



15 April 2021

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

Subject: Foss Upland Esplanade

Enclosed are the analytical results for samples collected 03/31/2021.

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,

Stuart Magoon

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: PWK-00423-01-01
Project Manager: Darius Thompson

Reported:
15-Apr-21 12:10

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled
MW-2 HC#7	2103087-01	Water	31-Mar-21 10:45
MW-5 HC#7	2103087-02	Water	31-Mar-21 09:44
P3-MW01R HC#7	2103087-03	Water	31-Mar-21 11:27
P3-MW2 HC#7	2103087-04	Water	31-Mar-21 15:31
P3-MW03 HC#7	2103087-05	Water	31-Mar-21 02:08
Landau Well HC#7	2103087-06	Water	31-Mar-21 13:53
MW-500 HC#7	2103087-07	Water	31-Mar-21 10:18
P3-MW-01-R-00 HC#7	2103087-08	Water	31-Mar-21 12:00

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CHAIN OF CUSTODY, SAMPLE RECEIPT, PRESERVATION AND STORAGE

The samples were received under appropriate Chain of Custody procedures.

HOLDING TIMES

All analyses were performed within the required holding times.

METHODS

The samples were analyzed by the following methods:

EPA Method 6020B for Total Metals Analysis
Washington Department of Ecology NWTPH-Dx, 1997 for Diesel Analysis

MINIMUM REPORTING LIMITS

All analytes are reported to the Practical Quantitation Limit (PQL) which is below or no greater than the Minimum Project Reporting Limit.

BLANKS

Blanks were analyzed at the required frequencies of the methods. Analytes were not detected in the blanks, sample concentrations were greater than 10 times the blank values, or the analytes detected in the blanks were not detected in associated samples.

SURROGATE COMPOUNDS

Surrogate compounds were added to the NWTPH-Dx sample to monitor system performance: surrogate recoveries were within laboratory limits.

LABORATORY CONTROL SAMPLES

Laboratory Control Samples were analyzed with these samples. The recoveries were within the laboratory limits.

DUPLICATE SAMPLE ANALYSIS

Duplicate analysis was performed with these samples. The Duplicate Relative Percent Differences (RPD) were within the project limits for analytes with concentrations greater than 5 times the reporting limit.

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE ANALYSIS

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

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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.

LABORATORY RECOMMENDATION

Landau Well sample 2103087-06 was noted to have a strong petroleum odor on the attached Chain of Custody. Diesel Analysis by the NWTPH-Dx method was performed on the 1L glass container received, but Diesel Range Organics were not detected in the sample. It was not possible to perform Gasoline Analysis by NWTPH-Gx analysis on the Landau Well sample because no sample was provided in a container appropriate for this analysis. The Environmental Services Lab advises the client to collect the Foss Upland Esplanade sample (in duplicate) in 40mL amber glass Volatile Organic Analysis (VOA) containers. With re-sampling in proper containers, NWTPH-Gx analysis can be performed in pursuit of the identity of the petroleum odor noted in Landau Well.

DATA AVAILABILITY

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

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

Eric Bitten

Reviewed By

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

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Environmental Services Laboratory
MW-2 HC#7
2103087-01 (Water)
31-Mar-21 10:45

Analyte	Result	PQL	Units
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Metals

EPA 6020B_(7/14)	Prepared: 05-Apr-21	Analyzed: 05-Apr-21		
Arsenic, Dissolved		2.50 U	2.50	ug/L
Copper, Dissolved		2.50 U	2.50	ug/L
Lead, Dissolved		2.50 U	2.50	ug/L
Nickel, Dissolved		2.50 U	2.50	ug/L
Zinc, Dissolved		2.50 U	2.50	ug/L

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Reported:
15-Apr-21 12:10

MW-5 HC#7
2103087-02 (Water)
31-Mar-21 09:44

Analyte	Result	PQL	Units
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Metals

EPA 6020B_(7/14)	Prepared: 05-Apr-21	Analyzed: 05-Apr-21		
Arsenic, Dissolved	2.50	U	2.50	ug/L
Copper, Dissolved	2.50	U	2.50	ug/L
Lead, Dissolved	2.50	U	2.50	ug/L
Nickel, Dissolved	2.50	U	2.50	ug/L
Zinc, Dissolved	2.50	U	2.50	ug/L

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Reported:
15-Apr-21 12:10

P3-MW01R HC#7
2103087-03 (Water)
31-Mar-21 11:27

Analyte	Result	PQL	Units
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Metals

EPA 6020B_(7/14)	Prepared: 05-Apr-21	Analyzed: 05-Apr-21		
Arsenic, Dissolved	2.50	U	2.50	ug/L
Copper, Dissolved	2.65		2.50	ug/L
Lead, Dissolved	2.50	U	2.50	ug/L
Nickel, Dissolved	2.50	U	2.50	ug/L
Zinc, Dissolved	4.45		2.50	ug/L

