MAUL FOSTER ALONGI
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May 30, 2019
Project No. 0747.01.10

Michael R. Warfel, LG, LHG, RG
Washington State Department of Ecology
3190 160th Avenue SE
Bellevue, WA 98008

Re: Quarterly Groundwater Monitoring Results
North Cascade Ford Property, Sedro-Woolley, Washington

Dear Mr. Warfel:

In March 2019, Maul Foster & Alongi, Inc. (MFA) conducted a quarterly groundwater monitoring event at the North Cascade Ford property at 116 West Ferry Street in Sedro-Woolley, Washington (the Property) (see Figure 1), per the Washington State Department of Ecology's request. Results of this event are provided below.

BACKGROUND

The North Cascade Ford Site (the Site) includes the Property as well as an adjacent property to the north, owned by the Burlington Northern Santa Fe Railway Company (see Figures 1 and 2). Previous investigations conducted as part of environmental due diligence, as well as preliminary remedial investigation activities, have identified environmental impacts in four areas of the Site, referred to as Areas of Concern (AOCs) 1 through 4 (Figure 2) (MFA, 2015, 2017).

FIELD PROCEDURES

During the monitoring event, static water levels were measured in all monitoring wells on the Property before groundwater samples were collected (see Table 1). Groundwater-monitoring and -sampling activities were conducted in accordance with industry-standard sampling protocols, using low-flow sampling methods, a peristaltic pump, a YSI water quality meter, a turbidity meter, and disposable tubing. Water quality parameters were recorded on field sampling data sheets (Attachment A). Monitoring well installation details for all monitoring wells on the Property are summarized in the May 2012 site investigation results letter and the August 2017 data gap investigation report (MFA, 2012, 2017).

Consistent with previous sampling events, free product was encountered in monitoring well (MW01) during the monitoring event. An oil interface probe and a disposable bailer were used to measure the free product thickness in the well. Because of the viscosity and adhesive properties of the free product, measurement of the thickness was not achieved. A disposable bailer was used to extract free product before the monitoring well was sampled.

On March 28, 2019, groundwater samples were collected from eight monitoring wells located on the Property. Eight monitoring wells located in AOCs 1, 2 and 4 were sampled: MW01, MW02R, MW03, MW04, MW05, MW06, MW07, and MW08 (Figure 2). A field duplicate sample was collected from monitoring well MW08.

Management of Investigation-Derived Waste

Investigation-derived waste generated during the March 2019 monitoring event was placed in appropriately labeled drums, which are being stored on the Property temporarily, pending off-site disposal.

Laboratory Analysis

Using standard chain-of-custody procedures, groundwater samples were submitted to OnSite Environmental, Inc., of Redmond, Washington. Samples were analyzed for:

- Diesel- and heavy-oil-range organics (DRO and ORO, respectively) by Northwest Total Petroleum Hydrocarbons (NWTPH) method Dx
- Gasoline-range organics (GRO) by NWTPH-Gx
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) by U.S. Environmental Protection Agency method 8021B

RESULTS

Water level measurements and analytical results are summarized in Tables 1 and 2, respectively. The laboratory analytical report is included as Attachment B. A data validation memorandum summarizing data evaluation procedures, usability of data, and deviations from field and/or laboratory methods, is presented as Attachment C. Analytical data and the laboratory's internal quality assurance and quality control data were reviewed to ensure that they meet data quality objectives. The data were validated and are considered acceptable for their intended use, with the appropriate qualifiers assigned.

During the sampling event, groundwater was encountered between 5.73 and 7.95 feet below ground surface (see Table 1). Water levels were higher during this sampling event than in the previous events in October and December 2018 (see Table 1). Generally, the highest water levels at the Property have been measured in the spring.

Potentiometric surface maps are provided as Figure 3. Groundwater elevation measurements taken during this event indicated that groundwater flow direction varied across the Property, with components of flow to the northeast, northwest, southeast, and southwest, consistent with previous monitoring events (MFA, 2019).

AOC 1: Auto Repair Shop

Five groundwater samples, including one field duplicate, from four monitoring wells (MW01, MW05, MW07, and MW08) were analyzed for GRO, DRO, and ORO. GRO was detected in MW01 and MW05 at 370 micrograms per liter (ug/L) and 600 ug/L, respectively (see Table 2). These samples were qualified as estimated values, as discussed in the data validation memorandum (Attachment C). DRO and ORO were detected in four samples from three monitoring wells MW01, MW05, and MW08. The highest concentrations of DRO and ORO were detected in MW01, at 2,400 ug/L and 2,200 ug/L, respectively.

The detections of DRO and ORO in samples from monitoring wells MW01, MW05, and MW08 were above their respective Model Toxics Control Act (MTCA) Method A cleanup levels (CULs), with the exception of ORO in the field duplicate collected at MW08. GRO, DRO, and ORO were not detected in the samples from monitoring well MW07.

AOC 2: Former Underground Storage Tanks

Three groundwater samples from three monitoring wells (MW02R, MW04, and MW06) were analyzed for DRO and ORO. Monitoring well MW06 was also analyzed for GRO. Concentrations of DRO and ORO were detected in MW02R, at 680 ug/L and 470 ug/L, respectively (see Table 2). No detections of DRO or ORO were identified in samples collected from MW04 or MW06, and GRO was not detected at MW06.

DRO detected at MW02R were above the MTCA Method A CUL, while ORO were detected below the MTCA Method A CUL. This is the second quarterly event where DRO exceeded the CUL and indicates contaminant rebound in this area.

AOC 3: Former Coal Storage Sheds/Possible Buried Object

There are no groundwater monitoring wells in AOC 3.

AOC 4: Former Auto Services

One groundwater sample from MW03 was analyzed for GRO and BTEX; no analytes were detected. This is the fourth consecutive sampling event where CULs have not been exceeded and this AOC is considered closed and requires no further actions.

SUMMARY

Comparison of the March 2019 monitoring results to previous monitoring events indicates the following:

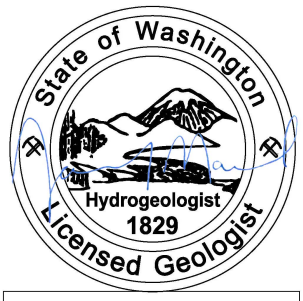
- Free product remains in MW01

- Localized groundwater flow variations, especially beneath the auto sales and service building, likely are influenced by variabilities of the subsurface soil and hydrogeologic conditions at the Property.
- AOC 1: DRO and ORO concentrations remain above MTCA Method A CULs in monitoring wells MW01, MW05, and MW08, consistent with previous observations.
- AOC 2: DRO was detected above the MTCA Method A CUL in monitoring well MW02R. Previously, DRO was detected in MW02R below the MTCA Method A CUL. ORO was detected at MW02R below the MTCA Method A CUL and was not detected in MW04 and MW06, consistent with previous observations.
- AOC 4: GRO and BTEX were not detected at monitoring well MW03.

If you have any questions, please feel free to contact either of us.

Sincerely,

Maul Foster & Alongi, Inc.



James J. Maul, LHG
Principal Hydrogeologist

Carolyn R. Wise, GIT
Project Geologist

Attachments: Limitations
References
Tables
Figures
A—Field Sampling Data Sheets
B—Laboratory Analytical Report
C—Data Validation Memorandum

cc: Holly Stafford, Chmelik, Sitkin & Davis P.S.
Larry Setchell, Helsell Fetterman, LLP

LIMITATIONS

The services undertaken in completing this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

REFERENCES

MFA. 2012. Letter (re: May 2012 site investigation results, North Cascade Ford property, Sedro-Woolley, Washington) to F. Chmelik, Chmelik, Sitkin, & Davis, PS, from H. Hirsch and J. Maul, Maul Foster & Alongi, Inc., Bellingham, Washington. July 30.

MFA. 2015. Preliminary remedial investigation and feasibility study, North Cascade Ford property, Sedro-Woolley, Washington. Maul Foster & Alongi, Inc., Bellingham, Washington. December 9.

MFA. 2017. Letter (re: 2016 data gap investigation results, North Cascade Ford property, Sedro-Woolley, Washington) to L. Setchell, Helsell Fetterman LLP, from H. Good and J. Clary, Maul Foster & Alongi, Inc., Bellingham, Washington. January 24.

MFA. 2019. Letter (re: Quarterly Groundwater Monitoring Results, North Cascade Ford Property, Sedro-Woolley, Washington. Maul Foster & Alongi, Inc., Bellingham, Washington. April 11.

