

December 20, 2022

Mr. Jim Schneider
HF Sinclair Puget Sound Refining LLC
P.O. Box 47600
Anacortes, WA 98221

**RE: 2022 Annual Reporting of Soil-Pore Water and Groundwater Sampling
Results at the SWMU-55 Site**

Mr. Schneider:

Whatcom Environmental Services has completed soil-pore water and groundwater monitoring at the Solid Waste Management Unit 55 (SWMU-55) site located at the HollyFrontier Puget Sound Refinery (PSR). HF Sinclair Puget Sound Refining LLC is located at 8505 South Texas Road in Anacortes, Washington. The site location is shown on Figure 1.

The lysimeters and groundwater wells at SWMU-55 have historically been monitored annually per Section V.B of the PSR Permit for Land Treatment of Dangerous Waste (the Permit). Sampling is now being completed as required per Agreed Order (No. DE 16081) relating to construction activities occurring at the site.

Lysimeter L90-13 was removed as a result of construction activities at the site in 2019. The lysimeter was replaced when construction activities were completed in 2020 and renamed L90-13a. Monitoring well and lysimeter locations are shown on Figure 2.

Soil Pore Water Sampling Methods

Soil pore water samples were collected from lysimeters L90-13a and L90-16E in November 2022. Samples were collected utilizing the porous cup lysimeter sample collection methodology in accordance with the procedures in Permit Attachment 11.

Groundwater Sampling Methods

Groundwater samples were collected from wells W-24 and W-46 in November 2022. Due to the depth to water in wells at the site, groundwater samples were collected using disposable bailers. Prior to collecting each sample, 1 to 3 well volumes of water were bailed from the well. Samples were then collected using sample containers provided by the analytical laboratory and placed in a cooler with ice. Dissolved metals samples were filtered in the field using a disposable 0.45 µm in-line filter.

Laboratory Analysis

Samples collected in November 2022 were sent to ALS Laboratory Group in Everett, WA for analysis. ALS Laboratory Group is accredited by the Washington State Department of Ecology. All samples were analyzed for the principal dangerous constituents listed in the Permit as well as contaminants of concern identified in the Agreed Order. Analytes included benzene, toluene, ethylbenzene, and xylenes (BTEX), methyl tert-butyl ether (MTBE), hexane, volatile petroleum hydrocarbons, extractable petroleum hydrocarbons, cPAHs, naphthalenes, chromium, nickel, vanadium, and mercury. Due to lab error, the PAH samples were extracted outside of the hold time. The reporting limits are well below the cleanup level and not considered a concern.

Analytical Results

Well W-24 contained detectable concentrations of dissolved nickel, dissolved chromium, and dissolved vanadium below the MTCA Method B residential groundwater cleanup level. All other analytes were non-detect.

Well W-46 contained detectable concentrations of dissolved nickel and dissolved vanadium below the MTCA Method B residential groundwater cleanup level. All other analytes were non-detect.

Lysimeter L90-13a contained a detectable concentration of dissolved nickel below the MTCA Method B residential groundwater cleanup level. All other analytes were non-detect.

Lysimeter L90-16E contained detectable concentrations of dissolved nickel and dissolved vanadium below MTCA Method B residential groundwater cleanup levels. All other analytes were non-detect.

A summary of the 2022 groundwater sampling results is provided in Table 1. The original laboratory data reports are provided in Appendix A.

Conclusions

Based on the results of this investigation, there is no evidence of groundwater or soil-pore water contamination above MTCA Method B residential groundwater cleanup levels at the SWMU-55 site.

Whatcom Environmental Services appreciates the opportunity to assist the HF Sinclair Puget Sound Refining LLC with the SWMU-55 sampling project. If you have any questions regarding this report, please call me at (360) 752-9571.

Sincerely,



Eric Libolt
Whatcom Environmental Services

122°36'0"W

122°34'0"W

122°32'0"W

48°30'0"N

48°30'0"N

48°28'0"N

48°28'0"N

122°36'0"W

122°34'0"W

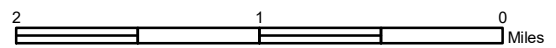
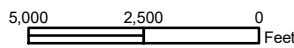
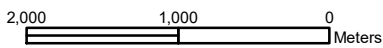
122°32'0"W



1:50,000

Site Location
 8505 S Texas Road
 Anacortes, WA 98221

Service Layer Credits: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S.



Prepared for:



