



HALEY & ALDRICH, INC.
3131 Elliott Avenue
Suite 600
Seattle, WA 98121
206.324.9530

15 December 2023
File No. 0202561-000

City of Tacoma
Public Works Department, Engineering Division
747 Market Street, Room 544
Tacoma, WA 98402

Attention: Charla Kinlow, Project Manager

Subject: Thea Foss Waterway Esplanade
Groundwater Monitoring Results, October 2023

Dear Ms. Kinlow:

This letter transmits the results of the October 2023 groundwater monitoring event conducted for the Thea Foss Waterway Esplanade site (Figure 1). The sampling was performed in accordance with our proposal dated 17 May 2023, and involved collecting and analyzing groundwater samples from the following monitoring wells (Figure 2):

- MW-2 (MW-09-2);
- MW-5;
- P3-MW-01R;
- P3-MW-02;
- P3-MW-03; and
- Landau Well.

Samples were collected using low-flow techniques and were analyzed for dissolved arsenic, copper, lead, nickel, and zinc by the City of Tacoma Environmental Services Laboratory using Method 6020B.

Table 1 presents the water levels measured in each well at the specified date and time in the table. Haley & Aldrich, Inc.'s (Haley & Aldrich's) field groundwater sampling data forms are included as Appendix A. The laboratory report, along with our data usability summary report, is included in Appendix B.

Table 2 summarizes the results of the chemical analyses and compares them to groundwater- and surface water-based cleanup levels. The groundwater sample collected from P3-MW-01R exceeded the Model Toxics Control Act (MTCA) surface water standards for marine waters, aquatic life, chronic for copper (3.1 micrograms per liter [$\mu\text{g/L}$]) with a value of 3.84 $\mu\text{g/L}$. All six wells exceeded the MTCA Method B groundwater cleanup level for drinking water for arsenic (0.058 $\mu\text{g/L}$) with values ranging

from 0.420 to 3.62 µg/L, though all these values are still below the MTCA Method A groundwater cleanup level (5 µg/L). All other dissolved metals results were either non-detect or below regulatory levels.

Table 3 summarizes the historical results of the chemical analyses and compares them to groundwater- and surface water-based cleanup levels.

Please note that surface monuments in several of the monitoring wells are missing bolts or are damaged. We recommend that these well monuments be repaired prior to or during the next sampling event, if possible.

We trust this letter meets your needs. Please contact us with any questions or if you would like to discuss further.

Sincerely yours,
HALEY & ALDRICH, INC.



Becca Dozier, L.G.
Hydrogeologist



Mark Dagel, L.H.G.
Program Manager

Attachments:

- Table 1 - Water-Level Measurements
- Table 2 - Analytical Results
- Table 3 - Historical Results
- Figure 1 - Vicinity Map
- Figure 2 - Well Locations
- Appendix A - Groundwater Sampling Field Forms
- Appendix B - Data Quality Review and Laboratory Data Report

TABLES

TABLE 1
WATER-LEVEL MEASUREMENTS
 THEA FOSS WATERWAY ESPLANADE
 TACOMA, WASHINGTON

Well	Time	Depth to Water (feet)
MW-2	11:15 AM	9.57
MW-5	10:30 AM	9.11
P3-MW-01R	12:03 PM	8.91
P3-MW-02	9:40 AM	6.02
P3-MW-03	12:53 PM	9.35
Landau Well	8:55 AM	12.26

Notes:

Measurements taken on 6 October 2023.

Depth to water measured from top of PVC well casings.

All times are in Pacific Standard Time.

TABLE 2
ANALYTICAL RESULTS
 THEA FOSS WATERWAY ESPLANADE
 TACOMA, WASHINGTON

Results in µg/L	Monitoring Well										Monitoring Well									
	MW-2					MW-5					P3-MW-01R					P3-MW-02				
Sampling Date	4/9/2019	1/27/2020	3/31/2021	6/24/2022	10/6/2023	4/9/2019	1/27/2020	3/31/2021	6/24/2022	10/6/2023	4/9/2019	1/27/2020	3/31/2021	6/24/2022	10/6/2023	4/9/2019	1/27/2020	3/31/2021	6/24/2022	10/6/2023
Depth to Water (feet)	11.81	10.72	11.9	11.86	9.57	9.46	8.64	9.85	9.67	9.11	8.55	7.12	8.52	8.69	8.91	5.43	5.43	5.89	5.99	6.02
Dissolved Metals																				
Arsenic	1.23	0.5 U	2.5 U	1 U	3.62	1.03	0.615	2.5 U	1 U	0.420 J	1.58	1.56	2.5 U	1.55	2.36	2.52	4.33	2.5 U	1 U	0.795
Copper	0.318 T	0.5 U	2.5 U	1 U	0.99	2.41	0.5 U	2.5 U	1 U	0.118 U	3.09	1.51	2.65	3.82	3.84	0.249 T	0.5 U	2.5 U	1 U	0.118 U
Lead	0.5 U	0.5 U	2.5 U	1 U	0.485 J	0.5 U	0.5 U	2.5 U	1 U	0.05 U	0.0061 U	0.5 U	2.5 U	1 U	0.0532 J	0.169 T	0.5 U	2.5 U	1 U	0.05 U
Nickel	0.965	0.566	2.5 U	1 U	2.01	0.845	0.538	2.5 U	1 U	0.519	1.11	0.829	2.5 U	1.22	1.67	0.411 T	0.5 U	2.5 U	1 U	0.429 U
Zinc	17.6	1.78	2.5 U	2.01	1.36	3.25	0.58	2.5 U	2.83 J	0.66	2.77	1.26	4.45	4.42	4.65	1.85	0.5 U	2.5 U	1.21	1.03
NWTPH-Dx																				
Diesel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Oil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NWTPH-Gx																				
Gasoline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds																				
Benzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 2
ANALYTICAL RESULTS
 THEA FOSS WATERWAY ESPLANADE
 TACOMA, WASHINGTON

Results in µg/L	Monitoring Well										Regulatory Levels			
	P3-MW-03					Landau Well					Groundwater Cleanup Levels, Cleanup Levels and Risk Calculation (CLARC)		Surface Water Standards for Marine Waters, Chapter 173-201A WAC	
	Method A		Method B, Drinking Water			Aquatic Life, Chronic		Human Health						
Sampling Date	4/9/2019	1/27/2020	3/31/2021	6/24/2022	10/6/2023	4/9/2019	1/27/2020	3/31/2021	6/24/2022	10/6/2023				
Depth to Water (feet)	8.73	7.94	9.07	9.82	9.35	12.03	11.98	12.35	16.29	12.26				
Dissolved Metals														
Arsenic	10.8	1.76	6.2	1 U	0.886	5.73	0.68	2.63	5 U	0.966 J	5 ^a	0.058	36	10
Copper	4.97	1.6	2.5 U	1 U	0.746	0.529	0.5 U	2.5 U	5 U	0.508 J	-	640 ^b	3.1	-
Lead	0.5 U	0.5 U	2.5 U	1 U	0.0552 J	0.0061 U	0.5 U	2.5 U	5 U	0.25 U	15	-	8.1	-
Nickel	1.53	0.544	2.5 U	4.39	0.867	2.83	0.595	2.5 U	5 U	0.858 U	-	-	8.2	190
Zinc	2.07	0.5	9.01	3.36	1.02	2.41	0.81	2.62	5 U	1.71	-	4800 ^b	81	2900
NWTPH-Dx														
Diesel	-	-	-	-	-	-	-	100 U	100 U	-	500	-	50 ^{d,e}	-
Heavy Oil	-	-	-	-	-	-	-	190 U	200 U	-	500	-	-	-
NWTPH-Gx														
Gasoline	-	-	-	-	-	-	-	-	250 U	-	800 / 1000 ^c	-	1700 ^d	-
Volatile Organic Compounds														
Benzene	-	-	-	-	-	-	-	-	2.5 U	-	5	0.8	23 ^d	1.6
Ethylbenzene	-	-	-	-	-	-	-	-	2.5 U	-	700	800 ^b	21 ^d	270
Toluene	-	-	-	-	-	-	-	-	2.5 U	-	1000	640 ^b	102 ^d	410
Xylenes	-	-	-	-	-	-	-	-	5 U	-	1000	1600 ^b	106 ^d	-