TABLES

Table 1
Water Level Measurements
VSF Properties, LLC, North Cascade Ford Property
Sedro-Woolley, Washington

Location	MP Elevation (feet, NAVD 88)	Measurement Date	NAPL Thickness (feet)	Depth to Water (feet)	NAPL-Corrected Depth to Water (feet)[a]	Groundwater Elevation (feet, NAVD 88)
MW01	56.09	05/15/2012	--	5.61	NA	50.48
		10/09/2012	--	9.87	NA	46.22
		12/03/2012	--	6.96	NA	49.13
		04/10/2014	NM[b]	NM[b]	NA	NM[b]
		06/17/2014	NM[c]	6.01	NA	50.16
		06/18/2014	--	6.09	NA	50.00
		09/10/2014	NM[c]	7.74	NA	48.43
		12/10/2014	0.01[d]	6.09	6.08	50.09
		04/26/2017	--	5.35	NA	50.74
		05/31/2017	--	5.96	NA	50.13
		10/17/2018	0.02	9.70	9.69	46.40
		12/06/2018	NM[e]	NA[e]	NA[e]	NA[e]
		03/28/2019	NM[e]	NA[e]	NA[e]	NA[e]
MW02 (decommissioned in September 2016)	56.73	05/15/2012	--	6.65	NA	50.08
		10/09/2012	--	9.29	NA	47.44
		12/03/2012	--	8.45	NA	48.28
		04/10/2014	--	6.12	NA	50.61
		06/17/2014	--	6.96	NA	49.77
		06/18/2014	--	6.98	NA	49.75
		09/10/2014	--	8.37	NA	48.36
		12/10/2014	--	7.11	NA	49.62

Table 1
Water Level Measurements
VSF Properties, LLC, North Cascade Ford Property
Sedro-Woolley, Washington

Location	MP Elevation (feet, NAVD 88)	Measurement Date	NAPL Thickness (feet)	Depth to Water (feet)	NAPL-Corrected Depth to Water (feet)[a]	Groundwater Elevation (feet, NAVD 88)
MW02R (replacement well for MW02)	56.59	04/26/2017	--	6.60	NA	49.99
		05/31/2017	--	7.07	NA	49.52
		10/17/2018	--	9.90	NA	46.69
		12/06/2018	--	8.80	NA	47.79
		03/28/2019	--	7.60	NA	48.99
MW03	55.08	05/15/2012	--	5.40	NA	49.68
		10/09/2012	--	8.11	NA	46.97
		12/03/2012	--	5.28	NA	49.80
		04/10/2014	--	5.00	NA	50.08
		06/17/2014	--	5.66	NA	49.42
		06/18/2014	--	5.87	NA	49.21
		09/10/2014	--	6.94	NA	48.14
		12/10/2014	--	5.10	NA	49.98
		05/31/2017	--	5.75	NA	49.33
		10/17/2018	--	7.72	NA	47.36
		12/06/2018	--	5.92	NA	49.16
		03/28/2019	--	5.73	NA	49.35
MW04	56.32	04/26/2017	--	6.39	NA	49.93
		05/31/2017	--	6.88	NA	49.44
		10/17/2018	--	10.23	NA	46.09
		12/06/2018	--	8.62	NA	47.70
		03/28/2019	--	7.40	NA	48.92

Table 1
Water Level Measurements
VSF Properties, LLC, North Cascade Ford Property
Sedro-Woolley, Washington

Location	MP Elevation (feet, NAVD 88)	Measurement Date	NAPL Thickness (feet)	Depth to Water (feet)	NAPL-Corrected Depth to Water (feet)[a]	Groundwater Elevation (feet, NAVD 88)
MW05	56.25	04/26/2017	--	5.76	NA	50.49
		05/31/2017	--	6.35	NA	49.90
		10/17/2018	--	NA[f]	NA[f]	NA[f]
		12/06/2018	--	8.05	NA	48.20
		03/28/2019	--	6.93	NA	49.32
MW06	56.58	04/26/2017	--	7.66	NA	48.92
		05/31/2017	--	8.06	NA	48.52
		10/17/2018	--	10.60	NA	45.98
		12/06/2018	--	9.10	NA	47.48
		03/28/2019	--	5.73	NA	50.85
MW07	56.46	04/26/2017	--	7.85	NA	48.61
		05/31/2017	--	8.02	NA	48.44
		10/17/2018	--	9.25	NA	47.21
		12/06/2018	--	9.15	NA	47.31
		03/28/2019	--	7.95	NA	48.51
MW08	56.48	04/26/2017	--	7.38	NA	49.10
		05/31/2017	--	8.01	NA	48.47
		10/17/2018	--	10.05	NA	46.43
		12/06/2018	--	9.02	NA	47.46
		03/28/2019	--	6.85	NA	49.63

Table 1
Water Level Measurements
VSF Properties, LLC, North Cascade Ford Property
Sedro-Woolley, Washington

NOTES:

-- = NAPL not observed.

Max = maximum.

Min = minimum.

MP = measuring point.

NA = not applicable.

NAPL = nonaqueous-phase liquid.

NAVD 88 = North American Vertical Datum of 1988.

NM = not measured.

[a]Water level corrected for presence of NAPL, using assumed product density of 0.8 gram per cubic centimeter.

[b]NAPL was observed, but interface probe was not available to measure NAPL thickness and water level.

[c]NAPL was observed on probe and tubing, but measurable and extractable quantity was not present.

[d]NAPL thickness was measured, but extractable quantity was not present.

[e]NAPL was present, coating entire probe tip and tubing; coated probe tip prevented measurement of thickness or water level.

[f]Water level may not be representative of groundwater elevation because screened interval was above low water table.

Table 2
Groundwater Analytical Results (ug/L)
VSF Properties, LLC, North Cascade Ford Property
Sedro-Woolley, Washington

AOC	Location	Sample Name	Collection Date:	Collection Depth (ft bgs)[a]	Benzene	Ethylbenzene	Toluene	m,p-Xylene	o-Xylene	Xylenes[b]	Gasoline-Range Organics	Diesel-Range Organics	Heavy-Oil-Range Organics
				MTCA Method A Cleanup Level	5	700	1,000	NV	NV	1,000	800[b]	500	500
1	MW01	MW1-W-8.5	05/15/2012	5.61-13.44	**0.3**	0.2 U	0.2 U	0.4 U	0.4 U	0.4 U	**400**	**1300**	**240**
		FIELD DUPLICATE			**0.3**	0.2 U	0.2 U	0.4 U	0.4 U	0.4 U	**380**	**1200**	**220**
		MW01-GW-20121019	10/09/2012	9.87-13.44	--	--	--	--	--	--	--	**1800**	**490**
		MW01	04/10/2014	NM	0.2 U	0.2 U	0.2 U	0.4 U	0.4 U	0.4 U	250 U	**1700**	**870**
		MWDUP			0.2 U	0.2 U	0.2 U	0.4 U	0.4 U	0.4 U	250 U	**1600**	**930**
		MW01-GW-140618	06/18/2014	6.09-13.45	--	--	--	--	--	--	--	**1400**	**310**
		FD-GW-140618			--	--	--	--	--	--	--	**1700**	**350**
		MW01-GW-091014	09/10/2014	7.74-13.44	--	--	--	--	--	--	--	**1300**	**300**
		FD-091014			--	--	--	--	--	--	--	**1400**	**390**
		MW01-GW-121014	12/10/2014	6.08-13.46	--	--	--	--	--	--	--	**2400**	**1400**
		FD-121014			--	--	--	--	--	--	--	**1900**	**1200**
		MW01-GW-112816	11/28/2016	6.12-13.43	--	--	--	--	--	--	--	**1300**	610 U
		MWDUP-GW-112816			--	--	--	--	--	--	--	**1300**	590 U
		MW01-GW-042617	04/26/2017	5.35-13.40	--	--	--	--	--	--	100 U	**620**	**510 J**
		MWDUP-GW-042617			--	--	--	--	--	--	100 U	**560**	410 U
		MW01-GW-101718	10/17/2018	9.70-13.40	--	--	--	--	--	--	500 U	**900**	**1500**
		MW01-GW-032819	03/28/2019	6.82-13.41	--	--	--	--	--	--	**370 J**	**2400**	**2200**
	MW05	MW05-GW-042617	04/26/2017	5.76-10.60	--	--	--	--	--	--	**490**	**1300**	**1100**
		MW05-GW-032819	03/28/2019	6.93-10.63	--	--	--	--	--	--	**600 J**	**1500**	**460**
	MW07	MW07-GW-042617	04/26/2017	7.85-19.74	--	--	--	--	--	--	100 U	260 U	410 U
		MW07-GW-101718	10/17/2018	9.25-19.74	--	--	--	--	--	--	100 U	250 U	400 U
		MW07-GW-032819	03/28/2019	7.95-19.74	--	--	--	--	--	--	100 U	250 U	410 U
	MW08	MW08-GW-042617	04/26/2017	7.38-15.80	--	--	--	--	--	--	400 U	**1000**	**690**
		MW08-GW-101718	10/17/2018	10.05-15.80	--	--	--	--	--	--	100 U	**700**	**580**
		MWDUP-GW-101718			--	--	--	--	--	--	500 U	**780**	**970**
		MW08-GW-032819	03/28/2019	6.85-15.82	--	--	--	--	--	--	100 U	**950**	**460**
		MWDUP-GW-032819			--	--	--	--	--	--	100 U	**1000**	**510**
2	MW02 (decommissioned in September 2016)	MW2-W-9	05/16/2012	6.65-13.85	0.2 U	0.2 U	0.2 U	0.4 U	0.4 U	0.4 U	250 U	**1900**	**240**
		MW02-GW-20121019	10/09/2012	9.29-13.84	--	--	--	--	--	--	--	**690**	200 U
		MW02	04/10/2014	6.12-13.81	--	--	--	--	--	--	--	**11000**	**1300**
		MW02-GW-140618	06/18/2014	6.98-13.80	--	--	--	--	--	--	--	**3800**	**410**
		MW02-GW-091014	09/10/2014	8.37-13.84	--	--	--	--	--	--	--	**770**	200 U
		MW02-GW-121014	12/10/2014	7.11-13.85	--	--	--	--	--	--	--	**1300**	**410**
	MW02R (replacement well for MW02)	MW02R-GW-042617	04/26/2017	6.60-14.80	--	--	--	--	--	--	--	**750**	410 U
		MW02R-GW-101718	10/17/2018	9.90-14.80	--	--	--	--	--	--	--	**480**	**450**
		MW02R-GW-032819	03/28/2019	7.60-14.79	--	--	--	--	--	--	--	**680**	**470**