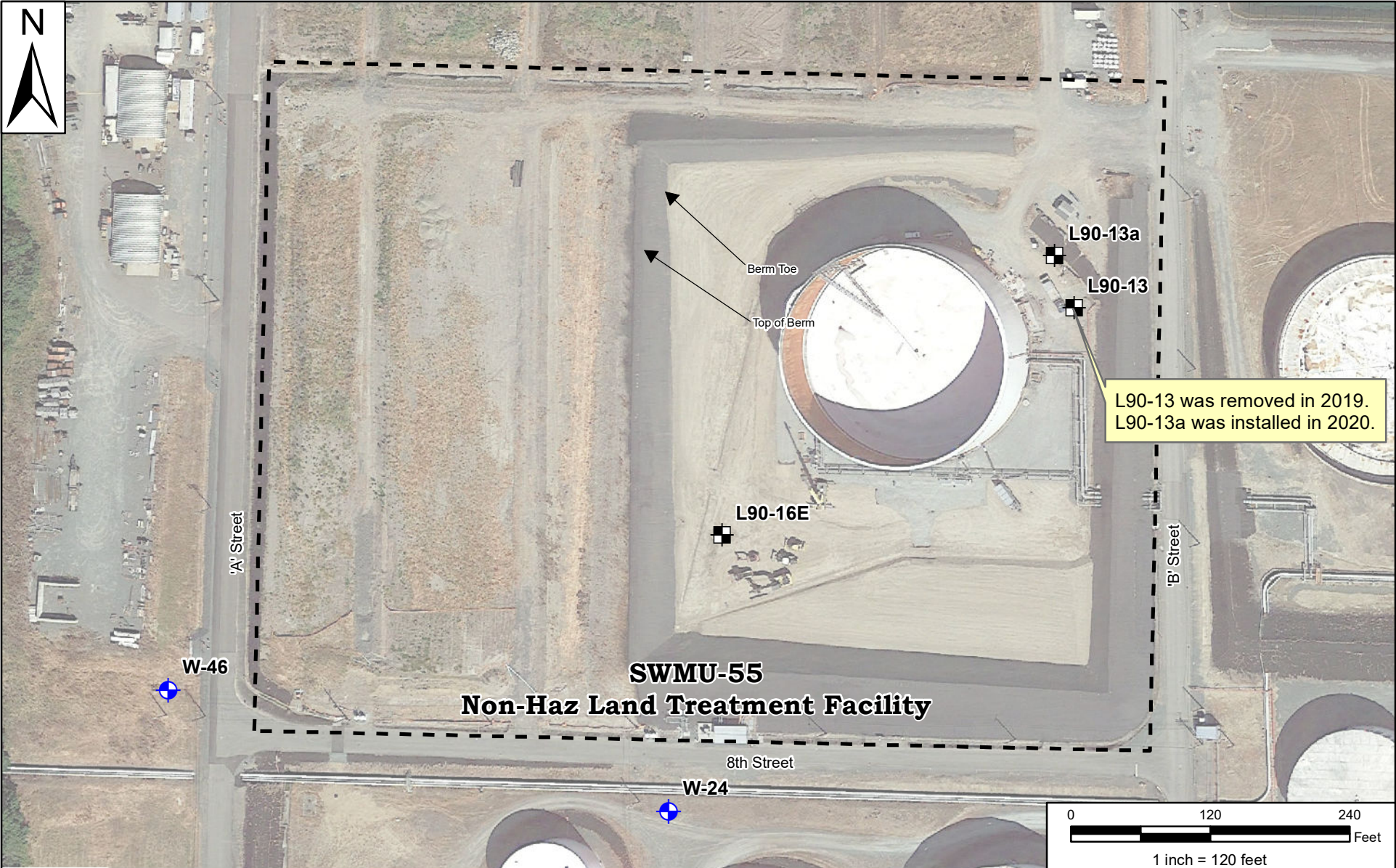
Prepared by:






Site Location Map

SWMU 55
 12/20/2022

Figure 1



-  Groundwater Well
-  Lysimeter
-  Site Boundary

All data are approximate and should be used for relative location reference only.

2020 Aerial Photograph (GoogleEarth)

Prepared for:



Prepared by:



Monitoring Well and Lysimeter Location Map	
SWMU-55	Figure 2
12/20/2022	

Table 1. Soil-pore Water and Groundwater Data - SWMU 55

Analyte	Method	Units	W-24	W-46	I90-13a		I90-16E	MTCA Method B
			11/9/2022	11/9/2022	11/8/2022	11/8/2022 (dup.)	11/8/2022	
Aliphatic EC 5-6	NWVPH	ug/L	ND(<50)	ND(<50)	ND(<50)	ND(<50)	ND(<50)	No Level
Aliphatic EC >6-8	NWVPH	ug/L	ND(<50)	ND(<50)	ND(<50)	ND(<50)	ND(<50)	No Level
Aliphatic EC >8-10	NWVPH	ug/L	ND(<50)	ND(<50)	ND(<50)	ND(<50)	ND(<50)	No Level
Aliphatic EC >10-12	NWEPH	ug/L	ND(<40)	ND(<40)	ND(<40)	ND(<40)	ND(<40)	No Level
Aliphatic EC >12-16	NWEPH	ug/L	ND(<48)	ND(<40)	ND(<40)	ND(<40)	ND(<40)	No Level
Aliphatic EC >16-21	NWEPH	ug/L	ND(<40)	ND(<40)	ND(<40)	ND(<40)	ND(<40)	No Level
Aliphatic EC >21-34	NWEPH	ug/L	ND(<40)	ND(<40)	ND(<40)	ND(<40)	ND(<40)	No Level
Aromatic EC >8-10	NWVPH	ug/L	ND(<50)	ND(<50)	ND(<50)	ND(<50)	ND(<50)	No Level
Aromatic EC >10-12	NWEPH	ug/L	ND(<40)	ND(<40)	ND(<40)	ND(<40)	ND(<40)	No Level
Aromatic EC >12-16	NWEPH	ug/L	ND(<40)	ND(<40)	ND(<40)	ND(<40)	ND(<40)	No Level
Aromatic EC >16-21	NWEPH	ug/L	ND(<40)	ND(<40)	ND(<40)	ND(<40)	ND(<40)	No Level
Aromatic EC >21-34	NWEPH	ug/L	ND(<40)	ND(<40)	ND(<40)	ND(<40)	ND(<40)	No Level
Benzene	EPA-8260	ug/L	ND(<0.2)	ND(<2)	ND(<2)	ND(<2)	ND(<2)	5*
Toluene	EPA-8260	ug/L	ND(<0.2)	ND(<2)	ND(<2)	ND(<2)	ND(<2)	1,000*
Ethylbenzene	EPA-8260	ug/L	ND(<0.2)	ND(<2)	ND(<2)	ND(<2)	ND(<2)	700*
Xylenes	EPA-8260	ug/L	ND(<4)	ND(<4)	ND(<4)	ND(<4)	ND(<4)	1,600
Methyl tert-butyl ether	EPA-8260	ug/L	ND(<0.2)	ND(<2)	ND(<2)	ND(<2)	ND(<2)	24
Hexane	EPA-8260	ug/L	ND(<6.8)	ND(<6.8)	ND(<6.8)	ND(<6.8)	ND(<6.8)	480
Naphthalene	EPA-8270 SIM	ug/L	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	160**
2-Methylnaphthalene	EPA-8270 SIM	ug/L	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	160**
1-Methylnaphthalene	EPA-8270 SIM	ug/L	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	160**
Benzo(A)Anthracene	EPA-8270 SIM	ug/L	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	--
Chrysene	EPA-8270 SIM	ug/L	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	--
Benzo(B)Fluoranthene	EPA-8270 SIM	ug/L	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	--
Benzo(K)Fluoranthene	EPA-8270 SIM	ug/L	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	--
Benzo(A)Pyrene	EPA-8270 SIM	ug/L	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	0.2***
Indeno(1,2,3-Cd)Pyrene	EPA-8270 SIM	ug/L	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	--
Dibenz(A,H)Anthracene	EPA-8270 SIM	ug/L	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	ND(<0.02) ^a	--
Total Toxic Equivalent Concentration (Total TEQ)****		ug/L	ND(<0.015)	ND(<0.015)	ND(<0.015)	ND(<0.015)	ND(<0.015)	0.2***
Mercury(Dissolved)	EPA 245.1	ug/L	ND(<0.2)	ND(<0.2)	ND(<0.2)	ND(<0.2)	ND(<0.2)	2*
Chromium (Dissolved)	EPA 200.8	ug/L	14	ND(<2)	ND(<2)	ND(<2)	ND(<2)	100*
Nickel (Dissolved)	EPA 200.8	ug/L	63	12	3.6	3.7	25	320
Vanadium (Dissolved)	EPA 200.8	ug/L	29	2.5	ND(<2)	ND(<2)	24	80

