AECOM
111 SW Columbia
Portland, OR 97201
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Project name:
Shell Harbor Island Terminal

Project ref:
Voluntary Compliance Agreement
Equilon Enterprises LLC
City of Seattle

From:
Nicky Moody, Senior Project Manager

Date:
October 14, 2019

To:
Beth Schmoyer
Seattle Public Utilities
Seattle Municipal Tower
700 5th Avenue, Suite 4900
PO Box 34018
Seattle, WA 98124

cc:
Tad Shimazu, Assistant City Attorney
Seattle City Attorneys Office
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PO Box 94769
Seattle, WA 98124

Shell Oil Products US
HSE – Environmental Services
Delivery Group – US Region

Technical Memorandum

Subject: **August 2019 Dry Weather Stormwater System Sampling Results**
Shell Harbor Island Terminal
Seattle, Washington

AECOM, on behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell), submits the following technical memorandum (memo) summarizing dry weather sampling conducted following the stormwater system rehabilitation project, which included Cured In Place Pipe (CIPP) installation and stormwater system cleaning, on the City of Seattle (City) stormwater system's 24-inch reinforced concrete pipe (RCP) mainline located directly north of the Main Tank Farm at the Shell Harbor Island Terminal in Seattle, Washington (Figure 1).

This memo includes the following attachments:

- Figure 1 – Site Vicinity Map
- Figure 2 – Site Map-2019
- Table 1 – Dry Weather Sampling Analytical Results
- Attachment A – Daily Field Logs
- Attachment B – Laboratory Analytical Report

1. Location

The Shell Harbor Island Terminal is an active petroleum distribution facility located on Harbor Island, approximately one mile southwest of downtown Seattle at the mouth of the Duwamish River (the Terminal; Figure 1). Harbor Island divides the Duwamish River into the West Waterway and the East Waterway as the Duwamish River empties into the Puget Sound. The Terminal is comprised of three parcels located at 2555 13th Avenue SW, 1835 13th Avenue SW, and 1711 13th Avenue SW. These parcels are designated as the Main Tank Farm, North Tank Farm, and Shoreline Manifold Area, respectively.

The 24-inch RCP mainline of the City's stormwater system is located directly north of the Main Tank Farm. The mainline routes stormwater west, under SW Florida Street, to the Duwamish Waterway (Figure 2). The 24-inch RCP mainline receives stormwater from laterals at multiple catch basins located in the vicinity of SW Florida Street. The mainline and laterals shown on Figure 2 are herein also referred to as the Site.

2. Summary of Stormwater System Rehabilitation Project

Per the terms of a Voluntary Compliance Agreement (VCA) between Equilon Enterprises LLC DBA Shell Oil Products US and the City of Seattle dated April 2016 (VCA, 2016), the stormwater system rehabilitation project was completed between March and September 2018 as described in AECOM's January 29, 2019 technical memorandum (AECOM, 2019). Project activities completed to date include:

- Pre-installation cleaning and collection of Closed-Circuit Television (CCTV) footage
- Installation of 440 feet of CIPP within the mainline from manholes D050-016 to D050-014 (the CIPP installation area)
- Reinstatement of active laterals within the mainline CIPP installation area with CIPP T-liner installation
- Post-installation cleaning and collection of CCTV footage of the mainline through the CIPP installation area and downstream to the mainline outfall (approximately 1,250 total feet of pipe)

3. Dry Weather Sampling Scope of Work

The following scope of work was conducted in accordance with the terms of the VCA following completion of the CIPP liner installation and subsequent line cleaning activities associated with the stormwater system rehabilitation project.

- Annual collection and analysis of water samples at two manhole locations during dry weather events for a period of 3 years:
    - D050-016 - Directly upstream of suspected groundwater infiltration
    - D050-014 – Downstream
- This report presents the results of the first annual sampling event.

4. Sampling Activities

The dry weather water samples were collected at manholes D050-014 and D050-016 on August 14, 2019 after at least 24 hours of antecedent dry weather conditions while tidal elevations were below sample points in the mainline. Dedicated disposable polyethylene tubing and a peristaltic pump were used to obtain sample volume from flowing water at each manhole. Details of sampling activities at each manhole are provided on the field sheet in Attachment A.

5. Analytical Methods and Results

The dry weather water samples were submitted to TestAmerica Laboratories in Spokane, Washington for the analyses listed below.

- Gasoline range hydrocarbons (gasoline) by method NWTPH-Gx
- Volatile organic compounds (VOCs) by method US Environmental Protection Agency (EPA) 8260C
- Diesel and residual range hydrocarbons by method NWTPH-Dx

The dry weather water sample results are presented in Table 1. The laboratory analytical report is provided in Attachment B. Concentrations of benzene, toluene, ethylbenzene and total xylenes (BTEX), gasoline, diesel, and residual range hydrocarbons are presented on Figure 2. The analytical results for selected constituents are

summarized below and compared to the Cleanup Levels (CULs) identified in the Cleanup Action Plan (Ecology, 1998).