Notes:

Analyses performed by City of Tacoma Environmental Services Laboratory using method 6020B for dissolved metals, method NWTPH-Gx for gasoline, method NWTPH-Dx for diesel and heavy oil-range hydrocarbons, and method 8260D for benzene, toluene, ethylbenzene, and xylenes (BTEX).
 U = Not detected at detection limit indicated.
 T = Value is between the MDL and RL.
 Monitoring well values represent dissolved metals concentrations (laboratory filtered).
 All concentrations in µg/L.
Bolded values indicate concentration exceeds Method A groundwater cleanup level.
Italicized values indicate concentration exceeds Method B groundwater cleanup level.
 Shaded values indicate concentration exceeds surface water standard.
 - = not applicable or no results
^a Arsenic cleanup level based on background groundwater concentrations for state of Washington.
^b Groundwater Method B Non-cancer cleanup level.
^c 800 µg/L when benzene is present in groundwater; 1000 µg/L when benzene is not detected.
^d Aquatic life protective values
^e Unweathered

TABLE 3
HISTORICAL RESULTS
 THEA FOSS WATERWAY ESPLANADE
 TACOMA, WASHINGTON

Well ID	Regulatory Level	MW-16							MW-30							
		8/5/2010	12/29/2010	7/26/2011	3/1/2012	10/15/2013	4/17/2014	10/23/2014	8/5/2010	12/29/2010	7/26/2011	3/1/2012	10/15/2013	4/17/2014	10/23/2014	10/15/2013
Sampling Date		8/5/2010	12/29/2010	7/26/2011	3/1/2012	10/15/2013	4/17/2014	10/23/2014	8/5/2010	12/29/2010	7/26/2011	3/1/2012	10/15/2013	4/17/2014	10/23/2014	10/15/2013
Depth to Water in Feet ^a		15.21	13.30	15.15	14.3	14.17	13.68	13.55	10.51	7.70	9.99	9.14	10.55	8.51	8.60	13.83
TPH in µg/L																
Diesel	500 ^c	80 U	100 U	70 U	70 U	100 U	100 U	30 UJ	80 U	100 T	70 T	70 U	100 U	100 U	50 J	1300
Heavy oil	500 ^c	210 U	100 U	40 U	50 T	200 U	200 U	50 UJ	210 U	100 U	40 U	40 U	200 U	200 U	50 UJ	410
Gasoline	800 ^c	35 T	50 U	70	10 U	50 U	50 U	21.9 J	87	50 U	158	29.7	114	143	124 J	1560
BTEX in µg/L																
Benzene	71 ^d	0.2 U	1 U	0.20	1.0 U	1.0 U	0.2 U	0.2 U	1.6	1.04	9.40	9.4	12	20	15	120
Toluene	200,000 ^d	0.2 U	1 U	0.20	1.0 U	1.0 U	0.2 U	0.2 U	0.2 U	1 U	0.20 T	0.20 U	1.0 U	0.2 U	0.2 U	2.4
Ethylbenzene	29,000 ^d	0.2 U	1 U	0.30 T	0.2 U	1.0 U	0.2 U	0.2 U	0.2 U	1 U	0.50 T	0.20 U	1.0 U	0.2 JT	0.2 U	29
Total xylene	1,600 ^e	0.6 U	2 U	0.70 T	0.6 U	2.0 U	0.4 U	0.4 U	0.6 U	2 U	1.00 T	0.60 U	0.7 T	0.9 JT	1.0 T	16.2
cPAHs in µg/L																
Benzo(a)anthracene	-	0.107	0.072	0.005 U	0.005 U	0.007 JT	0.010 UJ	0.005 U	0.048	0.006 U	0.005 U	0.005	0.010 UJ	0.010 UJ	0.005 UJ	10.200 J
Benzo(a)pyrene	-	0.117	0.078	0.009 U	0.009 U	0.01 UJ	0.010 UJ	0.005 U	0.052	0.004 U	0.009 U	0.009	0.010 UJ	0.010 UJ	0.005 UJ	2.680 J
Benzo(b,k)fluoranthenes	-	0.168	0.119	0.012 U	0.012 U	0.02 UJ	0.020 UJ	0.012 U	0.094	0.007 U	0.012 U	0.012	0.020 UJ	0.020 UJ	0.012 UJ	6.030 J
Chrysene	-	0.101	0.079	0.003 U	0.003 U	0.01 UJ	0.010 UJ	0.006 U	0.049	0.005 U	0.003 U	0.003	0.010 UJ	0.010 UJ	0.006 UJ	10.300 J
Dibenz(a,h)anthracene	-	0.014	0.027	0.005 U	0.007 T	0.01 UJ	0.010 UJ	0.004 U	0.009 U	0.008 T	0.005 U	0.005	0.010 UJ	0.010 UJ	0.004 UJ	0.276 J
Indeno(1,2,3-cd)pyrene	-	0.072	0.055	0.006 U	0.007 T	0.01 UJ	0.010 UJ	0.003 U	0.039	0.006 T	0.006 U	0.006 T	0.010 UJ	0.010 UJ	0.003 UJ	0.689 J
Total cPAHs ^b	0.031 ^{b,d}	0.154	0.106	0.006 U	0.007	0.008 J	0.008 UJ	0.004 U	0.071	0.004	0.006 U	0.012 J	0.008 UJ	0.008 UJ	0.004 UJ	4.503 J
Dissolved Metals in µg/L																
Arsenic	0.14 ^d	6.55	9.3	5.67	7.44	6.44	9.56	6.16	8.05	21.4	17.9	19.4	9.96	10.4	10.6	5 U
Copper	3.1 ^f	0.09 T	1.05 T	0.758	0.249	0.038 U	0.038 U	0.995	0.12 T	0.4 T	0.038 U	0.108 T	0.044 T	0.038 U	0.357	0.2 U
Lead	8.1 ^f	0.028 U	0.6 T	0.413	0.078 T	0.2 U	0.026 U	0.156 J	0.06 T	0.15 T	0.067 T	0.078 T	0.2 U	0.102 JT	0.026 U	0.2 U
Nickel	8.2 ^f	4.89	0.9 T	1.56	0.685	0.261	0.274	1.11	3.72	0.8 T	0.975	1.27	0.406	0.396	0.408 U	0.642
Zinc	81 ^f	16	4.3	3.06	0.688	0.79 U	0.66	2.17	15.4	2 T	0.983	1.93	0.898 U	1.97	1.05	0.695 U

