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February 15, 2021

Ms. Janice Wiegers
Unit Manager
Alaska Department of Environmental Conservation
610 University Avenue
Fairbanks, AK 99709

RE: 2020 Annual Groundwater Monitoring Report
Tesoro Logistics Operations, LLC – Anchorage Terminal 1
ADEC File No. 2100.38.311

Dear Ms. Wiegers:

Enclosed is the *2020 Annual Groundwater Monitoring Report* for the Tesoro Anchorage Terminal 1 site located at 1300, 1320, and 1522 Port Road in Anchorage, Alaska. This report was prepared by Trihydro Corporation, on behalf of Tesoro Alaska Company, a subsidiary of Marathon Petroleum Company, to present the results of the 2020 groundwater monitoring activities.

Groundwater monitoring activities were conducted during the reporting period and included annual gauging and sampling of monitoring wells.

If you need further information regarding the submittal, please contact me at (253) 896-8731.

Sincerely,

Kyle Waldron
Environmental Remediation Professional
kawaldron@marathonpetroleum.com

cc: Serena Lewellyn, MPLX
Chris Schultz, Trihydro

2020 ANNUAL REPORT
TESORO ALASKA COMPANY
ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

February 15, 2021

ADEC File #: 2100.38.311

Project #: 42H-001-006

SUBMITTED BY: Trihydro Corporation

312 Tyee St., Soldotna, AK 99669

PREPARED FOR: Tesoro Alaska Company

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List of Abbreviations and Acronyms

ADEC	Alaska Department of Environmental Conservation
AMSL	above mean sea level
ARRC	Alaska Railroad Corporation
AST	above ground storage tank
BTEX	benzene, toluene, ethylbenzene, and xylenes
COC	Contaminant of Concern
DRO	diesel-range organics
EPA	Environmental Protection Agency
GRO	gasoline-range organics
LNAPL	light non-aqueous phase liquid
mg/L	milligrams per liter
NRC	NRC Alaska, LLC
POA	Port of Anchorage
ppm	parts per million
QA/QC	quality assessment/ quality control
RLR	rail loading rack
SGS	SGS North America, Inc.
SVE	soil vapor extraction
TAH	Total Aromatic Hydrocarbon
Terminal	Petro Star Anchorage Terminal 1
Tesoro	Tesoro Alaska Company
Trihydro	Trihydro Corporation
µg/L	micrograms per liter

EXECUTIVE SUMMARY

On behalf of Tesoro Alaska Company (Tesoro), a subsidiary of Marathon Petroleum, Trihydro has prepared this 2020 Annual Report for Terminal 1 located in Port of Anchorage. This report presents to the results of monitoring and remediation activities completed in 2020. Petro Star acquired Terminal 1 (Terminal) from Tesoro in 2017, but Tesoro maintains responsibility for environmental remediation activities related to conditions prior to the sale. This report describes the groundwater monitoring and remediation for the Terminal conducted in October 2020.

Monitoring activities were completed as recommended in the 2019 Annual Groundwater Sampling Report (Trihydro, 2020), and in accordance with the Sampling Analysis Plan submitted in the 2019 Annual Report.

Sampling activities resulted in following observations:

- Light non-aqueous phase liquid (LNAPL) was detected in wells MW-12 and MW-31 during October sampling.
- Groundwater flow direction was consistent with past gauging events.
- Consistent with historical concentrations, onsite monitoring wells MW-30, MW-33, PW-18, and RW-PL are in exceedance of the ADEC groundwater cleanup levels for benzene, ethylbenzene, or diesel range organics (DRO).
- Groundwater analytical sampling results were consistent with historical sampling events.
- Surface water sampling locations SW-5, SDMH-N, and SDMH-S exceeded surface water standards for total aromatic hydrocarbons (TAH).

Trihydro recommends that Tesoro continue groundwater monitoring at the Terminal in the spring and fall of 2021. Consistent with historical events, surface water sampling should be conducted at the existing surface water locations for benzene, toluene, ethylbenzene, and total xylenes (BTEX), GRO, and DRO. Depth to groundwater and LNAPL should be gauged prior to the monitoring events.

1.0 INTRODUCTION

On behalf of Tesoro Alaska Company (Tesoro), a subsidiary of Marathon Petroleum, Trihydro has prepared this 2020 Annual Report for Terminal 1 located in Port of Anchorage. This report presents to the results of monitoring and remediation activities completed in 2020. Petro Star acquired Terminal 1 from Tesoro in 2017, but Tesoro maintains responsibility for environmental remediation activities related to conditions prior to the sale.

This report documents 2020 monitoring and remediation activities conducted at the Terminal shown on Figure 1. The following activities were completed in accordance with the 2019 Annual Groundwater Sampling Report (Trihydro, 2020), and in accordance with the Sampling Analysis Plan submitted in the 2019 Annual Report:

- Groundwater gauging and sampling to monitor the dissolved phase contaminants of concern in groundwater.
- Surface water sampling to monitor surface water quality that may be affected by groundwater migration to the storm drain.

A description of the site background and summary of previous investigations is included in Appendix A

2.0 FIELD ACTIVITIES

Trihydro completed semiannual groundwater and surface water (storm drain) sampling and gauging in October 2020. A site plan is included as Figure 2. A summary of field activities and field notes are included in Appendix B.

The 2020 monitoring and remediation activities completed by Trihydro are summarized below:

Gauged Groundwater Levels and LNAPL Thickness

- Gauged fluid levels and LNAPL thicknesses at accessible monitoring wells and surface water locations.
- Gauged 42 wells and found two containing LNAPL.

Groundwater gauging results are summarized in Table 1 and presented on Figure 3.

Groundwater and Surface Water Monitoring

- Sampled monitoring wells MW-30, MW-33, PW-18, and RW-PL. Groundwater sampling field parameter measurements are included in Table 2 and groundwater sampling results are included in Table 3 and presented spatially on Figure 4.
- Sampled surface water locations SW-2, SW-5, SDMH-N, and SDMH-S. Field parameters are included in Table 2 and surface water sampling results are included in Table 4 and presented spatially on Figure 4.
- Appendix B provides a detailed report of field methods and activities, along with groundwater and surface water sampling field data. Analytical laboratory reports are presented in Appendix C.

Deviations from 2019 Annual Report Plans

- In the 2019 Annual Report, Trihydro planned to do remedial monitoring and spring sampling at the Terminal. Due to Covid-19 site restrictions, this work will occur in 2021.

3.0 GROUNDWATER MONITORING RESULTS

This section summarizes the results of the semiannual groundwater and surface water sampling and gauging in 2020.

3.1 GROUNDWATER CONDITIONS

Trihydro measured groundwater and LNAPL elevations in October 2020. Groundwater elevations and LNAPL thicknesses are presented in Table 1 and spatially on Figure 3.

- Groundwater elevations from the October 2020 event ranged from 25.05 to 37.35 ft above mean sea level (amsl).

Groundwater predominantly flows to the west across the site toward the Cook Inlet (Figure 3). The groundwater flow direction observed in 2020 is consistent with historical groundwater flow directions.

3.2 LNAPL CONDITIONS

LNAPL was observed and measured in two monitoring wells, MW-12, and MW-31 (located within the C-line release plume area). LNAPL was detected in MW-31 at a thickness of 0.56 ft and in upgradient MW-12 at 0.37 ft. LNAPL in these wells is common based on historical gauging.

The following table summarizes historical LNAPL measurements from spring and fall gauging events between 2013 and 2020:

Year		MW-01 LNAPL Thickness (ft)	MW-12 LNAPL Thickness (ft)	MW-16 LNAPL Thickness (ft)	MW-17 LNAPL Thickness (ft)	MW-28 LNAPL Thickness (ft)	MW-31 LNAPL Thickness (ft)	MW-32 LNAPL Thickness (ft)
2013	Spring	--	0.74	0.01	0.01	--	NM	--
	Fall	--	0.01	--	0.02	--	0.01	--
2014	Spring	--	0.01	--	--	--	0.10	--
	Fall	--	0.01	--	0.01	--	0.01	--
2015	Spring	--	0.36	--	0.08	--	1.00	--
	Fall	--	0.01	--	--	--	0.01	--
2016	Spring	--	--	--	--	--	--	--
	Fall	--	--	--	0.01	--	0.01	--
2017	Spring	--	--	--	--	--	0.01	--
	Fall	0.01	0.65	--	0.01	0.01	0.13	--
2018	Spring	--	0.01	0.01	0.01	--	0.45	0.01
	Fall	--	0.50	NM*	0.03	--	0.46	--
2019	Spring	--	0.51	NM*	--	--	0.35	--
	Fall	--	--	NM*	--	NM	0.04	--
2020	Spring	NM	NM	NM*	NM	NM	NM	NM
	Fall	--	0.37	NM*	--	--	0.56	--

-- No LNAPL present; sample collected
NM Not Measured
* Well decommissioned September 2018

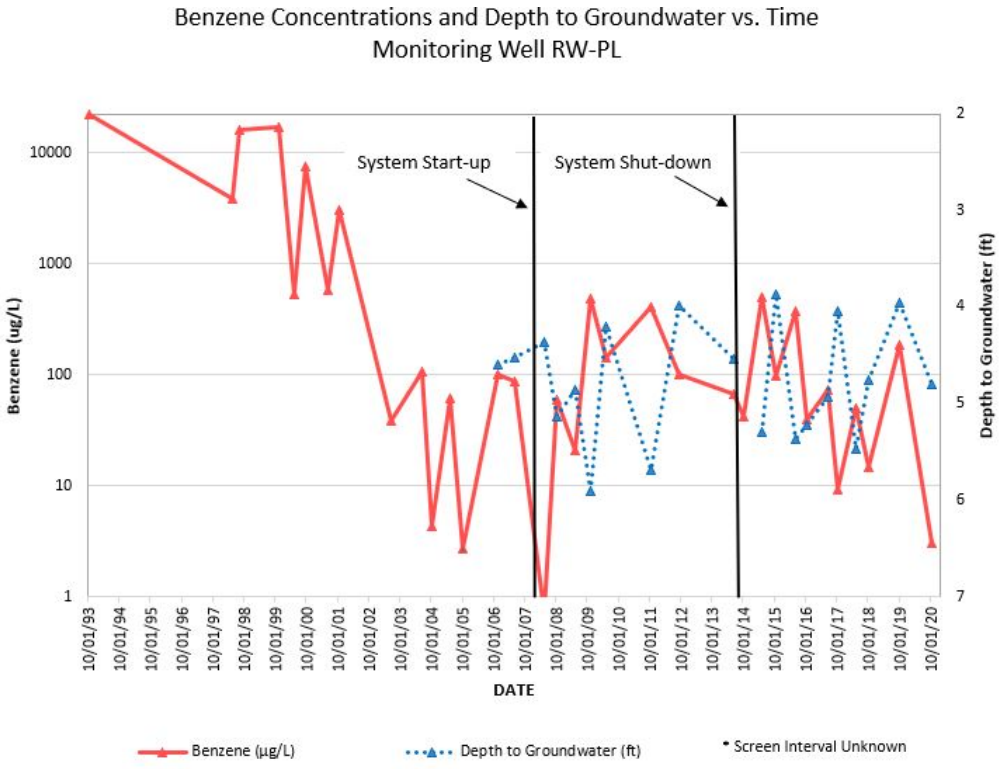
3.3 GROUNDWATER ANALYTICAL RESULTS

Results of the 2020 groundwater monitoring are included in Table 3 and are presented spatially on Figure 4. Analytical laboratory results can be found in Appendix C.

The primary contaminants of concern (COCs) at the site consist of benzene and DRO because their concentrations continue to exceed current ADEC groundwater cleanup levels (ADEC, 2020). The monitoring well network primarily focuses on the plume to the north at Tanks 6 and 7. Well PW-18 is monitored to evaluate groundwater quality near the Pump Warehouse at the south end of the site. For discussion, the analytical results for benzene and DRO in the north area of the site are separated in to upgradient, downgradient/RLR, and further downgradient areas.

Upgradient Area

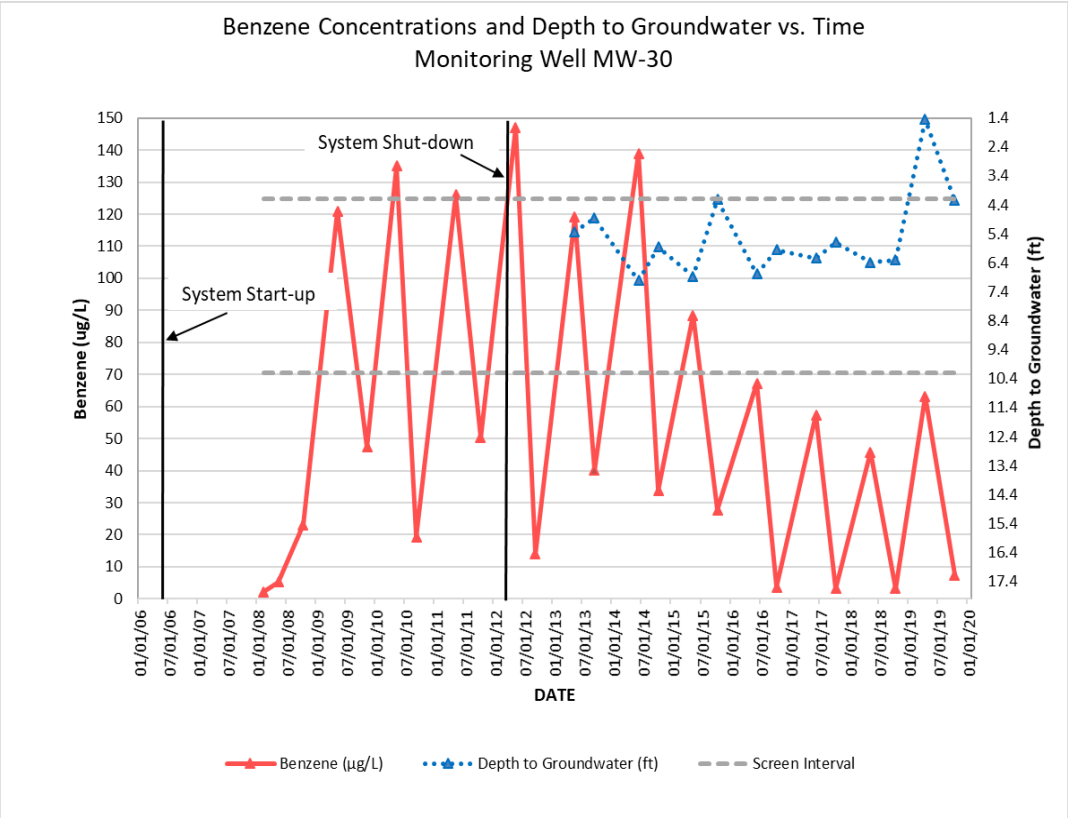
Monitoring well RW-PL is located upgradient of the C-Pipeline release point. Since 2003, benzene concentrations in this well have fluctuated between less than 1 µg/L (2008) and 490 µg/L (2009). The concentration in the fall 2020 was 3.06 µg/L. DRO has been below the ADEC cleanup level of 1.5 milligrams per liter (mg/L) since 2009 except for 2019, 2.61 mg/L and 2020, 1.58 mg/L. Benzene concentrations are shown in the following hydrograph for RW-PL.



Downgradient/RLR

Monitoring well MW-30 is located immediately downgradient of the aboveground storage tanks and along the former RLR. Monitoring well MW-33 is located north of MW-30 and downgradient of the RLR.

DRO in MW-30 and MW-33 were detected about cleanup levels, consistent with past sampling events. Ethylbenzene was also detected in MW-33, above ADEC groundwater cleanup levels (ADEC, 2020). Benzene concentrations in MW-30 has had a general decreasing trend since 2013. Benzene in MW-30 in October 2020 was 1.35 µg/L. Historical benzene results show seasonal variations at MW-30 with higher concentrations in the spring than the fall, as shown in the following hydrograph.

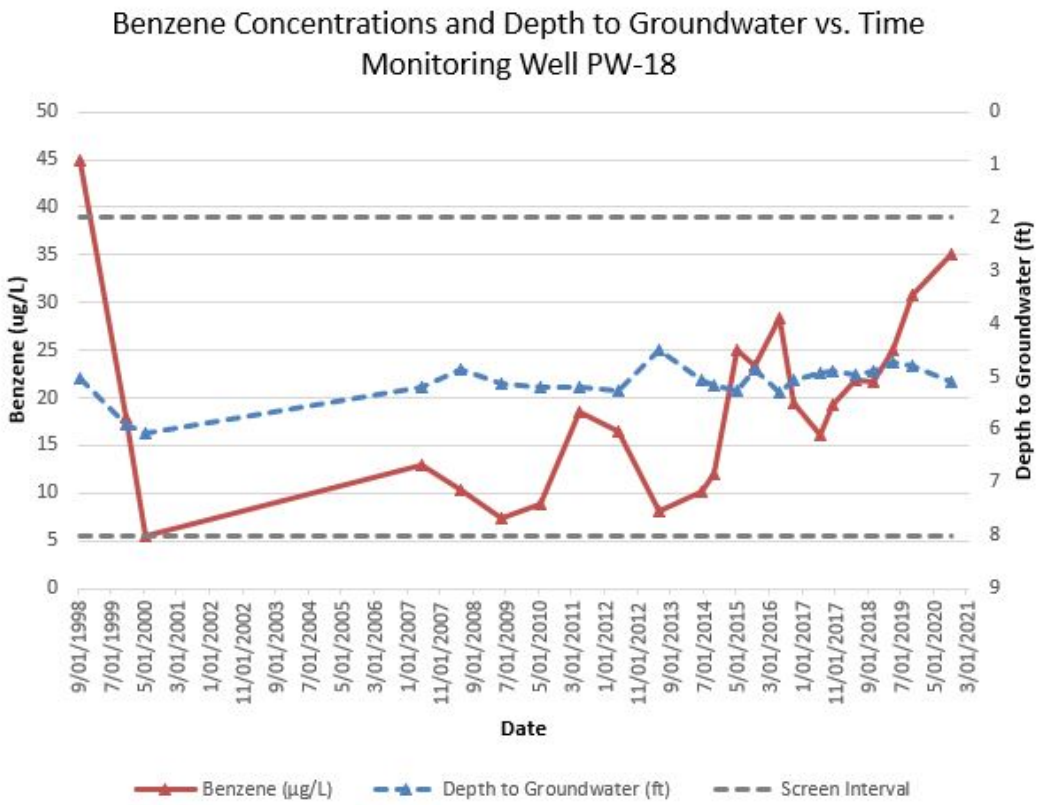


Further Downgradient Area

Well MW-21R was decommissioned by the Port of Anchorage (POA) while doing excavation work on SDMH-N in July 2019. Monitoring wells MW-22, and MW-23 were decommissioned by the Alaska Railroad in accordance with the Restoration Science and Engineering, LLC (RSE) work plan (RSE 2018). Replacement of these wells will be discussed as part of the annual strategic planning meeting and with the Alaska Railroad to determine appropriate replacement locations and options after work is completed in this area.

Pipeline Warehouse Area

Monitoring well PW-18 is located near the pipeline warehouse in southern area of the site. Benzene concentrations appear to be slightly increasing in recent years concurrent with slightly increasing groundwater elevation. However, the maximum concentration of 35.1 µg/L in 2020 is less than the historical high of 45 µg/L. DRO concentration exceeded groundwater cleanup level at 2.47 mg/L.



3.4 GROUNDWATER RESULTS SUMMARY

The 2020 sampling results were similar to data from previous sampling events, with benzene and DRO concentrations slightly higher in 2020 than 2019 in some wells, but overall, still consistent with decreasing trends. The data suggest that groundwater plume conditions remain stable and that benzene and DRO remain the primary contaminants of concern. Benzene, ethylbenzene, and DRO data from monitoring wells with sample concentrations above the ADEC groundwater cleanup level is summarized in the following inset table (ADEC, 2020).

Location Area	Well ID	Date	Benzene (µg/L)	Ethylbenzene (µg/L)	DRO (mg/L)
Upgradient Area	RW-PL	10/09/20	3.06	ND	**1.58**
Downgradient/RLR	MW-30	10/09/20	1.35	ND	**11.0**
Further Downgradient Area	MW-33	10/09/20	4.24	**89.5**	**7.06**
Pipeline Warehouse Area	PW-18	10/09/20	**35.1**	ND	**2.47**
ADEC Criteria			4.6	15	1.5
Results in **BOLD** exceed the ADEC 18 AAC 75 Groundwater Cleanup Level					

3.5 SURFACE WATER ANALYTICAL RESULTS

Results of the 2020 surface water monitoring are included in Table 4 and presented spatially on Figure 4.

Surface water samples were collected from SW-2, SW-5, SDMH-N, and SDMH-S and analyzed for BTEX, GRO, and DRO. Benzene and DRO were detected in each of the surface water monitoring locations in the fall 2020 sampling event. Total aromatic hydrocarbons (TAH) results were above 18AAC 70 Surface Water Standards in SW-5, SDMH-N, and SDMH-S. The results of the 2020 sampling were higher than 2019 results but less than historical highs except for SW-5, which had a benzene concentration of 408.57 µg/L. The source of the benzene in the SW-5 sample is unknown at this time however, it is not suspected to be caused by the groundwater at the site. The water within the SW-5 vault had minimal flow at the time of sampling and the benzene concentration is significantly higher than historical results. The highest benzene concentration from a surface water sample at location SW-5 occurred in 2019 at 3.33 µg/L. 2018 benzene results for SW-5 were 3.25 µg/L.

The storm drain manhole SDMH-S is the last location east of Ocean Dock Road prior to the storm drain routing under the road towards the inlet. Storm drain manhole SDMH-N is located west of Ocean Dock Road immediately prior to the stormwater outfall. Benzene, TAH, and DRO data from surface water sampling in order of flow direction along the storm drain system from furthest upstream at SW-2 to furthest downstream at SDMH-N is summarized in the following inset table.

Sample Location	Date	Benzene (µg/L)	TAH (µg/L)	DRO (mg/L)
SW-2	10/09/20	3.71	6.81	1.57
SW-5	10/09/20	405	**408.57**	3.85
SDMH-S	10/09/20	14.7	**28.6**	1.72
SDMH-N	10/09/20	10.4	**13.5**	1.69
ADEC Criteria		NA	10	NA

Results in **BOLD** exceed the ADEC 18 AAC 70 Surface Water Limits

Benzene concentrations in storm drain samples at SDMH-S and SDMH-N are consistent with historical results however concentrations are higher than recent results. Historical surface water results are available in Appendix A, Table A-2. Benzene concentration historical highs were 27.5 µg/L in SDMH-S in 2009 and 22.4 µg/L in SDMH-N in 2014. Since 2009, benzene in SDMH-S has remained between 3 and 13 µg/L with benzene in SDMH-N between 0.5 and 8.1 µg/L since 2014. The 2020 concentrations are likely the result of benzene from the SW-5 sample location which is significantly higher than historical results. The source of benzene in the surface water at SW-5 is not likely

from impacted groundwater as no flow was occurring at the time of sampling and benzene concentrations up and downstream of SW-5 were significantly lower and within historical levels.

4.0 QUALITY CONTROL SUMMARY

Trihydro completed a quality assurance/quality control (QA/QC) review of the analytical results. Results of the QA/QC review for data are summarized below and included in the Data Validation Reports and the ADEC Laboratory Data Review Checklists included in Appendix D. The sample results are reported under SGS North America, Inc. (SGS) project number 1205603. The following summary highlights the data evaluation findings for this sampling event, and a more detailed quality control summary is included in Appendix D:

- No data are rejected.
- The completeness objectives (greater than 85 percent complete) for this project are met.
- The precision and accuracy of the laboratory data, as measured by laboratory quality control indicators, suggest that the data are useable as qualified for the purposes of this project.
- The precision measurements for result comparisons between primary and duplicate field samples are acceptable for the purpose of this project and are marked with applicable qualifiers.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The following sections discusses the overall conclusions, recommendations, and planned 2021 work. The results of the 2021 field work will be presented in the 2021 Annual Report.

5.1 CONCLUSIONS

The following conclusions are based on an evaluation of the 2020 data:

- Gauging data was consistent with historical groundwater trends.
- Groundwater flow patterns remain consistent with a predominantly westward flow toward Cook Inlet.
- LNAPL was measured above 0.1 ft in two wells, MW-12 and MW-31. LNAPL is common for these locations based on historical gauging. LNAPL is residual phase because it is consistently only present in one to two wells and LNAPL has not been measured in downgradient wells.
- The dissolved phase benzene and hydrocarbon plumes appear to be stable across the site. Benzene continues to be detected in groundwater downgradient of the site. In 2018 BOS 200® was injected as a barrier to limit future offsite benzene flux from the upgradient tank farm area. Comparison with historical data suggests the plume is stable.
- Surface water samples collected from the storm drain system in 2020 were higher than 2019 results, primarily due to SW-5 which is thought to be from a source other than groundwater infiltration into the storm drain system. Sampling in the spring of 2021 should clarify results and help substantiate any increasing trends, if confirmed.

5.2 RECOMMENDATIONS

The following outlines recommendations and proposed future activities based on conclusions from site data. The results of the 2021 site activities will be reported in the 2021 Annual Monitoring Report after site activities have been completed.

- Continue groundwater sampling to monitor the dissolved phase plume.
- Continue surface water sampling to monitor surface water quality that may be affected by groundwater migration into the storm drain.
- Evaluate options for installation of monitoring wells to monitor the effectiveness of the carbon barrier following completion of Petro Star and Alaska Railroad work in this area. Work in this area was completed in 2020.