BTEX and gasoline, diesel, and residual range hydrocarbon results did not exceed the established CULs in either of the samples.

6. Comparison Between the 2014 and 2019 Dry Weather Sample Results

In 2014, prior to the completion of the stormwater system rehabilitation project, dry weather samples were collected from manholes D050-014 through D050-016, D050-039, and the outfall. The 2014 sample results are included on Table 1 with the 2019 sample results.

- In 2014, gasoline and benzene detections in the dry weather samples collected from manholes D050-014 and D050-015 exceeded the CULs. Both these manholes are within the downstream end of the CIPP installation area.
- In August 2019, the dry weather sampling results for BTEX, gasoline, diesel and residual range hydrocarbons were all below the CULs.

The August 2019 dry weather sample results indicate that BTEX and petroleum hydrocarbon concentrations within the CIPP installation area have been significantly reduced since the completion of the stormwater system rehabilitation project and are now below the CULs.

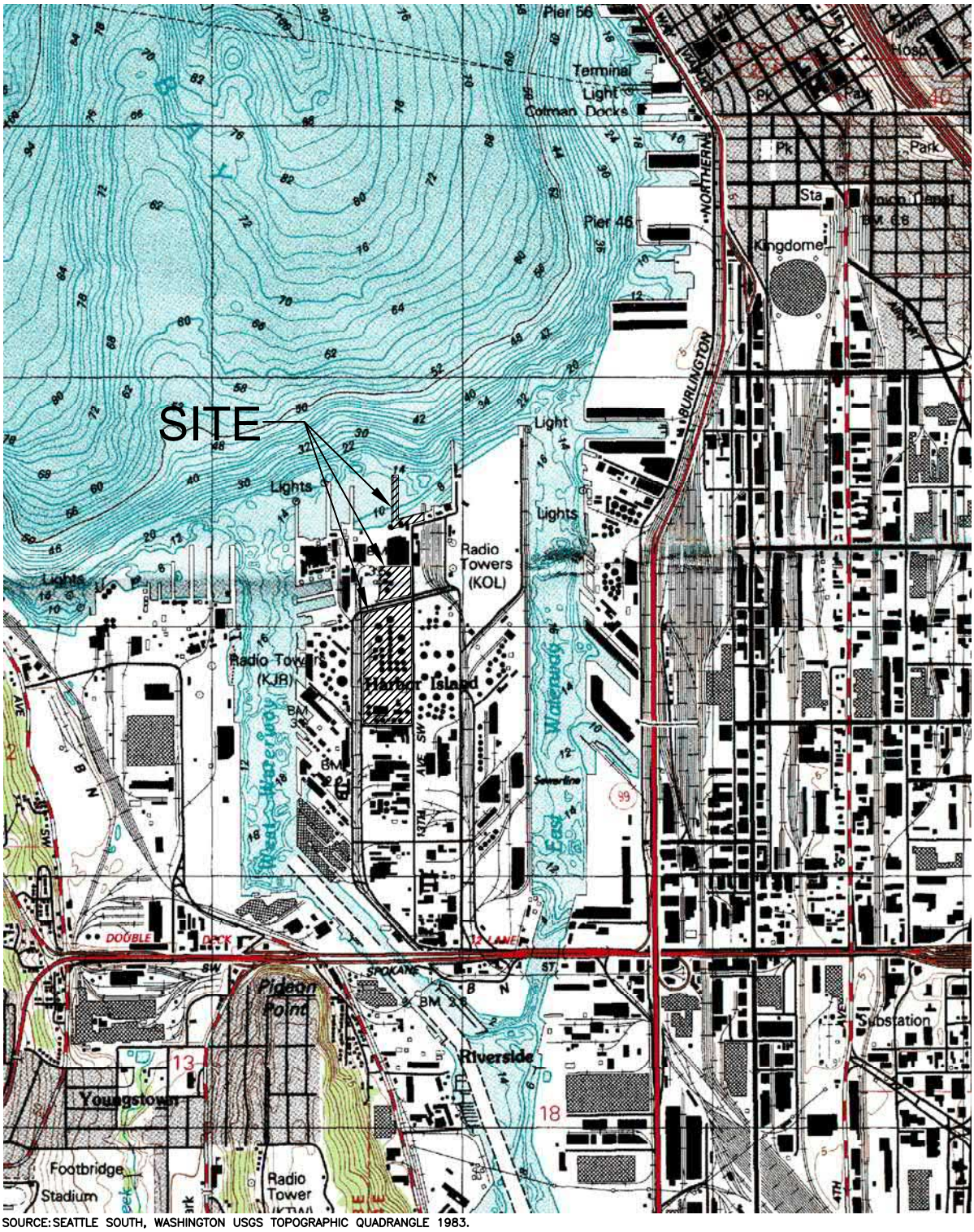
7. References

VCA, 2016. *Voluntary Compliance Agreement*, Shell Harbor Island Terminal, Seattle, Washington. April 2016.