TABLE 3
HISTORICAL RESULTS
 THEA FOSS WATERWAY ESPLANADE
 TACOMA, WASHINGTON

Well ID	MW-9		P4-MW02							P10-MW03R				P10-MW03R			
	4/17/2014	10/23/2014	8/5/2010	12/30/2010	7/26/2011	2/29/2012	10/15/2013	4/17/2014	10/23/2014	10/14/1997	1/20/1998	8/10/2010	12/29/2010	7/29/2011	3/1/2012	10/15/2013	4/17/2014
Sampling Date	4/17/2014	10/23/2014	8/5/2010	12/30/2010	7/26/2011	2/29/2012	10/15/2013	4/17/2014	10/23/2014	10/14/1997	1/20/1998	8/10/2010	12/29/2010	7/29/2011	3/1/2012	10/15/2013	4/17/2014
Depth to Water in Feet ^a	14.62	14.45	8.54	9.10	9.61	9.49	9.51	9.65	9.27	-	-	7.93	6.10	8.02	7.37	8.18	7.52
TPH in µg/L																	
Diesel	6400	4400 J	260	200	90 T	280	100 U	100 U	40 J	250 U	250 U	80 U	100 J	70	70 U	100 U	100 U
Heavy oil	3400	2000 J	210 U	200 T	40 U	360	200 U	200 U	50 UJ	500 U	500 U	210 U	200 T	60 T	40 U	200 U	200 U
Gasoline	1930	634	160	50 U	89.7	31.2	447	76.7 U	79.2	100 U	100 U	46 T	50 U	60.1	10 U	50 U	50 U
BTEX in µg/L																	
Benzene	220	80	3.2	2.32	4.9	2.70	3.8	3.5	3.6	0.5 U	0.5 U	2.0 U	1 U	0.2 U	0.2 U	1.0 U	0.2 U
Toluene	2.5 J	1.4 T	0.6 T	1 U	0.4 T	0.20 U	0.2 T	0.3 JT	0.3 T	0.5 U	0.5 U	2.0 U	1 U	0.2 U	0.2 U	1.0 U	0.2 U
Ethylbenzene	36	9.8	1.3	1 U	0.6 T	0.30 T	0.3 T	0.3 JT	0.3 T	0.5 U	0.5 U	2.0 U	1 U	0.2 U	0.2 U	1.0 U	0.2 U
Total xylene	12.2 J	5.3 T	1.7 T	2 U	1.3 T	0.60 T	1.2 T	1.7 JT	1.5 T	0.5 U	0.5 U	6.0 U	2 U	0.6 U	0.6 U	2.0 U	0.4 U
cPAHs in µg/L																	
Benzo(a)anthracene	2.34 J	7.56 J	0.454	0.404	0.067	0.236	0.198 J	0.0630 J	0.1420	1.000 U	0.015	0.102	0.035	0.040	0.014	0.128 J	0.015 J
Benzo(a)pyrene	26.3 J	1.79 J	0.371	0.357	0.016	0.199	0.048 J	0.0270 J	0.0660	1.000 U	0.010 U	0.073	0.029	0.030	0.010	0.054 J	0.010 UJ
Benzo(b,k)fluoranthenes	6.96 J	3.54 J	0.490	0.521	0.024	0.265	0.091 J	0.0380 J	0.0950	1.000 U	0.010 U	0.098	0.035	0.044	0.012 T	0.192 J	0.020 UJ
Chrysene	52.9 J	6.2 J	0.385	0.430	0.055	0.239	0.177 J	0.0580 J	0.1330	1.000 U	0.012	0.120	0.046	0.049	0.013	0.153 J	0.012 J
Dibenz(a,h)anthracene	101 J	0.204 J	0.030	0.050	0.005 U	0.020	0.005 JT	0.0100 UJ	0.0040 U	1.000 U	0.010 U	0.009 U	0.006	0.005 T	0.005	0.086 J	0.010 UJ
Indeno(1,2,3-cd)pyrene	112 J	0.506 J	0.145	0.158	0.006 U	0.092	0.012 J	0.0100 J	0.0260	1.000 U	0.010 U	0.032	0.013 T	0.015	0.006 T	0.083 J	0.010 UJ
Total cPAHs ^b	49.059 J	3.033 J	0.487	0.475	0.026	0.263	0.080 J	0.039 J	0.094	0.705 U	0.008	0.098	0.038 J	0.041 J	0.014 J	0.104 J	0.009 J
Dissolved Metals in µg/L																	
Arsenic	2.06	2.4	2.61	0.95 T	0.836	0.843 T	5 U	0.319	0.517	1.4 U	1.3 U	0.73	0.3 T	0.374	0.316 J	5 U	0.276
Copper	0.038 U	0.225	0.14 T	0.6 T	0.038 U	1.69	0.041 T	0.038 U	0.356	3.9 U	4.5 U	1.37	0.5 T	0.058 T	1.54	0.2 U	0.2 U
Lead	0.026 U	0.026 U	0.05 JT	3.5	0.026 U	0.401	0.2 U	0.026 U	0.026 U	4 U	1.2 U	0.028 U	0.5 T	0.165 T	0.286	0.2 U	0.026 U
Nickel	0.316	0.368 UJ	6.81	0.4 T	0.886	2.82	0.08 J	0.101 JT	0.2 U	0.4 U	0.6 U	8.11	0.75 T	2.67	26.4	0.446	0.457
Zinc	5.4	0.98	20.5	2.75	0.239	4.19	0.333 U	2.38	2.07	1.9 U	1.4 U	68.5	1.8 T	0.965	10	0.541 U	2.0

TABLE 3
HISTORICAL RESULTS
 THEA FOSS WATERWAY ESPLANADE
 TACOMA, WASHINGTON

Well ID		P10-MW04								R21-MW01	R21-MW02			MW-2			MW	
Sampling Date	10/23/2014	10/14/1997	1/20/1998	8/10/2010	12/29/2010	2/29/2012	10/15/2013	4/17/2014	10/23/2014	10/23/2014	10/15/2013	4/17/2014	10/23/2014	10/15/2013	4/17/2014	10/23/2014 ⁶	10/15/2013	4/17/2
Depth to Water in Feet ^a	7.05	-	-	10.12	8.10	10.34	10.38	9.74	9.48	8.9	12.02	10.04	11.59	11.9	11.53	-	9.8	9.44
TPH in µg/L																		
Diesel	30 UJ	250 U	250 U	80 U	300	70	100 U	100 U	30 UJ	30 UJ	100 U	100 U	30 UJ	100 U	100 U	-	40 T	100
Heavy oil	50 UJ	500 U	500 U	210 U	1,300	40	70 T	200 U	50 J	50 UJ	200 U	200 U	50 UJ	200 U	200 U	-	200 U	200
Gasoline	24.1 J	100 U	100 U	18 T	50 U	151	50 U	50 U	16.7 J	18.3 J	50 U	50 U	19.8 J	50 U	50 U	-	50 U	50
BTEX in µg/L																		
Benzene	0.2 U	0.5 U	0.5 U	0.2 U	1 U	2.5	1.0 U	0.2 U	0.2 U	0.2 U	1.0 U	0.2 U	0.2 U	1.0 U	0.2 U	-	1.0 U	0.2
Toluene	0.2 U	0.5 U	0.5 U	0.2 U	1 U	14	1.0 U	0.2 U	0.2 U	0.2 U	1.0 U	0.2 U	0.2 U	1.0 U	0.2 U	-	1.0 U	0.2
Ethylbenzene	0.2 U	0.5 U	0.5 U	0.2 U	1 U	2.8	1.0 U	0.2 U	0.2 U	0.2 U	1.0 U	0.2 U	2.0 U	1.0 U	0.2 U	-	1.0 U	0.2
Total xylene	0.4 U	0.5 U	0.5 U	0.6 U	2 U	13.9	2.0 U	0.4 U	0.4 U	0.4 U	2.0 U	0.4 U	0.4 U	2.0 U	0.4 U	-	2.0 U	0.4
cPAHs in µg/L																		
Benzo(a)anthracene	0.032 J	1.000 U	0.035	0.015	1.010 J	0.005	0.115 J	0.010 UJ	0.013	0.015	0.079 J	0.010 UJ	0.005 UJ	0.026 J	0.010 UJ	-	0.036 J	0.010
Benzo(a)pyrene	0.007 T	1.000 U	0.010 U	0.014	1.130 J	0.009	0.072 J	0.010 UJ	0.005 U	0.005 U	0.049 J	0.010 UJ	0.005 UJ	0.009 JT	0.010 UJ	-	0.010 UJ	0.010
Benzo(b,k)fluoranthenes	0.015 T	1.000 U	0.010 U	0.020	1.710 J	0.012	0.119 J	0.020 UJ	0.012 U	0.012 U	0.075 J	0.020 UJ	0.012 UJ	0.017 JT	0.020 UJ	-	0.020 UJ	0.020
Chrysene	0.025 J	1.000 U	0.022	0.140	1.230 J	0.007 T	0.120 J	0.010 UJ	0.008 T	0.010	0.077 J	0.010 UJ	0.006 UJ	0.018 J	0.010 UJ	-	0.026 J	0.010
Dibenz(a,h)anthracene	0.004 UJ	1.000 U	0.010 U	0.009 U	0.207 J	0.005	0.014 J	0.010 UJ	0.004 U	0.004 U	0.010 J	0.010 UJ	0.004 UJ	0.010 UJ	0.010 UJ	-	0.010 UJ	0.010
Indeno(1,2,3-cd)pyrene	0.003 UJ	1.000 U	0.010 U	0.009 T	0.683 J	0.006 T	0.043 J	0.010 UJ	0.003 U	0.003 U	0.025 J	0.010 UJ	0.003 UJ	0.006 JT	0.010 UJ	-	0.010 UJ	0.010
Total cPAHs ^b	0.012 J	0.705 U	0.010	0.020 J	1.503 J	0.012 J	0.102 J	0.008 UJ	0.005 J	0.005	0.069 J	0.008 UJ	0.004 UJ	0.015 J	0.008 UJ	-	0.011 J	0.008
Dissolved Metals in µg/L																		
Arsenic	0.278	5.5	1.3 U	3.2	1.25 T	2.71 T	5 U	0.42	1.46	2.81	25 U	1.06	1.07	5 U	0.441	-	5 U	0.584
Copper	0.266	3.9 U	9.2 U	0.079 U	0.095 T	0.183 T	0.2 U	0.2 U	0.417	0.307	0.316 T	0.905	0.854 J	0.2 U	0.2 U	-	0.2 U	0.2
Lead	0.026 U	9.4 U	2.3 U	0.15 T	7	0.153 T	0.294 U	0.306	0.407	0.223	1 U	0.052 U	0.13 U	0.2 U	0.026 U	-	0.2 U	0.026
Nickel	0.379 UJ	0.4 U	0.6 U	7.17	1.9 T	6.21	0.798	0.795	2.24	0.270 UJ	0.988 T	0.976	1.830 UJ	0.202	0.162 JT	-	0.134 T	0.403
Zinc	0.84	1.9 U	1.8 U	3.22	6.3	0.756	0.594 U	2.52	76.4	1.83	2.26 U	3.42	3.39	0.66 U	1.99	-	0.852 U	3.86