Table 2
Groundwater Analytical Results (ug/L)
VSF Properties, LLC, North Cascade Ford Property
Sedro-Woolley, Washington

AOC	Location	Sample Name	Collection Date:	Collection Depth (ft bgs)[a]	Benzene	Ethylbenzene	Toluene	m,p-Xylene	o-Xylene	Xylenes[b]	Gasoline-Range Organics	Diesel-Range Organics	Heavy-Oil-Range Organics
				MTCA Method A Cleanup Level	5	700	1,000	NV	NV	1,000	800[b]	500	500
2	MW04	MW04-GW-042617	04/26/2017	6.39-13.60	--	--	--	--	--	--	--	**260**	**450**
		MW04-GW-101718	10/17/2018	10.23-13.60	--	--	--	--	--	--	--	250 U	420 U
		MW04-GW-032819	03/28/2019	7.40-13.58	--	--	--	--	--	--	--	260 U	410 U
	MW06	MW06-GW-042617	04/26/2017	7.66-19.74	--	--	--	--	--	--	--	260 U	410 U
		MW06-GW-101718	10/17/2018	10.6-19.74	--	--	--	--	--	--	100 U	250 U	400 U
		MW06-GW-032819	03/28/2019	5.73-13.88	--	--	--	--	--	--	100 U	260 U	410 U
4	MW03	MW3-W-9	05/15/2012	5.40-13.85	0.2 U	0.2 U	0.2 U	0.4 U	0.4 U	0.4 U	250 U	--	--
		MW03-GW-121009	10/09/2012	8.11-13.85	**0.19 J**	0.2 U	0.2 U	0.4 U	0.4 U	0.4 U	250 U	**360**	**260**
		FD-GW-20121019			**0.2**	0.2 U	0.2 U	0.4 U	0.4 U	0.4 U	250 U	**310**	**200**
		MW03	04/10/2014	5.00-13.85	--	--	--	--	--	--	--	**340**	**370**
		MW03-GW-140618	06/18/2014	5.87-13.83	--	--	--	--	--	--	--	**320**	200 U
		MW03-GW-091014	09/10/2014	6.94-13.85	--	--	--	--	--	--	--	**210**	200 U
		MW03-GW-121014	12/10/2014	5.10-13.84	--	--	--	--	--	--	--	**210**	**300**
		MW03-GW-120718	12/07/2018	5.92-13.89	1 U	1 U	1 U	1 U	1 U	1 U	100 U	--	--
		MWDUP-GW-120718		5.92-13.89	1 U	1 U	1 U	1 U	1 U	1 U	100 U	--	--
		MW03-GW-032819	03/28/2019	5.73-13.88	1 U	1 U	1 U	1 U	1 U	1 U	100 U	--	--

NOTES:

CUL exceedances highlighted.

Detected concentrations are compared to MTCA Method A CULs for groundwater.

Detections in **bold.**

-- = not analyzed.

AOC = area of concern.

CUL = cleanup level.

ft bgs = feet below ground surface.

J = result is an estimated value.

MTCA = Model Toxics Control Act.

NM = Because of unanticipated presence of free product, water level not measured.

NV = no value.

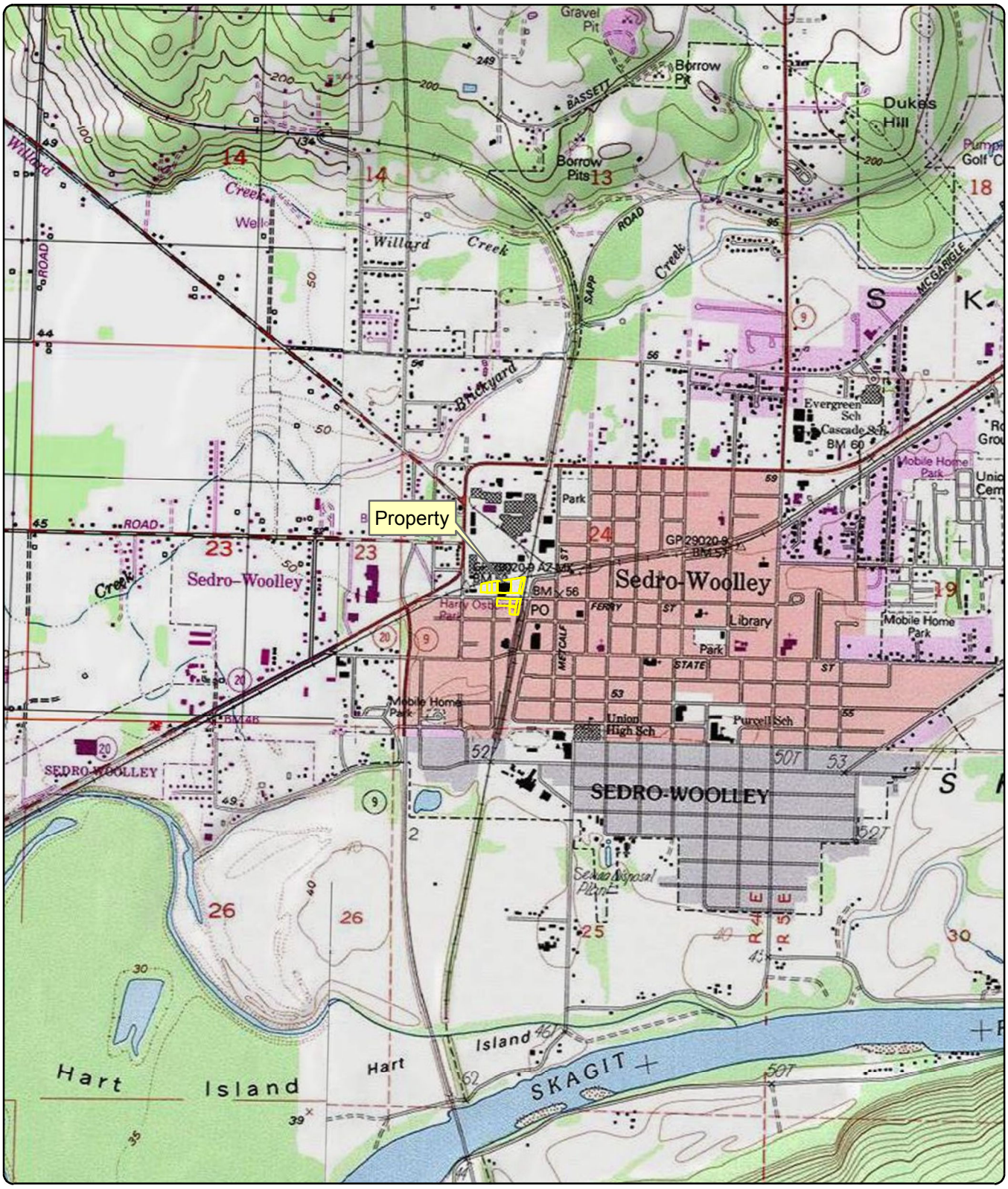
U = Analyte not detected at or above method reporting limit.

ug/L = micrograms per liter (parts per billion).

[a]Sample collection depths are from top of water table or top of screened interval, whichever is deeper, to bottom of screened interval.

[b]Total xylenes are sum of m,p-xylene and o-xylene. When both results are non-detect, the higher reporting limit is used.

