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Project name: Groundwater Monitoring WFS Cardlock Facility 6760 W Marginal Way SW

Project ref: 606

From: David Raubvogel AECOM Senior Geologist

Date: February 17, 2021

To: Ms. Taryn Olson World Fuel Services Tacoma, WA 988401

Copy:

Memo

Subject: Groundwater Monitoring -WFS Cardlock Facility 6760 W Marginal Way SW; Seattle, WA

Introduction & Background

AECOM has prepared this memorandum on behalf of World Fuel Services (WFS) presenting the results of the groundwater sampling performed at the cardlock facility located at 6760 W Marginal Way SW in Seattle, WA (Figure 1). The approximately 1-acre parcel is leased from the Port of Seattle (POS) and developed with a cardlock fueling facility consisting of a pump island with canopy and Subway restaurant (Figure 2). There are ten onsite monitoring wells as shown on Figure 2. AECOM understands that as part of the lease renewal, POS has requested current groundwater data for this property. The scope of work was performed in accordance with our proposal to WFS dated January 21, 2021. This memorandum documents the groundwater monitoring results including our field sampling observations and laboratory analytical results.

Sampling Procedures and Findings

The monitoring wells requested by the POS which included: EX-1 & 2, MW-23; 24; 25, 26 and 27, were sampled on February 8, 2021. The seven monitoring wells were gauged prior to sampling and purged via low flow sampling. The field parameters were recorded on sampling forms that are provided in Attachment 1. Groundwater samples were collected in appropriate laboratory provided glassware and stored on ice and delivered to the laboratory under proper chain of custody protocol. The groundwater samples were analyzed by Fremont Analytical, a Washington Department of Ecology(Ecology)-accredited laboratory for diesel and oil range petroleum hydrocarbons by Northwest Total Petroleum Hydrocarbons (NWTPH)-Diesel extended (Dx), gasoline range petroleum hydrocarbons by NWTPH-Gasoline extended (Gx) and benzene, toluene, ethylbenzene and xylenes (BTEX) by U.S. EPA Method 8260C.

The groundwater analytical results are summarized in Table 1 along with their respective Ecology Model Toxic Control Act (MTCA) cleanup levels from Ecology's CLARC Database (Ecology 2021). The laboratory analytical report is provided in Attachment 2. An AECOM project chemist reviewed the analytical data and no data usability issues were identified

Memo WFS Groundwater Monitoring 6760 W Marginal Way SW Cardlock Facility

We trust this memorandum meets your requirement. Please contact us if you have any questions or require additional information.

Sincerely,

K

David Raubvogel, LHG Senior Geologist

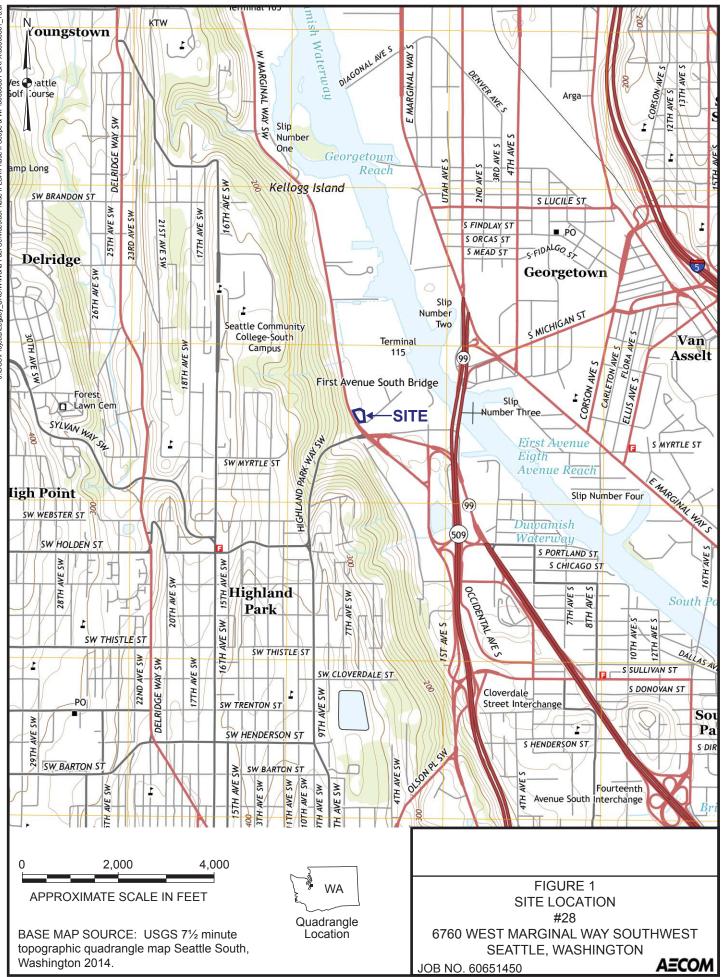
Attachments:

Figure 1 – Site Location Map Figure 2 – Site Plan Table 1 – Summary of Groundwater Analytical Results Attachment 1 – Groundwater Field Sampling Forms Attachment 2 – Fremont Analytical Laboratory Report

References

Washington State Department of Ecology (Ecology), 2021. CLARC Database. December.





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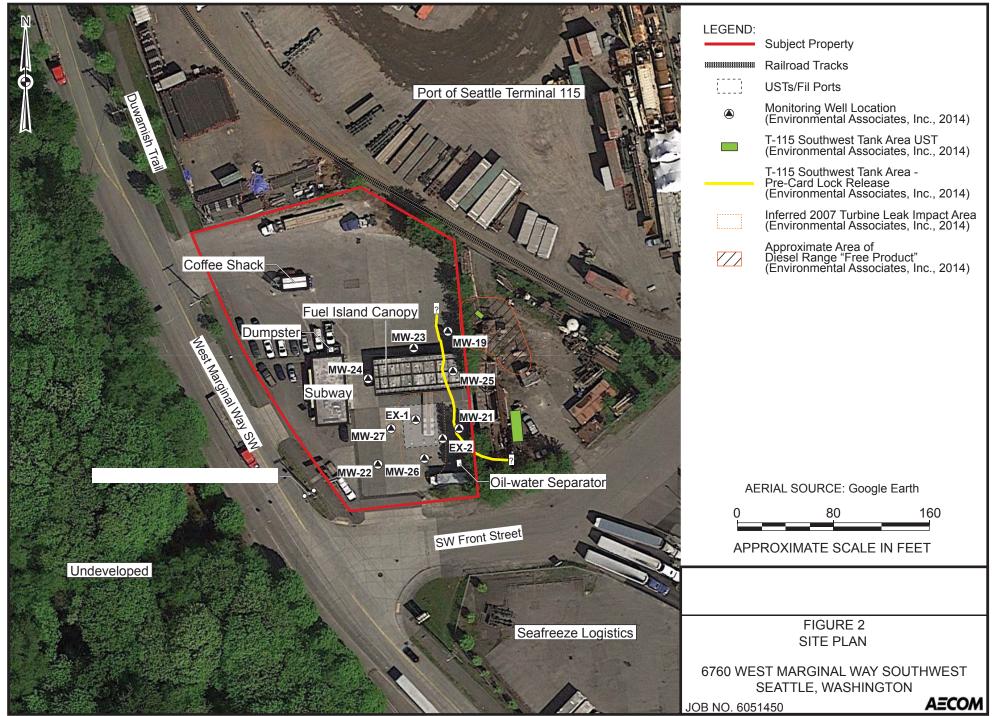


 Table 1

 Summary of Groundwater Analytical Results

WFS Cardlock Facility 6760 West Marginal Way SW Seattle, WA

			TPH (ug/L)		VOCs (ug/L)				
Sample ID	Sample Date	Gasoline-Range	Diesel-Range	Heavy Oil- Range	Benzene	Toluene	Ethylbenzene	Total Xylenes	
EX-1	2/8/21	50.0 U	5,900	99.2 U	1.00 U	1.00 U	1.00 U	1.00 U	
EX-2	2/8/21	198 °	6,670	98.7 U	1.00 U	1.00 U	1.00 U	1.00 U	
MW-23	2/8/21	50.0 U	99.0 U	620	1.00 U	1.00 U	1.00 U	1.00 U	
MW-24	2/8/21	50.0 U	98.8 U	98.8 U	1.00 U	1.00 U	1.00 U	1.00 U	
MW-25	2/8/21	50.0 U	305 ^b	676	1.00 U	1.00 U	1.00 U	1.00 U	
MW-26	2/8/21	889 °	15,400	98.7 U	1.00 U	1.00 U	1.00 U	1.00 U	
MW-27	2/8/21	50.0 U	99.0 U	99.0 U	1.00 U	1.00 U	1.00 U	1.00 U	
-	Method A Cleanup Level	800/1,000 ^a	500	500	5	1,000	700	1,000	

Notes:

Values in **bold** font indicate that the result reported meets or exceeds the most conservative MTCA Method A cleanup level based on the Ecology website.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method A and B values are from Ecology website CLARC tables dated August 2020 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx).