The activities and approximate timeframe for the 2021 season are presented below.

2021 Activity	Planned Timeframe
Groundwater Monitoring and Gauging and Surface Water Monitoring	Spring/Fall 2021
Work Plan and Installation of Remediation System Monitoring Wells and Downgradient Replacement Wells	Spring 2021
Reporting	Winter 2021

5.2.1 2021 MONITORING PROGRAM

Tesoro plans to continue semi-annual groundwater monitoring in 2021. The monitoring will be conducted during the 2nd and 4th quarters. The site monitoring wells will be gauged during both monitoring events to assess groundwater flow patterns. The planned monitoring wells and surface water sample collection locations and associated sampling is included in Table 5. Sampling details for new remediation system monitoring wells and replacement wells will be included in a standalone work plan. Groundwater monitoring will be completed in accordance with the Sampling and Analysis Plan included in Appendix E. Groundwater and surface water samples will be analyzed for BTEX, GRO, and DRO.

5.2.2 REMEDIATION SYSTEM MONITORING

Remediation system monitoring is planned to be conducted utilizing existing monitoring wells and new monitoring wells. New monitoring wells are planned for installation in 2021 with locations to be determined following completion of the new RLR in the injection area. A remediation system monitoring work plan outlining new well locations and the long-term monitoring will be submitted following completion of the RLR work and discussion with ADEC.

6.0 REFERENCES

Trihydro Corporation, Inc. 2020. *2019 Annual Groundwater Monitoring Report*. Tesoro Anchorage Terminal 1, Anchorage, AK. March 23, 2020.

Trihydro Corporation, Inc. 2018b. *Supplemental Remedial Action Plan for Groundwater.* Tesoro Anchorage Terminal 1, Anchorage, AK. August 3, 2018.

Restoration Science & Engineering, LLC. 2018. *ARRC POA Monitoring Well Decommissioning Work Plan.* RSE No. 19-2069 Rev. 2.0. June 18.

TABLES

TABLE 1 SUMMARY OF 2020 FLUID LEVELS
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE ALASKA

Location	Date Measured	Measuring Point Elevation (ft-msl)	Depth to Product (ft-BTOC)	Depth to Water (ft-BTOC)	Product Thickness (ft)	Water Elevation (ft-msl)
MW-01	10/09/2020	37.34	ND	2.86	NA	34.48
MW-02	10/09/2020	35.69	ND	2.07	NA	33.62
MW-03	10/09/2020	39.57	ND	7.04	NA	32.53
MW-04	10/09/2020	36.24	ND	3.23	NA	33.01
MW-09	10/09/2020	42.16	ND	12.03	NA	30.13
MW-11	10/09/2020	41.33	ND	5.42	NA	35.91
MW-12	10/09/2020	40.30	8.03	8.40	0.37	31.90
MW-13	10/09/2020	40.95	ND	9.11	NA	31.84
MW-14	10/09/2020	39.94	ND	7.99	NA	31.95
MW-15	10/09/2020	38.57	ND	8.51	NA	30.06
MW-17	10/09/2020	39.64	ND	8.92	NA	30.72
MW-21	10/09/2020	33.83	ND	8.78	NA	25.05
MW-24	10/09/2020	40.16	ND	2.81	NA	37.35
MW-25	10/09/2020	40.08	ND	7.50	NA	32.58
MW-26	10/09/2020	41.93	ND	9.44	NA	32.49
MW-28	10/09/2020	41.17	ND	6.58	NA	34.59
MW-29	10/09/2020	41.17	ND	6.92	NA	34.25
MW-30	10/09/2020	37.89	ND	4.36	NA	33.53
MW-31	10/09/2020	39.14	7.71	8.27	0.56	30.87
MW-32	10/09/2020	38.50	ND	7.19	NA	31.31
MW-33	10/09/2020	35.63	ND	6.45	NA	29.18
NS-1	10/09/2020	37.59	ND	4.28	NA	33.31
P-01	10/09/2020	37.66	ND	6.55	NA	31.11
P-03	10/09/2020	38.31	ND	9.12	NA	29.19
P-05	10/09/2020	38.06	ND	7.11	NA	30.95
PW-08	10/09/2020	37.15	NA	NA	NA	NA
PW-09	10/09/2020	37.35	ND	4.25	NA	33.10
PW-18	10/09/2020	36.95	ND	5.11	NA	31.84
PW-20	10/09/2020	34.89	ND	3.82	NA	31.07
PW-21	10/09/2020	34.01	ND	4.20	NA	29.81
PW-22	10/09/2020	32.81	ND	1.64	NA	31.17
PW-24A	10/09/2020	39.10	ND	7.75	NA	31.35
RW-PL	10/09/2020	40.10	ND	4.80	NA	35.30
SDMH-N	10/09/2020	38.40	ND	11.80	NA	26.60
SDMH-S	10/09/2020	37.64	ND	9.49	NA	28.15
SS-2	10/09/2020	37.65	ND	4.39	NA	33.26
SW-2	10/09/2020	31.91	ND	2.02	NA	29.89
SW-5	10/09/2020	NA	ND	3.82	NA	NA
TW-1	10/09/2020	39.92	ND	8.33	NA	31.59
TW-2	10/09/2020	39.02	ND	7.92	NA	31.10
TW-3	10/09/2020	38.37	ND	7.23	NA	31.14

TABLE 1 SUMMARY OF 2020 FLUID LEVELS
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE ALASKA

Location	Date Measured	Measuring Point Elevation (ft-msl)	Depth to Product (ft-BTOC)	Depth to Water (ft-BTOC)	Product Thickness (ft)	Water Elevation (ft-msl)
TW-4	10/09/2020	37.82	ND	6.66	NA	31.16

Notes:
BTOC - Below Top of Casing
ft - feet
MSL - Mean Sea Level
NA - Not Applicable/Not Sampled
ND - Not Detected

TABLE 2. SUMMARY GROUNDWATER SAMPLING FIELD DATA
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	pH (Std Units)	Oxidation-Reduction Potential (mV)	Temperature (°C)	Turbidity (NTU)	Oxygen, Dissolved (mg/L)	Specific Conductance @25C (mS/cm)
MW-30	10/09/20	6.55	37.8	10.48	21	1.76	1329
MW-33	10/09/20	6.19	131	10.17	1.38	1.67	903
PW-18	10/09/20	6.32	6.1	10.61	18.64	0.96	8409
RW-PL	10/09/20	6.51	11.2	10.28	3.11	1.65	18
SDMH-N	10/09/20	7.22	11.3	8.57	9.88	7.34	1912
SDMH-S	10/09/20	7.01	48.3	7.71	3.41	5.62	826
SW-2	10/09/20	7.04	0.8	7.68	2.94	3.67	888
SW-5	10/09/20	7.43	10.2	7.81	12.81	4.97	1382

Notes:
ORP - oxidation-reduction potential
std units - standard units
mV - millivolts
°C - degrees celsius
µmhos/cm - micromhos per centimeter
NTU - nephelometric turbidity units
mg/L - milligrams per liter

TABLE 3. 2020 GROUNDWATER ANALYTICAL DATA
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	GRO (mg/L)	DRO (mg/L)
MW-30	10/09/20	1.35 J+	ND(1) UJ	ND(1)	ND(3)	0.338 J+	**11**
MW-33	10/09/20	4.24	ND(1)	**89.5**	122	0.645 J+	**7.06**
PW-18	10/09/20	**35.1**	ND(1)	ND(1)	ND(3)	0.115	**2.47**
RW-PL	10/09/20	3.06	ND(1)	ND(1)	ND(3)	ND(0.1)	**1.58**
2020 ADEC GW Table C		4.6	1,100	15	190	2.2	1.5

Notes:
BOLD values indicate the concentration or reporting limit exceeds the 18 AAC 75 Groundwater Cleanup Levels
ADEC - Alaska Department of Environmental Conservation
DRO - Diesel Range Organics
GRO - Gasoline Range Organics
GW - Groundwater
mg/L - milligram per liter
ND - Not Detected
ug/L - microgram per liter
J - Estimated concentration
J+ - Estimated concentration, may be biased high
UJ - Estimated reporting limit

TABLE 4. 2020 SURFACE WATER ANALYTICAL DATA
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethyl- benzene (ug/L)	Xylenes (ug/L)	GRO (mg/L)	DRO (mg/L)	Total Aromatic Hydrocarbons (ug/L)
SW-2	10/09/20	3.71	ND(1)	ND(1)	ND(3)	ND(0.1)	1.57	6.81
SW-5	10/09/20	405	ND(1)	1.09	ND(3)	1.1	3.85	**408.57**
SDMH-N	10/09/20	10.4	ND(1)	ND(1)	ND(3)	ND(0.1)	1.69	**13.5**
SDMH-S	10/09/20	14.7	6.28	1.4	6.22	0.109	1.72	**28.6**
18 AAC 70 Surface Water		NA	NA	NA	NA	NA	NA	10

Notes:
BOLD values indicate the concentration or reporting limit exceeds the 18 AAC 70 Surface Water Discharge limits
ADEC - Alaska Department of Environmental Conservation
DRO - Diesel Range Organics
GRO - Gasoline Range Organics
GW - Groundwater
mg/L - milligram per liter
ND - Not Detected
ug/L - microgram per liter

TABLE 5. SUMMARY OF 2021 MONITORING PROGRAM
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Sample Location	Sampling Rationale	Frequency
Monitoring Well sampling BTEX/GRO and DRO [1,2]		
RW-PL	Upgradient Area	Spring and Fall
MW-30	Downgradient/RLR	
MW-33		
PW-18	Pipeline Warehouse Area	
SW-2	Surface Water Sampling	
SW-5		
SDMH-N		
SDMH-S		

Notes:
1. All accessible wells and observation wells will be gauged in both sampling events
2. BTEX/GRO by 8021/AK 101 and DRO by AK102

FIGURES

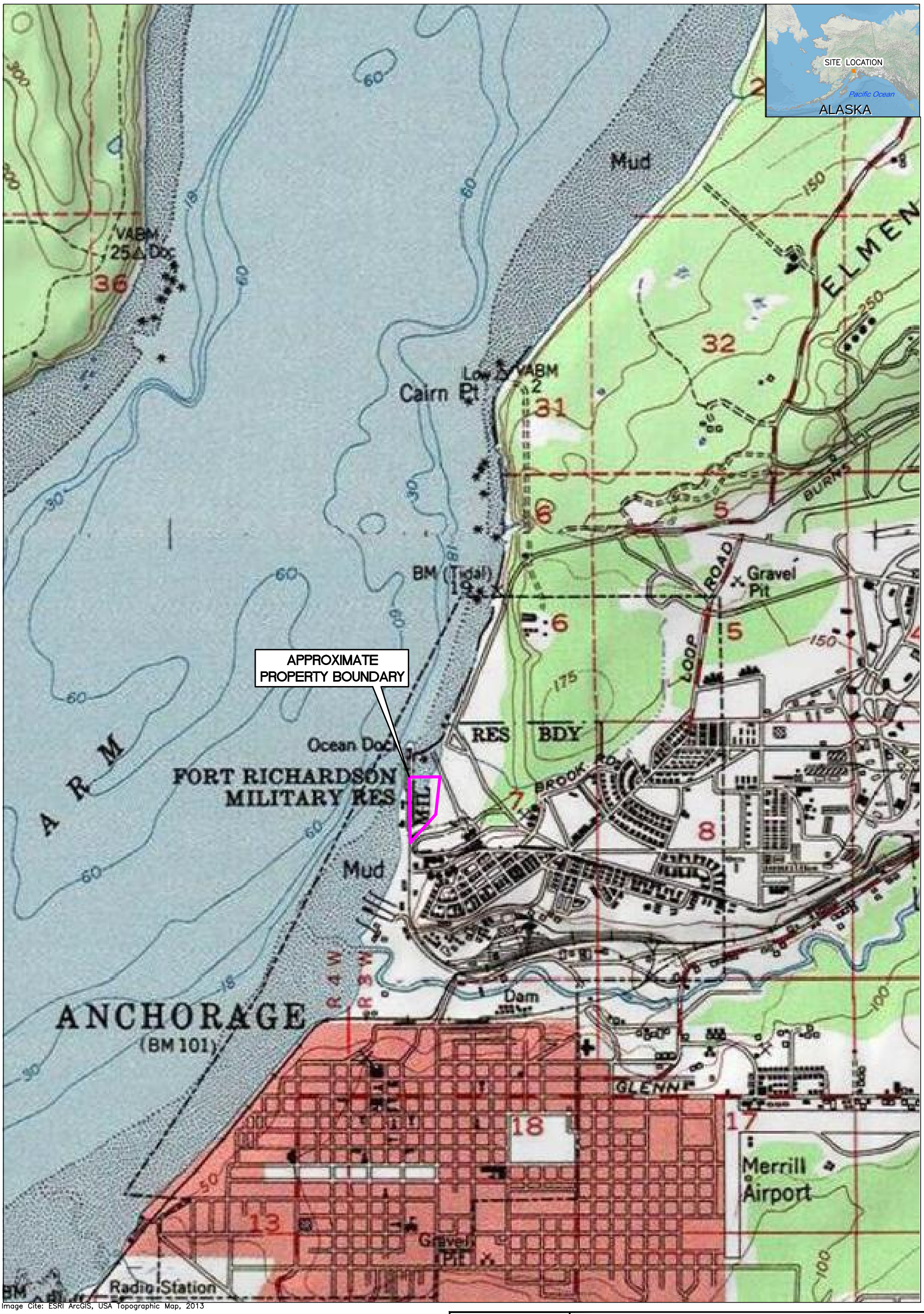


Image Cite: ESRI ArcGIS, USA Topographic Map, 2013

EXPLANATION

APPROXIMATE PROPERTY BOUNDARY

N

0 2,000'

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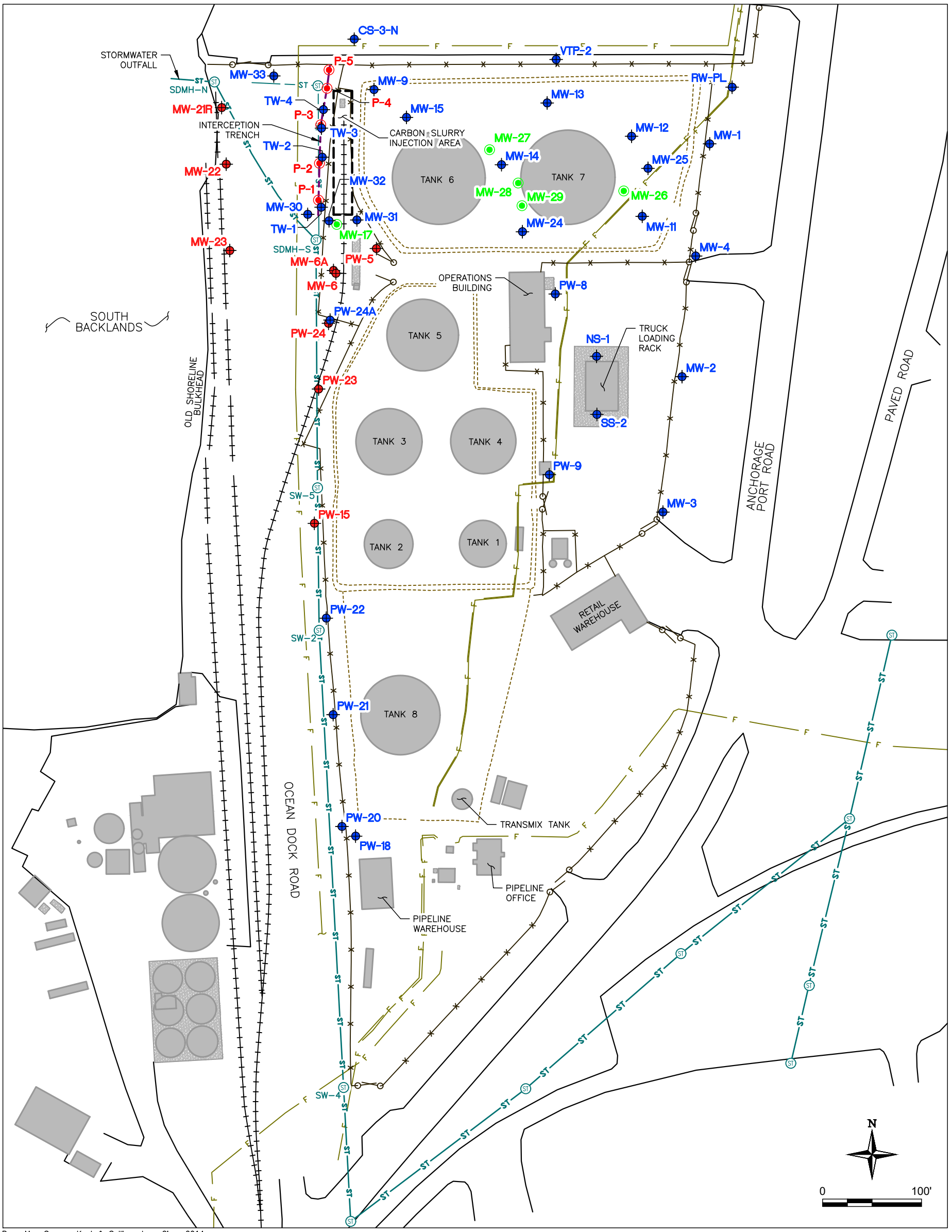
FIGURE 1

SITE LOCATION MAP

TESORO ALASKA COMPANY
ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Drawn By: RJ	Checked By: CS	Scale: 1" = 2,000'	Date: 4/5/2016	File: 42H-AT1-SITELOCATIONMAP

M:\STOV\TESORO\CADD\ANCHORAGETERMINALS\ANCHORAGETERMINAL1_COREFILE_BASEMAPS\42H-AT1-SITELOCATIONMAP



Base Map Source: Kent & Sullivan Inc.; Circa 2014

EXPLANATION

- PW-18 — MONITORING WELL AND DESIGNATION
- PW-19B — MONITORING WELL AND DESIGNATION (DESTROYED)
- MW-17 — RECOVERY WELL AND DESIGNATION
- GATE
- SW-4 — STORM SEWER MANHOLE AND DESIGNATION
- ST — STORMWATER LINE (UNDERGROUND)
- S — STORMWATER LINE (ABOVE GROUND)
- ST — STORMWATER LINE (ABANDONED)
- F — UNDERGROUND FUEL LINE
- INTERCEPTION TRENCH
- FENCE
- RAILROAD TRACK
- CONCRETE PAD
- BUILDING OR STRUCTURE
- TANK 8 — TANK AND DESIGNATION

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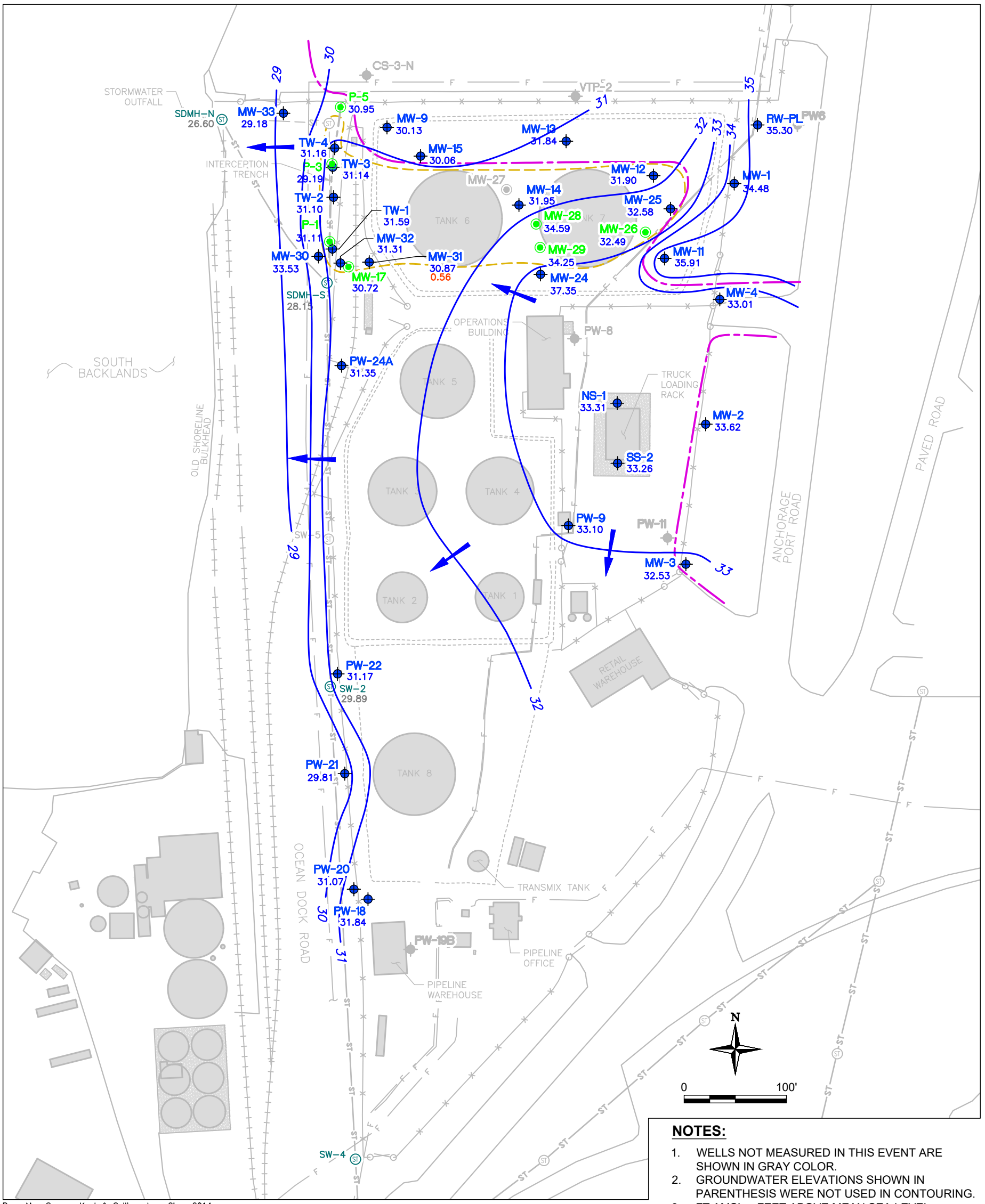
FIGURE 2

SITE PLAN

TESORO ALASKA COMPANY
ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Drawn By: RJ	Checked By: CS	Scale: 1" = 100'	Date: 12/15/2020	File: 42H-AT1-SITEPLAN202010

M:\STOV\TESORO\CADD\ANCHORAGETERMINALS\ANCHORAGETERMINAL1\WORK_2020\42H-AT1-SITEPLAN202010



Base Map Source: Kent & Sullivan Inc.; Circa 2014

NOTES:

1. WELLS NOT MEASURED IN THIS EVENT ARE SHOWN IN GRAY COLOR.
2. GROUNDWATER ELEVATIONS SHOWN IN PARENTHESIS WERE NOT USED IN CONTOURING.
3. FT AMSL = FEET ABOVE MEAN SEA LEVEL
4. LNAPL = LIGHT NON-AQUEOUS PHASE LIQUID

EXPLANATION

- MW-31 / 32.64 / 0.01 — MONITORING WELL AND DESIGNATION SHOWING GROUNDWATER ELEVATION IN FT AMSL (LNAPL THICKNESS SHOWN IN RED COLOR)
- MW-17 / 32.76 / 0.01 — RECOVERY WELL AND DESIGNATION SHOWING GROUNDWATER ELEVATION IN FT AMSL (LNAPL THICKNESS SHOWN IN RED COLOR)
- SW-4 / 31.33 — STORM SEWER MANHOLE AND DESIGNATION SHOWING GROUNDWATER ELEVATION IN FT AMSL
- 31 — LINE OF EQUAL ELEVATION OF POTENTIOMETRIC SURFACE (FT AMSL, CONTOUR INTERVAL 1 FT.)
- GENERALIZED GROUNDWATER FLOW DIRECTION
- AQUIFER PINCH OUT AREA
- CONTOUR LINE OF EQUAL CONCENTRATION SHOWING ESTIMATED EXTENT OF C-LINE PLUME
- PW-19B — MONITORING WELL AND DESIGNATION (DESTROYED)
- GATE
- ST — STORMWATER LINE (UNDERGROUND)
- S — S — STORMWATER LINE (ABOVE GROUND)
- ST — STORMWATER LINE (ABANDONED)
- F — UNDERGROUND FUEL LINE
- INTERCEPTION TRENCH
- FENCE
- RAILROAD TRACK
- CONCRETE PAD
- TANK 8 — BUILDING, TANK OR OTHER STRUCTURE