AECOM, 2019. *Stormwater system Pipe rehabilitation Construction Completion Memorandum,* Shell Harbor Island Terminal, Seattle, Washington. January 2019.

Ecology, 1998. *Cleanup Action Plan, Equilon Seattle Sales Terminal, Harbor Island Site, Seattle, Washington.* September 28.

Figures



SOURCE: SEATTLE SOUTH, WASHINGTON USGS TOPOGRAPHIC QUADRANGLE 1983.

AECOM

SITE VICINITY MAP

SHELL HARBOR ISLAND TERMINAL
SEATTLE, WASHINGTON

FIGURE 1

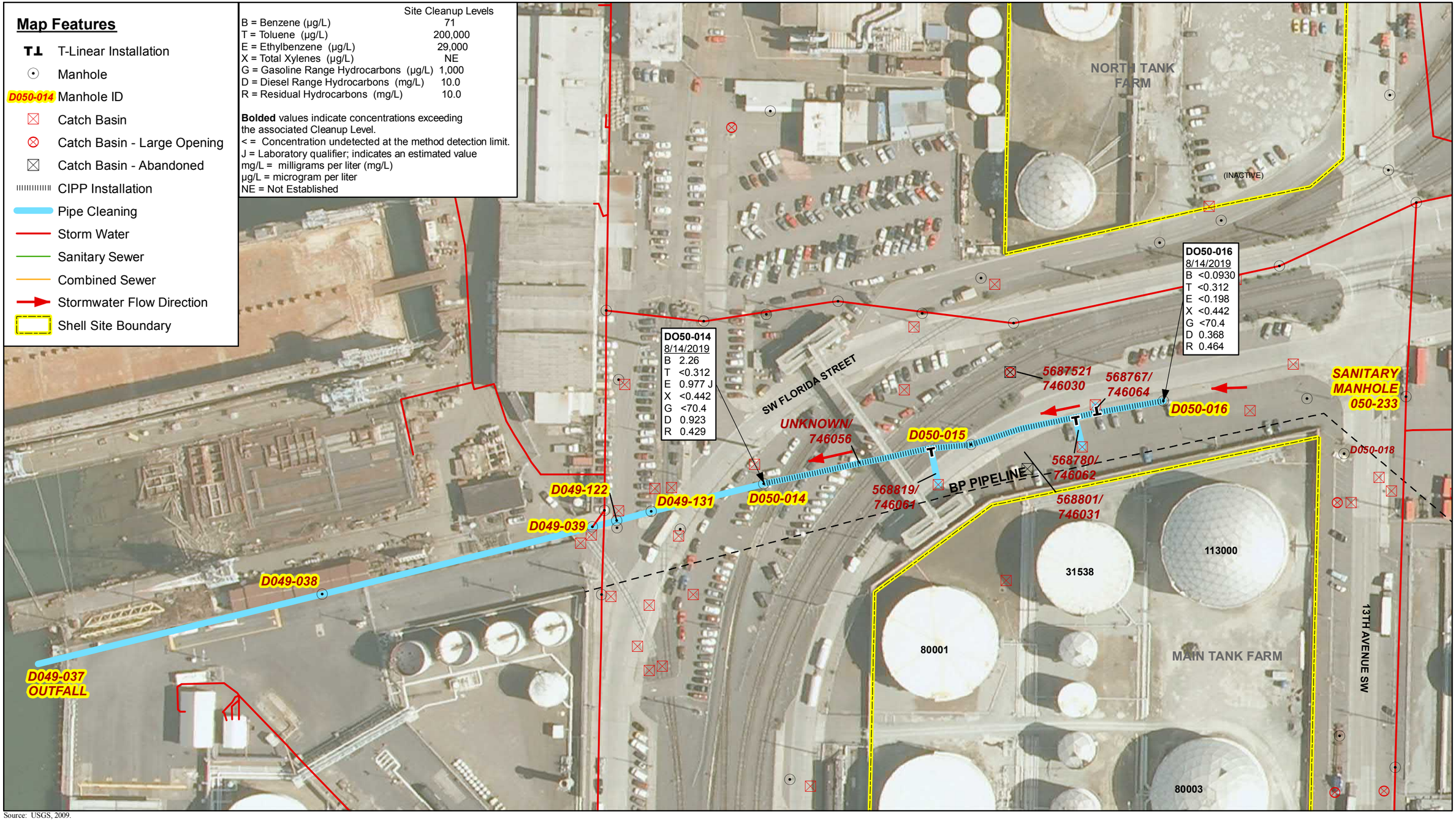
N

Map Features

- T-Linear Installation
- Manhole
- D050-014 Manhole ID
- Catch Basin
- Catch Basin - Large Opening
- Catch Basin - Abandoned
- CIPP Installation
- Pipe Cleaning
- Storm Water
- Sanitary Sewer
- Combined Sewer
- Stormwater Flow Direction
- Shell Site Boundary