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Reported:
15-Apr-21 12:10

P3-MW2 HC#7
2103087-04 (Water)
31-Mar-21 15:31

Analyte	Result	PQL	Units
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Metals

EPA 6020B_(7/14)	Prepared: 05-Apr-21	Analyzed: 05-Apr-21		
Arsenic, Dissolved	2.50	U	2.50	ug/L
Copper, Dissolved	2.50	U	2.50	ug/L
Lead, Dissolved	2.50	U	2.50	ug/L
Nickel, Dissolved	2.50	U	2.50	ug/L
Zinc, Dissolved	2.50	U	2.50	ug/L

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Reported:
15-Apr-21 12:10

P3-MW03 HC#7
2103087-05 (Water)
31-Mar-21 02:08

Analyte	Result	PQL	Units
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Metals

EPA 6020B_(7/14)

Prepared: 05-Apr-21

Analyzed: 05-Apr-21

Arsenic, Dissolved	6.20		2.50	ug/L
Copper, Dissolved	2.50	U	2.50	ug/L
Lead, Dissolved	2.50	U	2.50	ug/L
Nickel, Dissolved	2.50	U	2.50	ug/L
Zinc, Dissolved	9.01		2.50	ug/L

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 15-Apr-21 12:10

Landau Well HC#7
2103087-06 (Water)
31-Mar-21 13:53

Analyte	Result	PQL	Units
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Metals

EPA 6020B_(7/14)	Prepared: 05-Apr-21	Analyzed: 05-Apr-21		
Arsenic, Dissolved			2.63	2.50 ug/L
Copper, Dissolved			2.50 U	2.50 ug/L
Lead, Dissolved			2.50 U	2.50 ug/L
Nickel, Dissolved			2.50 U	2.50 ug/L
Zinc, Dissolved			2.62	2.50 ug/L

Semi-VOA

WDOE NWTPH-Dx_(1997)	Prepared: 05-Apr-21	Analyzed: 07-Apr-21		
NWTPH-Diesel			0.10 U	0.10 mg/L
NWTPH-Heavy Oil			0.19 U	0.19 mg/L
<i>Surrogate: 2-Fluorobiphenyl</i>			68.7 %	50-150
<i>Surrogate: Pentacosane</i>			70.6 %	50-150
<i>Surrogate: Terphenyl-d14</i>			84.8 %	50-150

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Reported:
15-Apr-21 12:10

MW-500 HC#7
2103087-07 (Water)
31-Mar-21 10:18

Analyte	Result	PQL	Units
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Metals

EPA 6020B_(7/14)	Prepared: 05-Apr-21	Analyzed: 05-Apr-21		
Arsenic, Dissolved	2.50	U	2.50	ug/L
Copper, Dissolved	2.50	U	2.50	ug/L
Lead, Dissolved	2.50	U	2.50	ug/L
Nickel, Dissolved	2.50	U	2.50	ug/L
Zinc, Dissolved	4.38		2.50	ug/L

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Reported:
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P3-MW-01-R-00 HC#7

2103087-08 (Water)

31-Mar-21 12:00

Analyte	Result	PQL	Units
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Metals

EPA 6020B_(7/14)	Prepared: 05-Apr-21	Analyzed: 05-Apr-21		
Arsenic, Dissolved	2.50	U	2.50	ug/L
Copper, Dissolved	2.50	U	2.50	ug/L
Lead, Dissolved	2.50	U	2.50	ug/L
Nickel, Dissolved	2.50	U	2.50	ug/L
Zinc, Dissolved	5.87		2.50	ug/L

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Metals - Quality Control
Environmental Services Laboratory

Sample ID Analyte	Result	MDL	Units	Spike Level	Source Result	%REC %REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BED0021 - EPA 6020B (7/14)

Blank Prepared & Analyzed: 05-Apr-21

BED0021-BLK1

Arsenic, Dissolved	0.500	U	0.050	ug/L						
Copper, Dissolved	0.500	U	0.022	ug/L						
Lead, Dissolved	0.500	U	0.0061	ug/L						
Nickel, Dissolved	0.500	U	0.012	ug/L						
Zinc, Dissolved	0.50	U	0.22	ug/L						

Duplicate

Source: 2103087-01

Prepared & Analyzed: 05-Apr-21

BED0021-DUP1

Arsenic, Dissolved	0.880		0.250	ug/L		1.27		37	20	
Copper, Dissolved	2.50	U	0.110	ug/L		0.174			20	
Lead, Dissolved	0.113		0.0305	ug/L		0.169		40	20	
Nickel, Dissolved	0.139		0.060	ug/L		0.257		60	20	
Zinc, Dissolved	1.62		1.10	ug/L		2.03		22	20	