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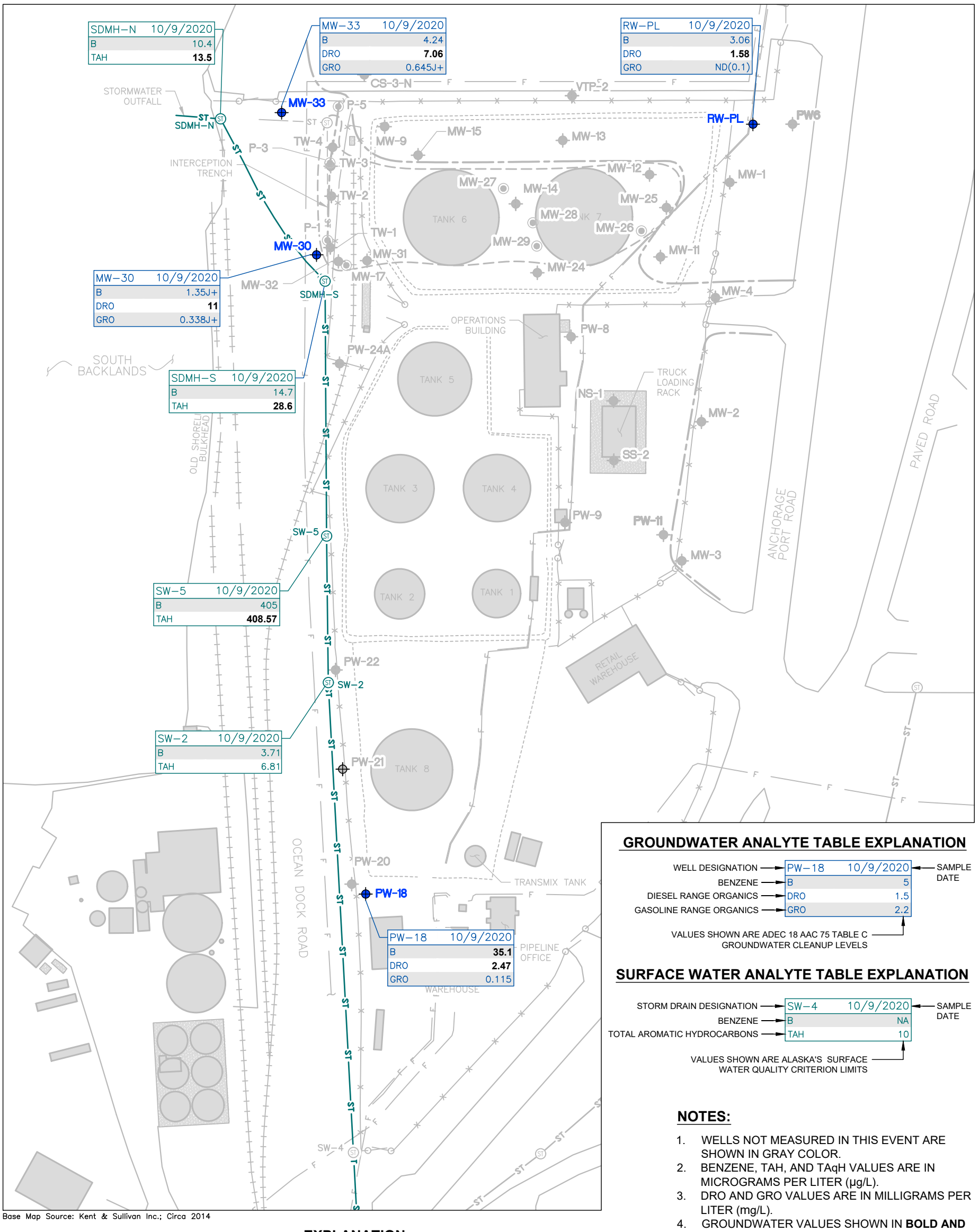
FIGURE 3

POTENTIOMETRIC SURFACE MAP
OCTOBER 2020

TESORO ALASKA COMPANY
ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Drawn By: RJ	Checked By: CS	Scale: 1" = 100'	Date: 11/19/2020	File: 42H-AT1-PS_20201009

C:\USERS\BJONES\ONEDRIVE - TRIHYDRO\DESKTOP\ANNUALGROUNDWATER AT1\42H-AT1-PS_20201009



Base Map Source: Kent & Sullivan Inc.; Circa 2014

GROUNDWATER ANALYTE TABLE EXPLANATION

WELL DESIGNATION → PW–18 10/9/2020 ← SAMPLE DATE
BENZENE → B 5
DIESEL RANGE ORGANICS → DRO 1.5
GASOLINE RANGE ORGANICS → GRO 2.2

VALUES SHOWN ARE ADEC 18 AAC 75 TABLE C GROUNDWATER CLEANUP LEVELS

SURFACE WATER ANALYTE TABLE EXPLANATION

STORM DRAIN DESIGNATION → SW–4 10/9/2020 ← SAMPLE DATE
BENZENE → B NA
TOTAL AROMATIC HYDROCARBONS → TAH 10

VALUES SHOWN ARE ALASKA'S SURFACE WATER QUALITY CRITERION LIMITS

NOTES:

1. WELLS NOT MEASURED IN THIS EVENT ARE SHOWN IN GRAY COLOR.
2. BENZENE, TAH, AND TAqH VALUES ARE IN MICROGRAMS PER LITER (µg/L).
3. DRO AND GRO VALUES ARE IN MILLIGRAMS PER LITER (mg/L).
4. GROUNDWATER VALUES SHOWN IN **BOLD AND BLACK COLOR** EXCEED ADEC 18 AAC 75 TABLE C GROUNDWATER CLEANUP LEVELS.
4. SURFACE WATER VALUES SHOWN IN **BOLD AND BLACK COLOR** EXCEED ALASKA'S SURFACE WATER QUALITY CRITERION LIMITS.
5. ADEC = ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
6. ND = ANALYTE WAS NOT DETECTED
7. NA = NOT APPLICABLE
8. J+ = VALUE IS ESTIMATED WITH A HIGH BIAS POTENTIAL

EXPLANATION

- PW–18 — MONITORING WELL AND DESIGNATION
- SW–4 — STORM SEWER MANHOLE AND DESIGNATION
- ST — STORMWATER LINE (UNDERGROUND)
- PW–19B — MONITORING WELL AND DESIGNATION (DESTROYED)
- GATE
- CONTOUR LINE OF EQUAL CONCENTRATION SHOWING ESTIMATED EXTENT OF C-LINE PLUME
- S — STORMWATER LINE (ABOVE GROUND)
- ST — STORMWATER LINE (ABANDONED)
- F — UNDERGROUND FUEL LINE
- AQUIFER PINCH OUT AREA
- INTERCEPTION TRENCH
- FENCE
- RAILROAD TRACK
- CONCRETE PAD
- TANK 8 — BUILDING, TANK OR OTHER STRUCTURE

N

0 100'

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FIGURE 4

ANALYTICAL SUMMARY
OCTOBER, 2020

TESORO ALASKA COMPANY
ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Drawn By: BJ	Checked By: CS	Scale: 1" = 100'	Date: 12/2/2020	File: 42H-AT1-ANALYTICALSUMM20201204ALL

M:_STOV_TESORO_CADD_ANCHORAGETERMINALS_ANCHORAGETERMINAL1_WORK_2020_42H-AT1-ANALYTICALSUMM20201204ALL

APPENDIX A

SITE BACKGROUND AND CUMULATIVE SUMMARY OF GROUNDWATER ANALYTICAL DATA

APPENDIX A. SITE BACKGROUND AND CUMULATIVE SUMMARY OF GROUNDWATER ANALYTICAL DATA

SITE HISTORY

Site Background

The Terminal 1 property is located in the Port of Anchorage (POA) at 1300, 1320, and 1522 Port Road (Figure 1). The facility covers approximately 7.6 acres and occupies POA Lots 10 and 11A which are between Port Road on the east and Ocean Dock Road on the west. In 2017, Tesoro sold the Terminal to Petro Star, Inc. However, Tesoro maintains environmental remediation responsibilities and is continuing with previously proposed cleanup efforts. Petro Star, Inc leases the property from the Alaska Railroad Corporation (ARRC), and ARRC also owns the land covered by Ocean Dock Road. The ARRC properties are part of its Anchorage Terminal Reserve (ATR) holdings. A paved POA parking lot is located north of the terminal. The site facilities are shown on Figure 2. OASIS (2006) provides a detailed description of the facilities, history, and local land use of the site. Historical groundwater and surface water sample results are included in tables A-1 and A-2.

Previous Investigations

Numerous investigations have been performed at the Terminal since 1989 in response to fuel releases. Comprehensive site investigations were performed in 1993 (Hart Crowser, 1994) and 1998 (OASIS, 1998) to establish site monitoring well networks, assess the extent of groundwater impacts, and evaluate the site hydrogeology. The response to the 2005/06 C-line release is documented by OASIS (2006), and the results of an expanded investigation of the C-line release area are provided by KSI (2008). Annual or semiannual groundwater monitoring has been conducted since 1999. An expanded monitoring program was conducted in 2009 (KSI, 2010b) to characterize volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) in groundwater and surface water and to assess potential vapor intrusion into the Terminal office and pipeline control room buildings. The purpose of the 2009 sampling program was to identify contaminants of potential concern (COPCs) associated with the site and to provide data to complete a feasibility study (KSI, 2011) of site cleanup alternatives.

A feasibility study (FS) of site remediation alternatives was completed in April 2011 (KSI, 2011). The FS was conducted at the request of ARRC to provide continuity with the Remedial Investigation and Feasibility Study that ARRC completed for the ATR under a 2004 Administrative Order on Consent with the US Environmental Protection Agency. The Terminal 1 FS identified site-wide institutional controls and monitored natural attenuation as the recommended corrective measure for the site after free-product recovery in the C-line release area is completed. The FS calculated risk-based concentrations for constituents of concern at the site assuming that shallow groundwater is not a potable water source.

In 2017, Shannon & Wilson, on behalf of Petro Star, completed a baseline environmental site assessment (ESA) as part of the due diligence process for the sale of the terminal to Petro Star. The results of the ESA were included in the *2017 Annual Report* (Trihydro, 2018).

On March 27, 2018 the ADEC approved Tesoro's 350 Determination request that the shallow aquifer at the Anchorage Terminal #1 be declared non-potable (ADEC 2018).

In 2018, Trihydro completed installation of a carbon barrier (BOS 200®) along the former rail loading rack (RLR). Injections were completed at 126 locations with injection intervals between 4 ft and 11 ft bgs. Injections were completed following demolition of above ground infrastructure by Petro Star (Trihydro 2019). During the

demolition of the above ground infrastructure at the RLR monitoring wells MW-16 and PW-25 were destroyed. Between fall 2018 and December 2019 ongoing capital improvement projects by the Alaska Railroad, Petro Star and the Port of Anchorage, have been ongoing and have made it infeasible to install monitoring wells to provide monitoring of groundwater conditions immediately downgradient of the injection area. Additionally, these ongoing improvement projects have required the demolition of wells MW-21R, MW-22, and MW-23.

References

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OASIS. 1998. Comprehensive Site Assessment Report, Tesoro Port of Anchorage Terminal, prepared for Tesoro Alaska Petroleum Company. October 1998.

OASIS. 2006. Port of Anchorage Terminal No. 1 Pipeline C 2006 Response Action Report, prepared for Tesoro Alaska Company. December 8, 2006.

Shannon & Wilson, Inc. 2017. Baseline Environmental Assessment Tesoro #1 Terminal Anchorage, Alaska. September 2017.

Trihydro. 2018. 2017 Annual Report, Anchorage Terminal 1, prepared for Tesoro Alaska Company. April 6, 2018.

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APPENDIX A. SITE BACKGROUND AND CUMULATIVE SUMMARY OF GROUNDWATER ANALYTICAL DATA

Abbreviations and Acronyms

ARRC	Alaska Rail Road Company
ATR	Alaska Terminal Reserve
COPC	Contaminants of potential concern
FS	Feasibility Study
KSI	Kent & Sullivan, Inc.
POA	Port of Anchorage
SVOC	Semi-volatile organic compound
Terminal	Tesoro's Anchorage Terminal 1
Tesoro	Tesoro Alaska Company
Trihydro	Trihydro Corporation
VOC	Volatile organic compound

TABLES

TABLE A-1 HISTORICAL GROUNDWATER ANALYTICAL DATA
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	GRO (mg/L)	DRO (mg/L)
CS-3N	11/06/06	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	0.762
	06/06/07	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	ND(0.431)
MW-01	07/24/89	**680**	820	**160**	**940**	**2.4**	1
	11/04/89	**1300**	480	**1100**	**1800**	**30**	**4.6**
	10/29/91	**210**	ND(100)	**ND(100)**	**3900**	--	--
	05/13/98	**71**	ND(10)	**125**	**564**	**2.4**	**21**
	08/06/98	**470**	ND(10)	**120**	**520**	**3.7**	**11**
	11/01/99	**1300**	ND(20)	**170**	**600**	**6.1**	**33**
	05/26/00	**8.13 J**	ND(20) J	**84.4 J**	**405 J**	2	**10.2**
	06/06/01	**368**	ND(2)	**65**	**386**	**2.82**	**20.6**
	10/03/01	**500 J**	ND(4) J	**51.3 J**	**326 J**	**2.32**	**26.6**
	10/18/02	**341**	ND(10)	**95.1**	**445**	**2.23**	**23.2**
	06/25/03	**38 J**	ND(1)	10.5	58.8	0.833	**98.2**
	11/06/03	**160**	ND(2.5)	**19.7**	37.1	0.71	**2.93**
	06/02/04	**8.99**	ND(0.5)	4.35	12.5	0.196	**17**
	10/11/04	**139**	ND(0.5)	**36.8**	117	0.721	**8.42**
	05/25/05	4.27	ND(0.5)	**18.2**	49.2	0.619	**1.91**
	10/11/05	**74.2**	ND(2.5)	**52.7**	136	0.852	**46**
	11/07/06	**1050**	ND(5)	**66**	**199**	**3.91**	**6.39**
	06/06/07	**850**	ND(50)	**65.6**	**280**	**ND(5)**	**11.5**
	09/25/07	**680**	ND(5)	**31.8**	144	**2.41**	**25.5**
	05/06/08	**801**	ND(2)	**72.3**	**195**	**2.86**	**10.8**
	05/04/10	**1200**	ND(20)	**108**	**378**	**3.34**	**7.38**
	07/10/17	**1160**	1.3	**173**	**318**	**3.57**	**6.36**
MW-02	07/24/89	ND(1)	ND(1)	ND(1)	1	1	1
	11/04/89	1	ND(1)	ND(1)	ND(1)	0.086	ND(0.05)
	10/29/91	1	ND(1)	ND(1)	ND(3)	--	--
	10/26/93	0.7	ND(0.5)	ND(0.5)	ND(1)	ND(0.1)	0.5
	05/13/98	ND(1)	ND(1)	ND(1)	ND(1)	ND(0.04)	**2.07**
	08/12/98	ND(1)	ND(1)	ND(1)	ND(1)	ND(0.1)	1.4
	11/01/99	ND(2)	ND(2)	ND(2)	ND(2)	ND(0.1)	--
	05/26/00	ND(0.5)	ND(2)	ND(2)	2.34	ND(0.09)	0.945
	09/13/00	0.58	ND(2)	ND(2)	ND(2)	ND(0.09)	0.655
	10/04/01	0.745	ND(2)	ND(2)	ND(2)	ND(0.09)	0.974
	06/05/02	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	0.757
	10/21/02	0.603	ND(2)	ND(2)	ND(2)	ND(0.09)	0.751
	06/06/07	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	ND(0.41)
	05/07/08	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	1.21
	05/18/09	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	1.12
	07/11/17	0.22	0.41	ND(0.5)	ND(1.5)	ND(0.05)	0.544
MW-03	11/04/89	ND(1)	ND(1)	ND(1)	ND(1)	ND(0.05)	0.26
	10/29/91	ND(1)	ND(1)	ND(1)	ND(3)	--	--
	10/26/93	ND(0.5)	ND(0.5)	ND(0.5)	ND(1)	ND(0.1)	0.92
	05/13/98	1	ND(1)	ND(1)	2	ND(0.04)	**1.52**
	08/12/98	ND(1)	1	ND(1)	ND(1)	ND(0.1)	1.1
	11/01/99	ND(2)	ND(2)	ND(2)	ND(2)	ND(0.1)	--
2020 ADEC GW Table C		4.6	1,100	15	190	2.2	1.5

Notes:
BOLD The concentration or reporting limit exceeds the 18 AAC 75 Groundwater Cleanup Level
GRO Gasoline Range Organics
DRO Diesel Range Organics
ND Not Detected
-- Not Analyzed
J - Estimated concentration
J+ - Estimated concentration, may be biased high
UJ - Estimated reporting limit

TABLE A-1 HISTORICAL GROUNDWATER ANALYTICAL DATA
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	GRO (mg/L)	DRO (mg/L)
MW-03	05/26/00	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	1.28
	09/13/00	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	**8.89 J**
	10/04/01	0.532	ND(2)	ND(2)	ND(2)	ND(0.09)	0.892
	06/05/02	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	0.8
	10/21/02	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	1.41
	06/08/07	ND(0.5)	0.56	ND(0.5)	ND(1.5)	ND(0.05)	**2.07**
	05/07/08	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	0.442
	05/18/09	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	ND(0.769)
	07/10/17	ND(0.2)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	0.687
MW-04	11/04/89	**580**	--	**79**	**930**	ND(0.11)	**3.2**
	10/29/91	**540**	170	**ND(100)**	**770**	--	--
	05/13/98	**72**	8	**81**	**503**	**2.4**	**14.4**
	08/11/98	**36**	3.5	14	88	0.64	**9.8**
	11/01/99	**320**	3.2	**110**	**890**	**3.6**	--
	05/26/00	**537 J**	10.6 J	**146 J**	**1343 J**	**5.9**	**10**
	09/13/00	**590**	ND(10)	**262**	**1420**	**10.2**	**24.2**
	06/06/01	**358**	ND(2)	**151**	**1022**	**5.53**	**54.8**
	10/03/01	**554 J**	ND(4) J	**187 J**	**1024 J**	**4.42**	**18.8**
	10/18/02	**553**	ND(10)	**238**	**1240**	**4.82**	**25.2**
	06/25/03	**318**	ND(10)	**126**	**701**	**3.98**	**27**
	11/06/03	**444**	ND(5)	**194**	**977**	**4.33**	**15.7**
	06/02/04	**511**	ND(0.5)	**293**	**1380**	**5.88**	**17.4**
	10/11/04	**313**	0.706	**123**	**658**	**3.06**	**13**
	05/25/05	**226**	ND(2.5)	**76.6**	**454**	**2.74**	**8.11**
	10/11/05	**254**	ND(2.5)	**72.6**	**310**	**2.35**	**12.7**
	11/07/06	**402**	ND(5)	**124**	**774**	**3.78**	**11.9**
	06/06/07	**5.02**	ND(0.5)	0.966	6.16	0.2	**13.6**
	05/06/08	**352**	ND(20)	**293**	**1330**	**5.31**	**8.39**
	10/28/08	**324**	ND(40)	**138**	**685**	**2.5**	**11.2**
	05/18/09	1.74	2.27	ND(2)	36.9	0.448	**5.42**
	11/05/09	**372**	ND(20)	**273**	**1260**	**6.89**	**37.9 J**
	05/04/10	**469**	ND(20)	**388**	**1630 J**	**5.53**	**13.7 J**
	09/21/10	**251**	ND(2)	**124**	**718**	**2.92 J**	**14.7 J**
	05/11/11	**322**	ND(2)	**260**	**1192**	**4.37**	**18.9**
	10/13/11	**285**	ND(10)	**265**	**1492**	**3.96**	**22.2**
	05/17/12	**34.3**	ND(1)	**18.1**	**271**	1.45	**6.82**
	09/27/12	**255**	ND(1)	**211**	**1355**	**5.22**	**15.4**
	05/15/13	**245**	ND(10)	**262**	**1700**	**6.35**	**29.8**
	09/20/13	**214**	ND(10)	**249**	**1700**	**6.65**	**15.7**
	07/10/17	**144**	ND(2.5)	**97.3**	**906.7**	**2.81**	**9.6**
MW-05	11/04/89	ND(1)	ND(1)	ND(1)	ND(1)	0.093	**1.6**
	05/13/98	**336**	ND(2)	ND(2)	ND(4)	0.66	1.12
	08/12/98	**1100**	ND(10)	ND(10)	3.1	**21**	1.5
	05/26/00	**119**	ND(1)	2.53	10.6	0.309	0.629
	09/13/00	**1460**	ND(20)	**ND(20)**	115	**3.7**	**2.94**
	10/04/01	**257**	ND(2)	11 J	**501**	2.14	**2.04**
2020 ADEC GW Table C		4.6	1,100	15	190	2.2	1.5

Notes:
BOLD The concentration or reporting limit exceeds the 18 AAC 75 Groundwater Cleanup Level
GRO Gasoline Range Organics
DRO Diesel Range Organics
ND Not Detected
-- Not Analyzed
J - Estimated concentration
J+ - Estimated concentration, may be biased high
UJ - Estimated reporting limit

TABLE A-1 HISTORICAL GROUNDWATER ANALYTICAL DATA
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	GRO (mg/L)	DRO (mg/L)
MW-05	06/05/02	**19.7**	ND(2)	ND(2)	ND(2)	0.128	**2.71**
	10/21/02	**444**	ND(2)	2.2	**305**	1.53	**4.58**
	11/06/03	**1010**	ND(10)	ND(10)	**739**	**3.97**	**3.83**
	10/11/04	**301**	ND(0.5)	1.19 J	171	1.28	**5.81**
	10/11/05	**459**	ND(100)	**ND(100)**	**392**	**ND(10)**	**3.95**
MW-06	10/26/93	**100**	26	**ND(50)**	180	1.1	**3.3**
	05/13/98	**7**	ND(1)	6	19	0.23	**5.34**
	08/11/98	**6.3**	1	4.3	17	0.64	**4.3**
	10/21/99	**10**	ND(2)	5.3	13	0.24	**5.7**
	05/26/00	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	**4.34**
	09/13/00	1.9	ND(2)	2.29	5.26	0.172	**3.64**
	10/03/01	**59.4**	ND(2)	ND(2)	4.25	0.311	**5.44**
	06/04/02	**48.9**	ND(2)	3.44	30.3	0.385	**8.36**
	10/17/02	**96.6**	ND(2)	5.47	20.4	0.503	**13.5**
	11/06/03	**8.02**	0.647	0.658	1.69	0.231	**8.12**
	10/11/04	0.699	ND(0.5)	ND(0.5)	ND(1.5)	0.241	**4.74**
	10/12/05	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	0.256	**4.31**
	07/13/06	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	0.0764	**2.7**
	11/07/06	**10.8**	ND(0.5)	1.54	6.23	0.383	**5.97**
MW-06A	06/07/07	**31.7**	ND(5)	**16**	**484**	**3.29**	**6.2**
	02/06/08	**42**	ND(5)	ND(5)	**271**	1.84	**8.02**
	05/08/08	**14.9**	ND(2)	2.65	**272**	1.18 J	**5.93**
	10/28/08	0.537	ND(2)	ND(2)	107	0.493 J	**4.92**
	05/19/09	0.968	ND(2)	ND(2)	ND(26.9)	0.269	**2.21**
	11/06/09	0.396 J	ND(2)	ND(2)	15.1	0.171	**1.87**
	05/05/10	**ND(5)**	ND(20)	**ND(20)**	33.1	ND(1)	**3.61**
	09/21/10	1.52	ND(2)	ND(2)	4	0.108	**2.73**
	05/11/11	0.78	ND(2)	ND(2)	ND(3.12)	ND(0.1)	**2.84**
	10/13/11	**6.16 J**	2.25 J	ND(1)	5.72 J	0.151	**6.81 J**
	05/18/12	1.42	ND(1)	ND(1)	2.07	ND(0.1)	**4.04**
	09/27/12	2.22	ND(1)	ND(1)	ND(3)	ND(0.1)	**4.02 J**
	05/16/13	**11.7**	ND(1)	ND(1)	10.8	0.216	**4.48**
	09/19/13	2.74	ND(1)	ND(1)	ND(3)	ND(0.1)	**4.69**
	07/08/17	0.39	ND(0.5)	ND(0.5)	0.8	0.0498	**4.29**
MW-08	10/26/93	ND(0.5)	ND(0.5)	ND(0.5)	ND(1)	ND(0.1)	0.4
	05/13/98	ND(1)	ND(1)	ND(1)	ND(1)	ND(0.04)	0.315
	08/12/98	1.2	ND(1)	ND(1)	ND(1)	ND(0.1)	0.81
MW-09	10/26/93	ND(0.5)	ND(0.5)	0.6	1.7	ND(0.1)	**10**
	05/13/98	ND(1)	ND(1)	ND(1)	ND(1)	ND(0.04)	**11.2**
	08/11/98	ND(1)	ND(1)	ND(1)	ND(1)	ND(0.1)	**4**
	10/21/99	ND(2)	ND(2)	ND(2)	ND(2)	ND(0.1)	**4.4**
	05/26/00	ND(1)	ND(1)	ND(1)	ND(1)	ND(0.09)	**4.2**
	09/13/00	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	**3.08**
	10/03/01	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	**3.24**
	06/04/02	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	**2.96**
	10/21/02	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	**2.78**
2020 ADEC GW Table C		4.6	1,100	15	190	2.2	1.5