TABLE 3
HISTORICAL RESULTS
 THEA FOSS WATERWAY ESPLANADE
 TACOMA, WASHINGTON

Well ID	-5	MW7-1A			P3-MW01R		P3-MW01R	P3-MW2			P3-MW03			Landau Well			
Sampling Date	014	10/23/2014	10/15/2013	4/17/2014	10/23/2014	10/15/2013	4/17/2014	10/23/2014	10/15/2013	4/17/2014	10/23/2014	10/15/2013	4/17/2014	10/23/2014	10/15/2013	4/17/2014	10/23/2014
Depth to Water in Feet ^a		9.01	4.74	4.69	2.91	8.09	8.19	8.00	6.03	6.05	5.30	9.06	9.11	8.53	12.72	12.38	11.20
TPH in µg/L																	
Diesel	U	30 UJ	40 T	100 U	30 UJ	50 U	100 U	30 UJ	30 T	100 U	30 UJ	30 T	100 U	30 UJ	80 T	100 U	70 J
Heavy oil	U	50 UJ	200 U	200 U	50 UJ	100 U	200 U	50 UJ	200 U	200 U	50 UJ	200 U	200 U	50 UJ	200 U	200 U	50 UJ
Gasoline	U	24.7 J	50 U	50 U	16.7 J	50 U	50 U	16.5 J	50 U	50 U	15.9 J	50 U	50 U	16.2 J	252	213	224 J
BTEX in µg/L																	
Benzene	U	0.2 U	1.0 U	0.2 U	0.2 U	1.0 U	0.2 U	0.2 U	1.0 U	0.2 U	0.2 U	1.0 U	0.2 U	0.2 U	0.7 T	0.3 JT	0.5 T
Toluene	U	0.2 U	1.0 U	0.2 U	0.2 U	1.0 U	0.2 U	0.2 U	1.0 U	0.2 U	0.2 U	1.0 U	0.2 U	0.2 U	1.0	0.8 JT	1.2
Ethylbenzene	U	0.2 U	1.0 U	0.2 U	0.2 U	1.0 U	0.2 U	0.2 U	1.0 U	0.2 U	0.2 U	1.0 U	0.2 U	0.2 U	0.2 T	0.2 U	0.2 U
Total xylene	U	0.4 U	2.0 U	0.4 U	0.4 U	2.0 U	0.4 U	0.4 U	2.0 U	0.4 U	0.4 U	2.0 U	0.4 U	0.4 U	1.5 T	1.5 JT	1.7 T
cPAHs in µg/L																	
Benzo(a)anthracene	UJ	0.014 J	0.043 J	0.020 J	0.071 J	0.030 J	0.010 UJ	0.005 UJ	0.019 J	0.010 UJ	0.005 UJ	0.024 J	0.010 UJ	0.005 U	0.022 J	0.010 UJ	0.005 U
Benzo(a)pyrene	UJ	0.005 UJ	0.023 J	0.023 J	0.084 J	0.008 JT	0.010 UJ	0.005 UJ	0.010 UJ	0.010 UJ	0.005 UJ	0.010 UJ	0.010 UJ	0.005 U	0.007 JT	0.010 UJ	0.005 U
Benzo(b,k)fluoranthenes	UJ	0.012 UJ	0.060 J	0.060 J	0.242 J	0.018 JT	0.020 UJ	0.012 UJ	0.020 UJ	0.020 UJ	0.012 UJ	0.020 UJ	0.020 UJ	0.012 U	0.017 JT	0.020 UJ	0.012 U
Chrysene	UJ	0.010 J	0.040 J	0.024 J	0.087 J	0.024 J	0.010 UJ	0.006 UJ	0.017 J	0.010 UJ	0.006 UJ	0.018 J	0.010 UJ	0.006 U	0.020 J	0.010 UJ	0.006 U
Dibenz(a,h)anthracene	UJ	0.004 UJ	0.005 JT	0.010 UJ	0.004 UJ	0.010 UJ	0.010 UJ	0.004 UJ	0.010 UJ	0.010 UJ	0.004 UJ	0.010 UJ	0.010 UJ	0.004 U	0.010 UJ	0.010 UJ	0.004 U
Indeno(1,2,3-cd)pyrene	UJ	0.003 UJ	0.021 J	0.021 J	0.079 J	0.005 JT	0.010 UJ	0.003 UJ	0.010 UJ	0.010 UJ	0.003 UJ	0.010 UJ	0.010 UJ	0.003 U	0.006 JT	0.010 UJ	0.003 U
Total cPAHs ^b	UJ	0.005 J	0.036 J	0.034 J	0.124 J	0.014 J	0.008 UJ	0.004 UJ	0.009 J	0.008 UJ	0.004 UJ	0.010 J	0.008 UJ	0.004 U	0.012 J	0.008 UJ	0.004 U
Dissolved Metals in µg/L																	
Arsenic		3.43	6.06	3.57	0.93	5 U	1.66	1.62	5 U	1.93	3.79	5 U	1.43	3.09	5 U	0.686	0.902
Copper	U	0.71	0.346	0.648	4.06	2.33	2.74	2.44	0.2 U	0.038 U	0.772	1.04	1.24	1.37	0.2 U	0.038 U	0.265
Lead	U	0.138 J	0.2 U	0.089 JT	0.469	0.2 U	0.026 U	0.161 J	0.2 U	0.026 U	0.0662 J	0.2 U	0.026 U	0.026 U	0.2 U	0.026 U	0.026 U
Nickel		1.49	0.556	0.791	0.377 UJ	1.16	0.788	1.29	0.125 T	0.191	0.2 U	0.591	0.483	1.12	0.36	0.314	0.52 UJ
Zinc		77.9	1.38 U	3.48	1.77	2.35 U	3.42	5.25	0.514 U	2.71	2.03	0.873 U	2.47	1.22	9.72	2.5	0.99