TPH - total petroleum hydrocarbon

U - Compound was analyzed for but not detected above the value shown.

ug/L - microgram per liter

VOC - volatile organic compound

^a The MTCA Method A groundwater cleanup level is 1,000 ug/L if benzene is not present and the total of ethylbenzene, toluene, and xylenes is less than 1% of the gasoline mixture. The MTCA Method A cleanup level for all other gasoline mixtures is 800 ug/L.

^b Indicates unresolved compounds in the Diesel range inconsistent with a known petroleum standard.

^c Indicates the presence of unresolved compounds eluting from hexane to dodecane, likely due to overlap with diesel range material.

Memo WFS Groundwater Monitoring 6760 W Marginal Way SW Cardlock Facility

Attachment 1

		GROUNE	WATER SA	MPLING	DATA SHE	ET	_	1	
Project Name: WF5	6760		The Way	SW					
Project Number: 60			inal way		Well Diame	ter:	MW-25 2"		
Date: 2/8/2					Screen Inter		2		
Weather: 50014	40's				Measuring F		<u>.</u>		
Sampler(s): NZG	70 5				Depth to W			- 1 - 1 - 2 - 2 - 2	
Purge Method: 1000	LIDIN				Depth to Bo				
Sample Method: Gra					Depth to NA				
Tubing Type: LOP					NAPL Thickr				
Pump Intake Depth:					Meter Infor			Calibration	
Water disposal: Drug		10			Horiba		odel U-52	Date	
water disposal. UNA			A DO ALL		Temperatur				
Contain <u>ers</u>		Number of	Number of	Number of	pH:	8.73		2 V	
Analysis	Bottle type	Primary	MS/MSD	Duplicate	Conductivity: 179			TT	
DX	I liker Anba		/		ORP: -146			ma	
GX	YOAL Vag				DO: 0.29			FR	
BTEX	HOMEVOU	3	/	/	Turbidity: 45.7		N		
0/27	10110 10 1			/	Comments: 0955 Steve		N		
	0-1 -					613	Jarra	1.	
					Tide event ('A			
						1	1	1	
Field Parameters	Units	+9 minutes	+9 minutes	+9 minutes	+3 minutes	+3 minutes	+ 3 minutes	+3 minutes	
Temperature	°C	1432	13.76	1343	13.33	1329	13.28	1328	
pH (±0.1)	-	7.22	7.05	7.00	6.98	6.48	698	697	
Conductivity (±3%)	ms/cm	1.81	1.91	182	1.82	1.82	1.82	182	
ORP (±10mV)	mV	-143	446	-147	-148	-148	-148	-148	
DO (±10%)		0.00	0.00	0.00	0.03	0.00	0.00	0.00	
Turbidity (±10%)	NTU	373	44,1	43.6	41.7	71.5	41.4	41.5	
Time 54-2 0955		1004	1013	1022	1025	1028	1031	1034	
Water Level		6.33		6.49	651	6.52	6.53	654	
Flow Rate	mL/min	200	6-41	100	100	100	103	100	
nownate			1			T			
	1. 121						- Si - Si		
Field Parameters	Units	minutes	minutes	minutes	minutes	minutes	minutes	minutes	
Temperature	°C							1.072.04	
pH (±0.1		1							
Conductivity (±3%)	ms/cm	1.				1			
ORP (±10mV)						1	1.00		
DO (±10%)			0.00				1.0		
	NTU							1.00	
Turbidity (±10%)					-	1	1		
	-								
Turbidity (±10%) Time Water Level	-								

COC Information	Sample ID	Sample Time	Total # of bottles
Primary Sample	MW-25	1035	4
MS/MSD Sample (if collected)			
Duplicate Sample (if collected)			

GROUNDWATER SAMPLING DATA SHEET

Project Name: WF5 6760 W Marginal Way 5W							Sample Number: MW ~ 23			
Project Name			vo marg	indi way	100	Well Diameter: 2				
						Screen Interval: 7				
	18/21	0								
Concession of the local data was a second data w	overess.	40°	RWEZY			Measuring Point: TOC				
Sampler(s): A		0.	/			Depth to Wa				
Purge Method	the second se					Depth to Bo		7		
Sample Metho						Depth to NA				
Tubing Type:						NAPL Thickn				
Pump Intake D		≈ 15.00				Meter Infor			Calibration	
Water disposa	11: Drun	nmed Onsi	Ke.	1 S		Horiba		odel U-52	Date	
						Temperature			PE	
Containers			Number of	Number of	Number of	pH:	751		-	
Analysis		Bottle type	Primary	MS/MSD	Duplicate	Conductivity	: 158		TT	
DX		1 liter Anba	1			ORP:	-137		17 4	
GX		YOAL Vag	3			DO:	1.81		TN	
BTEX		40 ML VOY				Turbidity:	43.2		21	
		,	1			Comments:	Comments: (1051) Start		- Town	
19. station									1.1.1.1.1.1.1	
						Charles .	- and the second second			
1						Tide event (ased on tide	chart):N	A	
And and a second se								1		
Field Paramet	ers	Units	+9 minutes	+9 minutes	+9 minutes	+3 minutes	+ 3 minutes	+ 3 minutes	minutes	
Temperature	Sec	°C	12.28	12.03	11.94	1192	11.90	1189		
pН	(±0.1)	- 8	7.33	7.29	7.29	729	7.29	7.29		
Conductivity	(±3%)	ms/cm	1.55	1.55	1.55	1-55	1.55	1,55	1 1 20 10	
ORP	(±10mV)	mV	-161	-167	-169	-170	-170	-171	A Second	
DO	(±10%)	mg/L	0.00	0.00	0.00	0.00	0.00	0,03	1. Oc 1	
Turbidity	(±10%)	NTU	19.0	12.4	9.6	9.9	9.7	9,5		
	1051	-	1100	1107	1118	1121	1124	1127	10.00	
Water Level		-	5.13	5.21	5.30	5.32	5.33	5.35		
Flow Rate		mL/min	100	100	100	100	100	100		
	1			13			1	1		
e: 115		11.24							minutos	
Field Paramet	ers	Units	minutes	minutes	minutes	minutes	minutes	minutes	minutes	
Temperature	11.0.1	°C								
рН	(±0.1)	-								
Conductivity	(±3%)	ms/cm			1					
	(±10mV)	mV	S			2090 T 20	5 0 C C L 4	1		
DO	(±10%)	mg/L							< 1 P	
Turbidity	(±10%)	NTU						Solution of the		
Time		-	Seat 1	1				1.1.1.0.13		
Water Level		-							L	
Flow Rate		mL/min								

COC Information	Sample ID	Sample Time	Total # of bottles
Primary Sample	MW-23	1130	4
MS/MSD Sample (if collected)			
Duplicate Sample (if collected)			

		GROUND	OWATER S	AMPLING	DATA SHEE	T		
Project Name: WF5	6760	W Marg	and way	SW	Sample Number: 14 w - 24			
Project Number: 600		1.17.		1.00	Well Diameter: 2"			
Date: 218/21	/	1.1			Screen Interval: ?			
	Veroust	40'3	Brezy	14	Measuring Point: TOC			
Sampler(s): NZG				10.00	Depth to Wa	ter: 57	4	
Purge Method: 1000	Flow				Depth to Bot	tom: 15.6	8	
Sample Method: Grad				1.1.1	Depth to NA			1
Tubing Type: LDPe			1.1.2		NAPL Thickn	ess: —		
Pump Intake Depth:		7	1.1.1.1.1	ALC: 10	Meter Inform	nation		Calibration
Water disposal: Drug				1.	Horiba	M	odel U-52	Date
					Temperature			-
Containers		Number of	Number of	Number of	pH:	740		P.Y.
Analysis	Bottele type	Primary	MS/MSD	Duplicate	Conductivity			TT
DX	I liker Anba		/	17	ORP:	-107	10.15.1	ma
GX	YOAL Vag		/	1	DO: 201		FIN	
BTEX	HOMLVOU	3	1	/	Turbidity:	262		
<u> </u>				/	Comments:	(1145)	Start Tim	1 12
					Connents	(in)	31-01 1	
	Tide event (based on tide chart):							
				I	I I I I I I I I I I I I I I I I I I I			
Field Parameters	Units	+9 minutes	+9 minutes	19 minutes	+ 3 minutes	+ 3 minutes	+3 minutes	minutes
Temperature	°C	13.06	12.99	13.00	12.94	12.94	13.00	
pH (±0.1)	-	7.09	7.02	7.00	6.99	6 44	6.19	
Conductivity (±3%)	ms/cm	1.28	1.28	1-28	1.28	1-28	1-28	
ORP (±10mV)	mV	-110	-113	-116	-117	-117	-118	
DO (±10%)	mg/L	1.77	1.54	1.55	1.56	1.57	11.59	
Turbidity (±10%)	NTU	13.3	9.0	4.2	4.3	44	4.4	1.2
Time Stort 1145	-	1154	1203	1212	1215	1218	1221	
Water Level	-	6.28	6.34	6.40	6.42	6.43	6:45	
Flow Rate	mL/min	iuu	100	10)	100	100	105	
Field Parameters	Units	minutes	minutes	minutes	minutes	minutes	minutes	minutes
Temperature	°C			1000			N 5. W	
pH (±0.1	-	1.1.4						
Conductivity (±3%)	ms/cm	110 - 1						
ORP (±10mV)	mV							
DO (±10%)	mg/L							
Turbidity (±10%)	NTU							
Time Steat	-			1.				
Water Level	-	1.1		1.197				
	mL/min						1	