Notes:
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GRO Gasoline Range Organics
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TABLE A-1 HISTORICAL GROUNDWATER ANALYTICAL DATA
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	GRO (mg/L)	DRO (mg/L)
MW-09	11/06/03	--	--	--	--	--	1.45
	10/11/04	--	--	--	--	--	1.35
	10/12/05	--	--	--	--	--	**1.78**
	07/13/06	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	1.27
	11/08/06	--	--	--	--	--	**1.98**
	06/06/07	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	1.46
	02/06/08	ND(0.5)	ND(0.5)	ND(0.5)	4.61	0.0764	1.27
	05/06/08	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	1.17
	05/20/09	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	**2.32**
	07/10/17	0.12	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	0.576
MW-10	10/26/93	**120**	2.2	8.4	24	0.47	0.17
	05/13/98	**2080**	15	**22**	83	**4**	**20.1**
	08/11/98	**1500**	2.8	6.2	33	**3.5**	**24**
MW-11	11/08/06	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	**2.78**
	06/06/07	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	0.106	1.39 J
	02/06/08	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	0.186	1.21
	05/06/08	ND(0.5)	ND(2)	ND(2)	2.5	0.1	0.585
	05/20/09	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	ND(0.8)
MW-13	11/08/06	ND(0.5)	0.583	2.01	25.7	0.922	0.787
	06/06/07	ND(0.5)	ND(0.5)	ND(0.5)	3.27	0.491	0.944
	05/06/08	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	ND(0.385)
	05/20/09	ND(0.5)	ND(2)	ND(2)	ND(2.25)	ND(0.1)	ND(0.833)
	07/10/17	0.16	0.46	ND(0.5)	ND(1.5)	ND(0.05)	1.11
MW-15	11/08/06	ND(0.5)	ND(0.5)	0.808	3.33	0.159	**2.51**
	06/06/07	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	**4.36**
	05/06/08	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	1.05
	05/20/09	ND(0.5) J	ND(2) J	ND(2) J	ND(4) J	ND(0.1)	1.19
MW-16	11/07/06	**755**	208	**164**	**953**	**6.2**	**6.53**
	06/07/07	**648**	168	**89.3**	**585**	**5.05**	**69.7**
	09/25/07	**1300**	26.7	**216**	**975**	**6.26**	**7.75**
	06/02/17	**176**	ND(1)	**67.7**	**731**	**2.72 J+**	**5.22 J-**
MW-17	11/07/06	**24.7**	ND(0.5)	13.3	47.1	1.41	**2.62**
	06/07/07	**10.5**	ND(5)	**63.8**	**371**	**3.4**	**1.86**
	05/08/08	**113**	20.2 J	**136**	**660 J**	**2.84**	**9.53 J**
MW-19	11/06/06	0.725	ND(0.5)	1.02	2.04	0.0639	**2.43**
	06/07/07	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	**1.91**
	02/06/08	0.641	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	1.2
	05/07/08	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	**1.6 J**
	10/28/08	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	1.34
	05/18/09	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	**1.72**
	11/03/09	0.369 J	ND(2)	ND(2)	ND(4)	ND(0.1)	ND(0.909)
	05/05/10	**ND(5)**	ND(20)	**ND(20)**	ND(40)	ND(1)	--
	05/11/11	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	--
	05/17/12	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	--
	05/16/13	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	--
MW-20	11/06/06	1.2	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	**1.53**
2020 ADEC GW Table C		4.6	1,100	15	190	2.2	1.5

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DRO Diesel Range Organics
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TABLE A-1 HISTORICAL GROUNDWATER ANALYTICAL DATA
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	GRO (mg/L)	DRO (mg/L)
MW-20	06/07/07	1.56	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	**3.04**
	05/07/08	**82.5**	ND(2)	ND(2)	ND(4)	0.155	**2.87**
	10/28/08	**99.6**	ND(20)	**ND(20)**	ND(40)	ND(1)	**3.33**
	05/18/09	**76.3**	71.8	**64.3**	**483**	1.77 J	**1.92**
	11/03/09	**95.3**	ND(10)	**23.2**	67.8	0.587 J	**2.85**
	05/05/10	**162**	ND(20)	**80.5**	**491**	1.9	**8.82**
	09/20/10	**107**	ND(2)	**48**	155	0.599	--
	05/11/11	**34.8**	ND(2)	**23.6**	157 J	0.609	**7.47**
	10/13/11	**49.3**	2.13	**79.7**	168	0.688 J	--
	05/17/12	**29.1**	1.04	**53.8**	**303**	1.53	**4.97**
	09/28/12	**33.7**	1.59	**74.4**	**356**	1.57 J	--
	05/16/13	**21.6**	ND(1)	**34.2 J**	102 J	0.537 J	**4.82**
	09/19/13	**31.2**	1.39	**84.1**	**369**	1.78 J	--
	06/05/14	**38.6**	1.11	**103**	**370 J**	1.61 J	**5.54**
	10/09/14	**40.7**	1.01	**102**	**315.4**	1.56 J	**3.83**
	05/19/15	**40.2**	ND(1)	**88.2**	**259.2**	1.41 J+	**4.65**
MW-21	11/06/06	1.12	ND(0.5)	0.758	2.06	0.294	**7.88**
	06/07/07	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	0.0745	**4.21**
	09/25/07	0.646	ND(0.5)	ND(0.5)	ND(1.5)	0.0695	**6.02**
MW-21R	02/06/08	2.83	ND(0.5)	ND(0.5)	2.14	0.223	**283 J**
	05/08/08	2.45	ND(2)	ND(2)	6.53	0.149	**8.34**
	10/28/08	3.63	ND(2)	ND(2)	ND(4)	ND(0.1)	**4.87 J**
	05/19/09	3.82	ND(2)	ND(2)	7.21	0.127	**3.15**
	11/05/09	**7.35**	ND(2)	ND(2)	2 J	0.0913 J	**4.91**
	05/05/10	**9.41**	ND(20)	**ND(20)**	ND(40)	ND(1)	**6.13**
	09/20/10	**15.5**	ND(2)	ND(2)	ND(4)	0.142	--
	05/11/11	**11**	ND(2)	ND(2)	ND(4)	0.1	**7.69**
	10/13/11	**12.3**	1.13	1.06	14.1	0.966 J	--
	05/17/12	**5.8**	ND(1)	ND(1)	ND(3)	ND(0.1)	**6.59**
	09/28/12	**16.1**	ND(1)	ND(1)	ND(3)	ND(0.1)	--
	05/17/13	**13.2**	ND(1)	ND(1)	8.14	0.715	**23.1**
	09/19/13	**16.5**	ND(1)	ND(1)	1.1	0.153	--
	06/05/14	**22.9**	ND(1)	ND(1)	6.36 J	0.435 J	**165**
	10/09/14	**22.2**	ND(1)	ND(1)	ND(3)	0.139 J	**7.26 J**
	05/19/15	**22.9**	ND(1)	ND(1)	2.88	0.327	**40.6**
	10/14/15	**15.5**	ND(1)	2.07	ND(2)	0.109	**6.75**
	06/16/16	**16.6**	ND(1)	ND(1)	ND(3)	ND(0.1)	**7.19**
	10/13/16	**19.9**	ND(1)	ND(1)	ND(3)	0.108	**9.7 J-**
	06/02/17	**12.9**	ND(1)	ND(1)	ND(3)	ND(0.1)	**4.79 J-**
	10/12/17	**15.3**	ND(1)	ND(1)	ND(2)	ND(0.1)	**15.2**
	05/31/18	**16.4**	ND(1)	ND(1)	ND(3)	0.135	**10**
	10/11/18	**12.9**	ND(1)	ND(1)	ND(3)	ND(0.1)	**8.09**
	04/19/19	**13.6**	ND(1)	ND(1)	ND(3)	0.163	**50.6**
MW-22	11/06/06	1.9	ND(0.5)	ND(0.5)	ND(1.5)	0.143	**6.44**
	06/07/07	3.31	ND(0.5)	0.73	ND(1.5)	0.0834	**4.69**
	09/25/07	1.72	ND(0.5)	0.563	ND(1.5)	0.0684	**5.59**
2020 ADEC GW Table C		4.6	1,100	15	190	2.2	1.5

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-- Not Analyzed
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TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	GRO (mg/L)	DRO (mg/L)
MW-22	02/06/08	**4.63**	ND(0.5)	ND(0.5)	ND(1.5)	0.0993	**6.04**
	05/08/08	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	**63.2**
	10/28/08	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	**5.03**
	05/19/09	**5.42**	ND(2)	ND(2)	ND(4)	ND(0.1)	**3.66**
	11/05/09	**5.93**	ND(2)	ND(2)	4	0.123	**7.49**
	05/05/10	**ND(5)**	ND(20)	**ND(20)**	ND(40)	ND(1)	**8.26**
	09/20/10	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	--
	05/11/11	**4.98**	ND(2)	ND(2)	ND(4)	ND(0.1)	**5.54**
	10/13/11	ND(0.5)	ND(0)	ND(1)	3.48 J	0.235	--
	05/17/12	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	**12.7**
	09/28/12	0.51	ND(1)	ND(1)	ND(3)	ND(0.1)	--
	05/17/13	0.91	ND(1)	ND(1)	1.38	0.228	**17.1**
	07/07/17	0.17	ND(0.5)	ND(0.5)	ND(1.5)	0.065	**4.13**
	04/19/19	0.54	ND(1)	ND(1)	ND(3)	ND(0.1)	**32.1**
MW-23	11/06/06	**66.3**	ND(0.5)	3.98	24.1	0.373	**4.56**
	06/07/07	2.15	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	1.1
	02/06/08	**46.8 J**	ND(0.5)	ND(0.5)	ND(1.5)	0.146	**3.36**
	05/08/08	**31.1**	ND(2)	ND(2)	2.7	ND(0.1)	**2.78**
	10/28/08	1.2	ND(2)	ND(2)	ND(4)	ND(0.1)	0.892
	05/19/09	1.18	ND(2)	ND(2)	ND(4)	ND(0.1)	1.11
	11/05/09	**17.4**	ND(10)	ND(10)	53.3	1.26	**2.15**
	05/05/10	**ND(5)**	ND(20)	**ND(20)**	ND(40)	ND(1)	ND(0.87)
	05/11/11	3.22	ND(2)	ND(2)	ND(4)	ND(0.1)	--
	05/17/12	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	--
	05/17/13	0.62	ND(1)	ND(1)	ND(3)	ND(0.1)	--
	07/08/17	0.25	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	0.182
	04/19/19	**27.8**	ND(1)	ND(1)	ND(3)	0.187	1.46
MW-24	06/06/07	**106**	ND(50)	**ND(50)**	**213**	**ND(5)**	**24.7**
	05/06/08	**824**	65.6	**317**	**1975**	**13.2 J**	**69.3**
MW-25	06/06/07	**1340**	ND(250)	**366**	**2330**	**ND(25)**	**16.2**
	02/06/08	**1840**	ND(10)	**481**	**2400**	**13.3**	**25.8**
	05/06/08	**1420**	ND(40)	**225**	**2056**	**7.88**	**24**
	05/20/09	**1150 J**	43.9	**265**	**1770 J**	**7.77**	**11.8**
	05/12/11	**827**	ND(2)	**341**	**762**	**4.73**	**7.67**
	05/18/12	**382**	1.13	**109**	**2189**	1.9 J	**3.7**
	05/16/13	**565**	1.05	**269**	**546**	**3.54**	**8.5**
MW-29	06/06/07	**895**	816	**350**	**2290**	**13.7**	**20.5**
MW-30	02/06/08	2.21	ND(0.5)	5.17	11.7	0.697	**3.93**
	05/07/08	**5.22**	7.3	11.1	17.9	0.54	**6.69**
	10/28/08	**23.1**	4.22 J	7.63	6.67	0.355	**9.21**
	05/19/09	**121**	ND(2)	3.29	ND(8.51)	0.518	**7.84**
	11/05/09	**47.4**	ND(10)	ND(10)	ND(20)	0.648 J	**6.91**
	05/04/10	**135**	ND(2)	ND(2)	26.5	0.712 J	**5.03**
	09/20/10	**19.4**	5.02	ND(2)	18.5	0.475 J	**5.33**
	05/11/11	**126**	ND(2)	ND(2)	22.8	0.718 J	**4.75**
	10/13/11	**50.2**	ND(1)	1.35	19.3	0.622 J	**7.4**
2020 ADEC GW Table C		4.6	1,100	15	190	2.2	1.5

Notes:
BOLD The concentration or reporting limit exceeds the 18 AAC 75 Groundwater Cleanup Level
GRO Gasoline Range Organics
DRO Diesel Range Organics
ND Not Detected
-- Not Analyzed
J - Estimated concentration
J+ - Estimated concentration, may be biased high
UJ - Estimated reporting limit

TABLE A-1 HISTORICAL GROUNDWATER ANALYTICAL DATA
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	GRO (mg/L)	DRO (mg/L)
MW-30	05/17/12	**147 J**	ND(1)	ND(1)	6.72 J	0.598 J	**5.45**
	09/27/12	**14**	ND(1)	ND(1)	6.28 J	0.4 J	**6.33**
	05/17/13	**119**	ND(1)	1.68	9.39	0.699 J	**11.5**
	09/19/13	**39.9**	ND(1)	1.49	8.77	0.63 J	**10.2**
	06/04/14	**139**	ND(1)	1.1	4.24	0.727 J	**6.57**
	10/09/14	**33.8**	ND(1)	1.12	2.94	0.614 J	**9.78**
	05/19/15	**88.4**	ND(1)	1.22	5.14	0.661 J+	**7.56**
	10/14/15	**27.8**	ND(1)	ND(1)	2.6	0.527 J+	**13.9**
	06/16/16	**67.2**	ND(1)	ND(1)	ND(3)	0.462 J+	**8.17**
	10/13/16	3.59	ND(1)	1.1	ND(3)	0.729 J+	**10.6 J-**
	06/02/17	**57.3 J-**	ND(1) UJ	ND(1) UJ	ND(3) UJ	0.5 J	**10.7 J-**
	10/12/17	3.16	ND(1)	1	ND(2)	0.506 J+	**12.1**
	05/31/18	**45.8**	ND(1)	ND(1)	ND(3)	0.703	**8.24**
	10/11/18	3.2	2.13	ND(1)	ND(3)	0.648	**10.8**
	04/19/19	**63.1**	ND(1)	ND(1)	ND(3)	0.379 J+	**4.86**
	10/17/19	**7.47 J+**	ND(1)	ND(1)	ND(3)	0.283 J+	**7.26**
	10/09/20	1.35 J+	ND(1) UJ	ND(1)	ND(3)	0.338 J+	**11**
NS-1	10/29/91	**36**	22	**ND(100)**	**1400**	--	--
	10/26/93	**250**	100	ND(5)	**710**	**3.6**	**2**
	05/13/98	**442**	**1770**	**335**	**3040**	**12**	0.39
	08/12/98	**1500**	**2700**	**1500**	**8300**	**41**	**5.6**
	09/25/07	**2680**	**1260**	**913**	**5570**	**28.3**	**7.71**
	05/07/08	0.988	ND(2)	ND(2)	21.6	ND(0.1)	**2.42**
	10/28/08	**1490**	192	**662**	**2960**	**12.6**	**3.74**
	05/18/09	**197**	65.3	**81.6**	**477**	**2.79 J**	**5.49**
	11/04/09	**2390**	704	**706**	**2870**	**10.6**	**3.22**
	05/05/10	**420**	217	**47**	**915**	**3.29**	--
	07/11/17	**846**	196	**305**	**1390**	**5.33**	**2.18**
P-05	06/07/07	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	ND(0.417)
PW-01	08/06/98	**170**	23	**96**	**1300**	**6.3**	**42**
PW-03	08/07/98	**280**	13	**270**	**2000**	**8.4**	**43**
PW-04	08/11/98	**4.8**	2.8	**16**	69	0.93	**28**
PW-05	08/07/98	**180**	ND(1)	ND(1)	ND(1)	0.46	**4.6**
	11/01/99	**110**	ND(2)	ND(2)	ND(2)	0.33	--
	05/26/00	**100**	ND(2)	ND(2)	ND(2)	0.3	--
	09/13/00	**156**	ND(2)	ND(2)	2.36	0.501	**4.38**
	10/03/01	**54.5**	ND(2)	ND(2)	3.62	0.279	**2.97**
	06/04/02	**209**	ND(2)	ND(2)	**275**	0.951	**2.04**
	10/17/02	**16.3**	ND(2)	ND(2)	2.61	0.155	**1.58**
	11/06/03	**46.2**	2.73	14.1	14.5	0.341	1.34
	10/11/04	2.38	ND(0.5)	ND(0.5)	ND(1.5)	0.0618	0.735
	10/12/05	**7.08**	ND(0.5)	0.533	2.67	0.141	1.08
	07/13/06	3.28	ND(0.5)	ND(0.5)	ND(1.5)	0.0918	0.684
	11/07/06	2.73	1.88	1.42	14	0.201	1.17
	06/07/07	3.53	ND(0.5)	ND(0.5)	2.56	0.0937	**11.2**
	05/08/08	4.27	ND(2)	ND(2)	ND(4)	ND(0.1)	0.408
2020 ADEC GW Table C		4.6	1,100	15	190	2.2	1.5

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TABLE A-1 HISTORICAL GROUNDWATER ANALYTICAL DATA
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	GRO (mg/L)	DRO (mg/L)
PW-05	10/28/08	**9.39**	ND(2)	ND(2)	ND(4)	0.112	**2**
	05/19/09	2.25	ND(2)	ND(2)	6.37	ND(0.1)	0.822
	11/05/09	**29**	ND(2)	0.779 J	6.66 J	0.264	**3.45**
	05/05/10	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	ND(0.855)
	09/21/10	**22.1**	ND(2)	**23.6**	95	0.629	**5.2**
	05/11/11	1.63	ND(2)	ND(2)	ND(4)	ND(0.1)	ND(0.952)
	10/13/11	**25.5**	ND(1)	1.79	3.27	0.114	**5.04**
	05/18/12	**18**	ND(1)	ND(1)	ND(3)	ND(0.1)	0.874
	09/27/12	**49.3**	ND(1)	1.41	ND(3)	0.163	**6.29**
	05/16/13	**6**	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.6)
	09/19/13	**68.8**	ND(1)	ND(1)	ND(3)	0.194	**8.27**
	06/02/17	2.39	ND(1)	ND(1)	ND(3)	ND(0.1)	1.1 J-
	07/08/17	**18.5**	ND(0.5)	0.77	11.11	0.114	**3.95**
PW-06	08/06/98	**4400**	190	**240**	**1900**	**14**	**2.2**
	11/01/99	**3200**	2.6	9.6	**400**	**4.1**	**3**
	05/26/00	**696 J**	ND(10) J	ND(10) J	31.6 J	1.6	**1.68**
	09/14/00	**1400**	ND(40)	**ND(40)**	127	**3.33**	1.29
	06/05/01	**165**	ND(2)	ND(2)	17.1	0.474	--
	10/04/01	**1130 J**	2.11 J	2.18 J	128 J	**2.81**	--
	10/21/02	**22.8**	ND(2)	ND(2)	ND(2)	ND(0.45)	--
	06/25/03	2.39	0.5	ND(0.5)	1	ND(0.05)	1.31
	11/06/03	3.71	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.741
	06/02/04	**43.2**	ND(0.5)	ND(0.5)	ND(1.5)	0.11	0.11
	10/11/04	**51**	ND(0.5)	ND(0.5)	ND(1.5)	0.115	**28.1**
	10/11/05	**29**	ND(0.5)	ND(0.5)	ND(1.5)	0.0891	1.49
	11/07/06	**49.5**	3.97	2.04	17.6	0.221	1.19
PW-07	08/12/98	**26000**	**34000**	**2500**	**13000**	**210**	**21**
PW-08	08/11/98	1.5	ND(1)	ND(1)	2.5	ND(0.1)	1.1
	05/26/00	ND(1)	ND(1)	ND(1)	ND(1)	ND(0.09)	0.968
	09/13/00	1.25	2.11	ND(2)	3.35	ND(0.09)	0.52
	10/04/01	0.929	ND(2)	ND(2)	2.96	ND(0.09)	**2.22**
	06/05/02	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	0.58
	10/21/02	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.521)
	11/07/06	ND(0.5)	1.35	0.566	6.54	0.0877	ND(0.394)
	06/06/07	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	0.907
	05/07/08	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	ND(0.417)
	05/18/09	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	ND(0.833)
	05/04/10	ND(0.5)	ND(2)	ND(2)	3.07	ND(0.1)	--
	05/18/12	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	--
PW-09	08/10/98	**5.7**	1.6	4	23	0.56	**4.1**
	11/01/99	**16**	ND(2)	5.5	10	0.22	**7.3**
	05/26/00	**145**	ND(2)	ND(2)	5.49	0.44	**4.83**
	09/13/00	**34.1**	ND(2)	ND(2)	2.59	0.174	**2.29**
	06/06/01	**48.4**	ND(2)	ND(2)	ND(2) J	0.193	**2.13**
	10/04/01	**31.1**	ND(2)	ND(2)	2.05	0.134	**7.79**
	10/21/02	**5.8**	ND(2)	ND(2)	ND(2)	0.0903	**3.37**
2020 ADEC GW Table C		4.6	1,100	15	190	2.2	1.5

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ND Not Detected
-- Not Analyzed
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TABLE A-1 HISTORICAL GROUNDWATER ANALYTICAL DATA
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	GRO (mg/L)	DRO (mg/L)
PW-09	06/25/03	**4.68**	ND(0.5)	ND(0.5)	3.95 J	0.107	**2.2 J**
	11/06/03	3.04	ND(0.5)	ND(0.5)	5.77	0.0935	**2.96**
	06/02/04	3.75	ND(0.5)	ND(0.5)	ND(1.5)	--	0.0929
	10/11/04	1.59	ND(0.5)	ND(0.5)	3.46	0.0706	**20.5**
	05/25/05	**13.4**	ND(0.5)	ND(0.5)	ND(1)	ND(0.08)	0.809
	10/11/05	**6.4**	ND(0.5)	ND(0.5)	ND(1.5)	0.0655	**2.87**
	11/07/06	1.1	0.954	0.619	6.35	0.0819	**6.42**
	06/08/07	2.45	ND(0.5)	ND(0.5)	ND(1.5)	0.0786	1.16 J
	05/07/08	**10**	ND(2)	ND(2)	ND(4)	ND(0.1)	**5.95**
	05/18/09	2.27	ND(2)	ND(2)	ND(4)	ND(0.1)	**3.79**
	05/05/10	**ND(5)**	ND(20)	**ND(20)**	ND(40)	ND(1)	--
	05/11/11	2.05	ND(2)	ND(2)	ND(4)	ND(0.1)	--
	05/17/12	1.82	ND(1)	ND(1)	ND(3)	ND(0.1)	--
	05/15/13	ND(0.5)	ND(1)	ND(1)	1.44	ND(0.1)	--
	07/08/17	0.19	ND(0.5)	ND(0.5)	1.06	0.0368	**5.09**
PW-10	08/07/98	ND(1)	ND(1)	ND(1)	ND(1)	ND(0.1)	0.36
	08/10/98	ND(1)	ND(1)	ND(1)	ND(1)	ND(0.1)	0.69
PW-12	08/07/98	**330**	1.3	**71**	**200**	**2.8**	**20**
PW-13	08/07/98	**12**	9.7	**80**	**790**	**4.5**	**24**
PW-14	08/07/98	**ND(10)**	ND(10)	ND(10)	ND(10)	0.7	**19**
PW-15	08/10/98	**8.5**	ND(1)	ND(1)	ND(1)	ND(0.1)	**7.5**
	10/22/99	**86**	ND(2)	ND(2)	ND(2)	0.26	**8.8**
	05/26/00	1.9	ND(2)	ND(2)	ND(2)	ND(0.09)	**2.03**
	09/14/00	2.06	ND(2)	ND(2)	ND(2)	ND(0.09)	**15.1**
	06/05/01	0.66	ND(2)	ND(2)	ND(2)	ND(0.09)	**2.81**
	10/02/01	1.66	ND(2)	ND(2)	ND(2)	ND(0.09)	**8.89**
	10/18/02	1.3	ND(2)	ND(2)	ND(2)	ND(0.09)	0.92
	06/25/03	1.64	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	**7.03**
	11/06/03	4.56	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	**4.83**
	06/02/04	0.78	1	ND(0.5)	ND(1.5)	ND(0.05)	**38.4**
	10/11/04	2.27	1.3	ND(0.5)	ND(1.5)	ND(0.05)	**33.1**
	05/27/05	**47**	ND(0.5)	ND(0.5)	ND(1)	0.121	**3.89**
	10/12/05	**19**	ND(0.5)	ND(0.5)	ND(1.5)	0.0697	**2.55**
	07/13/06	1.1	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	**1.73**
	11/06/06	1.64	ND(0.5)	ND(0.5)	1.65	ND(0.05)	**2.93**
	06/07/07	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	1.31
	02/06/08	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	**2.69**
	05/08/08	1.3	ND(2)	ND(2)	ND(4)	ND(0.1)	**3.62**
	10/28/08	1.23	ND(2)	ND(2)	ND(4)	ND(0.1)	**1.8**
	05/19/09	0.849	ND(2)	ND(2)	ND(4)	ND(0.1)	0.949
	11/03/09	2.26	ND(2)	ND(2)	ND(4)	ND(0.1)	0.407 J
	05/04/10	3.37	ND(2)	ND(2)	3.48	ND(0.1)	--
	05/11/11	**8.25**	ND(2)	ND(2)	ND(4)	ND(0.1)	--
	05/17/12	3.69	ND(1)	ND(1)	ND(3)	ND(0.1)	--
	05/17/13	**10.4**	ND(1)	ND(1)	ND(3)	ND(0.1)	--
	09/19/13	0.74	ND(1)	ND(1)	ND(3)	ND(0.1)	--
2020 ADEC GW Table C		4.6	1,100	15	190	2.2	1.5