Notes:

- Regulatory level = Consent Decree cleanup levels, which reflect the MCTA Amendments of February 2001.
- Values in **BOLD** indicate detected concentrations exceed Consent Decree cleanup levels.
- U = Not detected at the specified reporting limit.
- T/JT = Estimated value between the method detection limit (MDL) and the reporting limit (RL).
- J = Estimated value.
- = not applicable or no results
- a. Depth to water measurements were collected from top of casing.
- b. Total cPAHs calculated using the toxicity equivalency methodology (TEM) in WAC 173-340-708(8). Half detection limit was used for non-detects.
- c. Cleanup standard based on MTCA Method A Groundwater Cleanup Level
- d. Cleanup standard based on Federal National Toxics Rule Criteria (40 CFR 131) for human consumption of aquatic organisms.
- e. Cleanup standard based on Method B Groundwater Cleanup Level.
- f. Cleanup standard based on WAC 173-201A Marine Water Chronic.
- g. Not sampled because the monument was flooded/under water.

FIGURES



GIS: \\haleyaldrich.com\share\esa_projects\notebooks\1764604_Thea_Foss_Waterway_Esplanade\GIS\GIS2022_0720202561_000_0001_VICINITY_MAP.mxd - lphillips - 7/27/2022 10:22:01 AM



**HALEY
ALDRICH**

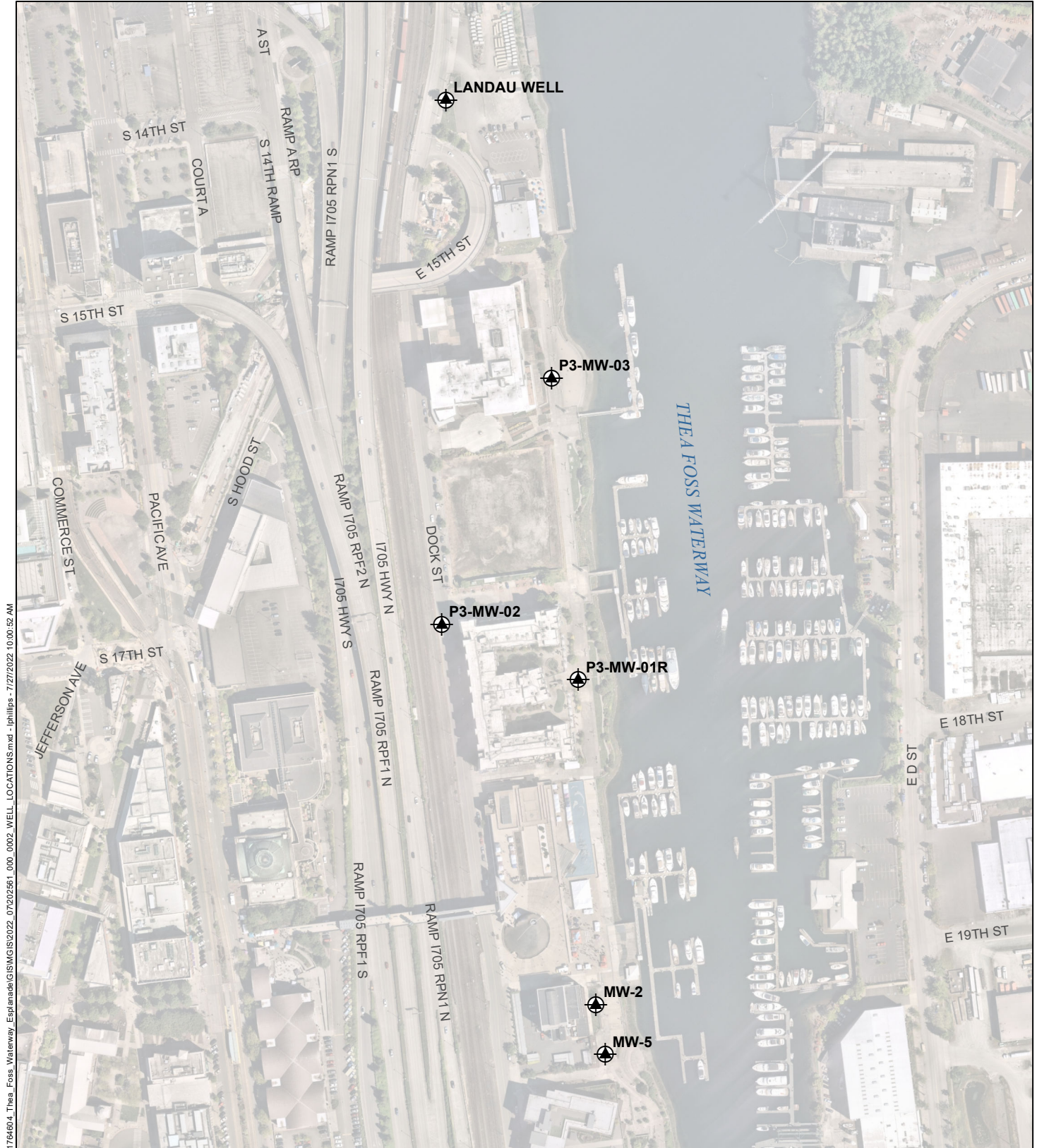
THEA FOSS WATERWAY ESPLANADE
TACOMA, WASHINGTON

VICINITY MAP

MAP SOURCE: ESRI
SITE COORDINATES: 47°14'53"N, 122°25'57"W

APPROXIMATE SCALE: 1 IN = 2000 FT
JULY 2022

FIGURE 1



GIS: \\haleyaldrich.com\share\esa_projects\notebooks\1764804_Thea_Foss_Waterway_Esplanade\GIS\GIS2022_072020561_000_0002_WELL_LOCATIONS.mxd - jphillips - 7/27/2022 10:00:52 AM

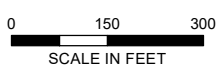
LEGEND

 MONITORING WELL



NOTES

- 1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
- 2. AERIAL IMAGERY SOURCE: NEARMAP, 22 MAY 2022



THEA FOSS WATERWAY ESPLANADE
TACOMA, WASHINGTON

WELL LOCATIONS

JULY 2022

FIGURE 2

APPENDIX A
Groundwater Sampling Field Forms

PROJECT Foss Waterway
 LOCATION Dock St.
 CLIENT City of Taloma
 CONTRACTOR _____

H&A FILE NO. _____
 PROJECT MGR. Mark Pajel
 FIELD REP Y.F. Z.S
 DATE 10/6/23

Sampling Data:

Well ID: P3-MW-01R Well Depth: 10.72 ft Initial Depth To Water: 8.91 ft Purging Device: Peri
 Start time: 12:03 Depth To Top Of Screen: 6? ft Depth Of Pump Intake: _____ ft Tubing Present In Well: Yes No
 Finish Time: 12:28 Depth To Bottom Of Screen: Specific 11? ft Tubing Type: _____

Time	Purge Rate (gal/min)	Cumulative Purge Vol. (gal)	Temperature (°C)	pH	Conductivity (us/cm)	ORP/eH (mv)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	DTW (feet btoc)	Comments
<u>12:08</u>			<u>18.7</u>	<u>6.67</u>	<u>1130</u>	<u>-1.4</u>	<u>1.67</u>	<u>3.39</u>	<u>8.92</u>	<u>no screen, no odor.</u>
<u>12:13</u>			<u>18.5</u>	<u>6.67</u>	<u>1116</u>	<u>8.9</u>	<u>1.54</u>	<u>2.18</u>	<u>8.93</u>	
<u>12:18</u>			<u>18.7</u>	<u>6.67</u>	<u>1108</u>	<u>160</u>	<u>1.43</u>	<u>1.96</u>	<u>8.92</u>	
<u>12:23</u>			<u>18.7</u>	<u>6.68</u>	<u>1112</u>	<u>16.1</u>	<u>1.36</u>	<u>1.97</u>	<u>8.92</u>	
<u>12:28</u>		<u>1.92</u>	<u>18.7</u>	<u>6.68</u>	<u>1104</u>	<u>24.3</u>	<u>1.29</u>	<u>1.82</u>	<u>8.92</u>	<u>sampled @ 12:28. ID. P3-MW-01R</u>