COC Information	Sample ID	Sample Time	Total # of bottles
Primary Sample	MW-24	1225	4
MS/MSD Sample (if collected)			

		GROUNE	WATER S	AMPLING	DATA SHEE	T		
Project Name: WFS	6760	W Marg	nul way	SW	Sample Num	ber: Ex	(-1	
Project Number: 600	651450				Well Diameter: 2 ~			
Date: 218/21	/		1 J - 2 F - 1	1.4.4.5.6.4	Screen Interval: ?			
Weather: Overc	-st 40	"S BK	121		Measuring P	oint: Toc		TE BULLIT
Sampler(s): NZG		1.12.1	-3-		Depth to Wa	ter: 5.71	7	E
Purge Method: 1000	FIOW				Depth to Bot	tom: 10.1	1	A Doub
Sample Method: Grad	6				Depth to NA	PL:		
Tubing Type: LDP	e .	1. I I I I I I I I I I I I I I I I I I I	1. 1. 1. 1.		NAPL Thickn	ess: —		
Pump Intake Depth: 🗧	≈ 10.00	1. Sec. 4. Sec. 4.			Meter Inform	nation		Calibratio
Water disposal: Drug	nmed Onsi	He.		1.1	Horiba	Mo	idel U-52	Date
		Cold Particular			Temperature	: 1063	1	5
Containers	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Number of	Number of	Number of	pH:	7-06		2
Analysis	Bottle type	Primary	MS/MSD	Duplicate	Conductivity			T
DX	I like Anba		/	1	ORP: -95		ma	
GX	YOML Vag		/	/	DO: 13.11		N P	
BTEX	HOMLVOY	-3-	/	/	Turbidity:	4.57		N
<u> </u>					Comments:	1235	Stert T	<u>N</u>
1.3. 2.7		0.080.00					1	
					- 1.754.5		10 M 10	
				Tide event (b	ased on tide	chart):N	A	
						-	· · · · ·	r
		. 0			. 7	1.7	1 2	+3
Field Parameters	Units	ナク minutes	ナダ minutes	<i>+9</i> minutes	+ 3 minutes	+ 3 minutes	+ 3 minutes	minutes
Temperature	°C	10.20	10.41	10.34	10.37	10.41	10.39	10,41
pH (±0.1)	. –	7.16	7.16	7.17	7.16	7.16	7.17	7.17
Conductivity (±3%)	ms/cm	1.07	1.05	1.04	104	1.04	1.04	104
ORP (±10mV)	mV	-64	~ 55	-50	-47	-47	-46	-45
DO (±10%)	mg/L	11.22	10,42	9.67	9.76	4.35	9.28	9.29
Turbidity (±10%)	NTU	149	83.6	32,4	30.5	Dec 8 27.	6 27.1	26.8
Time Short 1235		12.44	1253	1302	1305	1308	1311	1314
Water Level	~	5.75	5.76	576	5.76	5.76	5.76	5.76
Flow Rate	mL/min	120	120	120	120	120	120	120
						2716		
Field Parameters	Units	minutes	minutes	minutes	minutes	minutes	minutes	minutes
Temperature	°C	mmuco	acco					
pH (±0.1)	-							
Conductivity (±3%)	ms/cm	1 1 1						
ORP (±10mV)	mV							
DO (±10%)								
	mg/L NTU							
Turbidity (±10%)	NIU							
Time							-	
Water Level	-							
Flow Rate	mL/min				1000			

COC Information	Sample ID	Sample Time	Total # of bottles
Primary Sample	EX-I	1315	4
MS/MSD Sample (if collected)			
Duplicate Sample (if collected)			

	100	GROUNE	WATER S	AMPLING	DATA SHE	ET	3.500	
Project Name: WF5	6760	W Mara	inal way	SW	Sample Num	ber: EX	-2	
Project Number: 60		1.50			Well Diameter: 2 7			
Date: 2/8/21					Screen Interval: ?			
Weather: Over 20	12 40	"S Br	tez,		Measuring Point: Tac			
Sampler(s): NZG					Depth to Water: 5.30			
Purge Method: 1000	Flow				Depth to Bo	ttom: 10.3	2	
Sample Method: Grun			75.00	- 22.0	Depth to NA	PL:	1.24	
Tubing Type: LDP					NAPL Thickn	ess:	1. S. S. S. S.	1.
Pump Intake Depth:	~ 10.0	Ο	e di state	Contract of the	Meter Inform	mation		Calibration
Water disposal: Drug					Horiba	M	odel U-52	Date
	1.1	1 - 1 - 1 - 1		1.1.1.1.1.1	Temperature	e: 11.7-	1	57
Containers		Number of	Number of	Number of	pH:	7.29		25
Analysis	Bottle type	Primary	MS/MSD	Duplicate	Conductivity			TT
DX	I liker Anba		/	/	ORP: -28			ma
GX	York Vag			/	DO: 7.09			NH
BTEX	HOMEVOU	3	/	/	Turbidity: 61 3		8 . L. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	N
					Comments:	the second se	Street Tim	12
						Co		
DATE: DOI: 101								
					Tide event (I	based on tide	chart):N	4
Field Parameters	Units	+9 minutes	+9 minutes	+9 minutes	+ 3 minutes	+ 3 minutes	+ 3 minutes	73 minutes
Temperature	°C	11 72	11.71	11,75	11.74	11.72	1170	11.67
pH (±0.1)		7,14	7.09	7.07	707	7.07	707	7.06
Conductivity (±3%)	ms/cm	1.23	124	1.25	1.24	1.24	1.25	1,24
ORP (±10mV)	mV	-25	- 54	-64	-65	-68	-70	-71
DO (±10%)	mg/L	4.05	3.65	3.20	3,19	302	2.98	2.97
Turbidity (±10%)	NTU	33.3	6.3	3.2	2.4	1.5	1.8	1.6
Time Stury 1330	-	1339	1348	1357	1400	1403	1400	1409
Water Level	-	5.30	5.31	5.32	5.32	5.32	5.32	5.32
Flow Rate	mL/min	120	120	120	120	120	120	120
Field Parameters	Units	minutes	minutes	minutes	minutes	minutes	minutes	minutes
Temperature	°C							
pH (±0.1)								
Conductivity (±3%)	ms/cm		-					
ORP (±10mV)	mV							
DO (±10%)	mg/L							
Turbidity (±10%)	NTU							
Time and	-							
Water Level	-							

COC Information	Sample ID	Sample Time	Total # of bottles
Primary Sample	EX-2	1410	4
MS/MSD Sample (if collected)			
Duplicate Sample (if collected)			

Project Name: WAS	6760	W Marg	and way	SW	Sample Number: MW-27			
Project Number: 60				1	Well Diamet	er: 2	"	
Date: 218/21	/		Martin Hall	E	Screen Inter	val: ?		
Weather: 074	werst 41	ors ism	124		Measuring Point: TOC			
Sampler(s): NZG	?				Depth to Water: 5.51			
Purge Method: 1000	Flow				Depth to Bo	ttom: 🛛 😨 /	509	
Sample Method: Grut	6				Depth to NA	PL:		
Tubing Type: LDP					NAPL Thickn	ess: —		
Pump Intake Depth:	~ 14	50			Meter Information			Calibratio
Water disposal: Drug					Horiba	M	odel U-52	Date
					Temperature	e: 12."	71	57
Containers		Number of	Number of	Number of	pH:	7.4	5	12
Analysis	Bottle type	Primary	MS/MSD	Duplicate	Conductivity			IT
DX	I like - Anba		/		ORP:	- 91		ma
GX	YOAL Veg				DO: 0.61		5 P	
BTEX	40 ML VOU	_3	/	/	Turbidity:	64.5		N
0157	10110 10 (· · · ·		Comments:		stert Time	N
						01	I ary I are	
				1000			-	
					Tide quest (based on tide	chart):	4
					That event (r
							1.1	
Field Parameters	Linita	+9 minutes	+9 minutes	+9 minutes	+ 3 minutes	+ 3 minutes	+ 3 minutes	minutes
	Units °C		12.63	12.66	12,92	12.92	12.90	innaces
Temperature	-	12.64		6.48	6.96	6.96	6.45	
pH (±0.1)		7.13	7.02	1.17	1.17	1.18	1.16	
Conductivity (±3%)	ms/cm	1.19	-104	-108	-110	-110	~111	<u></u>
ORP (±10mV)	mV	- 99 0.00		0,00	0.00	0.00	0.00	
DO (±10%)			0.00			14.4	14.2	
Turbidity (±10%)	NTU	44.7	29.4	20.15.3			and the second se	
Time 1422 Showt	-	1431	1440	1449	1452	1455	1458	
Water Level		5.83	5.88	5.92	5,43	5.95	5.96	
Flow Rate	mL/min	150	150	150	150	150	150	
						1000		
			1000					
							minutes	minutes
Field Parameters	Units	minutes	minutes	minutes	minutes	minutes		
Temperature	Units °C	minutes	minutes	minutes	minutes	minutes		
Temperature pH (±0.1	°C	minutes	minutes	minutes	minutes	minutes		
Temperature pH (±0.1 Conductivity (±3%)	°C ms/cm	minutes	minutes	minutes				
Temperature pH (±0.1	°C	minutes	minutes	minutes	minutes	minutes		
Temperature pH (±0.1 Conductivity (±3%)	°C — ms/cm mV	minutes	minutes	minutes	minutes	minutes		
Temperature pH (±0.1 Conductivity (±3%) ORP (±10mV)	°C — ms/cm mV	minutes	minutes	minutes	minutes	minutes		
Temperature pH (±0.1 Conductivity (±3%) ORP (±10mV) DO (±10%)	°C — ms/cm mV mg/L	minutes	minutes	minutes	minutes	minutes		
Temperature pH (±0.1 Conductivity (±3%) ORP (±10mV) DO (±10%) Turbidity (±10%)	°C 	minutes	minutes	minutes	minutes			