ND indicates analyte was Not Detected at level above reporting limit. Reporting limit is given in parentheses.

* Indicates Washington Maximum Contaminant Level (MCL)

** Includes the sum of Naphthalene, 2-Methylnaphthalene, and 1-Methylnaphthalene

*** EPA/State Maximum Contaminant Level

**** Includes the sum of all the cPAHs multiplied by their respective toxicity equivalency factors in accordance with WAC 173-340-708(8)

^a Due to laboratory error the PAH samples were extracted outside of hold time.

APPENDIX A

Original Laboratory Analytical Data Reports



November 30, 2022

Mr. Eric Libolt
Whatcom Environmental Svcs., Inc.
228 E. Champion St., Suite 101
Bellingham, WA 98225

Dear Mr. Libolt,

On November 10th, 7 samples were received by our laboratory and assigned our laboratory project number EV22110073. The project was identified as your HF Sinclair Puget Sound Refining LLC (SWMU-55). The sample identification and requested analyses are outlined on the attached chain of custody record.

Due to laboratory error PAH samples were extracted outside of hold time. No other abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group

Glen Perry
Laboratory Director



CERTIFICATE OF ANALYSIS

CLIENT:	Whatcom Environmental Svcs., Inc. 228 E. Champion St., Suite 101 Bellingham, WA 98225	DATE:	11/30/2022
CLIENT CONTACT:	Eric Libolt	ALS JOB#:	EV22110073
CLIENT PROJECT:	HF Sinclair Puget Sound Refining LLC (SWMU-55)	ALS SAMPLE#:	EV22110073-01
CLIENT SAMPLE ID	L90-13a	DATE RECEIVED:	11/10/2022
		COLLECTION DATE:	11/8/2022 11:30:00 AM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
C5-C6 Aliphatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
>C6-C8 Aliphatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
>C8-C10 Aliphatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
>C8-C10 Aromatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
Hexane	NWVPH	U	5.0	1	UG/L	11/21/2022	ARI2
>C10-C12 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C12-C16 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C16-C21 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C21-C34 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C10-C12 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C12-C16 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C16-C21 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C21-C34 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
Methyl T-Butyl Ether	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Hexane	EPA-8260	U	6.8	1	UG/L	11/14/2022	DLC
Benzene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	11/14/2022	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Naphthalene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
2-Methylnaphthalene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
1-Methylnaphthalene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[A]Anthracene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Chrysene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[B]Fluoranthene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[K]Fluoranthene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[A]Pyrene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Dibenzo[A,H]Anthracene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Mercury (Dissolved)	EPA-245.1	U	0.20	1	UG/L	11/23/2022	RAL
Chromium (Dissolved)	EPA-200.8	U	2.0	1	UG/L	11/11/2022	RAL
Nickel (Dissolved)	EPA-200.8	3.6	2.0	1	UG/L	11/11/2022	RAL
Vanadium (Dissolved)	EPA-200.8	U	2.0	1	UG/L	11/11/2022	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT - Aliphatic	NWVPH	79.4	11/21/2022	ARI2

CERTIFICATE OF ANALYSIS

CLIENT:	Whatcom Environmental Svcs., Inc. 228 E. Champion St., Suite 101 Bellingham, WA 98225	DATE:	11/30/2022
CLIENT CONTACT:	Eric Libolt	ALS JOB#:	EV22110073
CLIENT PROJECT:	HF Sinclair Puget Sound Refining LLC (SWMU-55)	ALS SAMPLE#:	EV22110073-01
CLIENT SAMPLE ID	L90-13a	DATE RECEIVED:	11/10/2022
		COLLECTION DATE:	11/8/2022 11:30:00 AM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT - Aromatic	NWVPH	84.2	11/21/2022	ARI2
C25	NWEPH	46.2	11/23/2022	ARI2
p-Terphenyl	NWEPH	64.3	11/23/2022	ARI2
Toluene-d8	EPA-8260	100	11/14/2022	DLC
Terphenyl-d14	EPA-8270 SIM	75.6 HT03	11/23/2022	JMK

U - Analyte analyzed for but not detected at level above reporting limit.