	Site Cleanup Levels
B = Benzene (µg/L)	71
T = Toluene (µg/L)	200,000
E = Ethylbenzene (µg/L)	29,000
X = Total Xylenes (µg/L)	NE
G = Gasoline Range Hydrocarbons (µg/L)	1,000
D = Diesel Range Hydrocarbons (mg/L)	10.0
R = Residual Hydrocarbons (mg/L)	10.0

Bolded values indicate concentrations exceeding the associated Cleanup Level.
< = Concentration undetected at the method detection limit.
J = Laboratory qualifier; indicates an estimated value
mg/L = milligrams per liter (mg/L)
µg/L = microgram per liter
NE = Not Established



Source: USGS, 2009.

100 0 100 200
SCALE IN FEET

AECOM

SITE MAP

SHELL HARBOR ISLAND TERMINAL
SEATTLE, WASHINGTON

FIGURE 2

K:\46194268_Seattle_Terminal\MXD\2019\Fig 2 Site Map.mxd

Tables

Table 1
Dry Weather Sampling Analytical Results
Shell Harbor Island Terminal
Seattle, Washington

Sample Location	Sample Date	Units = µg/L					Units = mg/L	
		Benzene	Toluene	Ethylbenzene	Total Xylenes	Gasoline Range	Diesel Range	Residual Range
Cleanup Level [a]		71	200,000	29,000	NE	1,000	10	10
D050-017	07/25/14	0.200 U	0.200 U	0.200 U	0.460 U	57.0 J	0.165	0.094 U
D050-016	07/25/14	0.460 J	300.00 J	0.200 U	0.460 U	50.0 U	0.134	0.094 U
	09/23/14	0.200 U	0.200 U	0.200 U	0.460 U	50.0 U	0.0879 J	0.094 U
	01/15/19	0.245 J	0.312 U	0.198 U	0.442 U	70.4 U	3.41	**15.0**
	08/14/19	0.0930 U	0.312 U	0.198 U	0.442 U	70.4 U	0.368	0.464
D050-015	7/25/2014	**628**	15.2	36.1 J	16.6 J	**2,380**	0.435	0.094 U
	09/23/14	**280**	6.90	11.2	6.60	**1,360**	0.359	0.095 U
D050-014	07/25/14	**300**	7.20	17.0	7.80 J	**1,280**	0.461	0.094 U
	09/23/14	**133**	2.60	4.40	1.90	876	0.218	0.047 U
	01/15/19	12.2	0.314 J	4.84	0.442 U	171	2.13	0.612
	08/14/19	2.26	0.312 U	0.977 J	0.442 U	70.4 U	0.923	0.429
D050-039	09/23/14	65.9	1.80	3.00	1.80	466	0.326	0.095 U
D049-037 Outfall	09/23/14	8.50	0.330	0.510	0.500	89.1 J	0.165	0.095 U

Notes:
= Highlights the August 2019 samples
Bolded values indicate concentrations exceeding the associated Cleanup Level.
[a] Cleanup levels per the Cleanup Action Plan (Ecology, 1998).
J = Laboratory qualifier; indicates an estimated value
mg/L = milligrams per liter
µg/L = micrograms per liter
U = analyte not detected above method detection limit

Attachment A – Daily Field Logs

Location Harbor Island Date 8/14/19

Project / Client Dry Weather Storm Drain

D Lewis N Gyn Clear 75°

0930 on site, tailgate, set up at D050-014, Steady shallow flow, no sheen in bucket

1000 Sample # D050-014-081419

1020 Set up at D050-16, pooled water in low spot in drain, light sheen, slow flow

1030 Sample # D050-016-081419

1036 Looking into D050-017, pooled water slowly flowing, no sheen

1040 Looking into D050-018, pooled water no obvious flow, debris (sediment, etc)

1100 Checking for Well Points at Shoreline from field. None found, and no signs of abandoned ones

1115 Went to mail samples

1300 at office Demobing

Location Date

Project / Client

Attachment B – Laboratory Analytical Report

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Spokane
11922 East 1st Ave
Spokane, WA 99206
Tel: (509)924-9200

Laboratory Job ID: 590-11620-1
Client Project/Site: 2555 13th Avenue, Seattle Terminal Harbo