FIGURES



Property Address: 116 W Ferry Street, Sedro-Woolley, Washington
Source: US Geological Survey (1990) 7.5-minute topographic quadrangle: Sedro-Woolley North
Section 24, Township 35 North, Range 4 East

Legend

Property Parcel

Figure 1
Property Location

VSF Properties, LLC
North Cascade Ford Property
Sedro-Woolley, Washington

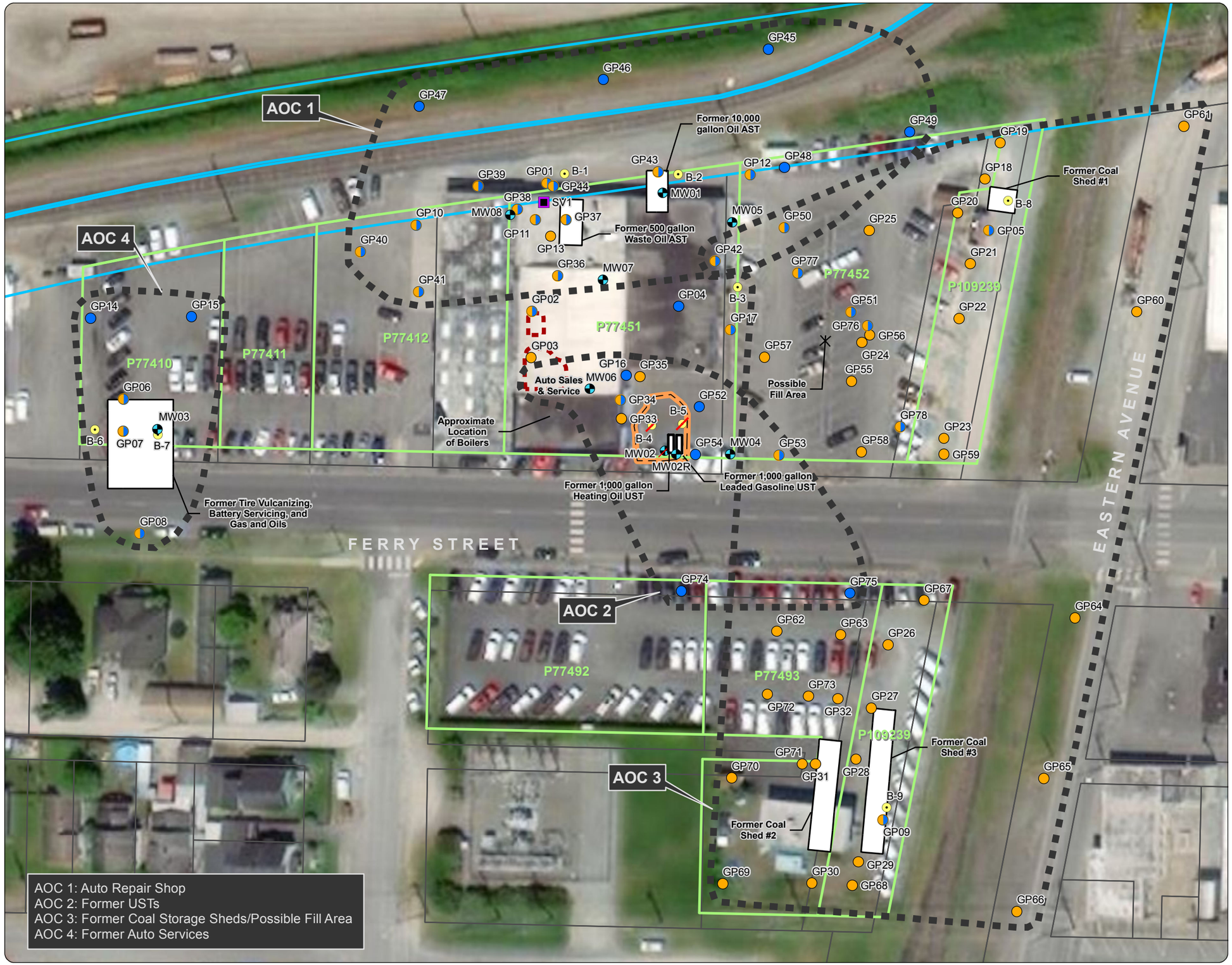
0 1,000 2,000
Feet

MAUL FOSTER ALONGI
p. 971 544 2139 | www.maulfoster.com

Path: X:\0747.01\Projects\0203\Fig1_PropertyLocation.mxd
Print Date: 1/24/2019
Approved By: H. Good
Produced By: abixby
Project: 0747.01.06

Figure 2
Site Features and Areas of Concern

VSF Properties, LLC
North Cascade Ford Property
Sedro-Woolley, Washington



AOC 1: Auto Repair Shop
AOC 2: Former USTs
AOC 3: Former Coal Storage Sheds/Possible Fill Area
AOC 4: Former Auto Services

Legend

- UST Removal Excavation Area
- Hoist Removal Excavation Area
- Property Parcel
- BNSF-owned Parcel
- Sub-slab Soil Vapor Probe
- Monitoring Well Location
- Monitoring Well Location (decommissioned)
- Phase II ESA Boring Location
- Phase II ESA Boring Location (soil removed)
- MFA Boring, Groundwater
- MFA Boring, Soil
- MFA Boring, Soil and Groundwater

NOTES:
AOC boundaries represent the extent of investigation locations included in the assessment of environmental impacts associated with potential releases in each AOC and are not necessarily representative of the extent of contamination associated with each AOC.
The surveyed Property parcel boundaries do not coincide with the adjacent parcel boundaries obtained from Skagit County; therefore, there is an overlap between the Property and BNSF parcels.
AOC = area of concern.
AST = aboveground storage tank.
BNSF = Burlington Northern Santa Fe Railway.
ESA = environmental site assessment.
MFA = Maul Foster & Alongi, Inc.
Property = North Cascade Ford Property.
UST = underground storage tank.

0 30 60
Feet

Source: Aerial photograph obtained from ArcGIS Online. Property parcel boundaries surveyed by Wilson Engineering, LLC. Adjacent parcel boundaries obtained from Skagit County.

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Path: X:\0747.01\Projects\02\03\Fig2_SiteFeatures_AOCs.mxd
Print Date: 1/31/2019
Approved By: H. Good
Produced By: abixby
Project: 0747.01.07

Figure 3
Groundwater Elevation Contours - March 2019

VSF Properties, LLC
North Cascade Ford Property
Sedro-Woolley, Washington

MW08
49.63 ft

MW01
NA

MW05
49.32 ft

MW07
48.51 ft

MW06
50.85 ft

MW03
49.35 ft

MW04
48.92 ft

MW02R
48.99 ft

49.0 ft
49.2 ft
50.4 ft
50.2 ft
50.0 ft
49.8 ft
49.6 ft
49.4 ft

FERRY STREET

Legend

- Monitoring Well Location
- Property Parcel
- BNSF-owned Parcel
- Groundwater Elevation Contour (feet NAVD 88; 0.2-foot interval)
- Groundwater Flow Direction

Notes:
The surveyed Property parcel boundaries do not coincide with the adjacent parcel boundaries obtained from Skagit County; therefore, there is an overlap between the Property and BNSF parcels.
Water levels measured on March 28, 2019.
BNSF = Burlington Northern Santa Fe Railway.
ft = feet.
NA = not available. Thick, viscous free product adhered to the oil-water interface probe sensor and prevented the probe from reading the water level.
NAVD = North American Vertical Datum of 1988.

0 25 50
Feet

Source: Aerial photograph obtained from Esri ArcGIS Online; Property parcel boundaries surveyed by Wilson Engineering, LLC. Adjacent parcel boundaries obtained from Skagit County.

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Path: X:\0747.01\Projects\10\Fig3_GroundwaterElevationContours_Mar2019.mxd
Print Date: 4/29/2019
Approved By: C. Wise
Produced By: abixby
Project: 0747.01.06

ATTACHMENT A

FIELD SAMPLING DATA SHEETS

Maul Foster & Alongi, Inc.

109 East 13th Street, Vancouver, WA 98660 (360) 694-2691 Fax. (360) 906-1

Water Field Sampling Data Sheet

Client Name	VSF Properties, LLC	**Sample Location**	MW-01		
Project #	0747.01.10	**Sampler**	R. Lewis		
Project Name	North Cascade Ford	**Sampling Date**	3/28/2019		
Sampling Event	March 2019	**Sample Name**	MW01-GW-032819		
Sub Area		**Sample Depth**	10.1		
FSDS QA:	A. Bixby 04/01/19	**Easting**		**Northing**	**TOC**

Hydrology/Level Measurements

					(Product Thickness)	(Water Column)	(Gallons/ft x Water Column)
Date	**Time**	**DT-Bottom**	**DT-Product**	**DT-Water**	**DTP-DTW**	**DTB-DTW**	**Pore Volume**
3/28/2019	12:30	13.41	6.82				1.1

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	**Time**	**Purge Vol (gal)**	**Flowrate l/min**	**pH**	**Temp (C)**	**E Cond (uS/cm)**	**DO (mg/L)**	**ORP**	**Turbidity**
(2) Peristaltic Pump									
Final Field Parameters									

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations:

Black, viscous free product present; sheen on water; strong hydrocarbon-like odor.