PROJECT Foss Waterway
 LOCATION Dock ST
 CLIENT City of Tallahassee
 CONTRACTOR _____

H&A FILE NO. _____
 PROJECT MGR. Mark Dagel
 FIELD REP. V.F., R.S.
 DATE 10/6/23

Sampling Data:

Well ID: Landan Well Well Depth: 29.69 ft Initial Depth To Water: 12.26 ft Purging Device: Peri
 Start time: 0855 Depth To Top Of Screen: 20(?) ft Depth Of Pump Intake: ~25 ft Tubing Present In Well: Yes No
 Finish Time: 0925 Depth To Bottom Of Screen: 30(?) ft Tubing Type: _____

Time	Purge Rate (gal/min)	Cumulative Purge Vol. (gal)	Temperature (°C)	pH	Spec. Conductivity (us/cm)	ORP/eH (mv)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	DTW (feet btoc)	Comments
0855			16.1	6.33	8782	-24.1	3.5	21	12.20	object removed from the well (see pictures)
0900			15.8	6.53	8761	-74.6	1.54	19	12.21	water clear N.S
0905			15.8	6.63	8681	-92.1	0.95	15	12.21	No odor.
0910			15.7	6.67	8584	-99	0.78	8.31	12.21	
0915			15.7	6.60	8567	-102.8	0.69	7.08	12.16	
0920			15.7	6.72	8578	-105.9	0.63	6.53	12.16	
0925		1 gal.	15.7	6.74	8546	-108.2	0.59	6.58	12.15	sample @ 9:25 I.D. Landan Well
										Drawn @ Dock ST 11:29



WELL SAMPLING FORM

Page of

PROJECT thea foss
 LOCATION Dock St
 CLIENT City of Taloma
 CONTRACTOR _____

H&A FILE NO. _____
 PROJECT MGR. Mark Dabel
 FIELD REP Y.F. ES.
 DATE 10/6/23

Sampling Data: P3
 Well ID: P3-MW-03 Well Depth: 10.55 ft Initial Depth To Water: 9.35 ft Purging Device: Peri-Pump
 Start time: 12:53 Depth To Top Of Screen: 6.7 ft Depth Of Pump Intake: ~10 ft Tubing Present In Well: Yes No
 Finish Time: 13:41 Depth To Bottom Of Screen: 11.7 ft Tubing Type: _____

Time	Purge Rate (gal/min)	Cumulative Purge Vol. (gal)	Temperature (°C)	pH	Specific Conductivity (us/cm)	ORP/eH (mv)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	DTW (feet btoc)	Comments
12:53			19.0	6.59	725	-3.6	2.63	12.15	9.35	No Sheen, No odor.
12:58			19.0	6.56	730	-4.2	1.78	7.30	9.35	Pump & Battery died during purge
13:03			18.9	6.56	728	-1.1	1.37	3.70	9.35	Replaced Pump and Re-purged another
13:08			19.0	6.55	730	-1.4	1.18	1.17	9.35	18 minutes until system stabilized
13:13			18.9	6.56	731	-3.2	1.04	2.78	9.35	before sampling.
13:18			19.4	6.55	734	-5.5	1.00	2.57	9.35	
13:36			18.6	6.54	725	-2.3	0.74	7.64	9.35	
13:41		1.25 gal	18.9	6.55	727	-4.7	0.68	5.03	9.35	Sampled @ 13:41 I.O. P3-MW-03

PROJECT Foss Waterway
 LOCATION Dock St.
 CLIENT City of Tallahassee
 CONTRACTOR _____

H&A FILE NO. _____
 PROJECT MGR. Mark Dajel
 FIELD REP Y.F., Z.S.
 DATE 10/6/23

Sampling Data:

Well ID: MW 2. Well Depth: 20.80 ft Initial Depth To Water: 9.57 ft Purging Device: Pori
 Start time: 11:15 Depth To Top Of Screen: ~10 ft Depth Of Pump Intake: ~15 ft Tubing Present In Well: Yes No
 Finish Time: 11:40 Depth To Bottom Of Screen: ~20 ft Tubing Type: _____

Time	Purge Rate (gal/min)	Cumulative Purge Vol. (gal)	Temperature (°C)	pH	Conductivity (us/cm)	ORP/eH (mv)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	DTW (feet btoc)	Comments
11:15			18.8	6.08	335.7	-23.5	2.53	24.53	9.71	No sheen, light sewer odor
11:20			18.6	6.09	360.9	-24.1	1.40	23.36	9.71	
11:25			18.6	6.11	391.8	-28.6	0.80	25.76	9.71	
11:30			18.6	6.13	415.2	-32.6	0.64	23.32	9.71	
11:35			18.6	6.15	440.5	-36.6	0.56	29.51	9.71	
11:40		1 gal	18.6	6.17	459.0	-39.8	0.52	18.09	9.71	sampled @ 11:40 I.D. MW 2 duplicate sample collected

PROJECT Foss Waterway
 LOCATION Dock St.
 CLIENT City of Tacoma
 CONTRACTOR _____

H&A FILE NO. _____
 PROJECT MGR. Mark Pagel
 FIELD REP Y.F., Z.S.
 DATE 10/6/23

Sampling Data:

Well ID: MW-5 Well Depth: 19.55 ft Initial Depth To Water: 9.11 ft Purging Device: Peti
 Start time: 10:30 Depth To Top Of Screen: 11 ft Depth Of Pump Intake: 215 ft Tubing Present In Well: Yes No
 Finish Time: 10:50 Depth To Bottom Of Screen: 21 ft Tubing Type: _____

Time	Purge Rate (gal/min)	Cumulative Purge Vol. (gal)	Temperature (°C)	pH	Specific Conductivity (us/cm)	ORP/eH (mv)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	DTW (feet btoc)	Comments
10:30			18.0	7.34	1303	-98.7	2.82	4.07	9.05	No sheen, slight sewer odor.
10:35			17.9	7.32	1306	-123.3	1.20	7.56	9.45	
10:40			17.6	7.29	1310	-128.3	0.72	11.51	9.60	
10:45			17.5	7.27	1313	-129.9	0.61	14.96	9.60	Sampled @ 10:50. I.D. MW-5
10:50		1 gal	17.5	7.25	1316	-130.4	0.55	12.85	9.70	

Chain of Custody



326 East D Street
Tacoma
WA, 98421-1801

phone (253) 502-2130
fax (253) 502-2170

Lab Work Order Number 2310012

Client Name PW Engineering		Project Name Foss Uplands Esplanade		Requested Analyses							Requested Turn Around		
Client Contact Darius Thompson		Project Number 662319		Arsenic, Dissolved 6020B::Copper, Dissolved 6020B::Lead, Dissolved 6020B::Fickel, Dissolved 6020B::Zinc, Dissolved 6020B								Sample Number	Rush requests subject to additional charge. Rush requests subject to lab approval.
Address 747 Market Street, Rm 744		Project Description Monitoring analyses											Standard (days)
City Tacoma		PO Number 61000073538											Expedited (days)
State/Zip WA, 98402		Sampler Signatures 											Due Date
Phone (253) 591 5305 / (253) 591 7911		Fax											
Sampler Becca Dozier													

Sample Name or Field ID	Sampled Date	Sampled Time	Sample Type	Matrix Code	Container Count	Preservation Code							Sample	Comments	
MW-5	10/6/23	10:50	G	W	0	1								01	
MW-2		11:40	G	W	0	1								02	
P3-MW-01R		12:28	G	W	0	1								03	
P3-MW-02		10:05	G	W	0	1								04	
P3-MW-03		13:41	G	W	0	1								05	
Landau Well		09:25	G	W	0	1								06	
DUP1	10/6/23	11:40	G	W	0	1								07	

Relinquished By Kida Fany	Received By 	Date/Time 10/6/23	Comments
Relinquished By	Received By	Date/Time	
Relinquished By	Received By	Date/Time	
Cooler Numbers and Temperatures			

Matrix Codes: W=Ground Water Cont. Codes =125 mL WM HDPE HNO3 Filter ;Metals Diss

APPENDIX B
Data Quality Review and Laboratory Data Report



13 October 2023

Darius Thompson
PW Engineering
747 Market Street, Rm 744
Tacoma, WA 98402

Subject: Foss Upland Esplanade

Enclosed are the analytical results for samples collected 10/06/2023.