Notes:
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DRO Diesel Range Organics
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-- Not Analyzed
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TABLE A-1 HISTORICAL GROUNDWATER ANALYTICAL DATA
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	GRO (mg/L)	DRO (mg/L)
PW-15	07/08/17	0.17	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	1.18
PW-16	08/10/98	ND(1)	ND(1)	ND(1)	ND(1)	0.15	**1.7**
PW-17	08/10/98	**10**	6.3	1.1	2.4	0.18	**16**
PW-18	08/10/98	**45**	19	11	130	0.55	**2.5**
	11/03/99	**18**	2.2	ND(2)	33	0.18	0.81
	05/26/00	**5.44**	3.29	14.3	79.4	0.46	--
	06/08/07	**12.9**	ND(0.5)	ND(0.5)	ND(1.5)	0.054	0.441
	05/07/08	**10.4**	ND(2)	ND(2)	ND(4)	ND(0.1)	1.04
	05/19/09	**7.42**	ND(2)	ND(2)	ND(4)	ND(0.1)	ND(0.87)
	05/04/10	**8.93**	ND(2)	ND(2)	2.03	ND(0.1)	--
	05/11/11	**18.6**	ND(2)	ND(2)	ND(4)	ND(0.1)	--
	05/17/12	**16.4**	ND(1)	ND(1)	ND(3)	ND(0.1)	--
	05/16/13	**8.12**	ND(1)	ND(1)	ND(3)	ND(0.1)	--
	06/05/14	**10.1**	ND(1)	ND(1)	ND(3)	ND(0.1)	1.08
	10/09/14	**12**	ND(1)	ND(1)	ND(3)	ND(0.1)	1.13
	05/19/15	**25.1**	ND(1)	ND(1)	ND(2)	ND(0.1)	0.835
	10/14/15	**23.4**	ND(1)	ND(1)	ND(2)	ND(0.1)	**2.31**
	06/16/16	**28.4**	ND(1)	ND(1)	ND(3)	ND(0.1)	0.812
	10/13/16	**19.5**	ND(1)	ND(1)	ND(3)	ND(0.1)	**1.54 J-**
	06/02/17	**16.1**	ND(1)	ND(1)	ND(3)	ND(0.1)	0.925 J-
	10/12/17	**19.2**	ND(1)	ND(1)	ND(2)	ND(0.1)	1.28
	05/31/18	**21.9**	ND(1)	ND(1)	ND(3)	ND(0.1)	0.982
	10/11/18	**21.7**	ND(1)	ND(1)	ND(3)	ND(0.1)	1.4
	04/19/19	**25**	ND(1)	ND(1)	ND(3)	ND(0.1)	1.21
	10/17/19	**30.7**	ND(1)	ND(1)	ND(3)	ND(0.1)	1.01
	10/09/20	**35.1**	ND(1)	ND(1)	ND(3)	0.115	**2.47**
PW-19B	08/10/98	**6900**	700	**440**	**1600**	**20**	**5.5**
	11/02/99	**2400 J**	100 J	**84 J**	**370 J**	**6.7 J**	--
	09/14/00	**4330**	ND(100)	**ND(100)**	ND(100)	**9.99**	**5.99**
	06/05/01	**880**	ND(2)	ND(2)	ND(2)	**2.29**	**4.49**
	10/02/01	**1910**	2.13	10.8	12.6	**3.63**	0.526
	10/18/02	**12600**	ND(200)	**377**	**884**	**26.6**	**5.81**
	06/25/03	**3270**	1.25	14.3	7.12	2.05	**2.14**
	11/06/03	**11500**	ND(100)	**511**	**1000**	**26.8**	**6.01**
	06/02/04	**8210 J**	51.7	**242**	**302**	**16.2**	**10.9**
	10/11/04	**1670**	ND(0.5)	**15.8**	12.1	**3.35**	**7.39**
	05/27/05	**12200**	ND(25)	**144**	ND(50)	**25.4**	**6.54**
	10/11/05	**12600**	ND(100)	**362**	**1140**	**38.5**	**6.3**
	11/07/06	**9890**	91.6	**570**	**1870**	**34.4**	**5.49**
	06/08/07	**1810**	ND(10)	ND(10)	ND(30)	**5.09**	**2.62**
	05/07/08	**5900**	ND(200)	**319**	**458**	**12.8**	**3.2**
	05/19/09	**13000**	ND(200)	**ND(200)**	**ND(400)**	**24.4**	**4.57**
	11/04/09	**2840**	10.2	**81.1**	137	**5.28**	**3.58**
	05/04/10	**4240 J**	81.5 J	6.31 J	8.08 J	**6.63**	--
	05/11/11	**50**	ND(2)	ND(2)	ND(4)	ND(0.1)	--
	05/17/12	**3500 J**	9.07 J	9.03 J	11.3 J	**3.85**	--
2020 ADEC GW Table C		4.6	1,100	15	190	2.2	1.5

Notes:
BOLD The concentration or reporting limit exceeds the 18 AAC 75 Groundwater Cleanup Level
GRO Gasoline Range Organics
DRO Diesel Range Organics
ND Not Detected
-- Not Analyzed
J - Estimated concentration
J+ - Estimated concentration, may be biased high
UJ - Estimated reporting limit

TABLE A-1 HISTORICAL GROUNDWATER ANALYTICAL DATA
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	GRO (mg/L)	DRO (mg/L)
PW-19B	05/16/13	**217**	ND(1)	ND(1)	ND(3)	0.463	--
PW-20	10/26/99	**ND(50)**	ND(50)	**2300**	**16000**	**69**	--
	05/26/00	**34.8 J**	117 J	**1320 J**	**10380 J**	**27**	1.44
	09/13/00	**19**	ND(20)	**360**	**3455**	**10.8**	1.35
	06/05/01	**21.7**	44.7	**149**	**934**	**5.58**	1.2
	10/02/01	**27.6 J**	8.36 J	**143 J**	**913 J**	**6.97**	1.06
	10/18/02	**39**	2.03	**70**	**295**	1.81	1.21
	06/25/03	**88.1**	2.86	**77.5**	**630**	**4.73**	**1.59**
	11/06/03	**8.65**	2.29	**48.9**	77.9	0.779	**2.36**
	10/11/04	**39.6**	0.86	**26.6**	148	1.12	**21.6**
	05/26/05	**8.11**	1.49	**47**	**229**	**3.01**	0.672
	10/12/05	**61.5**	1.34 J	**44**	**360**	**4.87**	**1.93**
	11/06/06	**29.9**	ND(5)	**30.6**	**360**	**5.28**	0.747
	06/08/07	2.39	ND(0.5)	1.72	20	0.289	1.48
	05/08/08	**7.69**	8.41	4.63	66.2	0.567	0.676
	10/28/08	**7.27**	8.41	5.04	56.3	0.478	0.715
	05/19/09	**8.49**	ND(2)	3.2	ND(62.4)	0.584	ND(0.8)
	05/04/10	**21.2 J**	ND(2)	**17.9 J**	174 J	1.63 J	--
	05/11/11	**33.2**	53.2	**39.3**	**235**	**3.25 J**	--
	05/17/12	**20.1**	ND(1)	12.4	75.9	0.904 J	--
	07/07/17	0.98	17.1	1.63	6.57	0.494	0.858
PW-21	10/26/99	ND(2)	ND(2)	ND(2)	ND(2)	ND(0.1)	--
	05/26/00	0.89	ND(2)	ND(2)	2.1	ND(0.09)	--
	09/14/00	1.78	ND(2)	ND(2)	ND(2)	ND(0.09)	--
	10/03/01	**6.71**	ND(2)	ND(2)	3.66	ND(0.09)	--
	06/04/02	**16.9 J**	7.23 J	**119 J**	**704 J**	**5.88 J**	**2.02**
	10/18/02	2.22	ND(2)	ND(2)	ND(2)	ND(0.09)	**11.6**
	11/06/03	**9.82**	ND(0.5)	1.3	1.93	0.0866	**5.55**
	10/11/04	**5.9**	0.566	ND(0.5)	ND(1.5)	ND(0.05)	**43.8**
	10/12/05	**8.84**	1.68 J	1.05 J	--	0.151	**8.01**
	11/06/06	**4.93**	0.752	0.739	5.39	0.532	**3.4**
	06/08/07	3.59	ND(0.5)	ND(0.5)	ND(1.5)	0.211	**1.66**
	11/04/09	**16.1**	ND(10)	ND(10)	ND(20)	0.121	**4.34**
	05/04/10	0.94	ND(2)	ND(2)	ND(4)	ND(0.1)	**4.12**
	09/21/10	1.14	ND(2)	ND(2)	ND(4)	ND(0.1)	--
	05/11/11	0.72	ND(2)	ND(2)	ND(4)	ND(0.1)	--
	10/13/11	1.19	ND(1)	ND(1)	ND(3)	ND(0.1)	--
	05/17/12	2.7	ND(1)	ND(1)	ND(3)	ND(0.1)	--
	09/27/12	**31.9**	24.5	**20.2**	171	**2.38 J**	--
	09/19/13	1.97	ND(1)	ND(1)	ND(3)	ND(0.1)	--
PW-22	10/26/99	ND(2)	ND(2)	ND(2)	ND(2)	ND(0.09)	1.2
	06/09/00	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	**3.46 J**
	09/14/00	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	**4.63**
	10/02/01	ND(0.5)	ND(2)	ND(2)	2.17	ND(0.09)	--
	11/06/03	0.649	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	**2.17**
	10/11/04	0.616	1.04	ND(0.5)	ND(1.5)	ND(0.05)	**19.3**
2020 ADEC GW Table C		4.6	1,100	15	190	2.2	1.5

Notes:
BOLD The concentration or reporting limit exceeds the 18 AAC 75 Groundwater Cleanup Level
GRO Gasoline Range Organics
DRO Diesel Range Organics
ND Not Detected
-- Not Analyzed
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J+ - Estimated concentration, may be biased high
UJ - Estimated reporting limit

TABLE A-1 HISTORICAL GROUNDWATER ANALYTICAL DATA
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	GRO (mg/L)	DRO (mg/L)
PW-22	10/12/05	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	**5.41**
	11/06/06	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	0.726
	06/07/07	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	**1.87**
	02/06/08	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	**2.26**
	05/08/08	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	**2.13**
	10/28/08	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	1.39
	05/19/09	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	1.26
	11/03/09	ND(0.5)	ND(2)	ND(2)	0.648 J	0.0372 J	0.526 J
	05/04/10	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	--
	05/11/11	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	--
	05/17/12	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	--
	05/17/13	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	--
PW-23	10/25/99	**130**	--	5.2	13	0.76	**7**
	05/26/00	**162 J**	ND(1) J	2.76 J	74.4 J	1.21	**12.2**
	09/14/00	**167**	--	4.23	106	1.5	**9.42**
	06/05/01	**224**	--	5.75	61.8	**2.59**	**9.09**
	10/02/01	**567 J**	8.01 J	9.31 J	**223 J**	**3.66**	**9.98**
	10/18/02	**64.4**	ND(2)	ND(2)	ND(2)	0.306	**4.51**
	06/25/03	**578 J**	ND(5)	**19.2**	**368**	**4.75**	**7.45**
	11/06/03	**29.1**	ND(0.5)	0.806	14.8	0.532	**2.07**
	06/02/04	**692**	5.07	13.7	**223**	**4.03**	**10.3**
	10/11/04	**82.5**	ND(0.5)	2.52	19.2	0.73	**5.61**
	05/27/05	**662**	ND(2.5)	6.29	105	**2.7**	**5.21**
	10/12/05	**88.3**	ND(0.5)	ND(0.5)	1.74	0.469	**1.62**
	07/13/06	**431**	3.96 J	**21.3**	93.3	**2.68**	**7.45**
	11/06/06	**194**	ND(0.5)	1.56	11.3	0.734	**3.17**
	06/07/07	**194**	5.26	11	**204**	**3.1**	**7.9**
	02/06/08	**173**	ND(0.5)	**17.2**	**258**	**7.54**	**8.31**
	05/08/08	**30.3**	ND(2)	ND(2)	7.96	0.247	**1.83**
	10/28/08	**117**	ND(20)	**ND(20)**	161	**3.01**	**4.28**
	05/19/09	**8.04**	ND(2)	ND(2)	ND(2.38)	0.112	**8.39**
	11/04/09	**75.9**	ND(10)	ND(10)	11.5 J	0.258 J	**3.44**
	05/04/10	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	--
	09/21/10	**57.6 J**	15.6 J	4.42 J	39.7 J	1.2 J	--
	05/11/11	2.38	ND(2)	ND(2)	ND(2.38)	ND(0.1)	--
	10/13/11	**10.8**	1.57	2.78	43.3	1.46 J	--
	05/17/12	0.55	ND(1)	ND(1)	ND(3)	ND(0.1)	--
	09/27/12	**13.8**	ND(1)	ND(1)	29.1	0.282 J	--
	05/17/13	**6.02**	ND(1)	1.99	20.1	0.34	--
	09/19/13	**15.2**	ND(1)	1.6	32.7	1.21 J	--
	07/08/17	1.24	ND(0.5)	0.37	3.39	0.145	**3.19**
PW-24	10/25/99	**280**	16	**38**	**900**	**5.5**	**11**
	05/26/00	**108 J**	7.73 J	8.12 J	**513 J**	**2.7**	**9.7**
	09/13/00	**115**	ND(10)	13.8	**911**	**4.91**	**8.25**
	06/05/01	**29.2 J**	ND(2)	ND(2)	**321**	1.85	**7.38 J**
	10/02/01	**17.5 J**	ND(2)	3.53 J	**276 J**	1.4	**7.96**
2020 ADEC GW Table C		4.6	1,100	15	190	2.2	1.5

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DRO Diesel Range Organics
ND Not Detected
-- Not Analyzed
J - Estimated concentration
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UJ - Estimated reporting limit

TABLE A-1 HISTORICAL GROUNDWATER ANALYTICAL DATA
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	GRO (mg/L)	DRO (mg/L)
PW-24	10/17/02	**60.6**	ND(2)	9.34	**303**	1.57	**18.8**
	06/25/03	3.43 J	0.784	1.38	114	0.452	**4.9**
	11/06/03	1.04	ND(1)	ND(1)	139	0.834	**3.16**
	06/02/04	**13.1 J**	ND(0.5)	1.39	95.5	0.609	**4.18**
	10/11/04	**5.69**	0.528	ND(0.5)	64.8	0.629	**5.49**
	05/26/05	**16.4**	ND(0.5)	6.02	175	0.95	**2.09**
	10/12/05	**5.77 J**	1.02 J	1.52	69.4	1.04	**1.98**
	07/13/06	2.59	ND(0.5)	2.4	46.4	0.518	**4.32**
	11/06/06	**11.2**	ND(0.5)	ND(0.5)	**7690**	0.242	**3.16**
	05/19/09	**22.7**	ND(2)	3.97	ND(93.6)	1.26 J	**3.4**
	07/07/17	**21.2**	0.48	7.43	**238.37**	1.53	**6.65**
PW-24A	06/07/07	**23.7**	ND(10)	**24.8**	**788**	**5.15**	**12.3**
	02/06/08	**16.7**	ND(5)	6.45	176	**2.29**	**10.4**
	10/28/08	**26.8**	ND(2)	ND(2)	43.5	0.452	**1.77**
	11/04/09	**17.5**	ND(1)	8.22	135	1.89 J	**5.76**
	05/04/10	ND(0.5) J	ND(2)	ND(2)	23.4	0.515	--
	09/21/10	4.27	ND(2)	ND(2)	50.6	0.804	--
	05/11/11	0.56 J	ND(2) J	ND(2) J	ND(4) J	ND(0.1) J	--
	10/13/11	**15.2**	3.95	8.34	170	1.4 J	--
	05/17/12	1.32	ND(1)	ND(1)	51.3	0.709 J	--
	09/27/12	**9.95**	ND(1)	10	**197**	1.55 J	--
	05/17/13	3.97	ND(1)	2.99	62.1	0.642	--
	09/19/13	3.74	ND(1)	4.92	105	0.793 J	--
PW-25	11/02/99	**810 J**	ND(10) J	**25 J**	13 J	**3 J**	**9.8**
	05/26/00	**1000 J**	ND(10) J	11.6 J	10.4 J	**2.3**	**9.35**
	09/13/00	**183**	ND(2)	8.52	6.83	0.547	**10.1**
	06/05/01	**29.2**	ND(2)	ND(2)	**321**	1.85	**7.38**
	10/03/01	**133 J**	ND(2)	4.11 J	6.41 J	0.41	**7.58**
	10/17/02	1.07	ND(2)	2.8	2.4	ND(0.09)	**5.18**
	06/25/03	**9.53**	ND(0.5)	2.28	1.5 J	0.0835	**7.04**
	11/06/03	0.516	0.685	ND(0.5)	3.2	0.101	**4.2**
	06/02/04	**7.373**	1.37 J	0.652 J	4.57 J	0.0885	**4.59**
	10/11/04	0.709	0.541 J	1.63 J	1.68	0.191	**12**
	05/26/05	**120**	ND(0.5)	5.64	9.36	0.36	**3.74**
	10/12/05	**18**	ND(0.5)	2.23	3.1	0.142	**4.06**
	07/13/06	1.89	ND(0.5)	0.914	ND(1.5)	ND(0.05)	**1.79**
RW-PL	10/26/93	**22000**	**18000**	**2500**	**21000**	**120**	**5.4**
	05/13/98	**3860**	593	**612**	**2960**	**13**	0.336
	08/12/98	**16000**	**8800**	**2000**	**9800**	**84**	**5.3**
	11/01/99	**17000**	**5100**	**2500**	**17000**	**97**	**9.3**
	05/26/00	**526 J**	264 J	**81.4 J**	**658 J**	**3.7**	**2.12**
	09/13/00	**7630**	287	**558**	**1229**	**21.5**	**2.07**
	06/06/01	**572 J**	13	**76.7**	**217 J**	**2.62**	1.32
	10/03/01	**3070 J**	94.1 J	**268 J**	**656 J**	**9.05**	**1.68**
	06/25/03	**38.6**	2.38	4.81	28.3	0.198	**7.42**
	06/02/04	**106**	1.07	**16.2**	34.2	0.352	0.88
2020 ADEC GW Table C		4.6	1,100	15	190	2.2	1.5

Notes:
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GRO Gasoline Range Organics
DRO Diesel Range Organics
ND Not Detected
-- Not Analyzed
J - Estimated concentration
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UJ - Estimated reporting limit

TABLE A-1 HISTORICAL GROUNDWATER ANALYTICAL DATA
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	GRO (mg/L)	DRO (mg/L)
RW-PL	10/11/04	4.26	ND(0.5)	1.24	ND(1.5)	ND(0.05)	0.852
	05/25/05	**61.7**	0.651	**15.2**	10.4	0.195	0.717
	10/11/05	2.7	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	1.03
	11/07/06	**99.9**	30.6	**28.5**	167	1.11	**4.27**
	06/06/07	**87.3**	13.4	2.04	11	0.327	0.435
	05/15/08	0.705	ND(2)	ND(2)	ND(4)	ND(0.1)	**2.19**
	10/28/08	**60.3**	ND(10)	ND(10)	ND(20)	ND(0.5)	**3.89**
	05/18/09	**20.7**	ND(2)	ND(2)	ND(2.79)	ND(0.1)	1.15
	11/05/09	**490**	ND(10)	ND(10)	ND(20)	1.04 J	**2.05**
	05/04/10	**142**	ND(2)	ND(2)	ND(4)	0.283	--
	10/13/11	**407**	ND(1)	8.53	ND(3)	0.641	--
	09/27/12	**101**	ND(1)	1.02	ND(3)	0.218	--
	06/04/14	**66.2**	ND(1)	ND(1)	ND(3)	0.163	1.03
	10/09/14	**42.1**	ND(1)	ND(1)	ND(3)	0.121	0.926
	05/19/15	**505**	ND(1)	5.62	3.77	0.834	ND(0.6)
	10/14/15	**97.7**	ND(1)	ND(1)	ND(2)	0.2	1.13
	06/15/16	**373**	ND(1)	ND(1)	ND(3)	0.828	1.1
	10/13/16	**40.1**	ND(1)	ND(1)	ND(3)	0.134	0.955 J-
	06/02/17	**73.1**	ND(1)	ND(1)	ND(3)	0.165	1.08 J-
	10/12/17	**9.12**	ND(1)	ND(1)	ND(2)	ND(0.1)	0.878
	05/31/18	**49.9**	ND(1)	ND(1)	ND(3)	0.134	0.876
	10/11/18	**14.8**	ND(1)	ND(1)	ND(3)	ND(0.1)	**2.61**
	10/17/19	**185 J+**	ND(1)	2.94 J+	13.1 J+	0.471	1.29
	10/09/20	3.06	ND(1)	ND(1)	ND(3)	ND(0.1)	**1.58**
RW-W	10/26/93	2	ND(2)	ND(5)	22	0.23	**2.4**
SS-2	05/13/98	**2710**	**1400**	**606**	**4620**	**16**	**7.75**
	08/12/98	**3600**	**4300**	**810**	**7100**	**36**	**7.1**
	05/07/08	**354**	8.89	**19**	177	1.29	**22.4**
	05/18/09	**654**	7.92 J	**40.5 J**	**295 J**	1.66 J	**19.4 J**
	11/05/09	**992**	41.5	**83.5**	**696**	**2.31 J**	**5.42**
	07/11/17	**1530**	4.53	**22.8**	**832**	**3.51**	**11.3**
TW-1	02/06/08	**253**	63.9	**108**	**865**	**4.2**	**180 J**
	05/07/08	**424**	198	**154**	**1180**	**4.39**	**12.4**
	05/19/09	**319**	161	**78.9**	**794**	**3.5**	**8.49**
	05/04/10	**262**	186	**104**	**1225**	**4.03**	--
TW-3	02/06/08	**569**	598	**270**	**2160**	**10.6**	**174**
VTP-2	11/06/06	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	**10.1**
	06/06/07	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	ND(0.424)
MW-31	06/02/17	**231**	2.79	**75.8**	**960**	**6.05 J+**	--
MW-32	06/02/17	**421**	ND(1)	**39.7**	**467**	2.13 J+	**18.6 J-**
MW-33	10/12/17	4.07	1.03	**28.1**	58.49 J	0.649 J+	**39.5 J**
	05/31/18	**13.1**	ND(1)	**22.7**	45.4	0.464	**9.36**
	10/11/18	**10.6**	ND(1)	**52.8**	93.6	0.452	**5.28**
	04/19/19	2.68	ND(1)	11.5	23	0.465	**8.12 J**
	10/17/19	1.78	ND(1)	3.14	5.11	ND(0.1)	**2.53**
	10/09/20	4.24	ND(1)	**89.5**	122	0.645 J+	**7.06**
2020 ADEC GW Table C		4.6	1,100	15	190	2.2	1.5

Notes:
BOLD The concentration or reporting limit exceeds the 18 AAC 75 Groundwater Cleanup Level
GRO Gasoline Range Organics
DRO Diesel Range Organics
ND Not Detected
-- Not Analyzed
J - Estimated concentration
J+ - Estimated concentration, may be biased high
UJ - Estimated reporting limit

TABLE A-2 HISTORICAL SURFACE WATER SAMPLING DATA
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	GRO (mg/L)	DRO (mg/L)	TAH (ug/L)	TAqH (ug/L)
SDMH	06/07/07	18.8	15.9	9.56	61	0.364	1.39	**105.26**	--
	09/25/07	2.81	1.97	0.811	8.77	0.0568	0.638	**14.361**	--
SDMH-N	11/13/07	9.21	ND(0.5)	ND(0.5)	2.57	0.0724	0.577	**12.28**	--
	02/06/08	42.4	ND(0.5)	2.62	12.3	0.284	2	**57.57**	--
	05/07/08	4.69	ND(2)	ND(2)	7.44	ND(0.1)	0.963	**14.13**	--
	10/28/08	23.1	ND(10)	ND(10)	ND(20)	ND(0.5)	1.66 J	**43.1**	--
	05/19/09	9.73	ND(2)	ND(2)	ND(2.29)	ND(0.1)	1.62	**12.875**	--
	06/15/09	13.2	ND(2)	ND(2)	3.09	ND(0.1)	1.43	**18.29**	--
	11/03/09	13.3	ND(1)	ND(1)	2.21	--	--	**16.51**	--
	05/04/10	5.49	ND(2)	ND(2)	2.03	ND(0.1)	--	9.52	--
	09/20/10	12.7	ND(2)	ND(2)	ND(4)	ND(0.1)	--	**16.7**	--
	05/12/11	7.96	ND(2)	ND(2)	ND(2.24)	ND(0.1)	--	**11.08**	--
	10/13/11	13.7	ND(1)	ND(1)	2.67	ND(0.1)	--	**16.62**	--
	05/17/12	5.92	ND(1)	ND(1)	ND(3)	ND(0.1)	--	8.42	--
	09/28/12	5.28	ND(1)	ND(1)	ND(3)	ND(0.1)	--	7.78	--
	05/17/13	16.8	1.29	1.12	ND(3)	0.101	--	**20.71**	--
	09/19/13	5.86	ND(1)	ND(1)	ND(3)	ND(0.1)	--	8.36	--
	06/09/14	8.5	ND(1)	ND(1)	ND(3)	ND(0.1)	1.14	**11**	--
	10/09/14	22.4	ND(1)	ND(1)	2.05	0.102	1.01	**25.45**	--
	05/19/15	7.49	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.682)	9.49	--
	10/15/15	7.07	ND(1)	ND(1)	3.44	ND(0.1)	ND(0.664)	**11.51**	--
	06/16/16	8	ND(1)	ND(1)	ND(3)	ND(0.1)	0.819	**11.5**	--
	10/13/16	8.1	ND(1)	ND(1)	ND(3)	ND(0.1)	0.955 J-	**10.6**	--
	06/02/17	6.71	ND(1)	ND(1)	ND(3)	ND(0.1)	0.603 J-	9.81	--
	07/12/17	0.77	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	ND(0.294)	4.01	4.47532
	10/12/17	3.46	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.652)	7.6	--
	05/31/18	5.3	ND(1)	ND(1)	ND(3)	ND(0.1)	0.729	8.4	--
	10/11/18	4.5	ND(1)	ND(1)	ND(3)	ND(0.1)	0.761	7.6	--
	04/19/19	5.98	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.61)	9	--
18 AAC 70 Surface Water		NA	NA	NA	NA	NA	NA	10	15

