MAUL FOSTER ALONGI
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June 28, 2021

Mr. Panjini Balaraju and Mr. Andy Smith
Washington State Department of Ecology
PO Box 47600
Olympia, WA 98504

Re: Groundwater Monitoring Report
Former Murray Pacific No. 2 Sort Yard
Consent Decree No. 94-2-09922-7
Washington State Department of Ecology Facility Site ID #1211
Monitoring Date: February 19, 2021

Dear Mr. Balaraju and Mr. Smith:

This report summarizes field activities and presents results of the groundwater monitoring event conducted by Maul Foster & Alongi, Inc. (MFA), on behalf of the Port of Tacoma (Port) at the former Murray Pacific No. 2 Log Sort Yard located at 2407 Port of Tacoma Road in Tacoma, Washington (the Site, refer to Figure 1). Groundwater monitoring and sampling activities were conducted in accordance with the requirements set forth in the Consent Decree (94-2-09922- 7), dated September 1994, between the Port and the Washington State Department of Ecology (Ecology, 1994) and the Operation and Maintenance Plan (HLA, 1997).

The monitoring frequency was changed from 12 months to 18 months based on a memorandum of understanding between Ecology and the Port in 2011 (Ecology, 2011). In July 2019, Ecology conducted a periodic review of post-cleanup Site conditions and to ensure that human health and the environment are being protected. The report on the review determined that the requirements of the restrictive covenants and the Consent Decree were met (Ecology, 2019).

The last groundwater monitoring event was conducted in August 2019 by Anchor QEA. The most recent cap inspection was completed in August 2019 by Windward. The next groundwater monitoring event is scheduled for August 2022. The next cap inspection is scheduled for February 2022.

SITE BACKGROUND

The Site is located adjacent to the Blair Waterway at 2407 Port of Tacoma Road in Tacoma, Washington (refer to Figure 1). The Site was previously leased to the Murray Pacific Corporation and operated as a log sort yard. ASARCO slag was used as fill to build stable

ground for machinery when the former log yard was in operation. Before 1970, the Site was unleased and undeveloped. The Port is the current property owner and leases the property to Washington United Terminals for use as a shipping container terminal.

Ecology collected stormwater runoff samples at the Site between November 1983 and June 1984. Analytical results indicated that metals in excess of the U.S. Environmental Protection Agency (EPA) quality standards were leaving the Site in stormwater. Kennedy/Jenks Consultants performed a remedial investigation and feasibility study in 1993 as an independent action for the Port in compliance with Ecology's Model Toxic Control Act (Kennedy/Jenks 1993). In September 1994, Ecology and the Port entered into a Consent Decree for the Site (Ecology 1994). Construction of a low-permeability asphalt cap and stormwater drainage system was completed in 1997. Monitoring wells MW-X, MW-Y, and MW-Z were installed in 1998 for compliance monitoring that is still being performed to fulfill the requirements of the Consent Decree (Anchor QEA, 2019). The contaminate of concern in groundwater is arsenic. The cleanup level was modified from 0.14 micrograms per liter (µg/L) (National Toxics Rule) to 5 µg/L (MTCA Method A) in 2009 (Ecology 2009).

FIELD PROCEDURES

MFA conducted a groundwater monitoring event at the Site on February 19, 2021. MFA used a water-level probe to measure static water levels at MW-X, MW-Y, and MW-Z (refer to Table 1 and Figure 2).

Groundwater monitoring and sampling activities were conducted in accordance with industry standard sampling protocols with at least one pore volume extracted from each well and field parameters allowed to stabilize before sample collection. Depth-to-water measurements at the monitoring wells were measured, and new polyethylene tubing was installed at each monitoring well before groundwater-sampling activities began.

Water-quality parameters were measured with a YSI meter (YSI 556MPS) and a turbidity meter (Hach 2100P) before sample collection, and the process and results were recorded on field sampling data sheets (refer to Attachment A). Four groundwater samples were collected, including a duplicate sample at MW-X, using low-flow sampling techniques involving a peristaltic pump and dedicated tubing. All groundwater samples were field filtered using the Voss Technologies 0.45 micron disposable groundwater filter.

The groundwater samples were submitted to Friedman & Bruya, Inc., of Seattle, Washington, under standard chain-of-custody procedures. Samples were analyzed for the contaminants of concern, dissolved arsenic, by the EPA Method 6020B.

Investigation-derived waste generated during the February 2021 sampling event was properly drummed and labeled and is temporarily stored off-site, pending investigation-derived waste pick-up and disposal.

RESULTS AND DISCUSSION

Water-level measurements and groundwater analytical results are summarized in Tables 1 and 2, respectively. Laboratory analytical reports are provided as Attachment B. Analytical data and the laboratory's internal quality assurance and quality control data were reviewed to assess whether they meet project-specific data quality objectives. This review was performed consistent with accepted EPA procedures for evaluating laboratory analytical data (EPA, 2017). A data validation memorandum summarizing data evaluation procedures, data usability, and deviations from specific field and/or laboratory methods for the February 2021 groundwater quality data is included as Attachment C. The data are considered acceptable for their intended use, with the appropriate data qualifiers assigned.

SUMMARY OF FINDINGS

Groundwater analytical results (refer to Table 2) indicate the following:

- Dissolved arsenic was detected at a concentration of 7.15 μg/L in MW-X, 6.74 μg/L in MW-Y, and 37.6 μg/L in MW-Z. These values exceed the Site's designated groundwater cleanup level of 5 μg/L for dissolved arsenic.

- The elevated dissolved arsenic values exhibited at MW-X and MW-Z appeared to be anomalous. The groundwater quality field parameters at MW-X and MW-Z did not fully stabilize during the purging and monitoring activities.[1] Groundwater monitoring and sampling activities had followed the same previous low-flow sampling and field filtering techniques.

Plots of dissolved arsenic versus time for MW-X, MW-Y, and MW-Z are presented in Figures 3, 4, and 5. respectively.