For:
AECOM
111 SW Columbia Street, Suite 1500
Portland, Oregon 97201

Attn: Nicky Moody

Authorized for release by:
8/28/2019 2:29:49 PM

Randee Arrington, Project Manager II
(509)924-9200
randee.arrington@testamericainc.com

Table of Contents

Case Narrative

Client: AECOM
Job ID: 590-11620-1
Project/Site: 2555 13th Avenue, Seattle Terminal Harbo

Job ID: 590-11620-1

Laboratory: Eurofins TestAmerica, Spokane

Narrative

Receipt
The samples were received on 8/15/2019 12:23 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.2º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Sample Summary

Client: AECOM
Job ID: 590-11620-1
Project/Site: 2555 13th Avenue, Seattle Terminal Harbo

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
590-11620-1	D050-014-081419	Water	08/14/19 10:00	08/15/19 12:44	
590-11620-2	D050-016-081419	Water	08/14/19 10:30	08/15/19 12:44	
590-11620-3	Trip Blank	Water	08/14/19 00:00	08/15/19 12:44	

Method Summary

Client: AECOM
Job ID: 590-11620-1
Project/Site: 2555 13th Avenue, Seattle Terminal Harbo

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL SPK
NWTPH-Gx	Northwest - Volatile Petroleum Products (GC/MS)	NWTPH	TAL SPK
NWTPH-Dx	Northwest - Semi-Volatile Petroleum Products (GC)	NWTPH	TAL SPK
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL SPK
5030C	Purge and Trap	SW846	TAL SPK

Protocol References:

NWTPH = Northwest Total Petroleum Hydrocarbon

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SPK = Eurofins TestAmerica, Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Detection Summary

Client: AECOM
Job ID: 590-11620-1
Project/Site: 2555 13th Avenue, Seattle Terminal Harbo

Client Sample ID: D050-014-081419 — Lab Sample ID: 590-11620-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	2.26		0.400	0.0930	ug/L	1		8260C	Total/NA
Ethylbenzene	0.977	J	1.00	0.198	ug/L	1		8260C	Total/NA
Diesel Range Organics (DRO) (C10-C25)	0.923		0.243	0.111	mg/L	1		NWTPH-Dx	Total/NA
Residual Range Organics (RRO) (C25-C36)	0.429		0.405	0.122	mg/L	1		NWTPH-Dx	Total/NA

Client Sample ID: D050-016-081419 — Lab Sample ID: 590-11620-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Diesel Range Organics (DRO) (C10-C25)	0.368		0.242	0.111	mg/L	1		NWTPH-Dx	Total/NA
Residual Range Organics (RRO) (C25-C36)	0.464		0.403	0.121	mg/L	1		NWTPH-Dx	Total/NA

Client Sample ID: Trip Blank — Lab Sample ID: 590-11620-3

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Spokane

Client Sample ID: D050-014-081419
Lab Sample ID: 590-11620-1
Date Collected: 08/14/19 10:00
Matrix: Water
Date Received: 08/15/19 12:44

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**2.26**		0.400	0.0930	ug/L			08/22/19 07:19	1
Ethylbenzene	**0.977**	**J**	1.00	0.198	ug/L			08/22/19 07:19	1
m,p-Xylene	ND		2.00	0.280	ug/L			08/22/19 07:19	1
o-Xylene	ND		1.00	0.162	ug/L			08/22/19 07:19	1
Toluene	ND		1.00	0.312	ug/L			08/22/19 07:19	1
Xylenes, Total	ND		3.00	0.442	ug/L			08/22/19 07:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*80 - 120*		*08/22/19 07:19*	*1*
4-Bromofluorobenzene (Surr)	*86*		*80 - 120*		*08/22/19 07:19*	*1*
Dibromofluoromethane (Surr)	*116*		*80 - 120*		*08/22/19 07:19*	*1*
Toluene-d8 (Surr)	*104*		*80 - 120*		*08/22/19 07:19*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150	70.4	ug/L			08/22/19 07:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*86*		*68.7 - 141*		*08/22/19 07:19*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	**0.923**		0.243	0.111	mg/L		08/21/19 11:21	08/21/19 22:59	1
Residual Range Organics (RRO) (C25-C36)	**0.429**		0.405	0.122	mg/L		08/21/19 11:21	08/21/19 22:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*97*		*50 - 150*	*08/21/19 11:21*	*08/21/19 22:59*	*1*
n-Triacontane-d62	*89*		*50 - 150*	*08/21/19 11:21*	*08/21/19 22:59*	*1*

Client Sample ID: D050-016-081419
Lab Sample ID: 590-11620-2
Date Collected: 08/14/19 10:30
Matrix: Water
Date Received: 08/15/19 12:44