HT03 -Sample extracted outside of the holding time due to laboratory error. Sample results should be considered estimated.



CERTIFICATE OF ANALYSIS

CLIENT:	Whatcom Environmental Svcs., Inc. 228 E. Champion St., Suite 101 Bellingham, WA 98225	DATE:	11/30/2022
CLIENT CONTACT:	Eric Libolt	ALS JOB#:	EV22110073
CLIENT PROJECT:	HF Sinclair Puget Sound Refining LLC (SWMU-55)	ALS SAMPLE#:	EV22110073-02
CLIENT SAMPLE ID	L90-16E	DATE RECEIVED:	11/10/2022
		COLLECTION DATE:	11/8/2022 12:40:00 PM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
C5-C6 Aliphatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
>C6-C8 Aliphatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
>C8-C10 Aliphatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
>C8-C10 Aromatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
Hexane	NWVPH	U	5.0	1	UG/L	11/21/2022	ARI2
>C10-C12 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C12-C16 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C16-C21 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C21-C34 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C10-C12 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C12-C16 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C16-C21 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C21-C34 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
Methyl T-Butyl Ether	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Hexane	EPA-8260	U	6.8	1	UG/L	11/14/2022	DLC
Benzene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	11/14/2022	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Naphthalene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
2-Methylnaphthalene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
1-Methylnaphthalene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[A]Anthracene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Chrysene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[B]Fluoranthene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[K]Fluoranthene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[A]Pyrene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Dibenz[A,H]Anthracene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Mercury (Dissolved)	EPA-245.1	U	0.20	1	UG/L	11/23/2022	RAL
Chromium (Dissolved)	EPA-200.8	U	2.0	1	UG/L	11/11/2022	RAL
Nickel (Dissolved)	EPA-200.8	25	2.0	1	UG/L	11/11/2022	RAL
Vanadium (Dissolved)	EPA-200.8	24	2.0	1	UG/L	11/11/2022	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT - Aliphatic	NWVPH	78.6	11/21/2022	ARI2



CERTIFICATE OF ANALYSIS

CLIENT: Whatcom Environmental Svcs., Inc. DATE: 11/30/2022
228 E. Champion St., Suite 101 ALS JOB#: EV22110073
Bellingham, WA 98225 ALS SAMPLE#: EV22110073-02
CLIENT CONTACT: Eric Libolt DATE RECEIVED: 11/10/2022
CLIENT PROJECT: HF Sinclair Puget Sound Refining LLC (SWMU-55) COLLECTION DATE: 11/8/2022 12:40:00 PM
CLIENT SAMPLE ID L90-16E WDOE ACCREDITATION: C601

SAMPLE DATA RESULTS

Table with 5 columns: SURROGATE, METHOD, %REC, ANALYSIS DATE, ANALYSIS BY. Rows include TFT - Aromatic, C25, p-Terphenyl, Toluene-d8, and Terphenyl-d14.

U - Analyte analyzed for but not detected at level above reporting limit.
HT03 -Sample extracted outside of the holding time due to laboratory error. Sample results should be considered estimated.



CERTIFICATE OF ANALYSIS

CLIENT:	Whatcom Environmental Svcs., Inc. 228 E. Champion St., Suite 101 Bellingham, WA 98225	DATE:	11/30/2022
CLIENT CONTACT:	Eric Libolt	ALS JOB#:	EV22110073
CLIENT PROJECT:	HF Sinclair Puget Sound Refining LLC (SWMU-55)	ALS SAMPLE#:	EV22110073-03
CLIENT SAMPLE ID	W-24	DATE RECEIVED:	11/10/2022
		COLLECTION DATE:	11/9/2022 12:15:00 PM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
C5-C6 Aliphatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
>C6-C8 Aliphatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
>C8-C10 Aliphatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
>C8-C10 Aromatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
Hexane	NWVPH	U	5.0	1	UG/L	11/21/2022	ARI2
>C10-C12 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C12-C16 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C16-C21 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C21-C34 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C10-C12 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C12-C16 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C16-C21 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C21-C34 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
Methyl T-Butyl Ether	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Hexane	EPA-8260	U	6.8	1	UG/L	11/14/2022	DLC
Benzene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	11/14/2022	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Naphthalene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
2-Methylnaphthalene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
1-Methylnaphthalene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[A]Anthracene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Chrysene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[B]Fluoranthene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[K]Fluoranthene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[A]Pyrene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Dibenz[A,H]Anthracene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Mercury (Dissolved)	EPA-245.1	U	0.20	1	UG/L	11/23/2022	RAL
Chromium (Dissolved)	EPA-200.8	14	2.0	1	UG/L	11/11/2022	RAL
Nickel (Dissolved)	EPA-200.8	63	2.0	1	UG/L	11/11/2022	RAL
Vanadium (Dissolved)	EPA-200.8	29	2.0	1	UG/L	11/11/2022	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT - Aliphatic	NWVPH	79.5	11/21/2022	ARI2

CERTIFICATE OF ANALYSIS

CLIENT:	Whatcom Environmental Svcs., Inc. 228 E. Champion St., Suite 101 Bellingham, WA 98225	DATE:	11/30/2022
CLIENT CONTACT:	Eric Libolt	ALS JOB#:	EV22110073
CLIENT PROJECT:	HF Sinclair Puget Sound Refining LLC (SWMU-55)	ALS SAMPLE#:	EV22110073-03
CLIENT SAMPLE ID	W-24	DATE RECEIVED:	11/10/2022
		COLLECTION DATE:	11/9/2022 12:15:00 PM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS	
			DATE	BY
TFT - Aromatic	NWVPH	85.4	11/21/2022	ARI2
C25	NWEPH	55.1	11/23/2022	ARI2
p-Terphenyl	NWEPH	72.4	11/23/2022	ARI2
Toluene-d8	EPA-8260	100	11/14/2022	DLC
Terphenyl-d14	EPA-8270 SIM	77.5 HT03	11/23/2022	JMK

U - Analyte analyzed for but not detected at level above reporting limit.