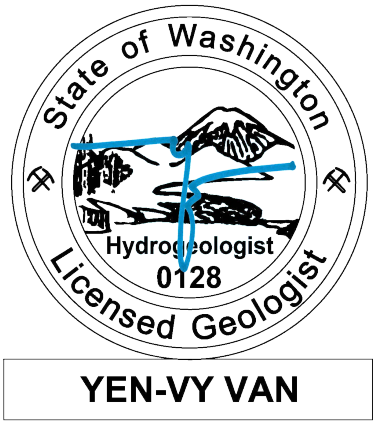
The dissolved arsenic concentrations in groundwater will continue to be monitored in accordance with the Consent Decree, as amended. The next scheduled sampling event will occur in August 2022.

[1] Groundwater field parameters stability criteria: ph +/- 0.1 unit, temperature +/- 0.1 unit, specific conductance 3%, turbidity – 10% for values greater than 5 NTU, if three turbidity values are less than 5 NTU then the values are considered stable.

Please contact me if you have any questions regarding this letter report.

Sincerely,

Maul Foster & Alongi, Inc.



6.28.2021

Yen-Vy Van, LHG
Senior Hydrogeologist

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

cc: Sarah Weeks, Port of Tacoma

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

Anchor QEA. 2019. Groundwater Monitoring Report—Former Murray Pacific No. 2 Sort Yard, Consent Decree No. 94-2-09922-7. November 14.

Ecology. 1994. Consent Decreet 94-2-09922-7. Washington State Department of Ecology. September 1994.

Ecology. 2009. Groundwater Monitoring Summary Report for 23 July 2009, Former Murray Pacific No. 2 Log Yard. Letter to Mark Rettman at Port of Tacoma from Guy Barrett at Washington Department of Ecology. October 26.

Ecology. 2011. Memorandum of Understanding, Former Log Yard Groundwater Monitoring and Cap Inspection. Washington Department of Ecology. September.

Ecology. 2019. Second Periodic Review Report Final, Murray Pacific 2. Washington Department of Ecology. July.

EPA. 2017. EPA 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.

HLA. 1997. Compliance Monitoring Plan. Murray Pacific No. 2 Log Sort Yard, Port of Tacoma, Tacoma, WA. Harding Lawson Associates.

Kennedy/Jenks. 1993. Remedial Investigation/Feasibility Study, Murray Pacific Logyard No. 2, Tacoma, Washington. Kennedy/Jenks Consultants Inc. 1993.

TABLES

Table 1
Water Level Measurements
Former Murray Pacific No. 2 Log Sort Yard

Well ID	Date	Depth to Water (feet)
MW-X	07/22/98	10.62
MW-X	01/21/99	10.08
MW-X	07/20/99	10.14
MW-X	02/24/00	10.09
MW-X	07/27/00	10.76
MW-X	07/17/01	11.02
MW-X	01/16/02	10.97
MW-X	07/16/02	10.78
MW-X	01/13/03	10.95
MW-X	07/15/03	10.90
MW-X	02/04/04	10.80
MW-X	08/02/04	11.00
MW-X	07/26/05	10.93
MW-X	08/11/06	10.84
MW-X	01/29/07	10.72
MW-X	02/08/08	10.14
MW-X	09/12/08	11.80
MW-X	02/27/09	11.12
MW-X	07/23/09	11.05
MW-X	02/04/10	10.90
MW-X	09/17/10	10.89
MW-X	02/15/11	10.70
MW-X	02/14/12	11.85
MW-X	08/23/13	10.91
MW-X	02/12/15	10.69
MW-X	08/26/16	10.83
MW-X	02/12/18	10.55
MW-X	08/23/19	10.90
MW-X	02/19/21	10.95
MW-Y	07/22/98	9.48
MW-Y	01/21/99	8.18
MW-Y	07/20/99	9.37
MW-Y	02/24/00	9.15
MW-Y	07/27/00	9.56
MW-Y	07/17/01	9.70
MW-Y	01/16/02	9.51
MW-Y	07/16/02	9.42
MW-Y	01/13/03	9.77

Table 1
Water Level Measurements
Former Murray Pacific No. 2 Log Sort Yard

Well ID	Date	Depth to Water (feet)
MW-Y	07/15/03	9.72
MW-Y	02/04/04	9.41
MW-Y	08/02/04	9.86
MW-Y	07/26/05	9.84
MW-Y	08/11/06	9.79
MW-Y	01/29/07	9.70
MW-Y	02/08/08	9.46
MW-Y	09/12/08	9.73
MW-Y	02/27/09	9.58
MW-Y	07/23/09	9.62
MW-Y	02/04/10	9.41
MW-Y	09/17/10	9.56
MW-Y	02/15/11	9.3
MW-Y	02/14/12	9.95
MW-Y	08/23/13	9.43
MW-Y	02/12/15	9.38
MW-Y	08/26/16	9.71
MW-Y	02/12/18	9.44
MW-Y	08/23/19	9.8
MW-Y	02/19/21	9.40
MW-Z	07/22/98	15.35
MW-Z	01/21/99	12.01
MW-Z	07/20/99	13.07
MW-Z	02/24/00	12.27
MW-Z	07/27/00	13.29
MW-Z	07/17/01	12.48
MW-Z	01/16/02	13.28
MW-Z	07/16/02	12.71
MW-Z	01/13/03	28.10
MW-Z	07/15/03	12.92
MW-Z	02/04/04	12.15
MW-Z	08/02/04	13.17
MW-Z	07/26/05	13.38
MW-Z	08/11/06	13.26
MW-Z	01/29/07	13.17
MW-Z	02/08/08	12.54
MW-Z	09/12/08	13.13
MW-Z	02/27/09	13.14

Table 1
Water Level Measurements
Former Murray Pacific No. 2 Log Sort Yard

Well ID	Date	Depth to Water (feet)
MW-Z	07/23/09	13.36
MW-Z	02/04/10	11.5
MW-Z	09/17/10	12.51
MW-Z	02/15/11	11.62
MW-Z	02/14/12	12.95
MW-Z	08/23/13	13.23
MW-Z	02/12/15	11.64
MW-Z	08/26/16	12.65
MW-Z	02/08/18	12.33
MW-Z	08/23/19	12.9
MW-Z	02/19/21	12.21

NOTES:

Depth to water results for groundwater samples collected in February 2021 provided by Maul Foster Alongi, Inc. All previous depth to water results provided by Port of Tacoma.