Sample Information

Sampling Method	**Sample Type**	**Sampling Time**	**Container Code/Preservative**	**#**	**Filtered**
(2) Peristaltic Pump	Groundwater	1:00:00 PM	VOA-Glass	3	No
			Amber Glass	2	No
			White Poly		
			Yellow Poly		
			Green Poly		
			Red Total Poly		
			Red Dissolved Poly		
			Total Bottles	5	

General Sampling Comments

Well contained black, viscous free product. Product adhered to interface probe tip; unable to measure depth to water. Removed approximately 2.5 gallons of water mixed with product prior to collecting a grab sample.

Maul Foster & Alongi, Inc.

109 East 13th Street, Vancouver, WA 98660 (360) 694-2691 Fax. (360) 906-1

Water Field Sampling Data Sheet

Client Name	VSF Properties, LLC	**Sample Location**	MW-02R
Project #	0747.01.10	**Sampler**	R. Lewis
Project Name	North Cascade Ford	**Sampling Date**	3/28/2019
Sampling Event	March 2019	**Sample Name**	MW02R-GW-032819
Sub Area		**Sample Depth**	11.2
FSDS QA:	A. Bixby 04/01/19	**Easting**	**Northing**	**TOC**

Hydrology/Level Measurements

					(Product Thickness)	(Water Column)	(Gallons/ft x Water Column)
Date	**Time**	**DT-Bottom**	**DT-Product**	**DT-Water**	**DTP-DTW**	**DTB-DTW**	**Pore Volume**
3/28/2019	8:50	14.79		7.6		7.19	1.2

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	**Time**	**Purge Vol (gal)**	**Flowrate l/min**	**pH**	**Temp (C)**	**E Cond (uS/cm)**	**DO (mg/L)**	**ORP**	**Turbidity**
(2) Peristaltic Pump	10:10:00 AM	1	0.3	7.7	11.61	372	2.33	-90.9	8.92
	10:15:00 AM	1.2	0.3	7.65	11.55	370	2.28	-95.7	8.84
Final Field Parameters	10:20:00 AM	1.4	0.3	7.68	11.53	367	2.25	-97.3	6.6

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations: Clear; no odor; no sheen.

Sample Information

Sampling Method	**Sample Type**	**Sampling Time**	**Container Code/Preservative**	**#**	**Filtered**
(2) Peristaltic Pump	Groundwater	10:30:00 AM	VOA-Glass	3	No
			Amber Glass	2	No
			White Poly		
			Yellow Poly		
			Green Poly		
			Red Total Poly		
			Red Dissolved Poly		
			Total Bottles	5	

General Sampling Comments Began purge at 09:50.

Maul Foster & Alongi, Inc.

109 East 13th Street, Vancouver, WA 98660 (360) 694-2691 Fax. (360) 906-1

Water Field Sampling Data Sheet

Client Name	VSF Properties, LLC	**Sample Location**	MW-03
Project #	0747.01.10	**Sampler**	R. Lewis
Project Name	North Cascade Ford	**Sampling Date**	3/28/2019
Sampling Event	March 2019	**Sample Name**	MW03-GW-032819
Sub Area		**Sample Depth**	11
FSDS QA:	A. Bixby 04/01/19	**Easting**	**Northing**	**TOC**

Hydrology/Level Measurements

					(Product Thickness)	(Water Column)	(Gallons/ft x Water Column)
Date	**Time**	**DT-Bottom**	**DT-Product**	**DT-Water**	**DTP-DTW**	**DTB-DTW**	**Pore Volume**
3/28/2019	9:40	13.88		5.73		8.15	1.3

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	**Time**	**Purge Vol (gal)**	**Flowrate l/min**	**pH**	**Temp (C)**	**E Cond (uS/cm)**	**DO (mg/L)**	**ORP**	**Turbidity**
(2) Peristaltic Pump	11:20:00 AM	1.5	0.3	8.39	12.58	164	2.26	-210.9	17.3
	11:40:00 AM	2	0.3	7.51	13.15	171	1.7	-191.6	17.5
	11:45:00 AM	2.3	0.3	7.48	13.2	170	1.72	-191.9	17.2
Final Field Parameters	11:50:00 AM	2.6	0.3	7.43	13.22	172	1.68	-193.4	16.9

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations: Clear; no odor; no sheen.

Sample Information

Sampling Method	**Sample Type**	**Sampling Time**	**Container Code/Preservative**	**#**	**Filtered**
(2) Peristaltic Pump	Groundwater	11:55:00 AM	VOA-Glass	3	No
			Amber Glass	2	No
			White Poly		
			Yellow Poly		
			Green Poly		
			Red Total Poly		
			Red Dissolved Poly		
			Total Bottles	5	

General Sampling Comments Began purge at 10:50.

Maul Foster & Alongi, Inc.

109 East 13th Street, Vancouver, WA 98660 (360) 694-2691 Fax. (360) 906-1

Water Field Sampling Data Sheet

Client Name	VSF Properties, LLC	**Sample Location**	MW-04				
Project #	0747.01.10	**Sampler**	R. Lewis				
Project Name	North Cascade Ford	**Sampling Date**	3/28/2019				
Sampling Event	March 2019	**Sample Name**	MW04-GW-032819				
Sub Area		**Sample Depth**	10.5				
FSDS QA:	A. Bixby 04/01/19	**Easting**		**Northing**		**TOC**	

Hydrology/Level Measurements

					(Product Thickness)	(Water Column)	(Gallons/ft x Water Column)
Date	**Time**	**DT-Bottom**	**DT-Product**	**DT-Water**	**DTP-DTW**	**DTB-DTW**	**Pore Volume**
3/28/2019	8:40	13.58		7.4		6.18	1

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	**Time**	**Purge Vol (gal)**	**Flowrate l/min**	**pH**	**Temp (C)**	**E Cond (uS/cm)**	**DO (mg/L)**	**ORP**	**Turbidity**
(2) Peristaltic Pump	9:15:00 AM	1.5	0.3	7.6	12.21	439	3	62	5.22
	9:20:00 AM	1.8	0.3	7.7	12.24	435	2.93	60.7	5.28
Final Field Parameters	9:25:00 AM	2.1	0.3	7.68	12.28	434	3.01	60.1	4.23

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations: Clean; no odor; no sheen

Sample Information

Sampling Method	**Sample Type**	**Sampling Time**	**Container Code/Preservative**	**#**	**Filtered**
(2) Peristaltic Pump	Groundwater	9:30:00 AM	VOA-Glass	3	No
			Amber Glass	2	No
			White Poly		
			Yellow Poly		
			Green Poly		
			Red Total Poly		
			Red Dissolved Poly		
			Total Bottles	5	

General Sampling Comments Began purge at 08:50.

Maul Foster & Alongi, Inc.

109 East 13th Street, Vancouver, WA 98660 (360) 694-2691 Fax. (360) 906-1

Water Field Sampling Data Sheet

Client Name	VSF Properties, LLC	**Sample Location**	MW-05		
Project #	0747.01.10	**Sampler**	R. Lewis		
Project Name	North Cascade Ford	**Sampling Date**	3/28/2019		
Sampling Event	March 2019	**Sample Name**	MW05-GW-032819		
Sub Area		**Sample Depth**	8.8		
FSDS QA:	A. Bixby 04/01/19	**Easting**		**Northing**	**TOC**

Hydrology/Level Measurements

					(Product Thickness)	(Water Column)	(Gallons/ft x Water Column)
Date	**Time**	**DT-Bottom**	**DT-Product**	**DT-Water**	**DTP-DTW**	**DTB-DTW**	**Pore Volume**
3/28/2019	8:30	10.63		6.93		3.7	0.6

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	**Time**	**Purge Vol (gal)**	**Flowrate l/min**	**pH**	**Temp (C)**	**E Cond (uS/cm)**	**DO (mg/L)**	**ORP**	**Turbidity**
(2) Peristaltic Pump	1:45:00 PM	0.4	0.3	7.19	13.47	317	2.39	-149.1	8.55
	1:50:00 PM	0.6	0.3	7.25	13.53	315	2.46	-149	4.46
Final Field Parameters	1:55:00 PM	0.8	0.3	7.15	13.55	314	2.4	-148.8	3.41

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations:

Clear; rainbow sheen; hydrocarbon-like odor

Sample Information

Sampling Method	**Sample Type**	**Sampling Time**	**Container Code/Preservative**	**#**	**Filtered**
(2) Peristaltic Pump	Groundwater	2:00:00 PM	VOA-Glass	3	No
			Amber Glass	2	No
			White Poly		
			Yellow Poly		
			Green Poly		
			Red Total Poly		
			Red Dissolved Poly		
			Total Bottles	5	

General Sampling Comments

Began purge at 13:35.

Maul Foster & Alongi, Inc.