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.400	0.0930	ug/L			08/22/19 07:41	1
Ethylbenzene	ND		1.00	0.198	ug/L			08/22/19 07:41	1
m,p-Xylene	ND		2.00	0.280	ug/L			08/22/19 07:41	1
o-Xylene	ND		1.00	0.162	ug/L			08/22/19 07:41	1
Toluene	ND		1.00	0.312	ug/L			08/22/19 07:41	1
Xylenes, Total	ND		3.00	0.442	ug/L			08/22/19 07:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*08/22/19 07:41*	*1*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*08/22/19 07:41*	*1*
Dibromofluoromethane (Surr)	*116*		*80 - 120*		*08/22/19 07:41*	*1*
Toluene-d8 (Surr)	*101*		*80 - 120*		*08/22/19 07:41*	*1*

Client: AECOM
Job ID: 590-11620-1
Project/Site: 2555 13th Avenue, Seattle Terminal Harbo

Client Sample ID: D050-016-081419
Lab Sample ID: 590-11620-2
Date Collected: 08/14/19 10:30
Matrix: Water
Date Received: 08/15/19 12:44

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150	70.4	ug/L			08/22/19 07:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*68.7 - 141*		*08/22/19 07:41*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	**0.368**		0.242	0.111	mg/L		08/21/19 11:21	08/22/19 07:36	1
Residual Range Organics (RRO) (C25-C36)	**0.464**		0.403	0.121	mg/L		08/21/19 11:21	08/22/19 07:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*89*		*50 - 150*	*08/21/19 11:21*	*08/22/19 07:36*	*1*
n-Triacontane-d62	*91*		*50 - 150*	*08/21/19 11:21*	*08/22/19 07:36*	*1*

Client Sample ID: Trip Blank
Lab Sample ID: 590-11620-3
Date Collected: 08/14/19 00:00
Matrix: Water
Date Received: 08/15/19 12:44

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.400	0.0930	ug/L			08/22/19 08:02	1
Ethylbenzene	ND		1.00	0.198	ug/L			08/22/19 08:02	1
m,p-Xylene	ND		2.00	0.280	ug/L			08/22/19 08:02	1
o-Xylene	ND		1.00	0.162	ug/L			08/22/19 08:02	1
Toluene	ND		1.00	0.312	ug/L			08/22/19 08:02	1
Xylenes, Total	ND		3.00	0.442	ug/L			08/22/19 08:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*		*08/22/19 08:02*	*1*
4-Bromofluorobenzene (Surr)	*86*		*80 - 120*		*08/22/19 08:02*	*1*
Dibromofluoromethane (Surr)	*120*		*80 - 120*		*08/22/19 08:02*	*1*
Toluene-d8 (Surr)	*107*		*80 - 120*		*08/22/19 08:02*	*1*

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 590-23701/5
Matrix: Water
Analysis Batch: 23701

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.400	0.0930	ug/L			08/22/19 02:21	1
Ethylbenzene	ND		1.00	0.198	ug/L			08/22/19 02:21	1
m,p-Xylene	ND		2.00	0.280	ug/L			08/22/19 02:21	1
o-Xylene	ND		1.00	0.162	ug/L			08/22/19 02:21	1
Toluene	ND		1.00	0.312	ug/L			08/22/19 02:21	1
Xylenes, Total	ND		3.00	0.442	ug/L			08/22/19 02:21	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*80 - 120*		*08/22/19 02:21*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*08/22/19 02:21*	*1*
Dibromofluoromethane (Surr)	*112*		*80 - 120*		*08/22/19 02:21*	*1*
Toluene-d8 (Surr)	*104*		*80 - 120*		*08/22/19 02:21*	*1*

Lab Sample ID: LCS 590-23701/1003
Matrix: Water
Analysis Batch: 23701

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	10.0	10.95		ug/L		109	80 - 126
Ethylbenzene	10.0	10.16		ug/L		102	80 - 120
m,p-Xylene	10.0	9.600		ug/L		96	80 - 120
o-Xylene	10.0	10.11		ug/L		101	80 - 120
Toluene	10.0	9.690		ug/L		97	80 - 123

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*
4-Bromofluorobenzene (Surr)	*85*		*80 - 120*
Dibromofluoromethane (Surr)	*115*		*80 - 120*
Toluene-d8 (Surr)	*100*		*80 - 120*

Lab Sample ID: LCSD 590-23701/6
Matrix: Water
Analysis Batch: 23701

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	10.0	11.18		ug/L		112	80 - 126	2	25
Ethylbenzene	10.0	10.69		ug/L		107	80 - 120	5	25
m,p-Xylene	10.0	10.17		ug/L		102	80 - 120	6	25
o-Xylene	10.0	10.47		ug/L		105	80 - 120	3	25
Toluene	10.0	10.73		ug/L		107	80 - 123	10	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*
4-Bromofluorobenzene (Surr)	*86*		*80 - 120*
Dibromofluoromethane (Surr)	*109*		*80 - 120*
Toluene-d8 (Surr)	*103*		*80 - 120*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Lab Sample ID: MB 590-23700/5
Matrix: Water
Analysis Batch: 23700