Table 2
Groundwater Analytical Data
Former Murray Pacific No. 2 Log Sort Yard

Well ID	Date	Dissolved Arsenic	Dissolved Copper	Dissolved Lead	Dissolved Zinc
		Concentration in µg/L			
Groundwater Cleanup Levels [(a)]:		**5**	**2.9**	**8.5**	**86**
MW-X	07/22/98	**20**	**3.2**	0.52	8.9
MW-X (Duplicate)	07/22/98	3.4	**3.3**	ND	8
MW-X	01/21/99	0.98	ND	ND	23
MW-X (Duplicate)	01/21/99	0.52	ND	ND	18
MW-X	07/20/99	**7.7**	2.2	ND	79
MW-X (Duplicate)	07/20/99	**8.7**	2	ND	71
MW-X	02/24/00	4.5	2.2	ND	**86**
MW-X (Duplicate)	02/24/00	4.8	2.3	ND	**100**
MW-X	07/27/00	4.9	1.4	ND	5.5
MW-X (Duplicate)	07/27/00	**5.4**	1.6	ND	4.4
MW-X	07/17/01	4.4	1.2	ND	50
MW-X (Duplicate)	07/17/01	4.3	ND	ND	64
MW-X	01/16/02	3.88	1.5	--	ND
MW-X (Duplicate)	01/16/02	4.15	1.9	--	7.93
MW-X	07/16/02	**5.06**	1.53	--	1.29
MW-X (Duplicate)	07/16/02	**5.33**	1.95	--	2.6
MW-X	01/13/03	4.97	ND	--	ND
MW-X (Duplicate)	01/13/03	4.73	ND	--	ND
MW-X	07/15/03	4.81	ND	--	ND
MW-X (Duplicate)	07/15/03	4.97	ND	--	ND
MW-X	02/04/04	**9.22**	1.32	--	5.46
MW-X (Duplicate)	02/04/04	**8.9**	1.17	--	6.23
MW-X	08/02/04	**8.24**	2.61	--	18.6
MW-X (Duplicate)	08/02/04	**7.45**	1.49	--	14.7
MW-X	07/26/05	**5.37**	ND	--	ND
MW-X (Duplicate)	07/26/05	**6.26**	**3.57**	--	7.44
MW-X	08/11/06	3	ND	--	ND
MW-X (Duplicate)	08/11/06	ND	ND	--	--
MW-X	01/29/07	**6.7**	ND	ND	ND
MW-X	02/08/08	3.1	--	--	--
MW-X (Duplicate)	02/08/08	1.9 J	--	--	--
MW-X	09/12/08	0.7	--	--	--
MW-X (Duplicate)	09/12/08	0.9	--	--	--
MW-X	02/27/09	0.6	--	--	--
MW-X (Duplicate)	02/27/09	0.6	--	--	--
MW-X	07/23/09	0.7	--	--	--
MW-X (Duplicate)	07/23/09	0.4	--	--	--

Table 2
Groundwater Analytical Data
Former Murray Pacific No. 2 Log Sort Yard

Well ID	Date	Dissolved Arsenic	Dissolved Copper	Dissolved Lead	Dissolved Zinc
		Concentration in µg/L			
Groundwater Cleanup Levels [(a)] **:**		**5**	**2.9**	**8.5**	**86**
MW-X	02/04/10	<0.5	--	--	--
MW-X (Duplicate)	02/04/10	<0.5	--	--	--
MW-X	09/17/10	<0.5	--	--	--
MW-X (Duplicate)	09/17/10	<0.5	--	--	--
MW-X	02/15/11	<0.5	--	--	--
MW-X (Duplicate)	02/15/11	<0.5	--	--	--
MW-X	02/14/12	<0.5	--	--	--
MW-X (Duplicate)	02/14/12	<0.5	--	--	--
MW-X	08/23/13	1.4	--	--	--
MW-X (Duplicate)	08/23/13	1.3	--	--	--
MW-X	02/12/15	3.0	--	--	--
MW-X (Duplicate)	02/12/15	3.0	--	--	--
MW-X	08/26/16	0.217	--	--	--
MW-X (Duplicate)	08/26/16	0.230	--	--	--
MW-X	02/12/18	0.357	--	--	--
MW-X (Duplicate)	02/12/18	0.388	--	--	--
MW-X	08/23/19	**0.76**	--	--	--
MW-X	02/19/21	**6.99**	--	--	--
MW-X (Duplicate)	02/19/21	**7.15**	--	--	--
MW-Y	07/22/98	**15**	2	1.7	8.5
MW-Y	01/21/99	0.52	ND	ND	24
MW-Y	07/20/99	3	ND	ND	73
MW-Y	02/24/00	2	ND	ND	**94**
MW-Y	07/27/00	ND	ND	ND	ND
MW-Y	07/17/01	**8**	ND	ND	23
MW-Y	01/16/02	**13.1**	ND	--	6.92
MW-Y	07/16/02	**18.7**	0.584	--	2.77
MW-Y	01/13/03	**9.49**	ND	--	ND
MW-Y	07/15/03	**16.5**	ND	--	ND
MW-Y	02/04/04	**8.45**	2.45	--	9.64
MW-Y	08/02/04	**7.64**	ND	--	12.9
MW-Y	07/26/05	**10.7**	ND	--	ND
MW-Y	08/11/06	**13**	ND	--	ND
MW-Y	01/29/07	**7**	ND	--	ND
MW-Y	02/08/08	**9.3**	--	--	--
MW-Y	09/12/08	**8.9**	--	--	--
MW-Y	02/27/09	**7.4**	--	--	--