109 East 13th Street, Vancouver, WA 98660 (360) 694-2691 Fax. (360) 906-1

Water Field Sampling Data Sheet

Client Name	VSF Properties, LLC	**Sample Location**	MW-06				
Project #	0747.01.10	**Sampler**	R. Lewis				
Project Name	North Cascade Ford	**Sampling Date**	3/28/2019				
Sampling Event	March 2019	**Sample Name**	MW06-GW-032819				
Sub Area		**Sample Depth**	9.8				
FSDS QA:	A. Bixby 04/01/19	**Easting**		**Northing**		**TOC**	

Hydrology/Level Measurements

					(Product Thickness)	(Water Column)	(Gallons/ft x Water Column)
Date	**Time**	**DT-Bottom**	**DT-Product**	**DT-Water**	**DTP-DTW**	**DTB-DTW**	**Pore Volume**
3/28/2019	9:40	13.88		5.73		8.15	1.3

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	**Time**	**Purge Vol (gal)**	**Flowrate l/min**	**pH**	**Temp (C)**	**E Cond (uS/cm)**	**DO (mg/L)**	**ORP**	**Turbidity**
(2) Peristaltic Pump	4:05:00 PM	1	0.3	6.99	17.4	297	2.8	-139.8	9.95
	4:10:00 PM	1.3	0.3	7.02	17.39	295	2.82	-142	9.78
Final Field Parameters	4:15:00 PM	1.5	0.3	6.98	17.4	292	2.8	-144.1	9.32

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations: Some particulates present in initial purge water. Clear; no odor; no sheen

Sample Information

Sampling Method	**Sample Type**	**Sampling Time**	**Container Code/Preservative**	**#**	**Filtered**
(2) Peristaltic Pump	Groundwater	4:20:00 PM	VOA-Glass	3	No
			Amber Glass	2	No
			White Poly		
			Yellow Poly		
			Green Poly		
			Red Total Poly		
			Red Dissolved Poly		
			Total Bottles	5	

General Sampling Comments Began purge at 15:50.

Maul Foster & Alongi, Inc.

109 East 13th Street, Vancouver, WA 98660 (360) 694-2691 Fax. (360) 906-1

Water Field Sampling Data Sheet

Client Name	VSF Properties, LLC	**Sample Location**	MW-07		
Project #	0747.01.10	**Sampler**	R. Lewis		
Project Name	North Cascade Ford	**Sampling Date**	3/28/2019		
Sampling Event	March 2019	**Sample Name**	MW07-GW-032819		
Sub Area		**Sample Depth**	13.8		
FSDS QA:	A. Bixby 04/01/19	**Easting**		**Northing**	**TOC**

Hydrology/Level Measurements

					(Product Thickness)	(Water Column)	(Gallons/ft x Water Column)
Date	**Time**	**DT-Bottom**	**DT-Product**	**DT-Water**	**DTP-DTW**	**DTB-DTW**	**Pore Volume**
3/28/2019	9:31	19.74		7.95		11.79	1.9

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	**Time**	**Purge Vol (gal)**	**Flowrate l/min**	**pH**	**Temp (C)**	**E Cond (uS/cm)**	**DO (mg/L)**	**ORP**	**Turbidity**
(2) Peristaltic Pump	5:20:00 PM	2.5	0.2	6.97	17.39	447	2.07	-128.1	490
	5:25:00 PM	2.8	0.2	6.94	17.38	451	2.02	-128.4	472
	5:30:00 PM	3.1	0.2	6.93	17.34	452	2.01	-128.6	467
	5:35:00 PM	3.4	0.2	6.93	17.35	457	1.97	-129.7	460
Final Field Parameters	5:50:00 PM	4.6	0.2	6.91	17.35	455	1.96	-129.4	456

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations: Ferrous particulates present in initial purge water. Cloudy; orange hue; no odor; no sheen.

Sample Information

Sampling Method	**Sample Type**	**Sampling Time**	**Container Code/Preservative**	**#**	**Filtered**
(2) Peristaltic Pump	Groundwater	6:00:00 PM	VOA-Glass	3	No
			Amber Glass	2	No
			White Poly		
			Yellow Poly		
			Green Poly		
			Red Total Poly		
			Red Dissolved Poly		
			Total Bottles	5	

General Sampling Comments Began purge at 16:30.

Maul Foster & Alongi, Inc.

109 East 13th Street, Vancouver, WA 98660 (360) 694-2691 Fax. (360) 906-1

Water Field Sampling Data Sheet

Client Name	VSF Properties, LLC	**Sample Location**	MW-08
Project #	0747.01.10	**Sampler**	R. Lewis
Project Name	North Cascade Ford	**Sampling Date**	3/28/2019
Sampling Event	March 2019	**Sample Name**	MW08-GW-032819
Sub Area		**Sample Depth**	11.3
FSDS QA:	A. Bixby 04/01/19	**Easting**	**Northing**	**TOC**

Hydrology/Level Measurements

					(Product Thickness)	(Water Column)	(Gallons/ft x Water Column)
Date	**Time**	**DT-Bottom**	**DT-Product**	**DT-Water**	**DTP-DTW**	**DTB-DTW**	**Pore Volume**
3/28/2019	9:11	15.82		6.85		8.97	1.5

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	**Time**	**Purge Vol (gal)**	**Flowrate l/min**	**pH**	**Temp (C)**	**E Cond (uS/cm)**	**DO (mg/L)**	**ORP**	**Turbidity**
(2) Peristaltic Pump	3:10:00 PM	2.5	0.3	7.64	13.87	556	1.81	-124.3	16.1
	3:15:00 PM	2.9	0.3	7.03	13.77	553	1.79	-122.2	16
	3:20:00 PM	3.3	0.3	7.02	13.77	552	1.76	-124.6	15.2
Final Field Parameters	3:25:00 PM	3.6	0.3	7.02	13.77	553	1.75	-125.1	15.1

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations: Ferrous particulates present in initial purge water. Slightly cloudy; no odor; no sheen

Sample Information

Sampling Method	**Sample Type**	**Sampling Time**	**Container Code/Preservative**	**#**	**Filtered**
(2) Peristaltic Pump	Groundwater	3:30:00 PM	VOA-Glass	6	No
			Amber Glass	3	No
			White Poly		
			Yellow Poly		
			Green Poly		
			Red Total Poly		
			Red Dissolved Poly		
			Total Bottles	9	

General Sampling Comments Began purge at 1425. Collected MWDUP-GW-032819.

ATTACHMENT B

ANALYTICAL LABORATORY REPORT

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

April 8, 2019

Andrew Kaparos
Maul Foster & Alongi, Inc.
Bay Vista Tower
2815 2nd Avenue, Suite 540
Seattle, WA 98121

Re: Analytical Data for Project 0747.01.10
Laboratory Reference No. 1903-290

Dear Andrew:

Enclosed are the analytical results and associated quality control data for samples submitted on March 29, 2019.

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: April 8, 2019
Samples Submitted: March 29, 2019
Laboratory Reference: 1903-290
Project: 0747.01.10

Case Narrative

Samples were collected on March 28, 2019 and received by the laboratory on March 29, 2019. 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: April 8, 2019
Samples Submitted: March 29, 2019
Laboratory Reference: 1903-290
Project: 0747.01.10

GASOLINE RANGE ORGANICS/BTEX
NWTPH-Gx/EPA 8021B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW01-GW-032819**					
Laboratory ID:	03-290-01					
Gasoline	**370**	100	NWTPH-Gx	3-30-19	3-30-19	O
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*80*	*66-117*				
Client ID:	**MW03-GW-032819**					
Laboratory ID:	03-290-03					
Benzene	**ND**	1.0	EPA 8021B	3-30-19	3-30-19	
Toluene	**ND**	1.0	EPA 8021B	3-30-19	3-30-19	
Ethyl Benzene	**ND**	1.0	EPA 8021B	3-30-19	3-30-19	
m,p-Xylene	**ND**	1.0	EPA 8021B	3-30-19	3-30-19	
o-Xylene	**ND**	1.0	EPA 8021B	3-30-19	3-30-19	
Gasoline	**ND**	100	NWTPH-Gx	3-30-19	3-30-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*80*	*66-117*				
Client ID:	**MW05-GW-032819**					
Laboratory ID:	03-290-05					
Gasoline	**600**	100	NWTPH-Gx	3-30-19	3-30-19	O
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*104*	*66-117*				
Client ID:	**MW06-GW-032819**					
Laboratory ID:	03-290-06					
Gasoline	**ND**	100	NWTPH-Gx	3-30-19	3-30-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*103*	*66-117*				
Client ID:	**MW07-GW-032819**					
Laboratory ID:	03-290-07					
Gasoline	**ND**	100	NWTPH-Gx	3-30-19	3-30-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*103*	*66-117*				
Client ID:	**MW08-GW-032819**					
Laboratory ID:	03-290-08					
Gasoline	**ND**	100	NWTPH-Gx	3-30-19	3-30-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*108*	*66-117*				

Date of Report: April 8, 2019
Samples Submitted: March 29, 2019
Laboratory Reference: 1903-290
Project: 0747.01.10