COC Information	Sample ID	Sample Time	Total # of bottles
Primary Sample	MW-27	1500	4
MS/MSD Sample (if collected)			
Duplicate Sample (if collected)			

Pullip intrace Deptition for the processing of the procesing of the processing of the processing of the proce		A	GROUND	WATER S	AWPLING	DATA SHE			1.00	
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COC Information	Sample ID	Sample Time	Total # of bottles
Primary Sample	MW-26	1555	4
MS/MSD Sample (if collected)			
MS/MSD Sample (if collected) Duplicate Sample (if collected)			

Memo WFS Groundwater Monitoring 6760 W Marginal Way SW Cardlock Facility

Attachment 2



3600 Fremont Ave. N. Seattle, WA 98103 T: (206) 352-3790 F: (206) 352-7178 info@fremontanalytical.com

AECOM David Raubvogel 1111 3rd Avenue Suite 1600 Seattle, WA 98101

RE: WFS 6760 W Marginal Way SW Work Order Number: 2102140

February 15, 2021

Attention David Raubvogel:

Fremont Analytical, Inc. received 8 sample(s) on 2/8/2021 for the analyses presented in the following report.

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext. Gasoline by NWTPH-Gx Volatile Organic Compounds by EPA Method 8260D

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes Project Manager

DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.3 for Environmental Testing ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910

Original



CLIENT: Project: Work Order:	AECOM WFS 6760 W Marginal Way SW 2102140	Work Order Sample Summary		
Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received	
2102140-001	MW-25	02/08/2021 10:35 AM	02/08/2021 5:10 PM	
2102140-002	MW-23	02/08/2021 11:30 AM	02/08/2021 5:10 PM	
2102140-003	MW-24	02/08/2021 12:25 PM	02/08/2021 5:10 PM	
2102140-004	EX-1	02/08/2021 1:15 PM	02/08/2021 5:10 PM	
2102140-005	EX-2	02/08/2021 2:10 PM	02/08/2021 5:10 PM	
2102140-006	MW-27	02/08/2021 3:00 PM	02/08/2021 5:10 PM	
2102140-007	MW-26	02/08/2021 3:55 PM	02/08/2021 5:10 PM	
2102140-008	Trip Blank		02/08/2021 5:10 PM	

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned



Case Narrative

WO#: **2102140** Date: **2/15/2021**

CLIENT:AECOMProject:WFS 6760 W Marginal Way SW

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:

Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers & Acronyms



 WO#:
 2102140

 Date Reported:
 2/15/2021

Qualifiers:

- * Flagged value is not within established control limits
- B Analyte detected in the associated Method Blank
- D Dilution was required
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- I Analyte with an internal standard that does not meet established acceptance criteria
- J Analyte detected below Reporting Limit
- N Tentatively Identified Compound (TIC)
- Q Analyte with an initial or continuing calibration that does not meet established acceptance criteria
- (<20%RSD, <20% Drift or minimum RRF)
- S Spike recovery outside accepted recovery limits
- ND Not detected at the Reporting Limit
- R High relative percent difference observed

Acronyms:

%Rec - Percent Recovery **CCB** - Continued Calibration Blank CCV - Continued Calibration Verification **DF** - Dilution Factor **DUP - Sample Duplicate** HEM - Hexane Extractable Material ICV - Initial Calibration Verification LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate MB or MBLANK - Method Blank MDL - Method Detection Limit MS/MSD - Matrix Spike / Matrix Spike Duplicate PDS - Post Digestion Spike Ref Val - Reference Value **REP - Sample Replicate RL** - Reporting Limit **RPD** - Relative Percent Difference **SD** - Serial Dilution SGT - Silica Gel Treatment SPK - Spike Surr - Surrogate



Client: AECOM			C	Collection	n Dat	e: 2/8/202	1 10:35:00 AM
Project: WFS 6760 W Marginal W Lab ID: 2102140-001 Client Sample ID: MW-25	Ν	Matrix: Groundwater					
Analyses	Result	RL	Qual	Units	DF	Da	te Analyzed
Diesel and Heavy Oil by NWTPH	-Dx/Dx Ext.			Batc	h ID:	31322	Analyst: MM
Diesel (Fuel Oil)	ND	98.7		µg/L	1	2/11/	/2021 7:02:21 PM
Diesel Range Organics (C12-C24)	305	98.7		µg/∟ µg/L	1		2021 7:02:21 PM
Heavy Oil	676	98.7		µg/∟ µg/L	1		2021 7:02:21 PM
Surr: 2-Fluorobiphenyl	93.0	50 - 150		%Rec	1		2021 7:02:21 PM
Surr: o-Terphenyl	75.0	50 - 150		%Rec	1		2021 7:02:21 PM
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NOTES:							
NOTES: Diesel Range Organics - Indicates unres	solved compounds	in the Diesel r	ange inconsis	stent with a	knowr	n petroleum :	standard.
	solved compounds	in the Diesel ra	ange inconsis			n petroleum : 31319	standard. Analyst: KT
Diesel Range Organics - Indicates unres	solved compounds	in the Diesel ra	ange inconsis			31319	
Diesel Range Organics - Indicates unres			ange inconsis	Batc	h ID:	31319 2/10/	Analyst: KT
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Diesel Range Organics - Indicates unres Gasoline by NWTPH-Gx Gasoline Surr: Toluene-d8 Surr: 4-Bromofluorobenzene	ND 89.1 98.6	50.0 65 - 135 65 - 135	ange inconsis	Batc µg/L %Rec %Rec	h ID: 1 1 1	31319 2/10/ 2/10/ 2/10/ 31319	Analyst: KT /2021 10:27:53 PM /2021 10:27:53 PM /2021 10:27:53 PM
Diesel Range Organics - Indicates unres Gasoline by NWTPH-Gx Gasoline Surr: Toluene-d8 Surr: 4-Bromofluorobenzene Volatile Organic Compounds by	ND 89.1 98.6 EPA Method	50.0 65 - 135 65 - 135 8260D	ange inconsis	Batc µg/L %Rec %Rec Batc	h ID: 1 1 h ID:	31319 2/10, 2/10, 2/10, 31319 2/10,	Analyst: KT /2021 10:27:53 PM /2021 10:27:53 PM /2021 10:27:53 PM Analyst: KT
Diesel Range Organics - Indicates unres Gasoline Surr: Toluene-d8 Surr: 4-Bromofluorobenzene Volatile Organic Compounds by Benzene	ND 89.1 98.6 EPA Method ND	50.0 65 - 135 65 - 135 8260D 1.00	ange inconsis	Batc μg/L %Rec %Rec Batc	h ID: 1 1 h ID: 1	31319 2/10, 2/10, 2/10, 31319 2/10, 2/10, 2/10,	Analyst: KT /2021 10:27:53 PM /2021 10:27:53 PM /2021 10:27:53 PM Analyst: KT /2021 10:27:53 PM
Diesel Range Organics - Indicates unres Gasoline by NWTPH-Gx Gasoline Surr: Toluene-d8 Surr: 4-Bromofluorobenzene Volatile Organic Compounds by Benzene Toluene	ND 89.1 98.6 EPA Method ND ND	50.0 65 - 135 65 - 135 8260D 1.00 1.00	ange inconsis	Batc µg/L %Rec %Rec Batc µg/L µg/L	h ID: 1 1 h ID: 1 1	31319 2/10/ 2/10/ 2/10/ 31319 2/10/ 2/10/ 2/10/ 2/10/	Analyst: KT /2021 10:27:53 PM /2021 10:27:53 PM /2021 10:27:53 PM Analyst: KT /2021 10:27:53 PM /2021 10:27:53 PM
Diesel Range Organics - Indicates unres Gasoline by NWTPH-Gx Gasoline Surr: Toluene-d8 Surr: 4-Bromofluorobenzene Volatile Organic Compounds by Benzene Toluene Ethylbenzene	ND 89.1 98.6 EPA Method ND ND ND	50.0 65 - 135 65 - 135 8260D 1.00 1.00 1.00	ange inconsis	Batc µg/L %Rec %Rec Batc µg/L µg/L µg/L µg/L	h ID: 1 1 h ID: 1 1 1	31319 2/10/ 2/10/ 2/10/ 31319 2/10/ 2/10/ 2/10/ 2/10/ 2/10/	Analyst: KT /2021 10:27:53 PM /2021 10:27:53 PM /2021 10:27:53 PM Analyst: KT /2021 10:27:53 PM /2021 10:27:53 PM /2021 10:27:53 PM
Diesel Range Organics - Indicates unres Gasoline by NWTPH-Gx Gasoline Surr: Toluene-d8 Surr: 4-Bromofluorobenzene Volatile Organic Compounds by Benzene Toluene Ethylbenzene m,p-Xylene	ND 89.1 98.6 EPA Method ND ND ND ND	50.0 65 - 135 65 - 135 8260D 1.00 1.00 1.00 1.00 1.00	ange inconsis	Batc µg/L %Rec %Rec Batc µg/L µg/L µg/L µg/L µg/L µg/L	h ID: 1 1 1 h ID: 1 1 1	31319 2/10/ 2/10/ 2/10/ 31319 2/10/ 2/10/ 2/10/ 2/10/ 2/10/ 2/10/	Analyst: KT /2021 10:27:53 PM /2021 10:27:53 PM /2021 10:27:53 PM Analyst: KT /2021 10:27:53 PM /2021 10:27:53 PM /2021 10:27:53 PM
Diesel Range Organics - Indicates unres Gasoline by NWTPH-Gx Gasoline Surr: Toluene-d8 Surr: 4-Bromofluorobenzene Volatile Organic Compounds by Benzene Toluene Ethylbenzene m,p-Xylene o-Xylene	ND 89.1 98.6 EPA Method ND ND ND ND ND ND	50.0 65 - 135 65 - 135 8260D 1.00 1.00 1.00 1.00 1.00 1.00	ange inconsis	Batc µg/L %Rec %Rec Batc µg/L µg/L µg/L µg/L µg/L µg/L µg/L	h ID: 1 1 h ID: 1 1 1 1	31319 2/10/ 2/10/ 2/10/ 31319 2/10/ 2/10/ 2/10/ 2/10/ 2/10/ 2/10/ 2/10/	Analyst: KT /2021 10:27:53 PM /2021 10:27:53 PM /2021 10:27:53 PM Analyst: KT /2021 10:27:53 PM /2021 10:27:53 PM /2021 10:27:53 PM /2021 10:27:53 PM