Notes:
BOLD The concentration or reporting limit exceeds the 18 AAC 70, Surface Water Quality Criterion
GRO Gasoline Range Organics
DRO Diesel Range Organics
TAH Total Aromatic Hydrocarbons
TAqH Total Aqueous Hydrocarbons
ND Not Detected
-- Not Sampled/Analyzed

J - Estimated concentration

TABLE A-2 HISTORICAL SURFACE WATER SAMPLING DATA
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	GRO (mg/L)	DRO (mg/L)	TAH (ug/L)	TAqH (ug/L)
SDMH-N	10/17/19	5.02	ND(1)	ND(1)	ND(3)	ND(0.1)	0.98	8.12	--
	10/09/20	10.4	ND(1)	ND(1)	ND(3)	ND(0.1)	1.69	**13.5**	--
SDMH-S	11/13/07	9.84	ND(0.5)	ND(0.5)	2.35	0.077	0.662	**12.69**	--
	02/06/08	3.49	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	0.85	4.74	--
	05/07/08	3.1	ND(2)	ND(2)	2.65	ND(0.1)	0.59	7.75	--
	10/28/08	3.25	ND(2)	ND(2)	ND(4)	ND(0.1)	1.46 J	7.25	--
	05/19/09	11.1	ND(2)	ND(2)	ND(2.26)	ND(0.1)	1.62	**14.23**	--
	06/15/09	11.8	ND(2)	ND(2)	2.29	ND(0.1)	1.27	**16.09**	--
	11/03/09	27.5	ND(1)	1.17	4.27	--	--	**33.44**	--
	05/04/10	5.78	ND(2)	ND(2)	ND(4)	ND(0.1)	--	9.78	--
	09/21/10	12.6	ND(2)	ND(2)	ND(4)	ND(0.1)	--	**16.6**	--
	06/02/17	ND(0.5) UJ	ND(1) UJ	ND(1) UJ	ND(3) UJ	ND(0.1) UJ	0.92 J-	ND(3.4)	--
	07/12/17	7.34	ND(0.5)	0.37	1.04	0.0332	0.306	**10.44**	--
	10/12/17	7	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.636)	8.24	--
	05/31/18	3.71	ND(1)	ND(1)	ND(3)	ND(0.1)	0.7	6.81	--
	10/11/18	5.14	ND(1)	ND(1)	ND(3)	ND(0.1)	0.916	8.24	--
	04/19/19	5.59	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.605)	8.69	--
	10/17/19	5.24	ND(1)	ND(1)	ND(3)	ND(0.1)	1.16	8.34	--
	10/09/20	14.7	6.28	1.4	6.22	0.109	1.72	**28.6**	--
SW-1	05/26/05	8.98	ND(0.5)	0.511	1.74	ND(0.08)	--	**11.481**	--
	10/11/05	5.09	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	--	6.34	--
SW-2	05/26/05	ND(0.5)	ND(0.5)	ND(0.5)	ND(1)	ND(0.08)	--	1.5	--
	10/11/05	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	--	1.5	--
	06/07/07	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	ND(0.42)	1.5	--
	09/25/07	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	ND(0.403)	1.5	--
	05/08/08	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	0.715	4.25	--
	05/19/09	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	1.41	4.25	--
	11/04/09	0.34 J	ND(1)	ND(1)	0.36 J	--	--	1.7	--
	05/04/10	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.1)	--	4.25	--
18 AAC 70 Surface Water		NA	NA	NA	NA	NA	NA	10	15

Notes:
BOLD The concentration or reporting limit exceeds the 18 AAC 70, Surface Water Quality Criterion
GRO Gasoline Range Organics
DRO Diesel Range Organics
TAH Total Aromatic Hydrocarbons
TAqH Total Aqueous Hydrocarbons
ND Not Detected
-- Not Sampled/Analyzed

J - Estimated concentration

TABLE A-2 HISTORICAL SURFACE WATER SAMPLING DATA
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	GRO (mg/L)	DRO (mg/L)	TAH (ug/L)	TAqH (ug/L)
SW-2	05/11/11	0.67	ND(2)	ND(2)	ND(4)	ND(0.1)	--	4.67	--
	05/17/12	0.98	ND(1)	ND(1)	ND(3)	ND(0.1)	--	3.48	--
	05/17/13	14.9	1.49	1.03	ND(3)	ND(0.1)	--	**18.92**	--
	06/09/14	2.02	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.6)	4.52	--
	10/09/14	5.64	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.622)	7.39	--
	05/19/15	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.676)	2.25	--
	10/14/15	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.1)	0.72	2.25	--
	06/16/16	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.6)	2.75	--
	10/13/16	0.63	ND(1)	ND(1)	ND(3)	ND(0.1)	0.775 J-	3.13	--
	06/02/17	ND(0.5) UJ	ND(1) UJ	ND(1) UJ	ND(3) UJ	ND(0.1) UJ	ND(0.641) UJ	ND(3.4)	--
	07/12/17	ND(0.2)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	0.272	ND(3.4)	4.22812
	10/12/17	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.636)	ND(3.4)	--
	05/31/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	0.731	ND(3.4)	--
	10/11/18	0.83	ND(1)	ND(1)	ND(3)	ND(0.1)	0.744	3.93	--
	04/19/19	2	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.61)	5.1	--
	10/17/19	0.5	ND(1)	ND(1)	ND(3)	ND(0.1)	1.01	3.6	--
	10/09/20	3.71	ND(1)	ND(1)	ND(3)	ND(0.1)	1.57	6.81	--
SW-2B	11/08/06	18.3	ND(0.5)	ND(0.5)	2.14	0.0877	--	**20.94**	--
	10/28/08	1.59	ND(2)	ND(2)	ND(4)	ND(0.1)	1.37	5.59	--
SW-3	05/26/05	ND(0.5)	0.584	ND(0.5)	ND(1)	ND(0.08)	--	1.584	--
	10/11/05	3.11	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	--	4.36	--
SW-4	05/26/05	38.4	ND(0.5)	4.09	1.68	0.183	--	**44.42**	--
	10/11/05	28.9	ND(0.5)	4.02	11.3	0.179	--	**44.47**	--
	11/08/06	38.9	1.97	6.33	13	0.271	--	**60.2**	--
	06/08/07	23.2	ND(0.5)	4.72	17.7	0.227	0.626	**45.87**	--
	05/07/08	11	ND(2)	3.92	14.6	0.161	0.989	**30.52**	--
	10/28/08	96.1	ND(2)	15.6	39.5	0.534	2.08	**152.2**	--
	05/19/09	5.41	ND(2)	2.74	ND(8.82)	0.152	0.886	**13.56**	--
	11/04/09	12.1	ND(1)	2.73	11.1	--	--	**26.43**	--
18 AAC 70 Surface Water		NA	NA	NA	NA	NA	NA	10	15

Notes:
BOLD The concentration or reporting limit exceeds the 18 AAC 70, Surface Water Quality Criterion
GRO Gasoline Range Organics
DRO Diesel Range Organics
TAH Total Aromatic Hydrocarbons
TAqH Total Aqueous Hydrocarbons
ND Not Detected
-- Not Sampled/Analyzed

J - Estimated concentration

TABLE A-2 HISTORICAL SURFACE WATER SAMPLING DATA
TESORO ALASKA COMPANY, ANCHORAGE TERMINAL 1
ANCHORAGE, ALASKA

Location ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	GRO (mg/L)	DRO (mg/L)	TAH (ug/L)	TAqH (ug/L)
SW-4	05/04/10	21.7	ND(2)	ND(2)	2.75	0.124	--	**26.45**	--
	05/11/11	50.3	ND(2)	ND(2)	ND(4)	0.152	--	**54.3**	--
	05/17/12	48.6	1.43	3.05	ND(3)	0.16	--	**54.58**	--
	05/17/13	18.4	1.11	1.7	2.64	0.112	--	**23.85**	--
	06/09/14	98.1	3.95	3.62	ND(3)	0.259	0.868	**107.17**	--
	10/09/14	74.3	ND(1)	1.75	ND(3)	0.247	ND(0.602)	**78.05**	--
	05/19/15	20.1	ND(1)	ND(1)	ND(2)	0.107	ND(0.61)	**22.1**	--
	10/14/15	8.87	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.61)	**10.87**	--
	06/16/16	9.67	ND(1)	ND(1)	ND(3)	ND(0.1)	0.832	**12.17**	--
	10/13/16	9.73	ND(1)	ND(1)	ND(3)	0.109	0.984 J-	**12.23**	--
	07/12/17	68.8	14.1	0.81	1.92	0.157	0.426	**85.38**	--
SW-5	05/19/15	0.51	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.615)	2.51	--
	10/15/15	2.56	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.625)	4.56	--
	06/16/16	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.664)	2.75	--
	10/13/16	2.07	ND(1)	ND(1)	ND(3)	ND(0.1)	0.755 J-	4.57	--
	06/02/17	ND(0.5) UJ	ND(1) UJ	ND(1) UJ	ND(3) UJ	ND(0.1) UJ	0.665 J-	ND(3.4)	--
	07/12/17	0.27	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	ND(0.283)	3.37	--
	10/12/17	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.652)	ND(3.4)	--
	05/31/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.63)	ND(3.4)	--
	10/11/18	2.51	ND(1)	ND(1)	ND(3)	ND(0.1)	0.809	5.61	--
	04/19/19	3.25	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.615)	6.6	--
	10/17/19	3.33	ND(1)	ND(1)	ND(3)	ND(0.1)	1.01	6.4	--
	10/09/20	405	ND(1)	1.09	ND(3)	1.1	3.85	**408.57**	--
18 AAC 70 Surface Water		NA	NA	NA	NA	NA	NA	10	15

Notes:
BOLD The concentration or reporting limit exceeds the 18 AAC 70, Surface Water Quality Criterion
GRO Gasoline Range Organics
DRO Diesel Range Organics
TAH Total Aromatic Hydrocarbons
TAqH Total Aqueous Hydrocarbons
ND Not Detected
-- Not Sampled/Analyzed

J - Estimated concentration

APPENDIX B

FIELD ACTIVITIES

FIELD ACTIVITIES

Groundwater Monitoring

Groundwater and surface water sampling along with water level gauging was completed October 9, 2020; fluid levels and light non aqueous phase liquid (LNAPL) thicknesses are presented in Table 1. Temperature, pH, dissolved oxygen (DO), oxidation-reduction potential (ORP), conductivity measurements, and turbidity measurements were made before collecting the samples. Samples were collected using a no purge method using disposable bailers and a peristaltic pump with new tubing. Table 2 summarizes the sampling purge data for the June and October events along with the groundwater field parameters for each well.

Groundwater samples were collected from monitoring wells MW-30, MW-33, PW-18, and RW-PL. Surface water samples were collected from SW-2, SW-5, SDMH-S and SDMH-N. Field notes are included in Attachment 1. Sample collection followed the Sampling and Analysis Plan presented in the 2019 Annual Report.

The groundwater and surface water samples were hand-delivered to the SGS North America, Inc. (SGS) laboratory in Anchorage for analysis. The groundwater and surface water samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), by United States Environmental Protection Agency (EPA) method 8021B, gasoline-range organics (GRO), by method AK 101, and diesel-range organics (DRO), by method AK 102.

Purge water generated from sampling activities was containerized in a labeled drum onsite. Following submittal of purge water samples for analysis to SGS there was no remaining volume for disposal.

References

Trihydro Corporation, 2020. *2019 Annual Report*. Tesoro Alaska Company. Anchorage Terminal 1, Anchorage, Alaska. March.

Abbreviations and Acronyms

ADEC	Alaska Department of Environmental Conservation
BTEX	benzene, toluene, ethylbenzene, and xylenes
DO	dissolved oxygen
DRO	diesel-range organics
EPA	United States Environmental Protection Agency
GRO	gasoline-range organics
LNAPL	light non-aqueous phase liquid
ORP	oxidation-reduction potential
PAH	polynuclear aromatic hydrocarbons
QA/QC	quality assessment/ quality control
RLR	rail loading rack

SGS	SGS North America, Inc.
Terminal	Tesoro's Anchorage Terminal 1
TOC	total organic carbon

ATTACHMENT A

SAMPLING FIELD FORMS AND FIELD NOTES

LOW-FLOW GROUNDWATER SAMPLING LOG

Client: Marathon
Project Number: 421f-001-005
Project Name: AT1
Project Location: Anchorage

Sample Date: 10-9-20
Weather: Cloudy
Field Personnel: BJ, BT

MONITORING WELL ID MW-30
Static Water Level: 4.36
Well Diameter (in): 2"
Depth to Bottom (ft BTOC):
Pump Depth: No Purge (Bailer)
Approx. Screen Interval (ft bgs): 4.2 - 16.2
Expected Purge Rate (mL/min): 50-500 mL/min
Expected Purge Volume to Stability (gal):
Laboratory Analysis: BTEX/GRO DRO
Containers/Preservatives: (3) VOA, (2) 250mL

SAMPLE ID: MW-30
Duplicate Sample? (yes) (no)
SAMPLE TIME: 10:50
Duplicate ID: Dup-1 **Time:** 9:00
Total Volume of Water Purged (gal): No Purge

Time	Pumping Rate (mL/min)	Depth to Water (ft-bmp) < 0.33 ft Δ	Temp (deg C) ---	Sp. Con. (mS/cm[C]) +/- 3%	DO (mg/L) +/- 10%	pH (S.U.) +/- 0.1	ORP (mV) +/- 10mV	Turbidity (NTU) +/- 10%	Comments Groundwater appearance, odor, NAPL, purge interruptions, etc.
	~~		10.48	1.329	1.76	6.55	32.8	21.0	clear, slight odor
									TOS is above water level can see screen inside well

LOW-FLOW GROUNDWATER SAMPLING LOG

Client: Marathon
Project Number: 42H-001-005
Project Name: AT1
Project Location: Anchorage

Sample Date: 10-9-20
Weather: Cloudy
Field Personnel: BJ, BT

MONITORING WELL ID MW-33
Static Water Level: 6.45
Well Diameter (in): 2"
Depth to Bottom (ft BTOC):
Pump Depth: Bailer No Purge
Approx. Screen Interval (ft bgs): 5.0 - 10.0
Expected Purge Rate (mL/min): 50-500 mL/min
Expected Purge Volume to Stability (gal):
Laboratory Analysis: BTEX/GRO DRO
Containers/Preservatives: 3 VOA, 2 250ml

SAMPLE ID: MW-33
Duplicate Sample? (yes) (no)
SAMPLE TIME: 10:30
Duplicate ID:
Time:
Total Volume of Water Purged (gal):

Time	Pumping Rate (mL/min)	Depth to Water (ft-bmp) < 0.33 ft Δ	Temp (deg C) ---	Sp. Con. (mS/cm[C]) +/- 3%	DO (mg/L) +/- 10%	pH (S.U.) +/- 0.1	ORP (mV) +/- 10mV	Turbidity (NTU) +/- 10%	Comments Groundwater appearance, odor, NAPL, purge interruptions, etc.
	—	—	10.19	0.903	1.67	6.19	131	1.38	clear, slight HC odor
									water level below screen
									Can see screen inside well TVC

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID PW-18

Client: Marathon
Project Number: 421001-015
Project Name: AJ
Project Location: Anchorage
Sample Date: 10-9-20
Weather: Cloudy
Field Personnel: BJ/BT

Static Water Level: 5.11
Well Diameter (in): 1.25
Depth to Bottom (ft BTOC):
Pump Depth: Peristaltic Pump
Approx. Screen Interval (ft bgs): 4-10
Expected Purge Rate (mL/min): 50-500 mL/min
Expected Purge Volume to Stability (gal):
Laboratory Analysis: BTEX/GRO DRO
Containers/Preservatives: 3 VOA, 2 250ml

SAMPLE ID: PW-18
SAMPLE TIME: 12:10

Duplicate Sample? (yes) (no)
Duplicate ID: **Time:**

Total Volume of Water Purged (gal): 0.1

Time	Pumping Rate (mL/min)	Depth to Water (ft-bmp) < 0.33 ft Δ	Temp (deg C) ---	Sp. Con. (mS/cm[C]) +/- 3%	DO (mg/L) +/- 10%	pH (S.U.) +/- 0.1	ORP (mV) +/- 10mV	Turbidity (NTU) +/- 10%	Comments Groundwater appearance, odor, NAPL, purge interruptions, etc.
	—	—	16.61	8.409	0.96	6.32	6.1	16.64	Clear, no odor

LOW-FLOW GROUNDWATER SAMPLING LOG

Client: Marathon
Project Number: 424-02005
Project Name: ATI
Project Location: Anchorage

Sample Date: 11-9-20
Weather: Cloudy
Field Personnel: BJ / BT

MONITORING WELL ID RW-PL
Static Water Level: 4.8
Well Diameter (in): 1.25
Depth to Bottom (ft BTOC):
Pump Depth: Peristaltic Pump
Approx. Screen Interval (ft bgs):
Expected Purge Rate (mL/min): 50-500 mL/min
Expected Purge Volume to Stability (gal):
Laboratory Analysis: BTEX/ GRO PRO
Containers/Preservatives: 3 VOA, 2 250ml

SAMPLE ID: RW-PL
Duplicate Sample? (yes) (no)
SAMPLE TIME: 11:30
Duplicate ID: **Time:**
Total Volume of Water Purged (gal): 0.1

Time	Pumping Rate (mL/min)	Depth to Water (ft-bmp) < 0.33 ft Δ	Temp (deg C) ---	Sp. Con. (mS/cm[C]) +/- 3%	DO (mg/L) +/- 10%	pH (S.U.) +/- 0.1	ORP (mV) +/- 10mV	Turbidity (NTU) +/- 10%	Comments Groundwater appearance, odor, NAPL, purge interruptions, etc.
	———		10.28	1.800	1.65	6.51	11.2	3.11	clear, rotten egg odor

LOW-FLOW GROUNDWATER SAMPLING LOG

Client: Marathon
Project Number: 421f - 001 - 005
Project Name: AT1
Project Location: Anchorage

Sample Date: 10-9-20
Weather: Cloudy
Field Personnel: BJ / AT

MONITORING WELL ID SDMH-N
Static Water Level: 11.8
Well Diameter (in): ~
Depth to Bottom (ft BTOC):
Pump Depth: Dip Cup
Approx. Screen Interval (ft bgs):
Expected Purge Rate (mL/min): 50-500 mL/min
Expected Purge Volume to Stability (gal):
Laboratory Analysis: BTEX/GRO DRO
Containers/Preservatives: 3 VOA 2 250ml

SAMPLE ID: SDMH-N
Duplicate Sample? (yes) (no)
SAMPLE TIME: 1310
Duplicate ID: **Time:**
Total Volume of Water Purged (gal): ~

Time	Pumping Rate (mL/min)	Depth to Water (ft-bmp) < 0.33 ft Δ	Temp (deg C) ---	Sp. Con. (mS/cm[C]) +/- 3%	DO (mg/L) +/- 10%	pH (S.U.) +/- 0.1	ORP (mV) +/- 10mV	Turbidity (NTU) +/- 10%	Comments Groundwater appearance, odor, NAPL, purge interruptions, etc.
			8.57	1,912	7.34	7.22	11.3	9.88	Clear, no odor

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID SDMH-S

Client: Marathon
Project Number: 424-004-005
Project Name: AJT
Project Location: Anchorage

Sample Date: 10-9-20
Weather: Cloudy
Field Personnel: AJ / BT

Static Water Level: 9.49
Well Diameter (in): —
Depth to Bottom (ft BTOC):
Pump Depth: Dip Cup
Approx. Screen Interval (ft bgs):
Expected Purge Rate (mL/min): 50-500 mL/min
Expected Purge Volume to Stability (gal):
Laboratory Analysis: BTEX/GRO DRO
Containers/Preservatives: 3 VOA 2 250ml

SAMPLE ID: SDMH-S
Duplicate Sample? (yes) (no)
SAMPLE TIME: 11:10
Duplicate ID:
Time:
Total Volume of Water Purged (gal): —

Time	Pumping Rate (mL/min)	Depth to Water (ft-bmp) < 0.33 ft Δ	Temp (deg C) ---	Sp. Con. (mS/cm[C]) +/- 3%	DO (mg/L) +/- 10%	pH (S.U.) +/- 0.1	ORP (mV) +/- 10mV	Turbidity (NTU) +/- 10%	Comments Groundwater appearance, odor, NAPL, purge interruptions, etc.
	—		7.71	0.826	5.62	7.01	48.3	3.41	Clear, strong odor Sewage smell

LOW-FLOW GROUNDWATER SAMPLING LOG

Client: Marathon
Project Number: 421t-001-005
Project Name: AT1
Project Location: Anchorage

Sample Date: 10-9-20
Weather: Cloudy
Field Personnel: BJ / BT

MONITORING WELL ID SW-2
Static Water Level: 2.02
Well Diameter (in): —
Depth to Bottom (ft BTOC):
Pump Depth: Dipper cup
Approx. Screen Interval (ft bgs):
Expected Purge Rate (mL/min): 50-500 mL/min
Expected Purge Volume to Stability (gal):
Laboratory Analysis: BTEX/GRO DRO
Containers/Preservatives: 3 VOA, 2x250mL

SAMPLE ID: SW-2
Duplicate Sample? (yes) (no)
SAMPLE TIME: 12:40
Duplicate ID:
Time:
Total Volume of Water Purged (gal): —

Time	Pumping Rate (mL/min)	Depth to Water (ft-bmp) < 0.33 ft Δ	Temp (deg C) ---	Sp. Con. (mS/cm[C]) +/- 3%	DO (mg/L) +/- 10%	pH (S.U.) +/- 0.1	ORP (mV) +/- 10mV	Turbidity (NTU) +/- 10%	Comments Groundwater appearance, odor, NAPL, purge interruptions, etc.
	—	—	7.68	0.888	3.67	7.04	0.8	2.94	clear, no odor

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID SW-5

Client: Marathon
Project Number: 421-001-005
Project Name: ATI
Project Location: Anchorage
Sample Date: 11-9-20
Weather: Cloudy
Field Personnel: BJ / RT

Static Water Level: 3.82
Well Diameter (in): —
Depth to Bottom (ft BTOC):
Pump Depth: Dipper Cup
Approx. Screen Interval (ft bgs):
Expected Purge Rate (mL/min): 50-500 mL/min
Expected Purge Volume to Stability (gal):
Laboratory Analysis: BTEX/GRO PRO
Containers/Preservatives: 3 VOA, 2 PRO

SAMPLE ID: SW-5
SAMPLE TIME: 12:55
Duplicate Sample? (yes) (no)
Duplicate ID: **Time:**
Total Volume of Water Purged (gal): —

Time	Pumping Rate (mL/min)	Depth to Water (ft-bmp) < 0.33 ft Δ	Temp (deg C) ---	Sp. Con. (mS/cm[C]) +/- 3%	DO (mg/L) +/- 10%	pH (S.U.) +/- 0.1	ORP (mV) +/- 10mV	Turbidity (NTU) +/- 10%	Comments Groundwater appearance, odor, NAPL, purge interruptions, etc.
			7.81	1.382	4.97	7.43	10.2	12.81	clear, no odor

APPENDIX C

LABORATORY REPORTS

Laboratory Report of Analysis

To: Trihydro Corporation
312 Tyee Street
Soldotna, AK 99669
(907)529-0100

Report Number: **1205603**

Client Project: **42H-002-005 ATI Fall 2020**

Dear Chris Schultz,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Chuck at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

_____

Chuck Homestead Date
Project Manager
Charles.Homestead@sgs.com

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Case Narrative

SGS Client: **Trihydro Corporation**
SGS Project: **1205603**
Project Name/Site: **42H-002-005 ATI Fall 2020**
Project Contact: **Chris Schultz**

Refer to sample receipt form for information on sample condition.

MW-30 (1205603001) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria. The sample was analyzed twice and results confirm.
8021B - Surrogate recovery for 1,4-difluorobenzene does not meet QC criteria. The sample was analyzed twice and results confirm.

MW-33 (1205603002) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria.