GASOLINE RANGE ORGANICS/BTEX
NWTPH-Gx/EPA 8021B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MWDUP-GW-032819**					
Laboratory ID:	03-290-09					
Gasoline	**ND**	100	NWTPH-Gx	3-30-19	3-30-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*97*	*66-117*				
Client ID:	**Trip Blank**					
Laboratory ID:	03-290-10					
Benzene	**ND**	1.0	EPA 8021B	3-30-19	3-30-19	
Toluene	**ND**	1.0	EPA 8021B	3-30-19	3-30-19	
Ethyl Benzene	**ND**	1.0	EPA 8021B	3-30-19	3-30-19	
m,p-Xylene	**ND**	1.0	EPA 8021B	3-30-19	3-30-19	
o-Xylene	**ND**	1.0	EPA 8021B	3-30-19	3-30-19	
Gasoline	**ND**	100	NWTPH-Gx	3-30-19	3-30-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*88*	*66-117*				

Date of Report: April 8, 2019
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GASOLINE RANGE ORGANICS/BTEX
NWTPH-Gx/EPA 8021B
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0330W1					
Benzene	**ND**	1.0	EPA 8021B	3-30-19	3-30-19	
Toluene	**ND**	1.0	EPA 8021B	3-30-19	3-30-19	
Ethyl Benzene	**ND**	1.0	EPA 8021B	3-30-19	3-30-19	
m,p-Xylene	**ND**	1.0	EPA 8021B	3-30-19	3-30-19	
o-Xylene	**ND**	1.0	EPA 8021B	3-30-19	3-30-19	
Gasoline	**ND**	100	NWTPH-Gx	3-30-19	3-30-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*85*	*66-117*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	03-279-01										
	ORIG	DUP									
Benzene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Toluene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Ethyl Benzene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
m,p-Xylene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
o-Xylene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Gasoline	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Surrogate:											
Fluorobenzene						*79*	*86*	*66-117*			
SPIKE BLANKS											
Laboratory ID:	SB0330W1										
	SB	SBD	SB	SBD		SB	SBD				
Benzene	**46.3**	**47.4**	50.0	50.0		**93**	**95**	82-122	2	11	
Toluene	**44.9**	**46.2**	50.0	50.0		**90**	**92**	83-123	3	12	
Ethyl Benzene	**45.9**	**47.4**	50.0	50.0		**92**	**95**	83-123	3	12	
m,p-Xylene	**46.1**	**47.4**	50.0	50.0		**92**	**95**	83-123	3	12	
o-Xylene	**46.4**	**47.8**	50.0	50.0		**93**	**96**	83-123	3	11	
Surrogate:											
Fluorobenzene						*108*	*105*	*66-117*			

Date of Report: April 8, 2019
Samples Submitted: March 29, 2019
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GASOLINE RANGE ORGANICS
NWTPH-Gx
CONTINUING CALIBRATION SUMMARY

Lab ID	True Value (ppm)	Calc. Value	Percent Difference	Control Limits
CCVD0330G-1	5.00	5.18	-3	+/- 20%
CCVD0330G-2	5.00	4.89	2	+/- 20%
CCVH0330G-1	2.50	2.37	5	+/- 20%
CCVH0330G-2	2.50	2.30	8	+/- 20%

Date of Report: April 8, 2019
Samples Submitted: March 29, 2019
Laboratory Reference: 1903-290
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BTEX
EPA 8021B
CONTINUING CALIBRATION SUMMARY

Analyte	Lab ID	True Value (ppb)	Calc. Value	Percent Difference	Control Limits
Benzene	CCVD0330B-1	50.0	50.8	-2	+/- 15%
Toluene	CCVD0330B-1	50.0	49.2	2	+/- 15%
Ethyl Benzene	CCVD0330B-1	50.0	51.0	-2	+/- 15%
m,p-Xylene	CCVD0330B-1	50.0	50.9	-2	+/- 15%
o-Xylene	CCVD0330B-1	50.0	51.3	-3	+/- 15%
Benzene	CCVD0330B-2	50.0	47.4	5	+/- 15%
Toluene	CCVD0330B-2	50.0	46.0	8	+/- 15%
Ethyl Benzene	CCVD0330B-2	50.0	47.3	5	+/- 15%
m,p-Xylene	CCVD0330B-2	50.0	47.6	5	+/- 15%
o-Xylene	CCVD0330B-2	50.0	47.7	5	+/- 15%
Benzene	CCVD0330B-3	50.0	45.8	8	+/- 15%
Toluene	CCVD0330B-3	50.0	44.4	11	+/- 15%
Ethyl Benzene	CCVD0330B-3	50.0	45.2	10	+/- 15%
m,p-Xylene	CCVD0330B-3	50.0	45.4	9	+/- 15%
o-Xylene	CCVD0330B-3	50.0	45.8	8	+/- 15%
Benzene	CCVD0330B-4	50.0	45.0	10	+/- 15%
Toluene	CCVD0330B-4	50.0	43.9	12	+/- 15%
Ethyl Benzene	CCVD0330B-4	50.0	44.7	11	+/- 15%
m,p-Xylene	CCVD0330B-4	50.0	44.9	10	+/- 15%
o-Xylene	CCVD0330B-4	50.0	45.3	9	+/- 15%
Benzene	CCVH0330B-1	50.0	47.0	6	+/- 15%
Toluene	CCVH0330B-1	50.0	50.2	0	+/- 15%
Ethyl Benzene	CCVH0330B-1	50.0	49.9	0	+/- 15%
m,p-Xylene	CCVH0330B-1	50.0	49.8	0	+/- 15%
o-Xylene	CCVH0330B-1	50.0	49.7	1	+/- 15%
Benzene	CCVH0330B-2	50.0	47.3	5	+/- 15%
Toluene	CCVH0330B-2	50.0	49.0	2	+/- 15%
Ethyl Benzene	CCVH0330B-2	50.0	49.4	1	+/- 15%
m,p-Xylene	CCVH0330B-2	50.0	48.3	4	+/- 15%
o-Xylene	CCVH0330B-2	50.0	48.7	3	+/- 15%

Date of Report: April 8, 2019
Samples Submitted: March 29, 2019
Laboratory Reference: 1903-290
Project: 0747.01.10

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:	**MW01-GW-032819**					
Laboratory ID:	03-290-01					
Diesel Range Organics	**2.4**	0.26	NWTPH-Dx	4-5-19	4-5-19	
Lube Oil Range Organics	**2.2**	0.41	NWTPH-Dx	4-5-19	4-5-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*90*	*50-150*				
Client ID:	**MW02R-GW-032819**					
Laboratory ID:	03-290-02					
Diesel Range Organics	**0.68**	0.26	NWTPH-Dx	4-5-19	4-5-19	
Lube Oil Range Organics	**0.47**	0.41	NWTPH-Dx	4-5-19	4-5-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*96*	*50-150*				
Client ID:	**MW04-GW-032819**					
Laboratory ID:	03-290-04					
Diesel Range Organics	**ND**	0.26	NWTPH-Dx	4-5-19	4-5-19	
Lube Oil Range Organics	**ND**	0.41	NWTPH-Dx	4-5-19	4-5-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*104*	*50-150*				
Client ID:	**MW05-GW-032819**					
Laboratory ID:	03-290-05					
Diesel Range Organics	**1.5**	0.26	NWTPH-Dx	4-5-19	4-5-19	
Lube Oil Range Organics	**0.46**	0.41	NWTPH-Dx	4-5-19	4-5-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*102*	*50-150*				
Client ID:	**MW06-GW-032819**					
Laboratory ID:	03-290-06					
Diesel Range Organics	**ND**	0.26	NWTPH-Dx	4-5-19	4-5-19	
Lube Oil Range Organics	**ND**	0.41	NWTPH-Dx	4-5-19	4-5-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*100*	*50-150*				
Client ID:	**MW07-GW-032819**					
Laboratory ID:	03-290-07					
Diesel Range Organics	**ND**	0.25	NWTPH-Dx	4-5-19	4-5-19	
Lube Oil Range Organics	**ND**	0.41	NWTPH-Dx	4-5-19	4-5-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*94*	*50-150*				

Date of Report: April 8, 2019
Samples Submitted: March 29, 2019
Laboratory Reference: 1903-290
Project: 0747.01.10

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:	**MW08-GW-032819**					
Laboratory ID:	03-290-08					
Diesel Range Organics	**0.95**	0.25	NWTPH-Dx	4-5-19	4-5-19	
Lube Oil Range Organics	**0.46**	0.40	NWTPH-Dx	4-5-19	4-5-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*94*	*50-150*				
Client ID:	**MWDUP-GW-032819**					
Laboratory ID:	03-290-09					
Diesel Range Organics	**1.0**	0.25	NWTPH-Dx	4-5-19	4-5-19	
Lube Oil Range Organics	**0.51**	0.41	NWTPH-Dx	4-5-19	4-5-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*97*	*50-150*				

Date of Report: April 8, 2019
Samples Submitted: March 29, 2019
Laboratory Reference: 1903-290
Project: 0747.01.10

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:	MB0405W1					
Diesel Range Organics	**ND**	0.25	NWTPH-Dx	4-5-19	4-5-19	
Lube Oil Range Organics	**ND**	0.40	NWTPH-Dx	4-5-19	4-5-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*99*	*50-150*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	03-290-01										
	ORIG	DUP									
Diesel Range Organics	**2.38**	**2.13**	NA	NA		NA		NA	11	NA	
Lube Oil Range Organics	**2.20**	**1.57**	NA	NA		NA		NA	33	NA	
Surrogate:											
o-Terphenyl						*90*	*103*	*50-150*			

Date of Report: April 8, 2019
Samples Submitted: March 29, 2019
Laboratory Reference: 1903-290
Project: 0747.01.10

DIESEL AND HEAVY OIL RANGE ORGANICS
NWTPH-Dx
CONTINUING CALIBRATION SUMMARY

Lab ID	True Value (ppm)	Calc. Value	Percent Difference	Control Limits
CCV0405F-V1	100	91.2	8.8	+/-15%
CCV0405F-V2	100	106	-6.4	+/-15%
CCV0405F-V3	100	99.2	0.8	+/-15%

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.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, 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.