HT03 -Sample extracted outside of the holding time due to laboratory error. Sample results should be considered estimated.



CERTIFICATE OF ANALYSIS

CLIENT:	Whatcom Environmental Svcs., Inc. 228 E. Champion St., Suite 101 Bellingham, WA 98225	DATE:	11/30/2022
CLIENT CONTACT:	Eric Libolt	ALS JOB#:	EV22110073
CLIENT PROJECT:	HF Sinclair Puget Sound Refining LLC (SWMU-55)	ALS SAMPLE#:	EV22110073-04
CLIENT SAMPLE ID	W-46	DATE RECEIVED:	11/10/2022
		COLLECTION DATE:	11/9/2022 2:00:00 PM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
C5-C6 Aliphatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
>C6-C8 Aliphatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
>C8-C10 Aliphatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
>C8-C10 Aromatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
Hexane	NWVPH	U	5.0	1	UG/L	11/21/2022	ARI2
>C10-C12 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C12-C16 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C16-C21 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C21-C34 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C10-C12 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C12-C16 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C16-C21 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C21-C34 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
Methyl T-Butyl Ether	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Hexane	EPA-8260	U	6.8	1	UG/L	11/14/2022	DLC
Benzene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	11/14/2022	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Naphthalene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
2-Methylnaphthalene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
1-Methylnaphthalene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[A]Anthracene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Chrysene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[B]Fluoranthene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[K]Fluoranthene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[A]Pyrene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Dibenz[A,H]Anthracene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Mercury (Dissolved)	EPA-245.1	U	0.20	1	UG/L	11/23/2022	RAL
Chromium (Dissolved)	EPA-200.8	U	2.0	1	UG/L	11/11/2022	RAL
Nickel (Dissolved)	EPA-200.8	12	2.0	1	UG/L	11/11/2022	RAL
Vanadium (Dissolved)	EPA-200.8	2.5	2.0	1	UG/L	11/11/2022	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT - Aliphatic	NWVPH	72.7	11/21/2022	ARI2

CERTIFICATE OF ANALYSIS

CLIENT:	Whatcom Environmental Svcs., Inc. 228 E. Champion St., Suite 101 Bellingham, WA 98225	DATE:	11/30/2022
CLIENT CONTACT:	Eric Libolt	ALS JOB#:	EV22110073
CLIENT PROJECT:	HF Sinclair Puget Sound Refining LLC (SWMU-55)	ALS SAMPLE#:	EV22110073-04
CLIENT SAMPLE ID	W-46	DATE RECEIVED:	11/10/2022
		COLLECTION DATE:	11/9/2022 2:00:00 PM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT - Aromatic	NWVPH	79.5	11/21/2022	ARI2
C25	NWEPH	56.2	11/23/2022	ARI2
p-Terphenyl	NWEPH	75.3	11/23/2022	ARI2
Toluene-d8	EPA-8260	98.8	11/14/2022	DLC
Terphenyl-d14	EPA-8270 SIM	80.3 HT03	11/23/2022	JMK

U - Analyte analyzed for but not detected at level above reporting limit.

HT03 -Sample extracted outside of the holding time due to laboratory error. Sample results should be considered estimated.



CERTIFICATE OF ANALYSIS

CLIENT:	Whatcom Environmental Svcs., Inc. 228 E. Champion St., Suite 101 Bellingham, WA 98225	DATE:	11/30/2022
CLIENT CONTACT:	Eric Libolt	ALS JOB#:	EV22110073
CLIENT PROJECT:	HF Sinclair Puget Sound Refining LLC (SWMU-55)	ALS SAMPLE#:	EV22110073-05
CLIENT SAMPLE ID	MW-Dup-1	DATE RECEIVED:	11/10/2022
		COLLECTION DATE:	11/8/2022 11:00:00 AM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
C5-C6 Aliphatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
>C6-C8 Aliphatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
>C8-C10 Aliphatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
>C8-C10 Aromatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
Hexane	NWVPH	U	5.0	1	UG/L	11/21/2022	ARI2
>C10-C12 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C12-C16 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C16-C21 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C21-C34 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C10-C12 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C12-C16 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C16-C21 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C21-C34 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
Methyl T-Butyl Ether	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Hexane	EPA-8260	U	6.8	1	UG/L	11/14/2022	DLC
Benzene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	11/14/2022	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Naphthalene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
2-Methylnaphthalene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
1-Methylnaphthalene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[A]Anthracene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Chrysene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[B]Fluoranthene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[K]Fluoranthene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[A]Pyrene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Dibenz[A,H]Anthracene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Mercury (Dissolved)	EPA-245.1	U	0.20	1	UG/L	11/23/2022	RAL
Chromium (Dissolved)	EPA-200.8	U	2.0	1	UG/L	11/11/2022	RAL
Nickel (Dissolved)	EPA-200.8	3.7	2.0	1	UG/L	11/11/2022	RAL
Vanadium (Dissolved)	EPA-200.8	U	2.0	1	UG/L	11/11/2022	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT - Aliphatic	NWVPH	80.2	11/21/2022	ARI2