Table 2
Groundwater Analytical Data
Former Murray Pacific No. 2 Log Sort Yard

Well ID	Date	Dissolved Arsenic	Dissolved Copper	Dissolved Lead	Dissolved Zinc
		Concentration in µg/L			
Groundwater Cleanup Levels [(a)]:		**5**	**2.9**	**8.5**	**86**
MW-Y	07/23/09	2.3	--	--	--
MW-Y	02/04/10	**10.9**	--	--	--
MW-Y	09/17/10	**26.6**	--	--	--
MW-Y	02/15/11	3.3	--	--	--
MW-Y	02/14/12	**19**	--	--	--
MW-Y	08/23/13	**7.4**	--	--	--
MW-Y	02/12/15	**6.5**	--	--	--
MW-Y	08/26/16	**8.62**	--	--	--
MW-Y	02/12/18	**10.2**	--	--	--
MW-Y	08/23/19	**15.4**	--	--	--
MW-Y	02/19/21	**6.74**	--	--	--
MW-Z	07/22/98	**6.5**	ND	0.84	3.7
MW-Z	01/22/99	ND	ND	ND	16
MW-Z	07/20/99	**30**	2.3	ND	68
MW-Z	02/24/00	**11**	2.3	0.52	44
MW-Z	07/27/00	**11**	1.9	ND	ND
MW-Z	07/17/01	**7.3**	1.4	ND	16
MW-Z	01/16/02	**5.68**	1.84	--	5.69
MW-Z	07/16/02	**5.99**	2.25	--	3.3
MW-Z	01/13/03	**5.1**	**2.92**	--	ND
MW-Z	07/15/03	**5.12**	ND	--	ND
MW-Z	02/04/04	**8.62**	1.62	--	6.62
MW-Z	08/02/04	**8.41**	2.07	--	14.3
MW-Z	07/26/05	**5.88**	ND	--	ND
MW-Z	08/11/06	2.6	ND	--	ND
MW-Z	01/29/07	**14**	ND	--	ND
MW-Z	02/08/08	3.4	--	--	--
MW-Z	09/12/08	0.6	--	--	--
MW-Z	02/27/09	0.8	--	--	--
MW-Z	07/23/09	0.4	--	--	--
MW-Z	02/04/10	<0.5	--	--	--
MW-Z	09/17/10	0.6	--	--	--
MW-Z	02/15/11	2.9	--	--	--
MW-Z	02/14/12	<0.5	--	--	--
MW-Z	08/23/13	1.9	--	--	--
MW-Z	02/12/15	3.1	--	--	--
MW-Z	08/26/16	0.401	--	--	--

Table 2
Groundwater Analytical Data
Former Murray Pacific No. 2 Log Sort Yard

Well ID	Date	Dissolved Arsenic	Dissolved Copper	Dissolved Lead	Dissolved Zinc
		Concentration in µg/L			
Groundwater Cleanup Levels [(a)] **:**		**5**	**2.9**	**8.5**	**86**
MW-Z	02/12/18	0.405	--	--	--
MW-Z	08/23/19	**0.542**	--	--	--
MW-Z (Duplicate)	08/23/19	**0.485**	--	--	--
MW-Z	02/19/21	**37.6**	--	--	--

Table 2
Groundwater Analytical Data
Former Murray Pacific No. 2 Log Sort Yard

NOTES:

Lead analysis was discontinued in 2001, and copper and zinc analyses were discontinued in 2008 with Ecology approval respectively dated September 28, 2001, and February 20, 2007.

Samples collected before 2019 were analyzed for dissolved metals by EPA Method 200.8. Samples collected in 2019 and after were analyzed by EPA Method 6020B.

Analytical results for groundwater samples collected in February 2021 provided by Maul Foster Alongi. All previous groundwater analytical results provided by Port of Tacoma.

The arsenic cleanup level was modified from 0.14 µg/L (National Toxics Rule) to 5 µg/L (MTCA Method A) in 2009 (Ecology 2009).

Value in **bold** indicates concentration greater than groundwater cleanup level.

-- = not analyzed.

< = Laboratory analytical result does not exceed laboratory quantitation limit.

EPA = U.S. Environmental Protection Agency.

ID = identification.

J = Concentration is estimated.

ND = Not detected. No quantitation limit indicated.

µg/L = Micrograms per liter.

[a]Groundwater cleanup levels established in Consent Decree 94-2-09922-7.

FIGURES

Source:
US Geological Survey (2021) 7.5-minute topographic quadrangle: Tacoma North. Township 21 North, Range 3 East, Section 34. Property boundary obtained from Pierce County GIS.

Legend

Site Boundary

Figure 1
Site Location

Port of Tacoma
Murray Pacific

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0 1,000 2,000
Feet

Path: X:\0615.18\Fig1_1_Site_Location.mxd
Print Date: 3/18/2021
Reviewed By:
Produced By: aguse
Project: 0615.18

Figure 2
Site Features
Port of Tacoma
Murray Pacific

Legend

- Monitoring Well
- Site Location
- Tax Lots

0 130 260
Feet

Source:
Aerial photograph obtained from Esri.
Tax lot data obtained from Pierce County GIS.