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150	70.4	ug/L			08/22/19 02:21	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*68.7 - 141*		*08/22/19 02:21*	*1*

Lab Sample ID: LCS 590-23700/1004
Matrix: Water
Analysis Batch: 23700

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline			1000	1005		ug/L		100	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*82*		*68.7 - 141*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 590-23682/1-A
Matrix: Water
Analysis Batch: 23671

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 23682

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.240	0.110	mg/L		08/21/19 11:21	08/21/19 18:58	1
Residual Range Organics (RRO) (C25-C36)	ND		0.400	0.120	mg/L		08/21/19 11:21	08/21/19 18:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*82*		*50 - 150*	*08/21/19 11:21*	*08/21/19 18:58*	*1*
n-Triacontane-d62	*80*		*50 - 150*	*08/21/19 11:21*	*08/21/19 18:58*	*1*

Lab Sample ID: LCS 590-23682/2-A
Matrix: Water
Analysis Batch: 23671

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 23682

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Diesel Range Organics (DRO) (C10-C25)			1.60	1.648		mg/L		103	50 - 150		
Residual Range Organics (RRO) (C25-C36)			1.60	1.798		mg/L		112	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*106*		*50 - 150*
n-Triacontane-d62	*105*		*50 - 150*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: LCSD 590-23682/3-A
Matrix: Water
Analysis Batch: 23671

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 23682

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Diesel Range Organics (DRO) (C10-C25)			1.60	1.602		mg/L		100	50 - 150	3	25
Residual Range Organics (RRO) (C25-C36)			1.60	1.765		mg/L		110	50 - 150	2	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*106*		*50 - 150*
n-Triacontane-d62	*104*		*50 - 150*

QC Association Summary

Client: AECOM
Job ID: 590-11620-1
Project/Site: 2555 13th Avenue, Seattle Terminal Harbo

GC/MS VOA

Analysis Batch: 23700

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
590-11620-1	D050-014-081419	Total/NA	Water	NWTPH-Gx	
590-11620-2	D050-016-081419	Total/NA	Water	NWTPH-Gx	
MB 590-23700/5	Method Blank	Total/NA	Water	NWTPH-Gx	
LCS 590-23700/1004	Lab Control Sample	Total/NA	Water	NWTPH-Gx	

Analysis Batch: 23701

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
590-11620-1	D050-014-081419	Total/NA	Water	8260C	
590-11620-2	D050-016-081419	Total/NA	Water	8260C	
590-11620-3	Trip Blank	Total/NA	Water	8260C	
MB 590-23701/5	Method Blank	Total/NA	Water	8260C	
LCS 590-23701/1003	Lab Control Sample	Total/NA	Water	8260C	
LCSD 590-23701/6	Lab Control Sample Dup	Total/NA	Water	8260C	

GC Semi VOA

Analysis Batch: 23671

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
590-11620-1	D050-014-081419	Total/NA	Water	NWTPH-Dx	23682
590-11620-2	D050-016-081419	Total/NA	Water	NWTPH-Dx	23682
MB 590-23682/1-A	Method Blank	Total/NA	Water	NWTPH-Dx	23682
LCS 590-23682/2-A	Lab Control Sample	Total/NA	Water	NWTPH-Dx	23682
LCSD 590-23682/3-A	Lab Control Sample Dup	Total/NA	Water	NWTPH-Dx	23682

Prep Batch: 23682

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
590-11620-1	D050-014-081419	Total/NA	Water	3510C	
590-11620-2	D050-016-081419	Total/NA	Water	3510C	
MB 590-23682/1-A	Method Blank	Total/NA	Water	3510C	
LCS 590-23682/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 590-23682/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Lab Chronicle

Client: AECOM
Job ID: 590-11620-1
Project/Site: 2555 13th Avenue, Seattle Terminal Harbo

Client Sample ID: D050-014-081419
Lab Sample ID: 590-11620-1
Date Collected: 08/14/19 10:00
Matrix: Water
Date Received: 08/15/19 12:44

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	43 mL	43 mL	23701	08/22/19 07:19	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	23700	08/22/19 07:19	JSP	TAL SPK
Total/NA	Prep	3510C			246.7 mL	2 mL	23682	08/21/19 11:21	AMB	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			23671	08/21/19 22:59	NMI	TAL SPK

Client Sample ID: D050-016-081419
Lab Sample ID: 590-11620-2
Date Collected: 08/14/19 10:30
Matrix: Water
Date Received: 08/15/19 12:44