CERTIFICATE OF ANALYSIS

CLIENT:	Whatcom Environmental Svcs., Inc. 228 E. Champion St., Suite 101 Bellingham, WA 98225	DATE:	11/30/2022
CLIENT CONTACT:	Eric Libolt	ALS JOB#:	EV22110073
CLIENT PROJECT:	HF Sinclair Puget Sound Refining LLC (SWMU-55)	ALS SAMPLE#:	EV22110073-05
CLIENT SAMPLE ID	MW-Dup-1	DATE RECEIVED:	11/10/2022
		COLLECTION DATE:	11/8/2022 11:00:00 AM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT - Aromatic	NWVPH	87.5	11/21/2022	ARI2
C25	NWEPH	49.3	11/23/2022	ARI2
p-Terphenyl	NWEPH	68.1	11/23/2022	ARI2
Toluene-d8	EPA-8260	99.4	11/14/2022	DLC
Terphenyl-d14	EPA-8270 SIM	73.7 HT03	11/23/2022	JMK

U - Analyte analyzed for but not detected at level above reporting limit.

HT03 -Sample extracted outside of the holding time due to laboratory error. Sample results should be considered estimated.



CERTIFICATE OF ANALYSIS

CLIENT:	Whatcom Environmental Svcs., Inc. 228 E. Champion St., Suite 101 Bellingham, WA 98225	DATE:	11/30/2022
CLIENT CONTACT:	Eric Libolt	ALS JOB#:	EV22110073
CLIENT PROJECT:	HF Sinclair Puget Sound Refining LLC (SWMU-55)	ALS SAMPLE#:	EV22110073-06
CLIENT SAMPLE ID	WES-FEB-1	DATE RECEIVED:	11/10/2022
		COLLECTION DATE:	11/8/2022 10:45:00 AM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
C5-C6 Aliphatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
>C6-C8 Aliphatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
>C8-C10 Aliphatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
>C8-C10 Aromatics	NWVPH	U	50	1	UG/L	11/21/2022	ARI2
Hexane	NWVPH	U	5.0	1	UG/L	11/21/2022	ARI2
>C10-C12 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C12-C16 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C16-C21 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C21-C34 Aliphatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C10-C12 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C12-C16 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C16-C21 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
>C21-C34 Aromatics	NWEPH	U	40	1	UG/L	11/23/2022	ARI2
Methyl T-Butyl Ether	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Hexane	EPA-8260	U	6.8	1	UG/L	11/14/2022	DLC
Benzene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	11/14/2022	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	11/14/2022	DLC
Naphthalene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
2-Methylnaphthalene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
1-Methylnaphthalene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[A]Anthracene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Chrysene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[B]Fluoranthene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[K]Fluoranthene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Benzo[A]Pyrene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Dibenz[A,H]Anthracene	EPA-8270 SIM	U, HT03	0.020	1	UG/L	11/23/2022	JMK
Mercury (Dissolved)	EPA-245.1	U	0.20	1	UG/L	11/23/2022	RAL
Chromium (Dissolved)	EPA-200.8	U	2.0	1	UG/L	11/11/2022	RAL
Nickel (Dissolved)	EPA-200.8	U	2.0	1	UG/L	11/11/2022	RAL
Vanadium (Dissolved)	EPA-200.8	2.2	2.0	1	UG/L	11/11/2022	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT - Aliphatic	NWVPH	76.8	11/21/2022	ARI2

CERTIFICATE OF ANALYSIS

CLIENT:	Whatcom Environmental Svcs., Inc. 228 E. Champion St., Suite 101 Bellingham, WA 98225	DATE:	11/30/2022
CLIENT CONTACT:	Eric Libolt	ALS JOB#:	EV22110073
CLIENT PROJECT:	HF Sinclair Puget Sound Refining LLC (SWMU-55)	ALS SAMPLE#:	EV22110073-06
CLIENT SAMPLE ID	WES-FEB-1	DATE RECEIVED:	11/10/2022
		COLLECTION DATE:	11/8/2022 10:45:00 AM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT - Aromatic	NWVPH	82.7	11/21/2022	ARI2
C25	NWEPH	52.6	11/23/2022	ARI2
p-Terphenyl	NWEPH	74.7	11/23/2022	ARI2
Toluene-d8	EPA-8260	100	11/14/2022	DLC
Terphenyl-d14	EPA-8270 SIM	89.3 HT03	11/23/2022	JMK

U - Analyte analyzed for but not detected at level above reporting limit.

HT03 -Sample extracted outside of the holding time due to laboratory error. Sample results should be considered estimated.



CERTIFICATE OF ANALYSIS

CLIENT:	Whatcom Environmental Svcs., Inc. 228 E. Champion St., Suite 101 Bellingham, WA 98225	DATE:	11/30/2022
CLIENT CONTACT:	Eric Libolt	ALS SDG#:	EV22110073
CLIENT PROJECT:	HF Sinclair Puget Sound Refining LLC (SWMU-55)	WDOE ACCREDITATION:	C601

LABORATORY BLANK RESULTS

MBLK-R422865 - Batch R422865 - Water by NWVPH

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
C5-C6 Aliphatics	NWVPH	U	UG/L	50	11/21/2022	ARI2
>C6-C8 Aliphatics	NWVPH	U	UG/L	50	11/21/2022	ARI2
>C8-C10 Aliphatics	NWVPH	U	UG/L	50	11/21/2022	ARI2
>C8-C10 Aromatics	NWVPH	U	UG/L	50	11/21/2022	ARI2
Hexane	NWVPH	U	UG/L	5.0	11/21/2022	ARI2