 Work Order:
 2102140

 Date Reported:
 2/15/2021

Client: AECOM				Collectior	n Dat	e: 2/8/2021	11:30:00 AM
Project: WFS 6760 W Marginal Way	SW						
Lab ID: 2102140-002				Matrix: G	round	dwater	
Client Sample ID: MW-23							
Analyses	Result	RL	Qual	Units	DF	Date	e Analyzed
Diesel and Heavy Oil by NWTPH-D	x/Dx Ext.			Batc	h ID:	31322	Analyst: MM
Diesel (Fuel Oil)	ND	99.0		μg/L	1	2/11/2	021 7:31:41 PM
Heavy Oil	620	99.0		µg/L	1	2/11/2	021 7:31:41 PM
Surr: 2-Fluorobiphenyl	85.1	50 - 150		%Rec	1	2/11/2	021 7:31:41 PM
Surr: o-Terphenyl	75.8	50 - 150		%Rec	1	2/11/2	021 7:31:41 PM
Gasoline by NWTPH-Gx				Batc	h ID:	31319	Analyst: KT
Gasoline	ND	50.0		μg/L	1	2/10/2	021 10:58:05 PM
Surr: Toluene-d8	99.8	65 - 135		%Rec	1	2/10/2	021 10:58:05 PM
Surr: 4-Bromofluorobenzene	97.7	65 - 135		%Rec	1	2/10/2	021 10:58:05 PM
Volatile Organic Compounds by El	PA Method	<u>8260D</u>		Batc	h ID:	31319	Analyst: KT
Benzene	ND	1.00		μg/L	1	2/10/2	021 10:58:05 PM
Toluene	ND	1.00		µg/L	1	2/10/2	021 10:58:05 PM
Ethylbenzene	ND	1.00		µg/L	1	2/10/2	021 10:58:05 PM
m,p-Xylene	ND	1.00		µg/L	1	2/10/2	021 10:58:05 PM
o-Xylene	ND	1.00		µg/L	1	2/10/2	021 10:58:05 PM
Surr: Dibromofluoromethane	101	87.8 - 114		%Rec	1	2/10/2	021 10:58:05 PM
Surr: Toluene-d8	108	90.6 - 109		%Rec	1	2/10/2	021 10:58:05 PM
Surr: 1-Bromo-4-fluorobenzene	95.4	88.6 - 111		%Rec	1	2/10/2	021 10:58:05 PM

Maction Data: 2/8/2021 11:20:00 AM



Client: AECOM				Collectior	n Date	e: 2/8/2021 12:25:00 PM
Project: WFS 6760 W Marginal Way S	SW					
Lab ID: 2102140-003				Matrix: G	round	lwater
Client Sample ID: MW-24						
Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx	/Dx Ext.			Batc	h ID: :	31322 Analyst: MM
Diesel (Fuel Oil)	ND	98.8		µg/L	1	2/11/2021 8:01:01 PM
Heavy Oil	ND	98.8		µg/L	1	2/11/2021 8:01:01 PM
Surr: 2-Fluorobiphenyl	96.7	50 - 150		%Rec	1	2/11/2021 8:01:01 PM
Surr: o-Terphenyl	82.0	50 - 150		%Rec	1	2/11/2021 8:01:01 PM
Gasoline by NWTPH-Gx				Batc	h ID: 🗄	31319 Analyst: KT
Gasoline	ND	50.0		µg/L	1	2/10/2021 11:28:21 PM
Surr: Toluene-d8	98.8	65 - 135		%Rec	1	2/10/2021 11:28:21 PM
Surr: 4-Bromofluorobenzene	98.0	65 - 135		%Rec	1	2/10/2021 11:28:21 PM
Volatile Organic Compounds by EP	A Method	<u>8260D</u>		Batc	h ID: :	31319 Analyst: KT
Benzene	ND	1.00		µg/L	1	2/10/2021 11:28:21 PM
Toluene	ND	1.00		µg/L	1	2/10/2021 11:28:21 PM
Ethylbenzene	ND	1.00		µg/L	1	2/10/2021 11:28:21 PM
m,p-Xylene	ND	1.00		µg/L	1	2/10/2021 11:28:21 PM
o-Xylene	ND	1.00		µg/L	1	2/10/2021 11:28:21 PM
Surr: Dibromofluoromethane	103	87.8 - 114		%Rec	1	2/10/2021 11:28:21 PM
Surr: Toluene-d8	104	90.6 - 109		%Rec	1	2/10/2021 11:28:21 PM
Surr: 1-Bromo-4-fluorobenzene	95.8	88.6 - 111		%Rec	1	2/10/2021 11:28:21 PM



Client: AECOM				Collection	n Dat	e: 2/8/202 ⁻	1 1:15:00 PM
Project: WFS 6760 W Marginal Way Lab ID: 2102140-004 Client Sample ID: EX-1	SW			Matrix: G	round	dwater	
Analyses	Result	RL	Qual	Units	DF	Da	te Analyzed
Diesel and Heavy Oil by NWTPH-D	<u>d/Dx Ext.</u>			Batc	h ID:	31322	Analyst: MM
Diesel (Fuel Oil)	5,900	99.2		µg/L	1	2/11/2	2021 8:30:21 PM
Heavy Oil	ND	99.2		µg/L	1	2/11/2	2021 8:30:21 PM
Surr: 2-Fluorobiphenyl	83.3	50 - 150		%Rec	1	2/11/2	2021 8:30:21 PM
Surr: o-Terphenyl	67.5	50 - 150		%Rec	1	2/11/2	2021 8:30:21 PM
Gasoline by NWTPH-Gx				Batc	h ID:	31319	Analyst: KT
Gasoline	ND	50.0		µg/L	1	2/10/2	2021 11:58:27 PM
Surr: Toluene-d8	98.7	65 - 135		%Rec	1	2/10/2	2021 11:58:27 PM
Surr: 4-Bromofluorobenzene	97.8	65 - 135		%Rec	1	2/10/2	2021 11:58:27 PM
Volatile Organic Compounds by EF	A Method	<u>8260D</u>		Batc	h ID:	31319	Analyst: KT
Benzene	ND	1.00		µg/L	1	2/10/2	2021 11:58:27 PM
Toluene	ND	1.00		µg/L	1	2/10/2	2021 11:58:27 PM
Ethylbenzene	ND	1.00		µg/L	1	2/10/2	2021 11:58:27 PM
m,p-Xylene	ND	1.00		µg/L	1	2/10/2	2021 11:58:27 PM
o-Xylene	ND	1.00		µg/L	1	2/10/2	2021 11:58:27 PM
Surr: Dibromofluoromethane	101	87.8 - 114		%Rec	1	2/10/2	2021 11:58:27 PM
Surr: Toluene-d8	108	90.6 - 109		%Rec	1	2/10/2	2021 11:58:27 PM
Surr: 1-Bromo-4-fluorobenzene	95.6	88.6 - 111		%Rec	1	2/10/2	2021 11:58:27 PM