Z -

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

Chain of Custody

Page 1 of 1

OnSite Environmental Inc.
Analytical Laboratory Testing Services
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Phone: (425) 883-3881 • www.onsite-env.com

Company: Mawl Foster & Alongi
Project Number: 0747.01.10
Project Name: North Cascade Ford GW Monitoring
Project Manager: Andrew Kaparos
Sampled by: A. Bixby & R. Lewis

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days) (TPH analysis 5 Days)
☐ _____ (other)

Laboratory Number: 03-290

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX 8021B	NWTPH-Gx	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260C	Halogenated Volatiles 8260C	EDB EPA 8011 (Waters Only)	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664A	% Moisture
1	MW01-GW-032819	3/28/19	1300	W	5			X	X														
2	MW02R-GW-032819	3/28/19	1030	W	5				X														
3	MW03-GW-032819	3/28/19	1155	W	5		X	X NO															
4	MW04-GW-032819	3/28/19	0930	W	5				X														
5	MW05-GW-032819	3/28/19	1400	W	5			X	X														
6	MW06-GW-032819	3/28/19	1620	W	5			X	X														
7	MW07-GW-032819	3/28/19	1800	W	5			X	X														
8	MW08-GW-032819	3/28/19	1530	W	5			X	X														
9	MWDUP-GW-032819	3/28/19	1530	W	4			X	X														
10	Trip Blank	—	—	W	3	X																	

	Signature	Company	Date	Time
Relinquished	Andrew Bixby	MFA	3/29/19	0930
Received	Isaacson	ALPHA	3/29/19	0930
Relinquished	Isaacson	ALPHA	3/29/19	10:31
Received	Kelly Lissen	OSE	3/29/19	1031
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions

Data Package: Standard ☒ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☒

ATTACHMENT C

DATA VALIDATION MEMORANDUM

DATA QUALITY ASSURANCE/QUALITY CONTROL REVIEW

PROJECT NO. 0747.01.10 | MAY 30, 2019 | VERN SIMS FAMILY

Maul Foster & Alongi, Inc. (MFA) conducted an independent review of the quality of analytical results for groundwater samples collected at the North Cascade Ford property at 116 West Ferry Street in Sedro-Woolley, Washington. Groundwater samples were collected on March 28, 2019.

OnSite Environmental, Inc. (OEI) performed the analyses. OEI report number 1903-290 was reviewed. The analyses performed and samples analyzed are listed below.

Analysis	Reference
BTEX Compounds	USEPA 8021B
Diesel- and Lube-Oil-Range Organics	NWTPH-Dx
Gasoline-Range Organics	NWTPH-Gx

BTEX = benzene, toluene, ethylbenzene, and total xylenes.
NWTPH = Northwest Total Petroleum Hydrocarbons.
USEPA = U.S. Environmental Protection Agency.

Samples Analyzed	
Report 1903-290	
MW01-GW-032819	MW06-GW-032819
MW02R-GW-032819	MW07-GW-032819
MW03-GW-032819	MW08-GW-032819
MW04-GW-032819	MWDUP-GW-032819
MW05-GW-032819	Trip Blank

DATA QUALIFICATIONS

Analytical results were evaluated according to applicable sections of USEPA procedures (USEPA, 2017) and appropriate laboratory and method-specific guidelines (OEI, 2017; USEPA, 1986).

Data validation procedures were modified, as appropriate, to accommodate quality-control requirements for methods not specifically addressed by the USEPA procedures (e.g., NWTPH-Dx).

The NWTPH-Gx gasoline result for samples MW01-GW-032819 and MW05-GW-032819 shown in report 1903-290 were flagged by OEI because hydrocarbons indicative of heavier fuels present in the sample were impacting the gasoline result. The associated sample results are qualified with "J," as estimated, as shown below.

Report	Sample	Component	Original Result (ug/L)	Qualified Result (ug/L)
1903-290	MW01-GW-032819	Gasoline	370	370 J
	MW05-GW-032819	Gasoline	600	600 J

NOTES:
J = result is estimated.
ug/L = micrograms per liter.

The data are considered acceptable for their intended use, with the appropriate data qualifiers assigned.

HOLDING TIMES, PRESERVATION, AND SAMPLE STORAGE

Holding Times

Extractions and analyses were performed within the recommended holding time criteria.

Preservation and Sample Storage

The samples were preserved and stored appropriately.

BLANKS

Method Blanks

Laboratory method blank analyses were performed at the required frequencies. For purposes of data qualification, the method blanks were associated with all samples prepared in the analytical batch. All method blanks were non-detect for all target analytes.

Trip Blanks

As stated in report 1903-290, a trip blank sample was submitted for NWTPH-Gx and USEPA Method 8021B analysis. The trip blank sample was non-detect.

Equipment Rinsate Blanks

Equipment rinsate blanks were not required for this sampling event, as all samples were collected using dedicated, single-use equipment.

SURROGATE RECOVERY RESULTS

The samples were spiked with surrogate compounds to evaluate laboratory performance on individual samples. All surrogate recoveries were within acceptance limits.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

Matrix spike/matrix spike duplicate (MS/MSD) results are used to evaluate laboratory precision and accuracy. All MS/MSD samples were extracted and analyzed at the required frequency.

No MS/MSD was submitted for analysis by NWTPH-Dx. Batch precision was evaluated with laboratory duplicate results. All recoveries were within acceptance limits for percent recovery and relative percent differences (RPDs).

LABORATORY DUPLICATE RESULTS

Duplicate results are used to evaluate laboratory precision. All duplicate samples were extracted and analyzed at the required frequency. Laboratory duplicate results within five times the method reporting limit (MRL) were not evaluated for precision. All laboratory duplicate RPDs were within acceptance limits.

LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RESULTS

A laboratory control sample/laboratory control sample duplicate (LCS/LCSD) is spiked with target analytes to provide information on laboratory precision and accuracy. No LCS was submitted for analysis by NWTPH-Gx. The reviewer confirmed with OEI that an LCS is not required by the method. NWTPH-Gx batch accuracy could not be evaluated. All samples were non-detect, and no qualification was performed by the reviewer. LCSD samples were not submitted for analysis by NWTPH-Dx. NWTPH-Dx batch precision was evaluated with laboratory duplicate sample results. All remaining LCS results were within acceptance limits for percent recovery.

FIELD DUPLICATE RESULTS

Field duplicate samples measure both field and laboratory precision. One field duplicate was submitted for analysis (MW08-GW-032819/MWDUP-GW-032819). MFA uses acceptance criteria of 100 percent RPD for results that are less than five times the MRL, or 50 percent RPD for results that are greater than five times the MRL. Non-detect data are not used in the evaluation of field duplicate results. All analytes were within the acceptance criteria.

CONTINUING CALIBRATION VERIFICATION RESULTS

Continuing calibration verification (CCV) results are used to demonstrate instrument precision and accuracy through the end of the sample batch. All CCVs were within acceptance limits for percent recovery.

REPORTING LIMITS

OEI used routine reporting limits for non-detect results. Results between the method detection limit and the reporting limit were qualified by OEI with "J" as estimated.

DATA PACKAGE

The data packages were reviewed for transcription errors, omissions, and anomalies. None were found.

REFERENCES

OEI. 2017. Quality assurance manual. Rev. 9.5. OnSite Environmental, Inc., Redmond, Oregon. June 2.

USEPA. 1986. Test methods for evaluating solid waste, physical/chemical methods. EPA publication SW-846. 3d ed. U.S. Environmental Protection Agency. Final updates I (1993), II (1995), IIA (1994), IIB (1995), III (1997), IIIA (1999), IIIB (2005), IV (2008), V (2015), VI phase I (2017), and VI phase II (2018).

USEPA. 2017. USEPA contract laboratory program, national functional guidelines for Superfund organic methods data review. EPA 540-R-2017-002. U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation. January.