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-R422864 - Batch R422864 - Water by NWEPH

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
>C10-C12 Aliphatics	NWEPH	U	UG/L	40	11/23/2022	ARI2
>C12-C16 Aliphatics	NWEPH	U	UG/L	40	11/23/2022	ARI2
>C16-C21 Aliphatics	NWEPH	U	UG/L	40	11/23/2022	ARI2
>C21-C34 Aliphatics	NWEPH	U	UG/L	40	11/23/2022	ARI2
>C10-C12 Aromatics	NWEPH	U	UG/L	40	11/23/2022	ARI2
>C12-C16 Aromatics	NWEPH	U	UG/L	40	11/23/2022	ARI2
>C16-C21 Aromatics	NWEPH	U	UG/L	40	11/23/2022	ARI2
>C21-C34 Aromatics	NWEPH	U	UG/L	40	11/23/2022	ARI2

U - Analyte analyzed for but not detected at level above reporting limit.

MB-111422W - Batch 186283 - Water by EPA-8260

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Methyl T-Butyl Ether	EPA-8260	U	UG/L	2.0	11/14/2022	DLC
Hexane	EPA-8260	U	UG/L	6.8	11/14/2022	DLC
Benzene	EPA-8260	U	UG/L	2.0	11/14/2022	DLC
Toluene	EPA-8260	U	UG/L	2.0	11/14/2022	DLC
Ethylbenzene	EPA-8260	U	UG/L	2.0	11/14/2022	DLC
m,p-Xylene	EPA-8260	U	UG/L	4.0	11/14/2022	DLC
o-Xylene	EPA-8260	U	UG/L	2.0	11/14/2022	DLC

U - Analyte analyzed for but not detected at level above reporting limit.

MB-111822W - Batch 186608 - Water by EPA-8270 SIM

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Naphthalene	EPA-8270 SIM	U	UG/L	0.020	11/23/2022	JMK
2-Methylnaphthalene	EPA-8270 SIM	U	UG/L	0.020	11/23/2022	JMK



CERTIFICATE OF ANALYSIS

CLIENT:	Whatcom Environmental Svcs., Inc. 228 E. Champion St., Suite 101 Bellingham, WA 98225	DATE:	11/30/2022
CLIENT CONTACT:	Eric Libolt	ALS SDG#:	EV22110073
CLIENT PROJECT:	HF Sinclair Puget Sound Refining LLC (SWMU-55)	WDOE ACCREDITATION:	C601

LABORATORY BLANK RESULTS

MB-111822W - Batch 186608 - Water by EPA-8270 SIM

1-Methylnaphthalene	EPA-8270 SIM	U	UG/L	0.020	11/23/2022	JMK
Benzo[A]Anthracene	EPA-8270 SIM	U	UG/L	0.020	11/23/2022	JMK
Chrysene	EPA-8270 SIM	U	UG/L	0.020	11/23/2022	JMK
Benzo[B]Fluoranthene	EPA-8270 SIM	U	UG/L	0.020	11/23/2022	JMK
Benzo[K]Fluoranthene	EPA-8270 SIM	U	UG/L	0.020	11/23/2022	JMK
Benzo[A]Pyrene	EPA-8270 SIM	U	UG/L	0.020	11/23/2022	JMK
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	UG/L	0.020	11/23/2022	JMK
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	UG/L	0.020	11/23/2022	JMK

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-R422650 - Batch R422650 - Water by EPA-245.1

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Mercury (Dissolved)	EPA-245.1	U	UG/L	0.20	11/23/2022	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

MB-111122W - Batch 186138 - Water by EPA-200.8

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Chromium (Dissolved)	EPA-200.8	U	UG/L	2.0	11/11/2022	RAL
Nickel (Dissolved)	EPA-200.8	U	UG/L	2.0	11/11/2022	RAL
Vanadium (Dissolved)	EPA-200.8	U	UG/L	2.0	11/11/2022	RAL

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT:	Whatcom Environmental Svcs., Inc. 228 E. Champion St., Suite 101 Bellingham, WA 98225	DATE:	11/30/2022
CLIENT CONTACT:	Eric Libolt	ALS SDG#:	EV22110073
CLIENT PROJECT:	HF Sinclair Puget Sound Refining LLC (SWMU-55)	WDOE ACCREDITATION:	C601

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: R422865 - Water by NWVPH

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS		ANALYSIS DATE	ANALYSIS BY
					MIN	MAX		
Hexane - BS	NWVPH	71.6			70	130	11/21/2022	ARI2
Hexane - BSD	NWVPH	72.0	1		70	130	11/21/2022	ARI2

ALS Test Batch ID: R422864 - Water by NWEPH

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS		ANALYSIS DATE	ANALYSIS BY
					MIN	MAX		
>C10-C12 Aliphatics - BS	NWEPH	38.6			10	130	11/23/2022	ARI2
>C12-C16 Aliphatics - BS	NWEPH	53.7			35	130	11/23/2022	ARI2
>C16-C21 Aliphatics - BS	NWEPH	69.1			45	130	11/23/2022	ARI2
>C21-C34 Aliphatics - BS	NWEPH	63.1			19	130	11/23/2022	ARI2
>C10-C12 Aromatics - BS	NWEPH	50.9			12	130	11/23/2022	ARI2
>C12-C16 Aromatics - BS	NWEPH	47.8			31	130	11/23/2022	ARI2
>C16-C21 Aromatics - BS	NWEPH	69.4			48	130	11/23/2022	ARI2
>C21-C34 Aromatics - BS	NWEPH	61.6			33	130	11/23/2022	ARI2