LCS Prepared & Analyzed: 05-Apr-21

BED0021-BS1

Arsenic, Dissolved	49.5		0.050	ug/L	50.0		99	80-120		200
Copper, Dissolved	121		0.022	ug/L	125		97	80-120		200
Lead, Dissolved	14.5		0.0061	ug/L	15.0		96	80-120		200
Nickel, Dissolved	196		0.012	ug/L	200		98	80-120		200
Zinc, Dissolved	99.4		0.22	ug/L	100		99	80-120		200

Matrix Spike

Source: 2103087-01

Prepared & Analyzed: 05-Apr-21

BED0021-MS1

Arsenic, Dissolved	493		0.250	ug/L	500	1.27	98	70-130		20
Copper, Dissolved	486		0.110	ug/L	500	0.174	97	70-130		20
Lead, Dissolved	479		0.0305	ug/L	500	0.169	96	70-130		20
Nickel, Dissolved	479		0.060	ug/L	500	0.257	96	70-130		20
Zinc, Dissolved	494		1.10	ug/L	500	2.03	98	70-130		200

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Semi-VOA - Quality Control
Environmental Services Laboratory

Sample ID Analyte	Result	MDL	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
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Batch BED0035 - WDOE NWTPH-Dx (1997)

Blank Prepared: 05-Apr-21 Analyzed: 07-Apr-21

BED0035-BLK1

NWTPH-Diesel	0.10 U	0.10	mg/L						
NWTPH-Heavy Oil	0.20 U	0.20	mg/L						
Surrogate: 2-Fluorobiphenyl	0.031		mg/L	0.0500		62.4 50-150			
Surrogate: Terphenyl-d14	0.042		mg/L	0.0500		84.1 50-150			
Surrogate: Pentacosane	0.035		mg/L	0.0500		69.8 50-150			

LCS Prepared: 05-Apr-21 Analyzed: 07-Apr-21

BED0035-BS1

NWTPH-Diesel	0.33	0.10	mg/L	0.500		65.7 50-150		200	
NWTPH-Heavy Oil	0.87	0.20	mg/L	1.00		86.7 50-150		200	
Surrogate: 2-Fluorobiphenyl	0.035		mg/L	0.0500		70.9 50-150			
Surrogate: Terphenyl-d14	0.042		mg/L	0.0500		83.5 50-150			
Surrogate: Pentacosane	0.046		mg/L	0.0500		92.6 50-150			

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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
- H The sample dilutions set up for the BOD analysis failed to meet the criteria of a residual dissolved oxygen of at least 1 mg/l. Therefore actual concentration is likely greater than the reported result.

Chain of Custody



326 East D Street
Tacoma
WA, 98421-1801

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

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Lab Work Order Number 2103087

Client Name PW Engineering		Project Name Foss Upland Esplanade		Requested Analyses								Requested Turn Around					
Client Contact Darius Thompson		Project Number PWK-00423-01-01		EPA Dissolved 6020B_Ar, Cu, Pb, Ni, Zn	NUTPH-6X	NUTPH-DX									Rush requests subject to additional charge. Rush requests subject to lab approval.		
Address 747 Market Street, Rm 744		Project Description Foss Upland Esplanade															Standard (days) 18
City Tacoma		PO Number 61000073538															Expedited (days)
State/Zip WA, 98402		Sampler Signatures															Due Date 4/18/2021 15:00
Phone (253) 591-5395 / (253) 594-7941		Fax		Sample Number													
Sample B. Lytle + B. Dozier																	

Sample Name or Field ID	Sampled Date	Sampled Time	Sample Type	Matrix Code	Container Count	AN	Preservation Code	Sample	Comments
MW-2	3/31/21	1045	G	W	1	1		-01	
MW-5		0944	G	W	1	1		-02	
P3-MW01R		1127	G	W	1	1		-03	
P3-MW2		1531	G	W	1	1		-04	
P3-MW03		1206	G	W	1	1		-05	
Landau Well		1353	G	W	1	1		-06	Strong Retardat
MW-500		1016	G	W	1	1		-07	
P3-MW-01-B-00		1250	G	W	1	1		-08	

Relinquished By <i>B. Lytle</i>	Received By <i>Robert J. Ward</i>	Date/Time 3/31/2021 1604	Comments ① No Gx volume received Gx cancelled. 04-15-21 erb1219
Relinquished By	Received By	Date/Time	
Relinquished By	Received By	Date/Time	
Cooler Numbers and Temperatures			

Matrix Codes: =Ground Water Preserv. Codes: AN=HNO3 to pH<2, Cool <6°C
Cont. Codes: =125 mL WM HDPE HNO3 Filter