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Print Date: 3/19/2021
Reviewed By:
Produced By: agase
Project:0615.18

Figure 3
MW-X Dissolved Arsenic Concentration Trends
Former Murray Pacific No. 2 Log Sort Yard

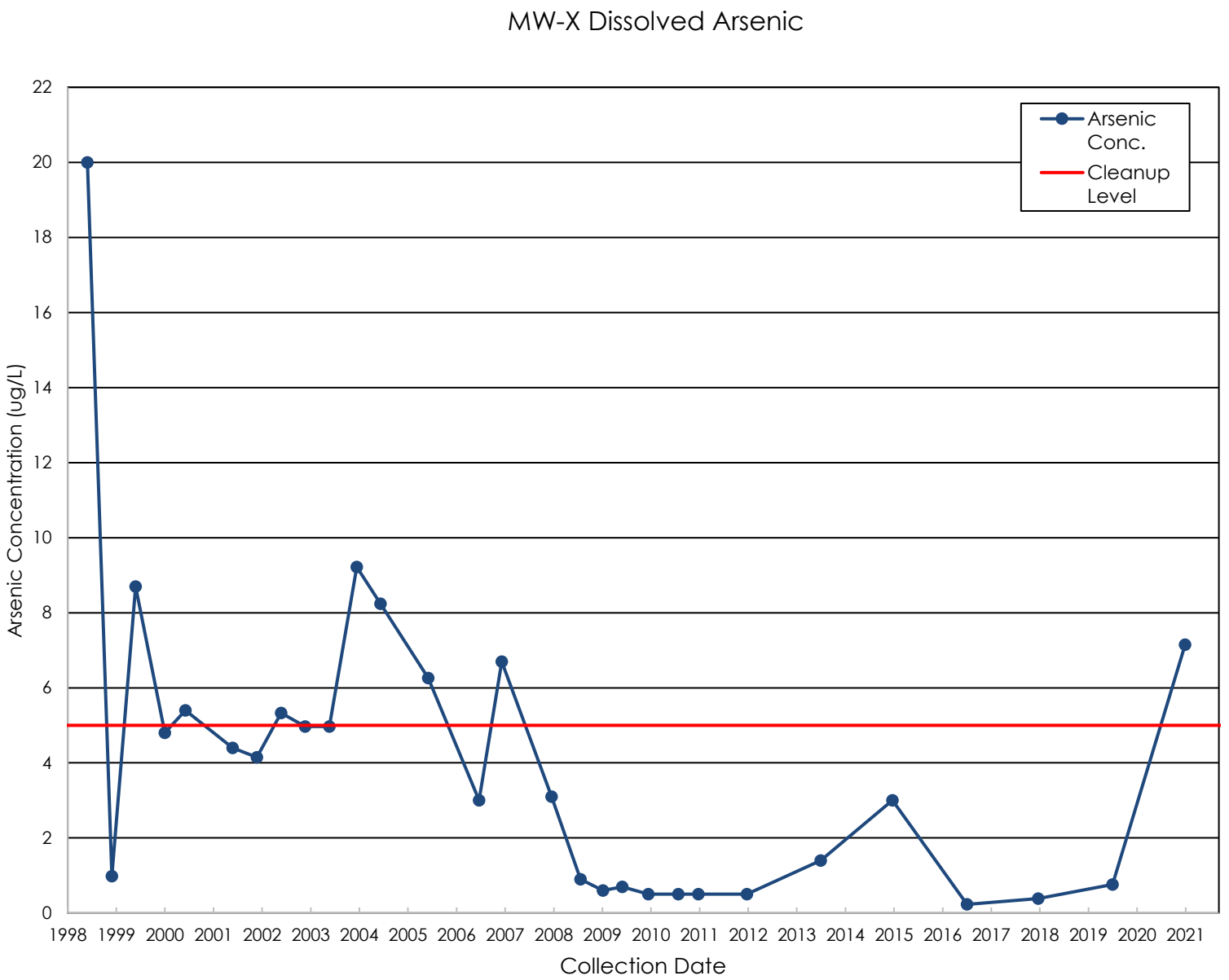


Figure 4
MW-Y Dissolved Arsenic Concentration Trends
Former Murray Pacific No. 2 Log Sort Yard