Dup-1 (1205603009) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria. The sample was analyzed twice and results confirm

LCSD for HBN 1812959 [VXX/3652 (1587424) LCSD

AK101 - LCSD recovery for GRO does not meet QC criteria. This analyte was not reported above the LOQ in the associated samples.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

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Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
TNTC	Too Numerous To Count
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
MW-30	1205603001	10/09/2020	10/09/2020	Water (Surface, Eff., Ground)
MW-33	1205603002	10/09/2020	10/09/2020	Water (Surface, Eff., Ground)
PW-18	1205603003	10/09/2020	10/09/2020	Water (Surface, Eff., Ground)
RW-PL	1205603004	10/09/2020	10/09/2020	Water (Surface, Eff., Ground)
SDMH-S	1205603005	10/09/2020	10/09/2020	Water (Surface, Eff., Ground)
SDMH-N	1205603006	10/09/2020	10/09/2020	Water (Surface, Eff., Ground)
SW-2	1205603007	10/09/2020	10/09/2020	Water (Surface, Eff., Ground)
SW-5	1205603008	10/09/2020	10/09/2020	Water (Surface, Eff., Ground)
Dup-1	1205603009	10/09/2020	10/09/2020	Water (Surface, Eff., Ground)
IDW	1205603010	10/09/2020	10/09/2020	Water (Surface, Eff., Ground)
Trip Blank	1205603011	10/09/2020	10/09/2020	Water (Surface, Eff., Ground)

Method	Method Description
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.
AK102	DRO Low Volume (W)
SW8260D TCLP	TCLP Volatile Organic Cmps 8260 Full

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Detectable Results Summary

Client Sample ID: **MW-30**
Lab Sample ID: 1205603001
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	11.0	mg/L
Benzene	1.35	ug/L
Gasoline Range Organics	0.338	mg/L

Client Sample ID: **MW-33**
Lab Sample ID: 1205603002
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	7.06	mg/L
Benzene	4.24	ug/L
Ethylbenzene	89.5	ug/L
Gasoline Range Organics	0.645	mg/L
o-Xylene	2.65	ug/L
P & M -Xylene	120	ug/L
Xylenes (total)	122	ug/L

Client Sample ID: **PW-18**
Lab Sample ID: 1205603003
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	2.47	mg/L
Benzene	35.1	ug/L
Gasoline Range Organics	0.115	mg/L

Client Sample ID: **RW-PL**
Lab Sample ID: 1205603004
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	1.58	mg/L
Benzene	3.06	ug/L

Client Sample ID: **SDMH-S**
Lab Sample ID: 1205603005
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	1.72	mg/L
Benzene	14.7	ug/L
Ethylbenzene	1.40	ug/L
Gasoline Range Organics	0.109	mg/L
o-Xylene	1.67	ug/L
P & M -Xylene	4.55	ug/L
Toluene	6.28	ug/L
Xylenes (total)	6.22	ug/L

Client Sample ID: **SDMH-N**
Lab Sample ID: 1205603006
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	1.69	mg/L
Benzene	10.4	ug/L
P & M -Xylene	2.45	ug/L

Client Sample ID: **SW-2**
Lab Sample ID: 1205603007
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	1.57	mg/L
Benzene	3.71	ug/L

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Detectable Results Summary

Client Sample ID: **SW-5**
Lab Sample ID: 1205603008

Parameter	Result	Units
Semivolatile Organic Fuels		
Diesel Range Organics	3.85	mg/L
Volatile Fuels		
Benzene	405	ug/L
Ethylbenzene	1.09	ug/L
Gasoline Range Organics	1.10	mg/L

Client Sample ID: **Dup-1**
Lab Sample ID: 1205603009

Parameter	Result	Units
Semivolatile Organic Fuels		
Diesel Range Organics	13.1	mg/L
Volatile Fuels		
Benzene	2.08	ug/L
Gasoline Range Organics	0.337	mg/L
Toluene	3.42	ug/L

Client Sample ID: **IDW**
Lab Sample ID: 1205603010

Parameter	Result	Units
Semivolatile Organic Fuels		
Diesel Range Organics	3.54	mg/L

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Results of **MW-30**

Client Sample ID: **MW-30**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603001
Lab Project ID: 1205603

Collection Date: 10/09/20 10:50
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	11.0		0.612	0.184	mg/L	1		10/21/20 20:25
Surrogates								
5a Androstane (surr)	95.7		50-150		%	1		10/21/20 20:25

Batch Information

Analytical Batch: XFC15783
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/21/20 20:25
Container ID: 1205603001-A

Prep Batch: XXX44093
Prep Method: SW3520C
Prep Date/Time: 10/20/20 16:33
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL

Print Date: 10/30/2020 3:13:53PM

Results of **MW-30**

Client Sample ID: **MW-30**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603001
Lab Project ID: 1205603

Collection Date: 10/09/20 10:50
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.338		0.100	0.0310	mg/L	1		10/12/20 21:17
Surrogates								
4-Bromofluorobenzene (surr)	184	*	50-150		%	1		10/12/20 21:17

Batch Information

Analytical Batch: VFC15393
Analytical Method: AK101
Analyst: E.L
Analytical Date/Time: 10/12/20 21:17
Container ID: 1205603001-C

Prep Batch: VXX36529
Prep Method: SW5030B
Prep Date/Time: 10/12/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	1.35		0.500	0.150	ug/L	1		10/12/20 21:17
Ethylbenzene	1.00 U		1.00	0.310	ug/L	1		10/12/20 21:17
o-Xylene	1.00 U		1.00	0.310	ug/L	1		10/12/20 21:17
P & M -Xylene	2.00 U		2.00	0.620	ug/L	1		10/12/20 21:17
Toluene	1.00 U		1.00	0.310	ug/L	1		10/12/20 21:17
Xylenes (total)	3.00 U		3.00	0.930	ug/L	1		10/12/20 21:17
Surrogates								
1,4-Difluorobenzene (surr)	121	*	77-115		%	1		10/12/20 21:17

Batch Information

Analytical Batch: VFC15393
Analytical Method: SW8021B
Analyst: E.L
Analytical Date/Time: 10/12/20 21:17
Container ID: 1205603001-C

Prep Batch: VXX36529
Prep Method: SW5030B
Prep Date/Time: 10/12/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/30/2020 3:13:53PM

Results of **MW-33**

Client Sample ID: **MW-33**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603002
Lab Project ID: 1205603

Collection Date: 10/09/20 10:30
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	7.06		0.625	0.188	mg/L	1		10/21/20 20:35
Surrogates								
5a Androstane (surr)	95.1		50-150		%	1		10/21/20 20:35

Batch Information

Analytical Batch: XFC15783
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/21/20 20:35
Container ID: 1205603002-A

Prep Batch: XXX44093
Prep Method: SW3520C
Prep Date/Time: 10/20/20 16:33
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Print Date: 10/30/2020 3:13:53PM

Results of **MW-33**

Client Sample ID: **MW-33**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603002
Lab Project ID: 1205603

Collection Date: 10/09/20 10:30
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.645		0.100	0.0310	mg/L	1		10/12/20 21:35
Surrogates								
4-Bromofluorobenzene (surr)	190	*	50-150		%	1		10/12/20 21:35

Batch Information

Analytical Batch: VFC15393
Analytical Method: AK101
Analyst: E.L
Analytical Date/Time: 10/12/20 21:35
Container ID: 1205603002-C

Prep Batch: VXX36529
Prep Method: SW5030B
Prep Date/Time: 10/12/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	4.24		0.500	0.150	ug/L	1		10/12/20 21:35
Ethylbenzene	89.5		1.00	0.310	ug/L	1		10/12/20 21:35
o-Xylene	2.65		1.00	0.310	ug/L	1		10/12/20 21:35
P & M -Xylene	120		2.00	0.620	ug/L	1		10/12/20 21:35
Toluene	1.00	U	1.00	0.310	ug/L	1		10/12/20 21:35
Xylenes (total)	122		3.00	0.930	ug/L	1		10/12/20 21:35
Surrogates								
1,4-Difluorobenzene (surr)	105		77-115		%	1		10/12/20 21:35

Batch Information

Analytical Batch: VFC15393
Analytical Method: SW8021B
Analyst: E.L
Analytical Date/Time: 10/12/20 21:35
Container ID: 1205603002-C

Prep Batch: VXX36529
Prep Method: SW5030B
Prep Date/Time: 10/12/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/30/2020 3:13:53PM

Results of **PW-18**

Client Sample ID: **PW-18**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603003
Lab Project ID: 1205603

Collection Date: 10/09/20 12:10
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	2.47		0.588	0.176	mg/L	1		10/21/20 20:45
Surrogates								
5a Androstane (surr)	95.3		50-150		%	1		10/21/20 20:45

Batch Information

Analytical Batch: XFC15783
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/21/20 20:45
Container ID: 1205603003-A

Prep Batch: XXX44093
Prep Method: SW3520C
Prep Date/Time: 10/20/20 16:33
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 10/30/2020 3:13:53PM

Results of **PW-18**

Client Sample ID: **PW-18**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603003
Lab Project ID: 1205603

Collection Date: 10/09/20 12:10
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.115		0.100	0.0310	mg/L	1		10/13/20 13:18
Surrogates								
4-Bromofluorobenzene (surr)	86.6		50-150		%	1		10/13/20 13:18

Batch Information

Analytical Batch: VFC15395
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 10/13/20 13:18
Container ID: 1205603003-E

Prep Batch: VXX36535
Prep Method: SW5030B
Prep Date/Time: 10/13/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	35.1		0.500	0.150	ug/L	1		10/13/20 13:18
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		10/13/20 13:18
o-Xylene	1.00	U	1.00	0.310	ug/L	1		10/13/20 13:18
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		10/13/20 13:18
Toluene	1.00	U	1.00	0.310	ug/L	1		10/13/20 13:18
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		10/13/20 13:18
Surrogates								
1,4-Difluorobenzene (surr)	105		77-115		%	1		10/13/20 13:18

Batch Information

Analytical Batch: VFC15395
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 10/13/20 13:18
Container ID: 1205603003-E

Prep Batch: VXX36535
Prep Method: SW5030B
Prep Date/Time: 10/13/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/30/2020 3:13:53PM

Results of **RW-PL**

Client Sample ID: **RW-PL**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603004
Lab Project ID: 1205603

Collection Date: 10/09/20 11:30
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.58		0.588	0.176	mg/L	1		10/23/20 17:08
Surrogates								
5a Androstane (surr)	96.1		50-150		%	1		10/23/20 17:08

Batch Information

Analytical Batch: XFC15786
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/23/20 17:08
Container ID: 1205603004-A

Prep Batch: XXX44102
Prep Method: SW3520C
Prep Date/Time: 10/21/20 16:04
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 10/30/2020 3:13:53PM

Results of **RW-PL**

Client Sample ID: **RW-PL**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603004
Lab Project ID: 1205603

Collection Date: 10/09/20 11:30
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.100	U	0.100	0.0310	mg/L	1		10/15/20 13:14
Surrogates								
4-Bromofluorobenzene (surr)	72.1		50-150		%	1		10/15/20 13:14

Batch Information

Analytical Batch: VFC15400
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 10/15/20 13:14
Container ID: 1205603004-E

Prep Batch: VXX36546
Prep Method: SW5030B
Prep Date/Time: 10/15/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	3.06		0.500	0.150	ug/L	1		10/15/20 13:14
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		10/15/20 13:14
o-Xylene	1.00	U	1.00	0.310	ug/L	1		10/15/20 13:14
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		10/15/20 13:14
Toluene	1.00	U	1.00	0.310	ug/L	1		10/15/20 13:14
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		10/15/20 13:14
Surrogates								
1,4-Difluorobenzene (surr)	102		77-115		%	1		10/15/20 13:14

Batch Information

Analytical Batch: VFC15400
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 10/15/20 13:14
Container ID: 1205603004-E

Prep Batch: VXX36546
Prep Method: SW5030B
Prep Date/Time: 10/15/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/30/2020 3:13:53PM

Results of **SDMH-S**

Client Sample ID: **SDMH-S**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603005
Lab Project ID: 1205603

Collection Date: 10/09/20 11:10
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.72		0.588	0.176	mg/L	1		10/23/20 17:17
Surrogates								
5a Androstane (surr)	98.9		50-150		%	1		10/23/20 17:17

Batch Information

Analytical Batch: XFC15786
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/23/20 17:17
Container ID: 1205603005-A

Prep Batch: XXX44102
Prep Method: SW3520C
Prep Date/Time: 10/21/20 16:04
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 10/30/2020 3:13:53PM

Results of **SDMH-S**

Client Sample ID: **SDMH-S**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603005
Lab Project ID: 1205603

Collection Date: 10/09/20 11:10
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.109		0.100	0.0310	mg/L	1		10/12/20 23:04
Surrogates								
4-Bromofluorobenzene (surr)	91.4		50-150		%	1		10/12/20 23:04

Batch Information

Analytical Batch: VFC15393
Analytical Method: AK101
Analyst: E.L
Analytical Date/Time: 10/12/20 23:04
Container ID: 1205603005-C

Prep Batch: VXX36529
Prep Method: SW5030B
Prep Date/Time: 10/12/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	14.7		0.500	0.150	ug/L	1		10/12/20 23:04
Ethylbenzene	1.40		1.00	0.310	ug/L	1		10/12/20 23:04
o-Xylene	1.67		1.00	0.310	ug/L	1		10/12/20 23:04
P & M -Xylene	4.55		2.00	0.620	ug/L	1		10/12/20 23:04
Toluene	6.28		1.00	0.310	ug/L	1		10/12/20 23:04
Xylenes (total)	6.22		3.00	0.930	ug/L	1		10/12/20 23:04
Surrogates								
1,4-Difluorobenzene (surr)	106		77-115		%	1		10/12/20 23:04

Batch Information

Analytical Batch: VFC15393
Analytical Method: SW8021B
Analyst: E.L
Analytical Date/Time: 10/12/20 23:04
Container ID: 1205603005-C

Prep Batch: VXX36529
Prep Method: SW5030B
Prep Date/Time: 10/12/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/30/2020 3:13:53PM

Results of **SDMH-N**

Client Sample ID: **SDMH-N**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603006
Lab Project ID: 1205603

Collection Date: 10/09/20 13:10
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.69		0.612	0.184	mg/L	1		10/23/20 17:27
Surrogates								
5a Androstane (surr)	98.1		50-150		%	1		10/23/20 17:27

Batch Information

Analytical Batch: XFC15786
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/23/20 17:27
Container ID: 1205603006-A

Prep Batch: XXX44102
Prep Method: SW3520C
Prep Date/Time: 10/21/20 16:04
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL

Print Date: 10/30/2020 3:13:53PM

Results of **SDMH-N**

Client Sample ID: **SDMH-N**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603006
Lab Project ID: 1205603

Collection Date: 10/09/20 13:10
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.100	U	0.100	0.0310	mg/L	1		10/13/20 13:36
Surrogates								
4-Bromofluorobenzene (surr)	93.2		50-150		%	1		10/13/20 13:36

Batch Information

Analytical Batch: VFC15395
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 10/13/20 13:36
Container ID: 1205603006-D

Prep Batch: VXX36535
Prep Method: SW5030B
Prep Date/Time: 10/13/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	10.4		0.500	0.150	ug/L	1		10/13/20 02:04
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		10/13/20 02:04
o-Xylene	1.00	U	1.00	0.310	ug/L	1		10/13/20 02:04
P & M -Xylene	2.45		2.00	0.620	ug/L	1		10/13/20 02:04
Toluene	1.00	U	1.00	0.310	ug/L	1		10/13/20 02:04
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		10/13/20 02:04
Surrogates								
1,4-Difluorobenzene (surr)	83.4		77-115		%	1		10/13/20 02:04

Batch Information

Analytical Batch: VFC15394
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 10/13/20 02:04
Container ID: 1205603006-C

Prep Batch: VXX36528
Prep Method: SW5030B
Prep Date/Time: 10/12/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/30/2020 3:13:53PM

Results of **SW-2**

Client Sample ID: **SW-2**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603007
Lab Project ID: 1205603

Collection Date: 10/09/20 12:40
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.57		0.625	0.188	mg/L	1		10/23/20 17:37
Surrogates								
5a Androstane (surr)	96.8		50-150		%	1		10/23/20 17:37

Batch Information

Analytical Batch: XFC15786
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/23/20 17:37
Container ID: 1205603007-A

Prep Batch: XXX44102
Prep Method: SW3520C
Prep Date/Time: 10/21/20 16:04
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Print Date: 10/30/2020 3:13:53PM

Results of **SW-2**

Client Sample ID: **SW-2**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603007
Lab Project ID: 1205603

Collection Date: 10/09/20 12:40
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.100	U	0.100	0.0310	mg/L	1		10/13/20 02:22
Surrogates								
4-Bromofluorobenzene (surr)	76.9		50-150		%	1		10/13/20 02:22

Batch Information

Analytical Batch: VFC15394
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 10/13/20 02:22
Container ID: 1205603007-C

Prep Batch: VXX36528
Prep Method: SW5030B
Prep Date/Time: 10/12/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	3.71		0.500	0.150	ug/L	1		10/13/20 02:22
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		10/13/20 02:22
o-Xylene	1.00	U	1.00	0.310	ug/L	1		10/13/20 02:22
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		10/13/20 02:22
Toluene	1.00	U	1.00	0.310	ug/L	1		10/13/20 02:22
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		10/13/20 02:22
Surrogates								
1,4-Difluorobenzene (surr)	82.7		77-115		%	1		10/13/20 02:22

Batch Information

Analytical Batch: VFC15394
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 10/13/20 02:22
Container ID: 1205603007-C

Prep Batch: VXX36528
Prep Method: SW5030B
Prep Date/Time: 10/12/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **SW-5**

Client Sample ID: **SW-5**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603008
Lab Project ID: 1205603

Collection Date: 10/09/20 12:55
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	3.85		0.625	0.188	mg/L	1		10/23/20 17:47
Surrogates								
5a Androstane (surr)	98		50-150		%	1		10/23/20 17:47

Batch Information

Analytical Batch: XFC15786
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/23/20 17:47
Container ID: 1205603008-A

Prep Batch: XXX44102
Prep Method: SW3520C
Prep Date/Time: 10/21/20 16:04
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Print Date: 10/30/2020 3:13:53PM

Results of **SW-5**

Client Sample ID: **SW-5**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603008
Lab Project ID: 1205603

Collection Date: 10/09/20 12:55
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.10		0.500	0.155	mg/L	5		10/13/20 23:53
Surrogates								
4-Bromofluorobenzene (surr)	86.8		50-150		%	5		10/13/20 23:53

Batch Information

Analytical Batch: VFC15396
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 10/13/20 23:53
Container ID: 1205603008-E

Prep Batch: VXX36537
Prep Method: SW5030B
Prep Date/Time: 10/13/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	405		2.50	0.750	ug/L	5		10/13/20 23:53
Ethylbenzene	1.09		1.00	0.310	ug/L	1		10/13/20 03:33
o-Xylene	1.00	U	1.00	0.310	ug/L	1		10/13/20 03:33
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		10/13/20 03:33
Toluene	1.00	U	1.00	0.310	ug/L	1		10/13/20 03:33
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		10/13/20 03:33
Surrogates								
1,4-Difluorobenzene (surr)	101		77-115		%	5		10/13/20 23:53

Batch Information

Analytical Batch: VFC15394
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 10/13/20 03:33
Container ID: 1205603008-C

Prep Batch: VXX36528
Prep Method: SW5030B
Prep Date/Time: 10/12/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VFC15396
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 10/13/20 23:53
Container ID: 1205603008-E

Prep Batch: VXX36537
Prep Method: SW5030B
Prep Date/Time: 10/13/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **Dup-1**

Client Sample ID: **Dup-1**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603009
Lab Project ID: 1205603

Collection Date: 10/09/20 08:00
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	13.1		0.612	0.184	mg/L	1		10/23/20 17:57
Surrogates								
5a Androstane (surr)	101		50-150		%	1		10/23/20 17:57

Batch Information

Analytical Batch: XFC15786
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/23/20 17:57
Container ID: 1205603009-A

Prep Batch: XXX44102
Prep Method: SW3520C
Prep Date/Time: 10/21/20 16:04
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL

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Results of **Dup-1**

Client Sample ID: **Dup-1**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603009
Lab Project ID: 1205603

Collection Date: 10/09/20 08:00
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.337		0.100	0.0310	mg/L	1		10/13/20 13:53
Surrogates								
4-Bromofluorobenzene (surr)	192	*	50-150		%	1		10/13/20 13:53

Batch Information

Analytical Batch: VFC15395
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 10/13/20 13:53
Container ID: 1205603009-E

Prep Batch: VXX36535
Prep Method: SW5030B
Prep Date/Time: 10/13/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	2.08		0.500	0.150	ug/L	1		10/13/20 02:39
Ethylbenzene	1.00 U		1.00	0.310	ug/L	1		10/13/20 02:39
o-Xylene	1.00 U		1.00	0.310	ug/L	1		10/13/20 02:39
P & M -Xylene	2.00 U		2.00	0.620	ug/L	1		10/13/20 02:39
Toluene	3.42		1.00	0.310	ug/L	1		10/13/20 02:39
Xylenes (total)	3.00 U		3.00	0.930	ug/L	1		10/13/20 02:39
Surrogates								
1,4-Difluorobenzene (surr)	114		77-115		%	1		10/13/20 02:39

Batch Information

Analytical Batch: VFC15394
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 10/13/20 02:39
Container ID: 1205603009-C

Prep Batch: VXX36528
Prep Method: SW5030B
Prep Date/Time: 10/12/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **IDW**

Client Sample ID: **IDW**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603010
Lab Project ID: 1205603

Collection Date: 10/09/20 13:35
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	3.54		0.577	0.173	mg/L	1		10/23/20 18:07
Surrogates								
5a Androstane (surr)	95.4		50-150		%	1		10/23/20 18:07

Batch Information

Analytical Batch: XFC15786
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/23/20 18:07
Container ID: 1205603010-A

Prep Batch: XXX44102
Prep Method: SW3520C
Prep Date/Time: 10/21/20 16:04
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Print Date: 10/30/2020 3:13:53PM

Results of **IDW**

Client Sample ID: **IDW**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603010
Lab Project ID: 1205603

Collection Date: 10/09/20 13:35
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **TCLP Volatiles GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0200	U	0.0200	0.00600	mg/L	50	(<0.5)	10/13/20 20:54
Surrogates								
1,2-Dichloroethane-D4 (surr)	114		81-118		%	50		10/13/20 20:54
4-Bromofluorobenzene (surr)	95.3		85-114		%	50		10/13/20 20:54
Toluene-d8 (surr)	99.1		89-112		%	50		10/13/20 20:54

Batch Information

Analytical Batch: VMS20406
Analytical Method: SW8260D TCLP
Analyst: NRB
Analytical Date/Time: 10/13/20 20:54
Container ID: 1205603010-D

Prep Batch: VXX36533
Prep Method: SW5030B
Prep Date/Time: 10/13/20 14:30
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **42H-002-005 ATI Fall 2020**
Lab Sample ID: 1205603011
Lab Project ID: 1205603

Collection Date: 10/09/20 07:30
Received Date: 10/09/20 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.100	U	0.100	0.0310	mg/L	1		10/13/20 12:06
Surrogates								
4-Bromofluorobenzene (surr)	85.2		50-150		%	1		10/13/20 12:06

Batch Information

Analytical Batch: VFC15395
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 10/13/20 12:06
Container ID: 1205603011-A

Prep Batch: VXX36535
Prep Method: SW5030B
Prep Date/Time: 10/13/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.500	U	0.500	0.150	ug/L	1		10/13/20 12:06
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		10/13/20 12:06
o-Xylene	1.00	U	1.00	0.310	ug/L	1		10/13/20 12:06
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		10/13/20 12:06
Toluene	1.00	U	1.00	0.310	ug/L	1		10/13/20 12:06
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		10/13/20 12:06
Surrogates								
1,4-Difluorobenzene (surr)	100		77-115		%	1		10/13/20 12:06

Batch Information

Analytical Batch: VFC15395
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 10/13/20 12:06
Container ID: 1205603011-A

Prep Batch: VXX36535
Prep Method: SW5030B
Prep Date/Time: 10/13/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/30/2020 3:13:53PM

Method Blank

Blank ID: MB for HBN 1812959 [VXX/36528]
Blank Lab ID: 1587420

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205603006, 1205603007, 1205603008, 1205603009

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	64.2	50-150		%

Batch Information

Analytical Batch: VFC15394
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ALJ
Analytical Date/Time: 10/12/2020 9:19:00PM

Prep Batch: VXX36528
Prep Method: SW5030B
Prep Date/Time: 10/12/2020 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1205603 [VXX36528]
Blank Spike Lab ID: 1587423
Date Analyzed: 10/12/2020 21:01

Spike Duplicate ID: LCSD for HBN 1205603 [VXX36528]
Spike Duplicate Lab ID: 1587424
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205603006, 1205603007, 1205603008, 1205603009

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.18	118	1.00	1.22	122	* (60-120)	3.20	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	85.2	85	0.0500	87.7	88	(50-150)	2.80	

Batch Information

Analytical Batch: **VFC15394**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36528**
Prep Method: **SW5030B**
Prep Date/Time: **10/12/2020 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1812959 [VXX/36528]
Blank Lab ID: 1587420

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205603006, 1205603007, 1205603008, 1205603009

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.310J	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	0.930	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	88.9	77-115		%

Batch Information

Analytical Batch: VFC15394
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ALJ
Analytical Date/Time: 10/12/2020 9:19:00PM

Prep Batch: VXX36528
Prep Method: SW5030B
Prep Date/Time: 10/12/2020 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1205603 [VXX36528]
Blank Spike Lab ID: 1587421
Date Analyzed: 10/12/2020 20:44

Spike Duplicate ID: LCSD for HBN 1205603 [VXX36528]
Spike Duplicate Lab ID: 1587422
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205603006, 1205603007, 1205603008, 1205603009