Batch ID: 31319

 Work Order:
 2102140

 Date Reported:
 2/15/2021

Analyst: KT

C14/			Collectior	Date:	2/8/2021 2:10:00 PM
300			Matrix: G	roundv	vater
Result	RL	Qual	Units	DF	Date Analyzed
/Dx Ext.			Batc	h ID: 3	1322 Analyst: MM
6,670	98.7		µg/L	1	2/11/2021 8:59:41 PM
ND	98.7		µg/L	1	2/11/2021 8:59:41 PM
79.9	50 - 150		%Rec	1	2/11/2021 8:59:41 PM
66.1	50 - 150		%Rec	1	2/11/2021 8:59:41 PM
			Batc	h ID: 3	1319 Analyst: KT
ND	50.0		µg/L	1	2/11/2021 12:28:38 AM
198	50.0		µg/L	1	2/11/2021 12:28:38 AM
98.5	65 - 135		%Rec	1	2/11/2021 12:28:38 AM
103	65 - 135		%Rec	1	2/11/2021 12:28:38 AM
	/Dx Ext. 6,670 ND 79.9 66.1 ND 198 98.5	Result RL /Dx Ext.	Result RL Qual /Dx Ext. 098.7 6,670 98.7 79.9 50 - 150 66.1 50 - 150 66.1 50 - 150 98.5 65 - 135	SW Result RL Qual Units /Dx Ext. Batcl 6,670 98.7 µg/L ND 98.7 µg/L 79.9 50 - 150 %Rec 66.1 50 - 150 %Rec Batcl ND 50.0 µg/L 198 50.0 µg/L 98.5 65 - 135 %Rec	SW Matrix: Groundv Result RL Qual Units DF /Dx Ext. Batch ID: 3 6,670 98.7 µg/L 1 ND 98.7 µg/L 1 79.9 50 - 150 %Rec 1 66.1 50 - 150 %Rec 1 Batch ID: 3 ND 50.0 µg/L 1 198 50.0 µg/L 1 98.5 65 - 135 %Rec 1

NOTES:

GRO - Indicates the presence of unresolved compounds eluting from hexane to dodecane, likely due to overlap with diesel range material.

Volatile Organic Compounds by EPA Method 8260D

Benzene	ND	1.00	µg/L	1	2/11/2021 12:28:38 AM
Toluene	ND	1.00	µg/L	1	2/11/2021 12:28:38 AM
Ethylbenzene	ND	1.00	µg/L	1	2/11/2021 12:28:38 AM
m,p-Xylene	ND	1.00	µg/L	1	2/11/2021 12:28:38 AM
o-Xylene	ND	1.00	µg/L	1	2/11/2021 12:28:38 AM
Surr: Dibromofluoromethane	99.4	87.8 - 114	%Rec	1	2/11/2021 12:28:38 AM
Surr: Toluene-d8	108	90.6 - 109	%Rec	1	2/11/2021 12:28:38 AM
Surr: 1-Bromo-4-fluorobenzene	99.0	88.6 - 111	%Rec	1	2/11/2021 12:28:38 AM



Client: AECOM				Collection	n Date	: 2/8/2021 3:00:00 PM
Project: WFS 6760 W Marginal Way	SW					
Lab ID: 2102140-006				Matrix: G	round	water
Client Sample ID: MW-27						
Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx	/Dx Ext.			Batc	h ID: 3	Analyst: MM
Diesel (Fuel Oil)	ND	99.0		µg/L	1	2/11/2021 9:58:25 PM
Heavy Oil	ND	99.0		µg/L	1	2/11/2021 9:58:25 PM
Surr: 2-Fluorobiphenyl	82.6	50 - 150		%Rec	1	2/11/2021 9:58:25 PM
Surr: o-Terphenyl	69.0	50 - 150		%Rec	1	2/11/2021 9:58:25 PM
Gasoline by NWTPH-Gx				Batc	h ID: 3	Analyst: KT
Gasoline	ND	50.0		µg/L	1	2/11/2021 12:58:39 AM
Surr: Toluene-d8	89.0	65 - 135		%Rec	1	2/11/2021 12:58:39 AM
Surr: 4-Bromofluorobenzene	104	65 - 135		%Rec	1	2/11/2021 12:58:39 AM
Volatile Organic Compounds by EP	A Method	<u>8260D</u>		Batc	h ID: 🔅	Analyst: KT
Benzene	ND	1.00		µg/L	1	2/11/2021 12:58:39 AM
Toluene	ND	1.00		µg/L	1	2/11/2021 12:58:39 AM
Ethylbenzene	ND	1.00		µg/L	1	2/11/2021 12:58:39 AM
m,p-Xylene	ND	1.00		µg/L	1	2/11/2021 12:58:39 AM
o-Xylene	ND	1.00		µg/L	1	2/11/2021 12:58:39 AM
Surr: Dibromofluoromethane	101	87.8 - 114		%Rec	1	2/11/2021 12:58:39 AM
Surr: Toluene-d8	94.1	90.6 - 109		%Rec	1	2/11/2021 12:58:39 AM
Surr: 1-Bromo-4-fluorobenzene	100	88.6 - 111		%Rec	1	2/11/2021 12:58:39 AM



Batch ID: 31319

 Work Order:
 2102140

 Date Reported:
 2/15/2021

Analyst: KT

Client: AECOM Collection Date: 2/8/2021 3:55:00 PM							
Project: WFS 6760 W Marginal Wa	ay SW						
Lab ID: 2102140-007				Matrix: G	roundw	vater	
Client Sample ID: MW-26							
Analyses	Result	RL	Qual	Units	DF	Date Analyzed	
Diesel and Heavy Oil by NWTPH-	Dx/Dx Ext.			Batc	h ID: 31	1322 Analyst: MM	
Diesel (Fuel Oil)	15,400	98.7		µg/L	1	2/11/2021 10:27:46 PM	
Heavy Oil	ND	98.7		µg/L	1	2/11/2021 10:27:46 PM	
Surr: 2-Fluorobiphenyl	90.6	50 - 150		%Rec	1	2/11/2021 10:27:46 PM	
Surr: o-Terphenyl	77.4	50 - 150		%Rec	1	2/11/2021 10:27:46 PM	
Gasoline by NWTPH-Gx				Batc	h ID: 31	1319 Analyst: KT	
Gasoline	ND	50.0		μg/L	1	2/11/2021 1:28:46 AM	
Gasoline Range Organics (C6-C12)	889	50.0		µg/L	1	2/11/2021 1:28:46 AM	
Surr: Toluene-d8	98.1	65 - 135		%Rec	1	2/11/2021 1:28:46 AM	
Surr: 4-Bromofluorobenzene	104	65 - 135		%Rec	1	2/11/2021 1:28:46 AM	

NOTES:

GRO - Indicates the presence of unresolved compounds eluting from hexane to dodecane, likely due to overlap with diesel range material.