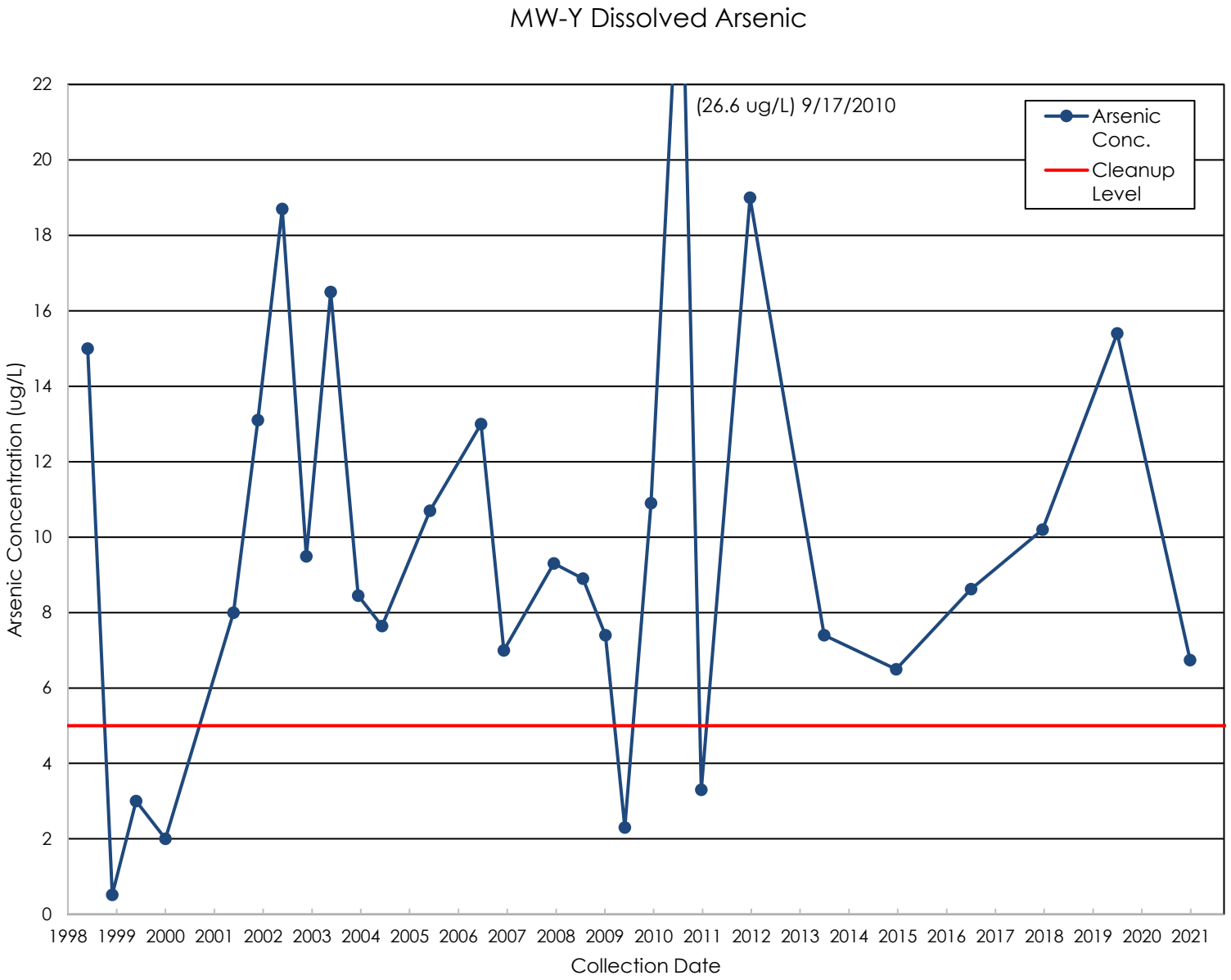
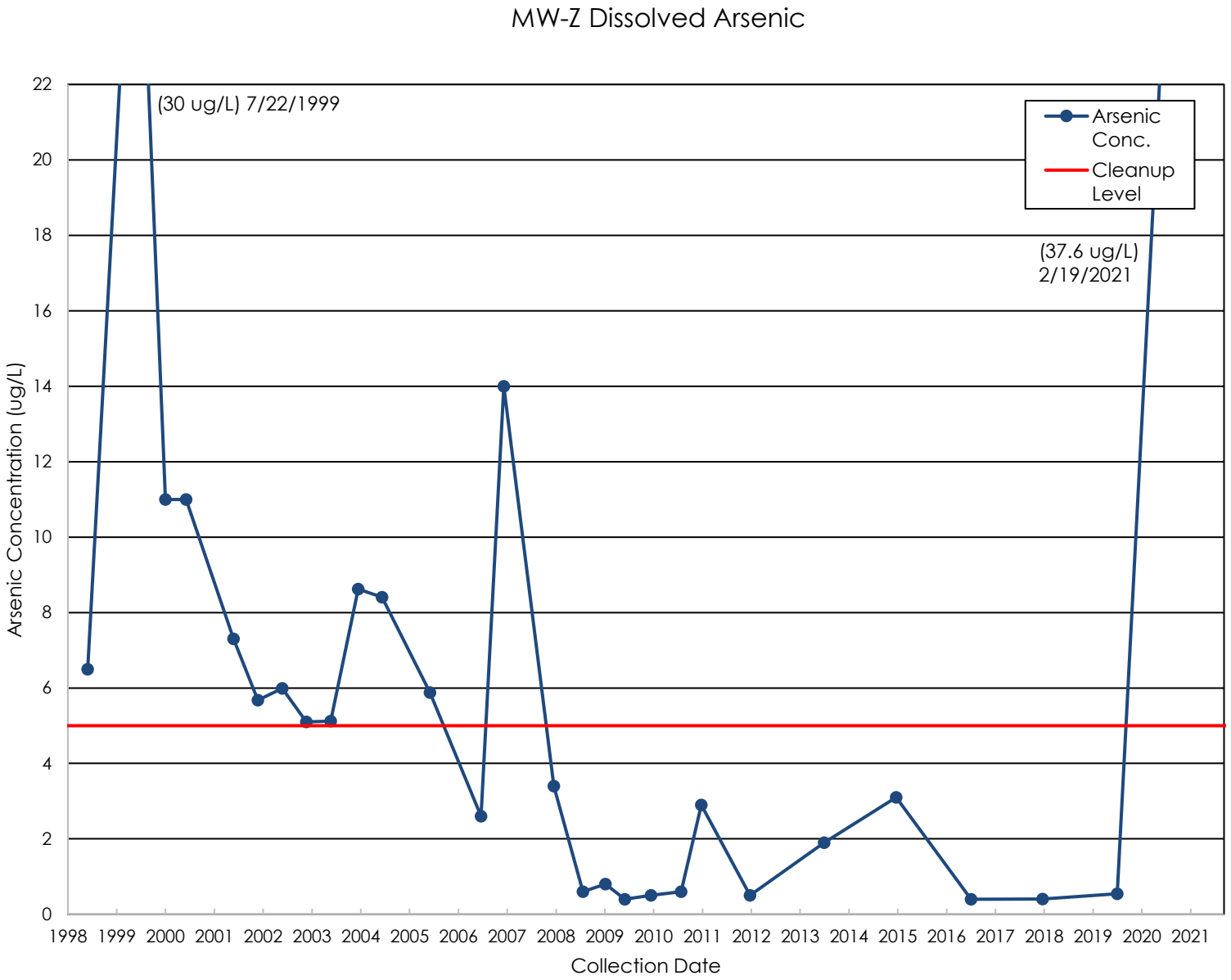


Figure 5
MW-Z Dissolved Arsenic Concentration Trends
Former Murray Pacific No. 2 Log Sort Yard



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	Port of Tacoma	**Sample Location**	MW-Y				
Project #	0615.18.01	**Sampler**	SRM				
Project Name	Former Murray Pacific Property	**Sampling Date**	2/19/2021				
Sampling Event	February 2021	**Sample Name**	MW-Y-GW-12.25				
Sub Area		**Sample Depth**	12.25				
FSDS QA:	B. James 3/2/2021	**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**
2/19/2021	12:30	14.94		9.4		5.54	0.9

(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	12:50:00 PM	0.4	0.4	6.52	12.9	3347	0.34	119.7	16.7
	12:55:00 PM	0.9	0.4	6.54	12.9	3314	0.21	113	10.5
	1:00:00 PM	1.4	0.4	6.58	12.9	3408	0.15	104.2	7.39
	1:05:00 PM	1.9	0.4	6.59	12.9	3422	0.13	97.9	5.65
	1:10:00 PM	2.4	0.4	6.59	12.8	3434	0.16	90.9	5.33
Final Field Parameters	1:15:00 PM	2.9	0.4	6.6	12.9	3458	0.1	77.1	5.1

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:

Clear; colorless; no odor; slight ribbon sheen.