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	43 mL	43 mL	23701	08/22/19 07:41	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	23700	08/22/19 07:41	JSP	TAL SPK
Total/NA	Prep	3510C			248.1 mL	2 mL	23682	08/21/19 11:21	AMB	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			23671	08/22/19 07:36	NMI	TAL SPK

Client Sample ID: Trip Blank
Lab Sample ID: 590-11620-3
Date Collected: 08/14/19 00:00
Matrix: Water
Date Received: 08/15/19 12:44

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	43 mL	43 mL	23701	08/22/19 08:02	JSP	TAL SPK

Laboratory References:
TAL SPK = Eurofins TestAmerica, Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Definitions/Glossary

Client: AECOM
Job ID: 590-11620-1
Project/Site: 2555 13th Avenue, Seattle Terminal Harbo

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Accreditation/Certification Summary

Client: AECOM
Job ID: 590-11620-1
Project/Site: 2555 13th Avenue, Seattle Terminal Harbo

Laboratory: Eurofins TestAmerica, Spokane

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Washington	State Program	C569	01-06-20

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte

Shell Oil Products US Chain Of Custody Record

AECOM

LAB (LOCATION)
- ☐ ACCUTEST (_____)
- ☐ CALSCIENCE (_____)
- ☒ TESTAMERICA (SPOKANE)
- ☐ Other (_____)

Lab Vendor # Dropdown

Please Check Appropriate Box:
- ☐ SGW FDG ☐ PIPELINE ☐ RETAIL
- ☐ CHEMICALS ☐ CONSULTANT ☐ LUBES
- ☐ TRANSPORTATION ☐ OTHER

Print Bill To Contact Name:

PlaNet Site or Project ID

☐ CHECK IF NO INCIDENT # APPLIES

PO #

GSAP Project ID

DATE:

PAGE: ____ of ____

SAMPLING COMPANY: AECOM

LOG CODE:

ADDRESS: 111 SW Columbia St. #1500

PROJECT CONTACT (Hardcopy or PDF Report to): TYLER HENRY

TELEPHONE: 503-222-7290

FAX:

Bill To Contact E-MAIL:

SITE ADDRESS: Street and City: 2225 13th AV. SW SEATTLE

State: WA

AECOM Project / Task Number: 60569419 - 1101.19

EDF DELIVERABLE TO (Name, Company, Office Location): ~~bee~~

PHONE NO.:

E-MAIL: tyler.henry@aecom.com

AECOM Other ID:

SAMPLER NAME(S) (Print): Dave Lewis Nate Gwyn

LAB USE ONLY

TURNAROUND TIME (CALENDAR DAYS):
☐ STANDARD (14 DAY) ☐ 5 DAYS ☐ 3 DAYS ☐ 2 DAYS ☐ 24 HOURS ☐ RESULTS NEEDED ON WEEKEND

☐ LA - RWQCB REPORT FORMAT ☐ UST AGENCY:

DELIVERABLES: ☐ LEVEL 1 ☐ LEVEL 2 ☐ LEVEL 3 ☐ LEVEL 4 ☐ OTHER (SPECIFY) _____

TEMPERATURE ON RECEIPT C° Cooler #1 | Cooler #2 | Cooler #3

SPECIAL INSTRUCTIONS OR NOTES :

- ☐ SHELL CONTRACT RATE APPLIES
- ☐ STATE REIMBURSEMENT RATE APPLIES
- ☐ EDD NOT NEEDED
- ☐ RECEIPT VERIFICATION REQUESTED
- ☐ PROVIDE LEDD DISK

REQUESTED ANALYSIS

UNIT COST: BTEX GX NWTPH-DX

NON-UNIT COST

FIELD NOTES:

TEMPERATURE ON RECEIPT C°

Container PID Readings or Laboratory Notes

LAB USE ONLY	Field Sample Identification	SAMPLING DATE	SAMPLING TIME	MATRIX	PRESERVATIVE HCL	HNO3	H2SO4	NONE	OTHER	NO. OF CONT.	BTEX	GX	NWTPH-DX
	D050-014-081419	8/14/19	1000	W	X					3	X	X	X
	D050-016-081419	"	1030	W	X					3	X	X	

590-11620 Chain of Custody

Relinquished by: (Signature)	Received by: (Signature)	Date	Time
Dave Lewis 8/14/19 1145	Mavia Oloole	8/15/19	12:23

Version: 14Dec15

3.2

8/28/2019

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Login Sample Receipt Checklist

Client: AECOM

Job Number: 590-11620-1

Login Number: 11620
List Number: 1
Creator: O'Toole, Maria C

List Source: Eurofins TestAmerica, Spokane

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	130269
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	No analysis requiring residual chlorine check assigned.