Volatile Organic Compounds by EPA Method 8260D

Benzene	ND	1.00	µg/L	1	2/11/2021 1:28:46 AM
Toluene	ND	1.00	µg/L	1	2/11/2021 1:28:46 AM
Ethylbenzene	ND	1.00	μg/L	1	2/11/2021 1:28:46 AM
m,p-Xylene	ND	1.00	μg/L	1	2/11/2021 1:28:46 AM
o-Xylene	ND	1.00	μg/L	1	2/11/2021 1:28:46 AM
Surr: Dibromofluoromethane	101	87.8 - 114	%Rec	1	2/11/2021 1:28:46 AM
Surr: Toluene-d8	103	90.6 - 109	%Rec	1	2/11/2021 1:28:46 AM
Surr: 1-Bromo-4-fluorobenzene	100	88.6 - 111	%Rec	1	2/11/2021 1:28:46 AM



Client: AECOM				Collectior	Date:	
Project: WFS 6760 W Marginal Wa	y SW					
Lab ID: 2102140-008				Matrix: G	roundwa	ater
Client Sample ID: Trip Blank						
Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by E Benzene Toluene	PA Method ND ND	8260D 1.00 1.00		µg/L	h ID: 31 1 1	319 Analyst: KT 2/10/2021 12:53:57 PM 2/10/2021 12:53:57 PM
Ethylbenzene m,p-Xylene	ND ND	1.00 1.00 1.00		μg/L μg/L μg/L	1 1	2/10/2021 12:53:57 PM 2/10/2021 12:53:57 PM 2/10/2021 12:53:57 PM
o-Xylene Surr: Dibromofluoromethane Surr: Toluene-d8 Surr: 1-Bromo-4-fluorobenzene	ND 102 99.6 93.8	1.00 87.8 - 114 90.6 - 109 88.6 - 111		μg/L %Rec %Rec %Rec	1 1 1 1	2/10/2021 12:53:57 PM 2/10/2021 12:53:57 PM 2/10/2021 12:53:57 PM 2/10/2021 12:53:57 PM
	93.0	00.0 - 111		70 Rec	I	2/10/2021 12.33.37 PW

Fremont
Analytical

Work Order: CLIENT:	2102140 AECOM								Diosol	QC S and Heavy			-
Project:	WFS 6760 V	V Margina	Way SW						Diesei	апи пеачу			
Sample ID: MB-31	322	SampType	e: MBLK			Units: µg/L		Prep Dat	e: 2/10/20	21	RunNo: 652	295	
Client ID: MBLK	W	Batch ID:	31322					Analysis Dat	e: 2/11/20	21	SeqNo: 131	13080	
Analyte			Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)			ND	99.4									
Diesel Range Orga	anics (C12-C24)		ND	99.4									
Heavy Oil			ND	99.4									
Surr: 2-Fluorobip	phenyl		73.8		79.52		92.8	50	150				
Surr: o-Terphen	yl		64.0		79.52		80.4	50	150				
Sample ID: LCS-3	1322	SampType	e: LCS			Units: µg/L		Prep Dat	e: 2/10/20)21	RunNo: 652	295	
Client ID: LCSW	1	Batch ID:	31322					Analysis Dat	e: 2/11/20)21	SeqNo: 131	13081	
Analyte			Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)			571	100	999.9	0	57.1	48.1	108				
Surr: 2-Fluorobi	phenyl		67.5		79.99		84.4	50	150				
Surr: o-Terphen	yl		57.9		79.99		72.4	50	150				
Sample ID: 21021:	33-001BDUP	SampType	e: DUP			Units: µg/L		Prep Dat	e: 2/10/20)21	RunNo: 652	295	
Client ID: BATCI	н	Batch ID:	31322					Analysis Dat	e: 2/11/20)21	SeqNo: 131	13085	
Analyte			Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)			ND	98.2						0		30	
Heavy Oil			ND	98.2						0		30	
Surr: 2-Fluorobi	phenyl		60.2		78.53		76.7	50	150		0		
Surr: o-Terphen	yl		45.8		78.53		58.3	50	150		0		
Sample ID: 21021	40-005BMS	SampType	e: MS			Units: µg/L		Prep Dat	e: 2/10/20)21	RunNo: 652	295	
Client ID: EX-2		Batch ID:	31322					Analysis Dat	e: 2/11/20)21	SeqNo: 131	13093	
Analyte			Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)			7,840	98.9	989.3	6,675	118	18.7	128				
Surr: 2-Fluorobi	phenyl		64.4		79.15		81.4	50	150				



Work Order: CLIENT:	2102140 AECOM									QC S	SUMMA	RY REF	PORT
Project:		W Marginal	l Way SW						Diesel	and Heavy	Oil by NW	TPH-Dx/I	Dx Ext
Sample ID: 21021	40-005BMS	SampType	e: MS			Units: µg/L		Prep Da	ate: 2/10/20)21	RunNo: 652	295	
Client ID: EX-2		Batch ID:	31322					Analysis Da	ate: 2/11/20)21	SeqNo: 131	3093	
Analyte			Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: o-Terphen	yl		54.7		79.15		69.1	50	150				
Sample ID: 21021	51-003BDUP	SampType	e: DUP			Units: µg/L		Prep Da	ate: 2/10/2 0)21	RunNo: 652	295	
Client ID: BATC	н	Batch ID:	31322					Analysis Da	ate: 2/12/20	021	SeqNo: 131	3112	
Analyte			Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)			ND	99.5						0		30	
Heavy Oil			115	99.5						107.9	6.24	30	
Surr: 2-Fluorobi	ohenyl		68.2		79.62		85.7	50	150		0		
Surr: o-Terphen	yl		55.9		79.62		70.2	50	150		0		



Work Order: CLIENT: Project:	2102140 AECOM WFS 6760	W Marginal	Way SW							QC S	SUMMAI Gasoline		-
Sample ID: LCS-31	1319	SampType	e: LCS			Units: µg/L		Prep Dat	te: 2/10/20	21	RunNo: 652	233	
Client ID: LCSW		Batch ID:	31319					Analysis Dat	te: 2/10/20	21	SeqNo: 131	1851	
Analyte			Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline			454	50.0	500.0	0	90.8	65	135				
Surr: Toluene-d8	ł		21.0		25.00		84.2	65	135				
Surr: 4-Bromoflu	orobenzene		26.5		25.00		106	65	135				
Sample ID: MB-31	319	SampTyp	e: MBLK			Units: µg/L		Prep Dat	te: 2/10/20	21	RunNo: 652	233	
Client ID: MBLK	N	Batch ID:	31319					Analysis Dat	te: 2/10/20	21	SeqNo: 131	1850	
Analyte			Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline			ND	50.0									
Surr: Toluene-d8			24.9		25.00		99.5	65	135				
Surr: 4-Bromoflu	orobenzene		24.1		25.00		96.4	65	135				
Sample ID: 210213	6-001ADUP	SampType	e: DUP			Units: µg/L		Prep Dat	ie: 2/10/20	21	RunNo: 652	233	
Client ID: BATCH	1	Batch ID:	31319					Analysis Dat	te: 2/10/20	21	SeqNo: 131	1827	
Analyte			Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline			ND	50.0						0		30	
Surr: Toluene-d8			24.9		25.00		99.5	65	135		0		
Surr: 4-Bromoflu	orobenzene		24.0		25.00		96.1	65	135		0		
Sample ID: 210213	7-001ADUP	SampType	e: DUP			Units: µg/L		Prep Dat	te: 2/10/20	21	RunNo: 652	233	
Client ID: BATCH	ł	Batch ID:	31319					Analysis Dat	te: 2/10/20	21	SeqNo: 131	1829	
Analyte			Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline			ND	50.0						0		30	
Surr: Toluene-d8			24.5		25.00		97.8	65	135		0		
	orobenzene		24.1		25.00		96.5	65	135		0		



Work Order: CLIENT: Project:	2102140 AECOM WFS 6760	W Marginal Way SW							QC S	SUMMA Gasoline		_
Sample ID: 21021	33-001AMS	SampType: MS			Units: µg/L		Prep Dat	te: 2/10/20)21	RunNo: 652	233	
Client ID: BATC	н	Batch ID: 31319					Analysis Dat	te: 2/10/20	021	SeqNo: 13	1825	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline		471	50.0	500.0	0	94.1	65	135				
Surr: Toluene-da	8	24.7		25.00		98.6	65	135				
Surr: 4-Bromoflu	uorobenzene	26.2		25.00		105	65	135				



Work Order:2102140CLIENT:AECOM						Volatile C		SUMMARY REF	
	V Marginal Way SW						•	•	02000
Sample ID: LCS-31319	SampType: LCS			Units: µg/L		Prep Date:	2/10/2021	RunNo: 65228	
Client ID: LCSW	Batch ID: 31319					Analysis Date:	2/10/2021	SeqNo: 1311745	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit H	lighLimit RPD Ref Val	%RPD RPDLimit	Qual
Benzene	19.0	1.00	20.00	0	95.2	83.4	116		
Toluene	19.9	1.00	20.00	0	99.7	83.6	117		
Ethylbenzene	19.3	1.00	20.00	0	96.7	82.8	117		
m,p-Xylene	39.7	1.00	40.00	0	99.2	81.6	116		
o-Xylene	19.6	1.00	20.00	0	97.9	82.4	115		
Surr: Dibromofluoromethane	26.0		25.00		104	87.8	114		
Surr: Toluene-d8	25.6		25.00		102	90.6	109		
Surr: 1-Bromo-4-fluorobenzene	26.3		25.00		105	88.6	111		
Sample ID: MB-31319	SampType: MBLK			Units: µg/L		Prep Date:	2/10/2021	RunNo: 65228	
Client ID: MBLKW	Batch ID: 31319					Analysis Date:	2/10/2021	SeqNo: 1311744	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit H	lighLimit RPD Ref Val	%RPD RPDLimit	Qual
Benzene	ND	1.00							
Toluene	ND	1.00							
Ethylbenzene	ND	1.00							
m,p-Xylene	ND	1.00							
o-Xylene	ND	1.00							
Surr: Dibromofluoromethane	25.4		25.00		102	87.8	114		
Surr: Toluene-d8	26.5		25.00		106	90.6	109		
Surr: 1-Bromo-4-fluorobenzene	23.6		25.00		94.2	88.6	111		
Sample ID: 2102136-001ADUP	SampType: DUP			Units: µg/L		Prep Date:	2/10/2021	RunNo: 65228	
Client ID: BATCH	Batch ID: 31319					Analysis Date:		SeqNo: 1311721	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit H	lighLimit RPD Ref Val	%RPD RPDLimit	Qual
Benzene	ND	1.00					0	30	
Toluene	ND	1.00					0	30	
Ethylbenzene	ND	1.00					0	30	



