152022		1630		9		X		X														X				
8	Trip Blanks	11/15	—	W	9		X		No DB																		

	Signature	Company	Date	Time
Relinquished	[signature]	SWI	11/16/22	0900
Received	[signature]	ALPHA	11/16/22	9:55
Relinquished	[signature]	ALPHA	11/16/22	2:13
Received	[signature]	ONE	11/16/22	1413
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions
Lab to filter
* Hold extra volume for analysis with silica gel cleanup. (Initially run w/ o SG cleanup).
Invoice directly to WSDOT Attn: Robyn Boyd BoydRL@wsdot.wa.gov

Data Package: Standard ☐ Level III ☐ Level IV ☐
Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