Quality Control Data are included with the sample results for your review.

If you have any questions concerning this report, call me at (253)502-2130. Please note that remaining samples associated with this report will be discarded **3 months** from the date of this report unless we are notified otherwise.

Sincerely,

DocuSigned by:

Stuart Magoon

F41AFFAA30F64EB...

Stuart Magoon
Assistant Division Manager
Environmental Services Laboratory

cc.

PW Engineering
747 Market Street, Rm 744
Tacoma WA, 98402

Project: **Foss Upland Esplanade**
Project Number: 662319
Project Manager: Darius Thompson

Reported:
13-Oct-23 09:52

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Sample Type	Date Sampled
MW-5 HC#7	2310012-01	Water	Grab	06-Oct-23 10:50
MW-2 HC#7	2310012-02	Water	Grab	06-Oct-23 11:40
P3-MW-01R HC#7	2310012-03	Water	Grab	06-Oct-23 12:28
P3-MW-02 HC#7	2310012-04	Water	Grab	06-Oct-23 10:05
P3-MW-03 HC#7	2310012-05	Water	Grab	06-Oct-23 13:41
Landau Well HC#7	2310012-06	Water	Grab	06-Oct-23 09:25
DUP1 HC#7	2310012-07	Water	Grab	06-Oct-23 11:40

CHAIN OF CUSTODY, SAMPLE RECEIPT, PRESERVATION AND STORAGE

Samples were received under appropriate Chain of Custody procedures. Containers were properly preserved and stored in accordance with the applicable method requirements.

HOLDING TIMES

All analyses were performed within the required holding times.

METHODS

The samples were analyzed by the following method:

EPA Method 6020B for Dissolved Metals

MINIMUM REPORTING LIMITS

All analytes are reported to the Method Detection Limit (MDL). Values between the MDL and Practical Quantitation Limit (PQL) are not as accurate as values reported greater than the PQL (the low standard or 3 - 5 times the MDL), and are considered estimates. These values are qualified estimated (J).

BLANKS

Blanks were analyzed at the required frequencies of the methods. Analytes were not detected in the blanks .

LABORATORY CONTROL/REFERENCE SAMPLES

Laboratory Control and/or Reference Samples were analyzed with these samples. The recoveries were within the laboratory or project limits.

DUPLICATE SAMPLE ANALYSIS

Duplicate analysis was performed with these samples. Relative percent differences were within the laboratory or project limits .

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE ANALYSIS

Matrix Spike and/or Matrix Spike Duplicate analysis was performed with these samples. The recoveries were within the laboratory or project limits.

INTERNAL STANDARDS

Internal Standards were added to these samples to monitor instrument performance related to calibration drift of matrix interference in the analysis by ICP-MS. The Internal Standards met the method criteria.

DATA AVAILABILITY

All data associated with the samples referenced in this report are archived at the Environmental Services Laboratory and are available upon request.

PW Engineering

747 Market Street, Rm 744
Tacoma WA, 98402

Project: Foss Upland Esplanade

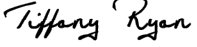
Project Number: 662319
Project Manager: Darius Thompson

Reported:

13-Oct-23 09:52

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan and project QAPP.

DocuSigned by:



9D4B4D82A1DE4B7...

Reviewed By

PW Engineering
747 Market Street, Rm 744
Tacoma WA, 98402

Project: **Foss Upland Esplanade**
Project Number: 662319
Project Manager: Darius Thompson

Reported:
13-Oct-23 09:52

MW-5 HC#7
2310012-01 (Water)
06-Oct-23 10:50

Analyte	Result	PQL	MDL	Units
---------	--------	-----	-----	-------

Metals

EPA 6020B_(7/14)

Prepared: 10-Oct-23

Analyzed: 10-Oct-23

Arsenic, Dissolved	0.420 J	0.500	0.161	ug/L
Copper, Dissolved	0.118 U	0.500	0.118	ug/L
Lead, Dissolved	0.0500 U	0.500	0.0500	ug/L
Nickel, Dissolved	0.519	0.500	0.429	ug/L
Zinc, Dissolved	0.66	0.50	0.16	ug/L

PW Engineering
747 Market Street, Rm 744
Tacoma WA, 98402

Project: **Foss Upland Esplanade**
Project Number: 662319
Project Manager: Darius Thompson

Reported:
13-Oct-23 09:52

MW-2 HC#7
2310012-02 (Water)
06-Oct-23 11:40

Analyte	Result	PQL	MDL	Units
---------	--------	-----	-----	-------

Metals

EPA 6020B_(7/14)

Prepared: 10-Oct-23

Analyzed: 10-Oct-23

Arsenic, Dissolved	3.62	0.500	0.161	ug/L
Copper, Dissolved	0.990	0.500	0.118	ug/L
Lead, Dissolved	0.485 J	0.500	0.0500	ug/L
Nickel, Dissolved	2.01	0.500	0.429	ug/L
Zinc, Dissolved	1.36	0.50	0.16	ug/L

PW Engineering
747 Market Street, Rm 744
Tacoma WA, 98402

Project: **Foss Upland Esplanade**
Project Number: 662319
Project Manager: Darius Thompson

Reported:
13-Oct-23 09:52

P3-MW-01R HC#7

2310012-03 (Water)

06-Oct-23 12:28

Analyte	Result	PQL	MDL	Units
---------	--------	-----	-----	-------

Metals

EPA 6020B_(7/14)

Prepared: 10-Oct-23

Analyzed: 10-Oct-23

Arsenic, Dissolved	2.36	0.500	0.161	ug/L
Copper, Dissolved	3.84	0.500	0.118	ug/L
Lead, Dissolved	0.0532 J	0.500	0.0500	ug/L
Nickel, Dissolved	1.67	0.500	0.429	ug/L
Zinc, Dissolved	4.65	0.50	0.16	ug/L

PW Engineering
747 Market Street, Rm 744
Tacoma WA, 98402

Project: **Foss Upland Esplanade**
Project Number: 662319
Project Manager: Darius Thompson

Reported:
13-Oct-23 09:52

P3-MW-02 HC#7

2310012-04 (Water)

06-Oct-23 10:05

Analyte	Result	PQL	MDL	Units
---------	--------	-----	-----	-------

Metals

EPA 6020B_(7/14)

Prepared: 10-Oct-23

Analyzed: 10-Oct-23

Arsenic, Dissolved	0.795	0.500	0.161	ug/L
Copper, Dissolved	0.118 U	0.500	0.118	ug/L
Lead, Dissolved	0.0500 U	0.500	0.0500	ug/L
Nickel, Dissolved	0.429 U	0.500	0.429	ug/L
Zinc, Dissolved	1.03	0.50	0.16	ug/L

PW Engineering
747 Market Street, Rm 744
Tacoma WA, 98402

Project: **Foss Upland Esplanade**
Project Number: 662319
Project Manager: Darius Thompson