Work Order: 2102140 CLIENT: AECOM Project: WFS 6760 V	V Marginal Way SW					Volatile C	Organic	QC S Compoun	SUMMAI		-
Sample ID: 2102136-001ADUP	SampType: DUP			Units: µg/L		Prep Date:	2/10/202	21	RunNo: 652	228	
Client ID: BATCH	Batch ID: 31319					Analysis Date:	: 2/10/202	21	SeqNo: 131	1721	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit H	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
m,p-Xylene	ND	1.00						0		30	
o-Xylene	ND	1.00						0		30	
Surr: Dibromofluoromethane	24.9		25.00		99.6	87.8	114		0		
Surr: Toluene-d8	27.7		25.00		111	90.6	109		0		S
Surr: 1-Bromo-4-fluorobenzene	23.5		25.00		94.0	88.6	111		0		
NOTES: S - Outlying surrogate recovery(ie	es) observed.										
Sample ID: 2102137-001ADUP	SampType: DUP			Units: µg/L		Prep Date:	2/10/202	21	RunNo: 652	228	
Client ID: BATCH	Batch ID: 31319					Analysis Date:	2/10/202	21	SeqNo: 131	1723	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit H	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	1.00						0		30	
Toluene	ND	1.00						0		30	
Ethylbenzene	ND	1.00						0		30	
m,p-Xylene	ND	1.00						0		30	
o-Xylene	ND	1.00						0		30	
Surr: Dibromofluoromethane	25.0		25.00		100	87.8	114		0		
Surr: Toluene-d8	27.2		25.00		109	90.6	109		0		
Surr: 1-Bromo-4-fluorobenzene	23.6		25.00		94.5	88.6	111		0		
Sample ID: 2102133-001AMS	SampType: MS			Units: µg/L		Prep Date:	2/10/202	21	RunNo: 652	228	
Client ID: BATCH	Batch ID: 31319					Analysis Date:	: 2/10/202	21	SeqNo: 131	1719	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit H	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	20.2	1.00	20.00	0	101	85.3	129				
Toluene	24.0	1.00	20.00	0	120	87.3	124				
Ethylbenzene	20.8	1.00	20.00	0	104	92.7	120				
m,p-Xylene	42.9	1.00	40.00	0	107	89.7	118				
o-Xylene	21.2	1.00	20.00	0	106	90.3	117				



Work Order: 2102140 QC SUMM CLIENT: AECOM Volatile Organic Compounds by EF Project: WFS 6760 W Marginal Way SW Volatile Organic Compounds by EF												-
Sample ID: 210213 Client ID: BATCH		SampType: MS Batch ID: 31319			Units: µg/L		Prep Da Analysis Da	te: 2/10/20 te: 2/10/20		RunNo: 652 SeqNo: 131		
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Dibromoflu	oromethane	25.4		25.00		102	89.1	116				
Surr: Toluene-d8	3	28.5		25.00		114	90.5	111				S
Surr: 1-Bromo-4- NOTES:	-fluorobenzene	26.4		25.00		106	97.8	110				

S - Outlying surrogate recovery(ies) observed.



Sample Log-In Check List

С	lient Name:	URS	Work Or	der Numb	ber: 2102140	
Lo	ogged by:	Gabrielle Coeuille	Date Re	ceived:	2/8/2021	5:10:00 PM
Cha	nin of Cust	ody				
1.	Is Chain of C	sustody complete?	Yes	✓	No 🗌	Not Present
2.	How was the	sample delivered?	<u>Clien</u>	<u>t</u>		
Log	<u>In</u>					
3.	Coolers are	present?	Yes	✓	No 🗌	NA 🗌
4.	Shipping con	tainer/cooler in good condition?	Yes	✓	No 🗌	
5.		Is present on shipping container/cooler? nments for Custody Seals not intact)	Yes	✓	No 🗌	Not Present
6.	Was an atter	npt made to cool the samples?	Yes	✓	No 🗌	NA 🗌
7.	Were all item	as received at a temperature of >2°C to 6°C *	Yes	✓	No 🗌	
8.	Sample(s) in	proper container(s)?	Yes	✓	No 🗌	
9.	Sufficient sa	mple volume for indicated test(s)?	Yes	✓	No 🗌	
10.	Are samples	properly preserved?	Yes	✓	No 🗌	
11.	Was preserv	ative added to bottles?	Yes		No 🗹	NA 🗌
12.	Is there head	Ispace in the VOA vials?	Yes		No 🗹	NA 🗌
13.	Did all samp	es containers arrive in good condition(unbroken)?	Yes	✓	No 🗌	
14.	Does paperw	vork match bottle labels?	Yes	✓	No 🗌	
15.	Are matrices	correctly identified on Chain of Custody?	Yes	✓	No 🗌	
16.	Is it clear wh	at analyses were requested?	Yes	✓	No 🗌	
17.	Were all hold	ling times able to be met?	Yes	✓	No 🗌	
<u>Spe</u>	cial Handl	ing (if applicable)				
18.	Was client n	otified of all discrepancies with this order?	Yes		No 🗌	NA 🗹
	Person	Notified: Date	:			
	By Who	via:	🗌 eMa	il 🗌 Ph	one 🗌 Fax 🛛	In Person
	Regard	ing:				
	Client Ir	nstructions:				
19	Additional re	marks:				

Item Information

Item #	Temp ⁰C
Sample 1	0.5

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

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Date/Time	Print Name	Received (Signature)			Date/Time	-		Print Name		Relinquished (Signature) x	x Rel
Winnson 2/8/21 (2 1710	Our Print Name	Received (Signature)	1645	121	2/ S	Curo	ne http://G	Print Name	Sum	× NLCL &	X
_	ve, that I have veri	I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above, that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.	cal on behal	Analyti	Fremont	eement.	is Agreen f this Agr	enter into th 1d backside o	I represent that I am authorized to enter into this Agreement wit to each of the terms on the front and backside of this Agreement.	I represent that I to each of the terr	2
3 Dav Same Dav		Nitrate+Nitrite	Fluoride	O-Phosphate		Bromide	Sulfate	Chloride	Nitrate Nitrite	***Anions (Circle):	1:
sr sn Ti Ti V Zn Standard Next Day	Mo Na Ni Pb Sb Se	Cr Cu Fe Hg K Mg Mn	Be Ca Cd Co	As B Ba	1: Ag Al As	Individual:	ts TAL	Priority Pollutants	MTCA-5 RCRA-8	**Metals (Circle): MT	1
m Water, WW = Waste Water Turn-around Time:	nd Water, SW = Storm Water,	DW = Drinking Water, GW = Ground Water,	W = Water, D	SL = Solid,		S = Soil, SD = Sediment,		O = Other, P = Product,	8 = Bulk,	Matrix: A = Air, AQ = Aqueous,	*
											10
											9
				×	~	66	1035	2/8/21		Trip Blank	00
			×	×	1	Gw	1555	2/8/21		MW-26	7
			×××	×	4	60	1500	2/8/21		14-27	6
			XX	X	Ŧ	00	0141	2/8/21		EX-2	5
			×××	×	7	Gw	1315	2/8/21		m×-1	4
			×	×	τ	50	1225	2/8/21		MW-24	ω
			× ×	×	L	Cw	1130	2/8/21		MW-23	N
				×	4	62	1035	2/8/21		Mw-25	H
Comments		2115 112 42 10 10 10 10 10 10 10 10 10 10 10 10 10		105-5 (CP 70145) (SP 81	# of Cont.	Sample Type (Matrix)*	Sample	Sample Date		Sample Name	10
	io m	David. raubility of Aecon. Con	u.d. rau		PM Email:					Fax:	27
Sample Disposal: Return to client Disposal by lab (after 30 days)	Sa	Reub Voyel	Durid 1	1	Report To (PM):			0	438 2700	Telephone: 206	ы
	ŝ	Marginal Way S	3	6067	Location:			10186	Seattle, WA	City, State, Zip: Se.	0
			NZC	by: N	Collected by:		00	Su:te 1600	AUC,	Address: 1111 3 + d	Þ
		0	60651450		Project No:					Client: AECOM	10
Special Remarks:	ay sw	Ine: Earl	WFS 6	4	Project Name:	2-11/8	Fax: 206-352-7178		Analysical		1
Laboratory Project No (Internal): 2402(40	of: / 14	12021 Page: 1		80/20	Date:	2-3790	Tel: 206-352-3790				
Chain of Custody Record & Laboratory Services Agreement	& Labora	istody Record	n of Cu	Chai		Ave N.	3600 Fremont Ave N.		535		-