ALS Test Batch ID: 186283 - Water by EPA-8260

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS		ANALYSIS DATE	ANALYSIS BY
					MIN	MAX		
Methyl T-Butyl Ether - BS	EPA-8260	105			50	150	11/14/2022	DLC
Methyl T-Butyl Ether - BSD	EPA-8260	110	4		50	150	11/14/2022	DLC
Hexane - BS	EPA-8260	116			50	150	11/14/2022	DLC
Hexane - BSD	EPA-8260	123	6		50	150	11/14/2022	DLC
Benzene - BS	EPA-8260	103			74.7	143	11/14/2022	DLC
Benzene - BSD	EPA-8260	109	6		74.7	143	11/14/2022	DLC
Toluene - BS	EPA-8260	107			71.7	139	11/14/2022	DLC
Toluene - BSD	EPA-8260	113	5		71.7	139	11/14/2022	DLC
Ethylbenzene - BS	EPA-8260	106			50	150	11/14/2022	DLC
Ethylbenzene - BSD	EPA-8260	113	6		50	150	11/14/2022	DLC
m,p-Xylene - BS	EPA-8260	105			50	150	11/14/2022	DLC
m,p-Xylene - BSD	EPA-8260	112	6		50	150	11/14/2022	DLC
o-Xylene - BS	EPA-8260	105			50	150	11/14/2022	DLC
o-Xylene - BSD	EPA-8260	111	6		50	150	11/14/2022	DLC

ALS Test Batch ID: 186608 - Water by EPA-8270 SIM

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS		ANALYSIS DATE	ANALYSIS BY
					MIN	MAX		
Naphthalene - BS	EPA-8270 SIM	46.9			36	118	11/23/2022	JMK
Naphthalene - BSD	EPA-8270 SIM	62.8	29		36	118	11/26/2022	JMK



CERTIFICATE OF ANALYSIS

CLIENT:	Whatcom Environmental Svcs., Inc. 228 E. Champion St., Suite 101 Bellingham, WA 98225	DATE:	11/30/2022
CLIENT CONTACT:	Eric Libolt	ALS SDG#:	EV22110073
CLIENT PROJECT:	HF Sinclair Puget Sound Refining LLC (SWMU-55)	WDOE ACCREDITATION:	C601

LABORATORY CONTROL SAMPLE RESULTS

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS		ANALYSIS DATE	ANALYSIS BY
					MIN	MAX		
2-Methylnaphthalene - BS	EPA-8270 SIM	49.2			20	150	11/23/2022	JMK
2-Methylnaphthalene - BSD	EPA-8270 SIM	64.5	27		20	150	11/26/2022	JMK
1-Methylnaphthalene - BS	EPA-8270 SIM	47.4			20	150	11/23/2022	JMK
1-Methylnaphthalene - BSD	EPA-8270 SIM	61.6	26		20	150	11/26/2022	JMK
Benzo[A]Anthracene - BS	EPA-8270 SIM	87.8			20	150	11/23/2022	JMK
Benzo[A]Anthracene - BSD	EPA-8270 SIM	106	19		20	150	11/26/2022	JMK
Chrysene - BS	EPA-8270 SIM	85.9			20	150	11/23/2022	JMK
Chrysene - BSD	EPA-8270 SIM	93.2	8		20	150	11/26/2022	JMK
Benzo[B]Fluoranthene - BS	EPA-8270 SIM	84.1			20	150	11/23/2022	JMK
Benzo[B]Fluoranthene - BSD	EPA-8270 SIM	103	20		20	150	11/26/2022	JMK
Benzo[K]Fluoranthene - BS	EPA-8270 SIM	88.5			20	150	11/23/2022	JMK
Benzo[K]Fluoranthene - BSD	EPA-8270 SIM	96.5	9		20	150	11/26/2022	JMK
Benzo[A]Pyrene - BS	EPA-8270 SIM	88.6			20	150	11/23/2022	JMK
Benzo[A]Pyrene - BSD	EPA-8270 SIM	95.8	8		20	150	11/26/2022	JMK
Indeno[1,2,3-Cd]Pyrene - BS	EPA-8270 SIM	95.5			20	150	11/23/2022	JMK
Indeno[1,2,3-Cd]Pyrene - BSD	EPA-8270 SIM	103	7		20	150	11/26/2022	JMK
Dibenz[A,H]Anthracene - BS	EPA-8270 SIM	97.2			20	150	11/23/2022	JMK
Dibenz[A,H]Anthracene - BSD	EPA-8270 SIM	102	5		20	150	11/26/2022	JMK

ALS Test Batch ID: R422650 - Water by EPA-245.1

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS		ANALYSIS DATE	ANALYSIS BY
					MIN	MAX		
Mercury (Dissolved) - BS	EPA-245.1	103			80.6	118	11/23/2022	RAL
Mercury (Dissolved) - BSD	EPA-245.1	102	1		80.6	118	11/23/2022	RAL

ALS Test Batch ID: 186138 - Water by EPA-200.8

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS		ANALYSIS DATE	ANALYSIS BY
					MIN	MAX		
Chromium (Dissolved) - BS	EPA-200.8	101			86.2	107	11/11/2022	RAL
Chromium (Dissolved) - BSD	EPA-200.8	99.6	1		86.2	107	11/11/2022	RAL
Nickel (Dissolved) - BS	EPA-200.8	104			85.4	109	11/11/2022	RAL
Nickel (Dissolved) - BSD	EPA-200.8	103	1		85.4	109	11/11/2022	RAL
Vanadium (Dissolved) - BS	EPA-200.8	99.7			80.1	108	11/11/2022	RAL
Vanadium (Dissolved) - BSD	EPA-200.8	98.3	1		80.1	108	11/11/2022	RAL

CERTIFICATE OF ANALYSIS

APPROVED BY



Laboratory Director