Sample Information

Sampling Method	**Sample Type**	**Sampling Time**	**Container Code/Preservative**	**#**	**Filtered**
(2) Peristaltic Pump	Groundwater	1:20:00 PM	VOA-Glass		
			Amber Glass		
			White Poly		
			Yellow Poly		
			Green Poly		
			Red Total Poly		
			Red Dissolved Poly	1	Yes
			Total Bottles	1	

General Sampling Comments

Began purging at 12:45.

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	Port of Tacoma	**Sample Location**	MW-X
Project #	0615.18.01	**Sampler**	SRM
Project Name	Former Murray Pacific Property	**Sampling Date**	2/19/2021
Sampling Event	February 2021	**Sample Name**	MW-X-GW-11.75
Sub Area		**Sample Depth**	11.75
FSDS QA:	B. James 3/2/2021	**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**
2/19/2021	9:17	13.49		10.95		2.54	0.41

(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	10:05:00 AM	0.5	0.2	6.68	13.9	5631	0.26	188.2	6.09
	10:10:00 AM	0.8	0.2	6.72	13.9	5620	0.19	177.8	3.06
	10:15:00 AM	1.1	0.2	6.73	13.9	5615	0.18	172.7	1.76
Final Field Parameters	10:20:00 AM	1.4	0.2	6.74	14	5622	0.18	168.2	1.02

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; colorless; no odor; no sheen.

Sample Information

Sampling Method	**Sample Type**	**Sampling Time**	**Container Code/Preservative**	**#**	**Filtered**
(2) Peristaltic Pump	Groundwater	10:25:00 AM	VOA-Glass		
			Amber Glass		
			White Poly		
			Yellow Poly		
			Green Poly		
			Red Total Poly		
			Red Dissolved Poly	1	Yes
			Total Bottles	1	

General Sampling Comments

Began purging at 10:00. MWDUP-GW-11.75 collected here.

J-plug did not appear to seal properly, and well cap screws appeared to be stripped or of a wrong size.

Maul Foster & Alongi, Inc.

400 E. Mill Plain Blvd, Suite 400, Vancouver, WA 98660 (360) 694-2691 Fax. (360) 906-1958

Water Field Sampling Data Sheet

Client Name	Port of Tacoma	**Sample Location**	MW-Z				
Project #	0615.18.01	**Sampler**	SRM				
Project Name	Former Murray Pacific Property	**Sampling Date**	2/19/2021				
Sampling Event	February 2021	**Sample Name**	MW-Z-GW-20.25				
Sub Area		**Sample Depth**	20.25				
FSDS QA:	B. James 3/2/2021	**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**
2/19/2021	10:56	28.31		12.21		16.1	2.62

(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	11:13:00 AM	0.3	0.3	6.47	14.4	5386	0.72	180.4	4.83
	11:18:00 AM	0.7	0.3	6.52	14.1	5326	0.25	168.5	
	11:23:00 AM	1.1	0.3	6.53	14.1	5401	0.15	159.8	13.5
	11:28:00 AM	1.5	0.3	6.54	14	5354	0.14	151.2	15.4
Final Field Parameters	12:00:00 PM	7.8	0.3	6.56	14.2	5171	0.4	118.7	8.89

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; colorless; no odor; no sheen.

Sample Information

Sampling Method	**Sample Type**	**Sampling Time**	**Container Code/Preservative**	**#**	**Filtered**
(2) Peristaltic Pump	Groundwater	12:05:00 PM	VOA-Glass		
			Amber Glass		
			White Poly		
			Yellow Poly		
			Green Poly		
			Red Total Poly		
			Red Dissolved Poly	1	Yes
			Total Bottles	1	

General Sampling Comments

Began purging at 11:07.

Due to variability in parameters observed at other wells and in the first intervals of purging, purged three well volumes prior to sampling to ensure all sampling conditions were met during sample collection, per SOP.

Signature _____

ATTACHMENT B

LABORATORY ANALYTICAL REPORT

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

March 1, 2021

Yen-Vy Van, Project Manager
Maul Foster Alongi
2815 2nd Ave, Suite 540
Seattle, WA 98121

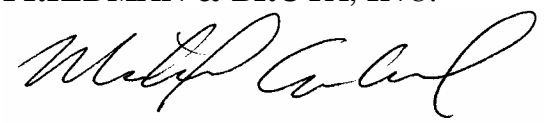
Dear Ms Van:

Included are the results from the testing of material submitted on February 19, 2021 from the Port of Tacoma Murray Pacific PO 0615.18.01-01, F&BI 102311 project. There are 8 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
MFA0301R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on February 19, 2021 by Friedman & Bruya, Inc. from the Maul Foster Alongi Port of Tacoma Murray Pacific PO 0615.18.01-01, F&BI 102311 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Maul Foster Alongi
102311 -01	MW-X-GW-11.75
102311 -02	MW-Y-GW-20.25
102311 -03	MW-Z-GW-12.5
102311 -04	MWDUP-GW-11.75

All quality control requirements were acceptable.