Reported:
13-Oct-23 09:52

P3-MW-03 HC#7

2310012-05 (Water)

06-Oct-23 13:41

Analyte	Result	PQL	MDL	Units
---------	--------	-----	-----	-------

Metals

EPA 6020B_(7/14)

Prepared: 10-Oct-23

Analyzed: 10-Oct-23

Arsenic, Dissolved	0.886	0.500	0.161	ug/L
Copper, Dissolved	0.746	0.500	0.118	ug/L
Lead, Dissolved	0.0552 J	0.500	0.0500	ug/L
Nickel, Dissolved	0.867	0.500	0.429	ug/L
Zinc, Dissolved	1.02	0.50	0.16	ug/L

PW Engineering
747 Market Street, Rm 744
Tacoma WA, 98402

Project: **Foss Upland Esplanade**
Project Number: 662319
Project Manager: Darius Thompson

Reported:
13-Oct-23 09:52

Landau Well HC#7

2310012-06 (Water)

06-Oct-23 09:25

Analyte	Result	PQL	MDL	Units
---------	--------	-----	-----	-------

Metals

EPA 6020B_(7/14)

Prepared: 10-Oct-23

Analyzed: 10-Oct-23

Arsenic, Dissolved	0.966 J	1.00	0.322	ug/L
Copper, Dissolved	0.508 J	1.00	0.236	ug/L
Lead, Dissolved	0.250 U	2.50	0.250	ug/L
Nickel, Dissolved	0.858 U	1.00	0.858	ug/L
Zinc, Dissolved	1.71	1.00	0.32	ug/L

PW Engineering
747 Market Street, Rm 744
Tacoma WA, 98402

Project: **Foss Upland Esplanade**
Project Number: 662319
Project Manager: Darius Thompson

Reported:
13-Oct-23 09:52

DUP1 HC#7
2310012-07 (Water)
06-Oct-23 11:40

Analyte	Result	PQL	MDL	Units
---------	--------	-----	-----	-------

Metals

EPA 6020B_(7/14)

Prepared: 10-Oct-23

Analyzed: 10-Oct-23

Arsenic, Dissolved	3.60	0.500	0.161	ug/L
Copper, Dissolved	0.996	0.500	0.118	ug/L
Lead, Dissolved	0.450 J	0.500	0.0500	ug/L
Nickel, Dissolved	1.92	0.500	0.429	ug/L
Zinc, Dissolved	1.51	0.50	0.16	ug/L

PW Engineering
 747 Market Street, Rm 744
 Tacoma WA, 98402

Project: Foss Upland Esplanade
 Project Number: 662319
 Project Manager: Darius Thompson

Reported:
 13-Oct-23 09:52

Metals - Quality Control
Environmental Services Laboratory

Sample ID	Result	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
-----------	--------	-----	-------	-------------	---------------	------	-------------	-----	-----------

Batch BGJ0191 - EPA 6020B (7/14)

Blank (BGJ0191-BLK1)

Prepared & Analyzed: 10-Oct-23

BGJ0191-BLK1

Arsenic, Dissolved	0.161 U	0.161	ug/L						
Copper, Dissolved	0.118 U	0.118	ug/L						
Lead, Dissolved	0.0500 U	0.0500	ug/L						
Nickel, Dissolved	0.429 U	0.429	ug/L						
Zinc, Dissolved	0.16 U	0.16	ug/L						

Duplicate (BGJ0191-DUP1)

Source: 2310012-03

Prepared & Analyzed: 10-Oct-23

BGJ0191-DUP1

Arsenic, Dissolved	2.41	0.161	ug/L		2.36			2	20
Copper, Dissolved	3.90	0.118	ug/L		3.84			1	20
Lead, Dissolved	0.0604 J	0.0500	ug/L		0.0532			13	20
Nickel, Dissolved	1.72	0.429	ug/L		1.67			3	20
Zinc, Dissolved	4.79	0.16	ug/L		4.65			3	20

LCS (BGJ0191-BS1)

Prepared & Analyzed: 10-Oct-23

BGJ0191-BS1

Arsenic, Dissolved	49.0	0.161	ug/L	50.0		98	80-120		
Copper, Dissolved	125	0.118	ug/L	125		100	80-120		
Lead, Dissolved	15.4	0.0500	ug/L	15.0		102	80-120		
Nickel, Dissolved	200	0.429	ug/L	200		100	80-120		
Zinc, Dissolved	100	0.16	ug/L	100		100	80-120		

Matrix Spike (BGJ0191-MS1)

Source: 2310012-03

Prepared & Analyzed: 10-Oct-23

BGJ0191-MS1

Arsenic, Dissolved	105	0.161	ug/L	100	2.36	102	75-125		
Copper, Dissolved	95.6	0.118	ug/L	100	3.84	92	75-125		
Lead, Dissolved	95.4	0.0500	ug/L	100	0.0532	95	75-125		
Nickel, Dissolved	93.9	0.429	ug/L	100	1.67	92	75-125		
Zinc, Dissolved	99.2	0.16	ug/L	100	4.65	95	75-125		

PW Engineering

747 Market Street, Rm 744
Tacoma WA, 98402

Project: **Foss Upland Esplanade**

Project Number: 662319

Project Manager: Darius Thompson

Reported:

13-Oct-23 09:52

Notes and Definitions

U	Analyte Not Detected at or above the associated value
UJ	Analyte Not Detected at or above the associated estimated value
J	The analyte was positively identified. The associated value is an estimate. For BOD Analysis: The sample dilutions set-up for the BOD analysis did not meet the oxygen depletion criteria of at least 2 mg/l dissolved oxygen depletion. Therefore the reported BOD result is estimated biased high
ND	Analyte NOT DETECTED at or above the reporting limit
E	Analyte was determined above the upper quantitation range of the method. The associated value is an estimate.
NJ	There is evidence the analyte is present. The associated value is an estimate.
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Chain of Custody



326 East D Street
Tacoma
WA, 98421-1801

phone (253) 502-2130
fax (253) 502-2170

Page 1 of 1

Lab Work Order Number 2310012

Client Name PW Engineering		Project Name Foss Uplands Esplanade		Requested Analyses								Requested Turn Around				
Client Contact Darius Thompson		Project Number 662319		Arsenic, Dissolved 6020B::Copper, Dissolved 6020B::Lead, Dissolved 6020B::Nickel, Dissolved 6020B::Zinc, Dissolved 6020B											Rush requests subject to additional charge. Rush requests subject to lab approval.	
Address 747 Market Street, Rm 744		Project Description Monitoring analyses														Standard (days)
City Tacoma		PO Number 61000073538														Expedited (days)
State/Zip WA, 98402		Sampler Signatures 													Due Date	
Phone (253) 591-5395 / (253) 594-7941		Fax														
Sampler Becca Dozier																

Sample Name or Field ID	Sampled Date	Sampled Time	Sample Type	Matrix Code	Container Count	Preservation Code								Sample	Comments
MW-5	10/6/23	10:50	G	W	0	1								01	
MW-2		11:40	G	W	0	1								02	
P3-MW-01R		12:28	G	W	0	1								03	
P3-MW-02		1:05	G	W	0	1								04	
P3-MW-03		13:41	G	W	0	1								05	
Landau Well		09:25	G	W	0	1								06	
DUP1	10/6/23	11:40	G	W	0	1								07	

Relinquished By <i>Kida Fans</i>	Received By <i>Tiffany Ryan</i>	Date/Time 10/6/23 @ 14:15	Comments 9.5°C corrected Samples filtered & preserved 10/6/23 @ 14:34 15 filter lot 1376827
Relinquished By	Received By	Date/Time	
Relinquished By	Received By	Date/Time	
Cooler Numbers and Temperatures			

Matrix Codes: W=Ground Water Cont. Codes =125 mL WM HDPE HNO3 Filter::Metals Diss
Tiffany Ryan 10/6/23 15:00