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW-X-GW-11.75	Client:	Maul Foster Alongi
Date Received:	02/19/21	Project:	Port of Tacoma Murray Pacific
Date Extracted:	02/22/21	Lab ID:	102311-01 x5
Date Analyzed:	02/25/21	Data File:	102311-01 x5.204
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	6.99

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW-Y-GW-20.25	Client:	Maul Foster Alongi
Date Received:	02/19/21	Project:	Port of Tacoma Murray Pacific
Date Extracted:	02/22/21	Lab ID:	102311-02 x5
Date Analyzed:	02/25/21	Data File:	102311-02 x5.205
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	6.74

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW-Z-GW-12.5	Client:	Maul Foster Alongi
Date Received:	02/19/21	Project:	Port of Tacoma Murray Pacific
Date Extracted:	02/22/21	Lab ID:	102311-03 x10
Date Analyzed:	02/25/21	Data File:	102311-03 x10.206
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	37.6

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MWDUP-GW-11.75	Client:	Maul Foster Alongi
Date Received:	02/19/21	Project:	Port of Tacoma Murray Pacific
Date Extracted:	02/22/21	Lab ID:	102311-04 x5
Date Analyzed:	02/25/21	Data File:	102311-04 x5.208
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	7.15

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Maul Foster Alongi
Date Received:	Not Applicable	Project:	Port of Tacoma Murray Pacific
Date Extracted:	02/22/21	Lab ID:	I1-130 mb
Date Analyzed:	02/22/21	Data File:	I1-130 mb.058
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

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

Date of Report: 03/01/21
Date Received: 02/19/21
Project: Port of Tacoma Murray Pacific PO 0615.18.01-01, F&BI 102311

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

Laboratory Code: 102311-01 x10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	<10	105	116	75-125	10

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	96	80-120

Data Qualifiers & Definitions

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

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

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

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

cf - The sample was centrifuged prior to analysis.

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

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

102311

SAMPLE CHAIN OF CUSTODY MS

0219-21

AT2

Page # 1 of 1

Report To Yen-Vy Von

Company Maul Foster & Alongi, Inc.

Address 2815 2nd Avenue, Suite 540

City, State, ZIP Seattle, WA 98121

Phone 253-320-5378 Email yvan@maulfoster.com

SAMPLERS (*signature*)

PROJECT NAME: Port of Tacoma - Murray Pacific

PO #: 0615.18.01-01

REMARKS

Project specific RLs? - Yes / No

INVOICE TO: accounting@maulfoster.com

TURNAROUND TIME
- [x] Standard turnaround
- [ ] RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- [ ] Archive samples
- [ ] Other
- Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Ass. As by USEPA 6020				Notes
MW-X-GW-11.75	01	2/19/2021	1025	GW	1								X				All samples field-filtered.
MW-Z-GW-20.25	02	"	1205	"	1								X				"
MW-Y-GW-12.5	03	"	1320	"	1								X				"
MWDUP-GW-11.75	04	"	1025	"	1								X				"

ANALYSES REQUESTED

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Sean Maloney	MFA	2/19/21	1700
Received by:	V/NH	FBI	2/19/21	1700
Relinquished by:				
Received by:		Samples received at 7 °C		

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

ATTACHMENT C

DATA VALIDATION MEMORANDUM

DATA QUALITY ASSURANCE/QUALITY CONTROL REVIEW

PROJECT NO. 0615.18.01 | MARCH 4, 2021 | PORT OF TACOMA – MURRAY PACIFIC

Maul Foster & Alongi, Inc. (MFA) conducted an independent review of the quality of analytical results for groundwater samples collected at the Port of Tacoma Cascade Timber site. The samples were collected on February 19, 2021.

Friedman & Bruya, Inc. (FBI) performed the analyses. FBI report number 102311 was reviewed. The analyses performed and samples analyzed are listed below.

Analysis	Reference
Dissolved Arsenic	EPA 6020B

NOTES:
EPA = U.S. Environmental Protection Agency.

Samples Analyzed
Report 102311
MW-X-GW-11.75
MW-Y-GW-20.25
MW-Z-GW-12.5
MWDUP-GW-11.75

DATA QUALIFICATIONS

Analytical results were evaluated according to applicable sections of EPA procedures (EPA, 2017) and appropriate laboratory and method-specific guidelines (EPA, 1986; FBI, 2019).

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

According to the chain of custody in report 102311, samples were received by FBI at 7 degrees Celsius, which is above the upper recommended storage temperature range of 2 to 6 degrees

Celsius. The reviewer confirmed that the samples were received by FBI in a cooler with ice still present, and that samples were received only 2.5 hours after collection; thus, qualification was not required.

There were no additional issues related to sample storage or preservation.

BLANKS

Method Blanks

A laboratory method blank analysis was performed at the required frequency. For purposes of data qualification, the method blank was associated with all samples prepared in the analytical batch. The laboratory method blank result was non-detect to method reporting limit.

Trip Blanks

Trip blanks were not required for this sampling event, as volatile organic compounds were not analyzed.

Equipment Rinsate Blanks

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

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

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

The MS/MSD results were within acceptance limits for percent recovery and RPD.

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 were not reported; batch precision was evaluated with MS/MSD sample results.

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. The LCS sample was extracted and analyzed at the required frequency. LCSD results were not reported; batch precision was evaluated with MS/MSD sample results.

All 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 (MW-X-GW-11.75/MWDUP-GW-11.75). MFA uses acceptance criteria of 100 percent RPD for results that are less than five times the method reporting limit, or 50 percent RPD for results that are greater than five times the method reporting limit. Non-detect data are not used in the evaluation of field duplicate results. All analytes were within the acceptance criteria.

REPORTING LIMITS

FBI used routine reporting limits for non-detect results, except for samples requiring dilutions because of high analyte concentrations and/or matrix interferences.

DATA PACKAGE

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

REFERENCES

EPA. 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), VI phase II (2018), and VI phase III (2019).

EPA. 2017. EPA contract laboratory program, national functional guidelines for inorganic Superfund methods data review. EPA 540-R-2017-001. U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation. January.

FBI. 2019. Quality assurance manual. Rev. 16. Friedman & Bruya, Inc., Seattle, Washington. October 2.