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	116	116	100	119	119	(80-120)	2.50	(< 20)
Ethylbenzene	100	93.4	93	100	98.3	98	(75-125)	5.10	(< 20)
o-Xylene	100	87.9	88	100	92.6	93	(80-120)	5.10	(< 20)
P & M -Xylene	200	183	91	200	192	96	(75-130)	4.90	(< 20)
Toluene	100	103	103	100	106	106	(75-120)	3.20	(< 20)
Xylenes (total)	300	270	90	300	284	95	(79-121)	5.00	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50	103	103	50	98.9	99	(77-115)	4.20	

Batch Information

Analytical Batch: **VFC15394**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36528**
Prep Method: **SW5030B**
Prep Date/Time: **10/12/2020 06:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1812960 [VXX/36529]
Blank Lab ID: 1587425

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205603001, 1205603002, 1205603005

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	88.2	50-150		%

Batch Information

Analytical Batch: VFC15393
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: E.L
Analytical Date/Time: 10/12/2020 8:05:00PM

Prep Batch: VXX36529
Prep Method: SW5030B
Prep Date/Time: 10/12/2020 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1205603 [VXX36529]
Blank Spike Lab ID: 1587426
Date Analyzed: 10/12/2020 19:47

Spike Duplicate ID: LCSD for HBN 1205603 [VXX36529]
Spike Duplicate Lab ID: 1587427
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205603001, 1205603002, 1205603005

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.08	108	1.00	1.05	105	(60-120)	3.00	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	99.8	100	0.0500	95.2	95	(50-150)	4.70	

Batch Information

Analytical Batch: **VFC15393**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **E.L**

Prep Batch: **VXX36529**
Prep Method: **SW5030B**
Prep Date/Time: **10/12/2020 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1812960 [VXX/36529]
Blank Lab ID: 1587425

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205603001, 1205603002, 1205603005

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	0.930	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	98.4	77-115		%

Batch Information

Analytical Batch: VFC15393
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: E.L
Analytical Date/Time: 10/12/2020 8:05:00PM

Prep Batch: VXX36529
Prep Method: SW5030B
Prep Date/Time: 10/12/2020 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/30/2020 3:14:19PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1205603 [VXX36529]
Blank Spike Lab ID: 1587428
Date Analyzed: 10/12/2020 19:29

Spike Duplicate ID: LCSD for HBN 1205603 [VXX36529]
Spike Duplicate Lab ID: 1587429
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205603001, 1205603002, 1205603005

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	108	108	100	110	110	(80-120)	1.70	(< 20)
Ethylbenzene	100	92.6	93	100	92.9	93	(75-125)	0.30	(< 20)
o-Xylene	100	94.5	95	100	93.9	94	(80-120)	0.66	(< 20)
P & M -Xylene	200	184	92	200	185	92	(75-130)	0.08	(< 20)
Toluene	100	99.4	99	100	101	101	(75-120)	2.10	(< 20)
Xylenes (total)	300	279	93	300	279	93	(79-121)	0.17	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50	104	104	50	104	104	(77-115)	0.04	

Batch Information

Analytical Batch: **VFC15393**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **E.L**

Prep Batch: **VXX36529**
Prep Method: **SW5030B**
Prep Date/Time: **10/12/2020 06:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1813005 [VXX/36533]
Blank Lab ID: 1587662

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205603010

Results by **SW8260D TCLP**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.000200U	0.000400	0.000120	mg/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	114	81-118		%
4-Bromofluorobenzene (surr)	97.2	85-114		%
Toluene-d8 (surr)	99.7	89-112		%

Batch Information

Analytical Batch: VMS20406
Analytical Method: SW8260D TCLP
Instrument: Agilent 7890-75MS
Analyst: NRB
Analytical Date/Time: 10/13/2020 2:48:00PM

Prep Batch: VXX36533
Prep Method: SW5030B
Prep Date/Time: 10/13/2020 2:30:00PM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Leaching Blank

Blank ID: LB for HBN 1812795 [TCLP/10865
Blank Lab ID: 1586590

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205603010

Results by **SW8260D TCLP**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.0100U	0.0200	0.00600	mg/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	114	81-118		%
4-Bromofluorobenzene (surr)	95.8	85-114		%
Toluene-d8 (surr)	101	89-112		%

Batch Information

Analytical Batch: VMS20406
Analytical Method: SW8260D TCLP
Instrument: Agilent 7890-75MS
Analyst: NRB
Analytical Date/Time: 10/13/2020 5:58:00PM

Prep Batch: VXX36533
Prep Method: SW5030B
Prep Date/Time: 10/13/2020 2:30:00PM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1205603 [VXX36533]
Blank Spike Lab ID: 1587663
Date Analyzed: 10/13/2020 15:02

Spike Duplicate ID: LCSD for HBN 1205603 [VXX36533]
Spike Duplicate Lab ID: 1587664
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205603010

Results by **SW8260D TCLP**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	0.0300	0.0304	101	0.0300	0.0294	98	(79-120)	3.10	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	0.0300	107	107	0.0300	106	106	(81-118)	0.69	
4-Bromofluorobenzene (surr)	0.0300	96.5	97	0.0300	94.8	95	(85-114)	1.80	
Toluene-d8 (surr)	0.0300	100	100	0.0300	101	101	(89-112)	0.70	

Batch Information

Analytical Batch: **VMS20406**
Analytical Method: **SW8260D TCLP**
Instrument: **Agilent 7890-75MS**
Analyst: **NRB**

Prep Batch: **VXX36533**
Prep Method: **SW5030B**
Prep Date/Time: **10/13/2020 14:30**
Spike Init Wt./Vol.: 0.0300 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 0.0300 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1813009 [VXX/36535]
Blank Lab ID: 1587678

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205603003, 1205603006, 1205603009, 1205603011

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	84.6	50-150		%

Batch Information

Analytical Batch: VFC15395
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ALJ
Analytical Date/Time: 10/13/2020 9:57:00AM

Prep Batch: VXX36535
Prep Method: SW5030B
Prep Date/Time: 10/13/2020 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1205603 [VXX36535]
Blank Spike Lab ID: 1587681
Date Analyzed: 10/13/2020 10:51

Spike Duplicate ID: LCSD for HBN 1205603 [VXX36535]
Spike Duplicate Lab ID: 1587682
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205603003, 1205603006, 1205603009, 1205603011

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.14	114	1.00	1.14	114	(60-120)	0.38	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	92.8	93	0.0500	94.3	94	(50-150)	1.60	

Batch Information

Analytical Batch: **VFC15395**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36535**
Prep Method: **SW5030B**
Prep Date/Time: **10/13/2020 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1813009 [VXX/36535]
Blank Lab ID: 1587678

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205603003, 1205603006, 1205603009, 1205603011

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	0.930	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	100	77-115		%

Batch Information

Analytical Batch: VFC15395
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ALJ
Analytical Date/Time: 10/13/2020 9:57:00AM

Prep Batch: VXX36535
Prep Method: SW5030B
Prep Date/Time: 10/13/2020 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/30/2020 3:14:40PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1205603 [VXX36535]
Blank Spike Lab ID: 1587679
Date Analyzed: 10/13/2020 10:33

Spike Duplicate ID: LCSD for HBN 1205603 [VXX36535]
Spike Duplicate Lab ID: 1587680
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205603003, 1205603006, 1205603009, 1205603011

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	110	110	100	107	107	(80-120)	3.00	(< 20)
Ethylbenzene	100	94.0	94	100	89.1	89	(75-125)	5.40	(< 20)
o-Xylene	100	94.3	94	100	89.4	89	(80-120)	5.30	(< 20)
P & M -Xylene	200	187	94	200	177	88	(75-130)	5.80	(< 20)
Toluene	100	100	100	100	95.6	96	(75-120)	5.00	(< 20)
Xylenes (total)	300	281	94	300	266	89	(79-121)	5.60	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50	104	104	50	105	105	(77-115)	0.82	

Batch Information

Analytical Batch: **VFC15395**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36535**
Prep Method: **SW5030B**
Prep Date/Time: **10/13/2020 06:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1813020 [VXX/36537]
Blank Lab ID: 1587736

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205603008

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	82.5	50-150		%

Batch Information

Analytical Batch: VFC15396
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ALJ
Analytical Date/Time: 10/13/2020 2:05:00PM

Prep Batch: VXX36537
Prep Method: SW5030B
Prep Date/Time: 10/13/2020 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1205603 [VXX36537]
Blank Spike Lab ID: 1587739
Date Analyzed: 10/13/2020 20:55

Spike Duplicate ID: LCSD for HBN 1205603 [VXX36537]
Spike Duplicate Lab ID: 1587740
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205603008

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.05	105	1.00	1.02	102	(60-120)	2.40	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	105	105	0.0500	100	100	(50-150)	5.20	

Batch Information

Analytical Batch: **VFC15396**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36537**
Prep Method: **SW5030B**
Prep Date/Time: **10/13/2020 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

Print Date: 10/30/2020 3:14:51PM

Method Blank

Blank ID: MB for HBN 1813020 [VXX/36537]
Blank Lab ID: 1587736

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205603008

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	88.5	77-115		%

Batch Information

Analytical Batch: VFC15396
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ALJ
Analytical Date/Time: 10/13/2020 2:05:00PM

Prep Batch: VXX36537
Prep Method: SW5030B
Prep Date/Time: 10/13/2020 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1205603 [VXX36537]
Blank Spike Lab ID: 1587737
Date Analyzed: 10/13/2020 20:37

Spike Duplicate ID: LCSD for HBN 1205603 [VXX36537]
Spike Duplicate Lab ID: 1587738
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205603008

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	101	101	100	103	103	(80-120)	2.80	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50	110	110	50	103	103	(77-115)	6.80	

Batch Information

Analytical Batch: **VFC15396**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36537**
Prep Method: **SW5030B**
Prep Date/Time: **10/13/2020 06:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1813086 [VXX/36546]
Blank Lab ID: 1588115

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205603004

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	76.3	50-150		%

Batch Information

Analytical Batch: VFC15400
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ALJ
Analytical Date/Time: 10/15/2020 9:58:00AM

Prep Batch: VXX36546
Prep Method: SW5030B
Prep Date/Time: 10/15/2020 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1205603 [VXX36546]
Blank Spike Lab ID: 1588118
Date Analyzed: 10/15/2020 10:51

Spike Duplicate ID: LCSD for HBN 1205603 [VXX36546]
Spike Duplicate Lab ID: 1588119
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205603004

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.11	111	1.00	1.17	117	(60-120)	5.70	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	84.3	84	0.0500	87.6	88	(50-150)	3.90	

Batch Information

Analytical Batch: **VFC15400**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36546**
Prep Method: **SW5030B**
Prep Date/Time: **10/15/2020 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1813086 [VXX/36546]
Blank Lab ID: 1588115

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205603004

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	0.930	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	101	77-115		%

Batch Information

Analytical Batch: VFC15400
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ALJ
Analytical Date/Time: 10/15/2020 9:58:00AM

Prep Batch: VXX36546
Prep Method: SW5030B
Prep Date/Time: 10/15/2020 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/30/2020 3:15:09PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1205603 [VXX36546]
Blank Spike Lab ID: 1588116
Date Analyzed: 10/15/2020 10:33

Spike Duplicate ID: LCSD for HBN 1205603 [VXX36546]
Spike Duplicate Lab ID: 1588117
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205603004

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	111	111	100	113	113	(80-120)	2.20	(< 20)
Ethylbenzene	100	91.1	91	100	94.2	94	(75-125)	3.30	(< 20)
o-Xylene	100	90.4	90	100	93.5	94	(80-120)	3.40	(< 20)
P & M -Xylene	200	181	90	200	185	93	(75-130)	2.60	(< 20)
Toluene	100	99.3	99	100	100	100	(75-120)	0.72	(< 20)
Xylenes (total)	300	271	90	300	279	93	(79-121)	2.90	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50	104	104	50	106	106	(77-115)	1.70	

Batch Information

Analytical Batch: **VFC15400**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36546**
Prep Method: **SW5030B**
Prep Date/Time: **10/15/2020 06:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1813224 [XXX/44093]
Blank Lab ID: 1588853

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205603001, 1205603002, 1205603003

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	99	60-120		%

Batch Information

Analytical Batch: XFC15783
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: CDM
Analytical Date/Time: 10/21/2020 6:27:00PM

Prep Batch: XXX44093
Prep Method: SW3520C
Prep Date/Time: 10/20/2020 4:33:29PM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 10/30/2020 3:15:17PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1205603 [XXX44093]
Blank Spike Lab ID: 1588854
Date Analyzed: 10/21/2020 18:37

Spike Duplicate ID: LCSD for HBN 1205603 [XXX44093]
Spike Duplicate Lab ID: 1588855
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205603001, 1205603002, 1205603003

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	20	19.9	99	20	20.3	101	(75-125)	2.20	(< 20)
Surrogates									
5a Androstane (surr)	0.4	101	101	0.4	102	102	(60-120)	0.67	

Batch Information

Analytical Batch: **XFC15783**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **CDM**

Prep Batch: **XXX44093**
Prep Method: **SW3520C**
Prep Date/Time: **10/20/2020 16:33**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

Print Date: 10/30/2020 3:15:20PM

Method Blank

Blank ID: MB for HBN 1813274 [XXX/44102]
Blank Lab ID: 1589119

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205603004, 1205603005, 1205603006, 1205603007, 1205603008, 1205603009, 1205603010

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	101	60-120		%

Batch Information

Analytical Batch: XFC15786
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: CDM
Analytical Date/Time: 10/23/2020 4:38:00PM

Prep Batch: XXX44102
Prep Method: SW3520C
Prep Date/Time: 10/21/2020 4:04:34PM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 10/30/2020 3:15:24PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1205603 [XXX44102]
Blank Spike Lab ID: 1589120
Date Analyzed: 10/23/2020 16:48

Spike Duplicate ID: LCSD for HBN 1205603 [XXX44102]
Spike Duplicate Lab ID: 1589121
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205603004, 1205603005, 1205603006, 1205603007, 1205603008, 1205603009, 1205603010

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	20	19.5	98	20	20.8	104	(75-125)	6.50	(< 20)
Surrogates									
5a Androstane (surr)	0.4	100	100	0.4	104	104	(60-120)	3.40	

Batch Information

Analytical Batch: **XFC15786**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **CDM**

Prep Batch: **XXX44102**
Prep Method: **SW3520C**
Prep Date/Time: **10/21/2020 16:04**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

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CHAIN OF CUSTODY RECORD

1205603

p# 359,64 AD

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Instructions: ... out.
Omissions may delay the onset of analysis.

Page 1 of 2

Section 1

CLIENT: Trihydro			
CONTACT: C Schultz		PHONE #: 907-529-0100	
PROJECT NAME: ATI Fall 2020		PROJECT/ PWSID/ PERMIT#: 4214-002-005	
REPORTS TO: C Schultz		E-MAIL: cschultz@trihydro.com	Profile #:
INVOICE TO: Trihydro		QUOTE #:	P.O. #: 20-245WO-L

Section 3 — Preservative: HCL, HCL, None

NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Comp Grab MI (Multi-incremental)	BTEX 8021B GRO AK101 (HCL)	DRO AK102 (HCL)	TCLP Benzene (None)								REMARKS/LOC ID
1AE	MW-30	10-9-20	10:50	Water	5	Grab	3	2									
2AE	MW-33	10-9-20	10:30	↓	↓	↓	↓	↓									
3AE	PW-18	10-9-20	12:10														
4AE	RW-PL	10-9-20	11:30														
5AE	SDMH-S	10-9-20	11:10														
6AE	SDMH-N	10-9-20	13:10														
7AE	SW-2	10-9-20	12:40														
8AE	SW-5	10-9-20	12:55														
9AE	Dup-1	10-9-20	8:00														
10AE	IDW	10-9-20	13:35	↓	↓	↓		3	2								

Section 5

Relinquished By	Date	Time	Received By
(1) B. [signature]	10-9-20	14:21	
(2)			
(3)			
(4)	10/9/20	14:35	Received For Laboratory By: [signature] RJC

Section 4 DOD Project? Yes No

Cooler ID: ______

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 3.3 D23

or Ambient [ ]

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT (circled)

Delivery Method: Hand Delivery [X] Commerical Delivery [ ]

http://www.sgs.com/terms-and-conditions

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SGS North America Inc.
CHAIN OF CUSTODY RECORD

1205603

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Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Section 1

CLIENT: Trihydro	
CONTACT: C Schultz	PHONE #: 907-529-0100
PROJECT NAME: ATI Fall 2020	PROJECT/ PWSID/ PERMIT#: 4214-002-005
REPORTS TO: C Schultz	E-MAIL: cschultz@trihydro.com Profile #:
INVOICE TO: Trihydro	QUOTE #: P.O. #: 20-295WO-2

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Comp Grab MI (Multi-incremental)	Preservative: HCL	Analysis*: BTEX GRO AK101	REMARKS/LOC ID
(1AC)	Trip Blank	10-9-20	07:30	Water				X	

NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS

Section 5

	Date	Time	
Relinquished By: (1) B	10-9-20	14:21	Received By:
Relinquished By: (2)			Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	10/9/20	14:35	Received For Laboratory By:

Section 4

DOD Project? Yes No

Cooler ID:

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 2.3 D23

or Ambient [ ]

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Delivery Method: Hand Delivery [ ] Commerical Delivery [ ]

e-Sample Receipt Form

SGS Workorder #: **1205603** | 1205603

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		Yes — Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
Yes — **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 3.3 °C Therm. ID: D23
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	Yes	
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
	N/A	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	Yes	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition
1205603001-A	HCL to pH < 2	OK
1205603001-B	HCL to pH < 2	OK
1205603001-C	HCL to pH < 2	OK
1205603001-D	HCL to pH < 2	OK
1205603001-E	HCL to pH < 2	OK
1205603002-A	HCL to pH < 2	OK
1205603002-B	HCL to pH < 2	OK
1205603002-C	HCL to pH < 2	OK
1205603002-D	HCL to pH < 2	OK
1205603002-E	HCL to pH < 2	OK
1205603003-A	HCL to pH < 2	OK
1205603003-B	HCL to pH < 2	OK
1205603003-C	HCL to pH < 2	OK
1205603003-D	HCL to pH < 2	OK
1205603003-E	HCL to pH < 2	OK
1205603004-A	HCL to pH < 2	OK
1205603004-B	HCL to pH < 2	OK
1205603004-C	HCL to pH < 2	OK
1205603004-D	HCL to pH < 2	OK
1205603004-E	HCL to pH < 2	OK
1205603005-A	HCL to pH < 2	OK
1205603005-B	HCL to pH < 2	OK
1205603005-C	HCL to pH < 2	OK
1205603005-D	HCL to pH < 2	OK
1205603005-E	HCL to pH < 2	OK
1205603006-A	HCL to pH < 2	OK
1205603006-B	HCL to pH < 2	OK
1205603006-C	HCL to pH < 2	OK
1205603006-D	HCL to pH < 2	OK
1205603006-E	HCL to pH < 2	OK
1205603007-A	HCL to pH < 2	OK
1205603007-B	HCL to pH < 2	OK
1205603007-C	HCL to pH < 2	OK
1205603007-D	HCL to pH < 2	OK
1205603007-E	HCL to pH < 2	OK
1205603008-A	HCL to pH < 2	OK
1205603008-B	HCL to pH < 2	OK
1205603008-C	HCL to pH < 2	OK
1205603008-D	HCL to pH < 2	OK
1205603008-E	HCL to pH < 2	OK
1205603009-A	HCL to pH < 2	OK
1205603009-B	HCL to pH < 2	OK
1205603009-C	HCL to pH < 2	OK
1205603009-D	HCL to pH < 2	OK
1205603009-E	HCL to pH < 2	OK
1205603010-A	HCL to pH < 2	OK
1205603010-B	HCL to pH < 2	OK
1205603010-C	HCL to pH < 2	OK
1205603010-D	No Preservative Required	OK
1205603010-E	No Preservative Required	OK
1205603011-A	HCL to pH < 2	OK
1205603011-B	HCL to pH < 2	OK
1205603011-C	HCL to pH < 2	OK

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
QN - Insufficient sample quantity provided.

APPENDIX D

LABORATORY DATA REVIEW CHECKLISTS AND DATA VALIDATION REPORTS

Tier II Data Validation Report Summary

Client: Andeavor / Tesoro Alaska Company	Laboratory: SGS North America
Project Name: Anchorage Terminal 1	Sample Matrix: Groundwater
Project Number: 42H-002-005 Task 1001	Sample Start Date: 10/09/2020
Date Validated: 12/01/2020	Sample End Date: 10/09/2020
Parameters Included: ▪ Volatile Organic Compounds (VOC) by Test Methods for Evaluating Solid Waste (SW-846) Method 8021B ▪ Toxicity Characteristic Leaching Procedure (TCLP) Benzene by SW-846 Method 1311 and Method 8260D ▪ Gasoline Range Organics (GRO) by Alaska Department of Environmental Conservation (ADEC) Method AK101 ▪ Diesel Range Organics (DRO) by ADEC Method AK102	
Laboratory Project ID: 1205603	
Data Validator: Daran O'Hollearn, Lead Project Scientist	
Reviewer: Charles Ballek, Senior Chemist	

DATA EVALUATION CRITERIA SUMMARY

A Tier II Data Validation was performed by Trihydro Corporation's Chemical Data Evaluation Services Group on the analytical data report package generated by SGS North America (SGS) located in Anchorage, Alaska, evaluating samples from an Andeavor / Tesoro site located in Anchorage, Alaska.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values from:

- Field duplicate pairs
- Laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) pairs

Laboratory accuracy was established by reviewing the demonstrated percent recoveries (%R) of the following items to verify that data are not biased.

- LCS/LCSD samples
- Organic system monitoring compounds (surrogates)

Field accuracy was established by collecting and analyzing the following samples to monitor for possible ambient or cross contamination during sampling and transportation.

- Trip blanks

Method compliance was established by reviewing sample integrity, holding times, detection limits, surrogate recoveries, laboratory blanks, initial and continuing calibrations (where applicable), and the LCS/LCSD percent recoveries against method-specific requirements.

Completeness was evaluated by determining the overall ratio of the number of samples and analyses planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other laboratory and field documents associated with this analytical data set.

Tier II Data Validation Report Summary

SAMPLE NUMBERS TABLE

Client Sample ID	Laboratory Sample Number
MW-30	1205603001
MW-33	1205603002
PW-18	1205603003
RW-PL	1205603004
SDMH-S	1205603005
SDMH-N	1205603006
SW-2	1205603007
SW-5	1205603008
Dup-1	1205603009
IDW	1205603010
Trip Blank	1205603011

Tier II Data Validation Report Summary

The laboratory data were reviewed to evaluate compliance with the methods and the quality of the reported data. Assessment of CoC completeness is included in Item 3 of the Data Validation Checklist. A check mark (✓) indicates that the referenced validation criteria were deemed acceptable, whereas a crossed circle (⊗) indicates validation criteria for which the data have been qualified by the data validator. An empty circle (○) indicates that the specified criterion does not apply to the reviewed data. Details are noted in the tables below.

Validation Criteria

- ✓ Data Completeness
- ✓ CoC Documentation (Item 3)
- ✓ Holding Times and Preservation (Items 6 and 7)
- ○ Initial and Continuing Calibrations (Items 9 and 10)
- ✓ Laboratory Blanks (Items 11 and 12)
- ○ Matrix Spike (MS) and Matrix Spike Duplicate (MSD) (Items 13 and 14)
- ✓ LCS/LCSD (Items 15 and 16)
- ⊗ System Monitoring Compounds (i.e., Surrogates) (Item 17)
- ✓ Trip Blanks (Items 18 and 19)
- ⊗ Field Duplicates (Items 20 and 21)
- ○ Laboratory Duplicates (Item 22)
- ○ Data Relationships (Item 23)

Guidance References

Chemical data validation was conducted in accordance with the United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines for the analyses listed below, or by the appropriate method if not covered in the National Functional Guidelines.

- Data for organic analyses were evaluated according to validation criteria set forth in the USEPA CLP National Functional Guidelines for Organic Superfund Methods Data Review, document number EPA-540-R-2017-002, January 2017 with additional reference to the USEPA CLP National Functional Guidelines for Organic Data Review, document number EPA 540/R-99/008, October 1999.
- Review of field duplicates was conducted according to the USEPA Region 1 - New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018.
- Trihydro Data Validation Variance Documentation, February 2020.
- Project-specific Quality Assurance Project Plans (QAPP) data validation requirements, as applicable.

Tier II Data Validation Report Summary

OVERALL DATA PACKAGE ASSESSMENT

Based on a data validation review, the data are acceptable as delivered. Data qualified by the laboratory are discussed in Item 2 of the Validation Criteria Checklist.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data that are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an R (rejected, data not usable), the data may be used for site evaluation; however, consideration should be given to the reasons for qualification when interpreting sample concentrations. Data points that are assigned an R qualifier should not be used for site evaluation purposes.

If applicable, text was identified in **bold font** in the Validation Criteria Checklist to indicate that further action and/or qualification of the data were required. Data may have been qualified with J data flags by the laboratory if the result was greater than or equal to the method detection limit (MDL) but less than the reporting limit (RL). These laboratory-applied J flags were preserved, if present, and included in the Data Qualification Summary table at the end of this report. If applicable, data validation qualifiers were added for the items noted with crossed circles in the Validation Criteria section above. Please see the Data Qualification Summary table at the end of this report for a complete list of samples and analytes qualified.

If data would be qualified with more than one flag, one qualifier was assigned based on the severity; however, all reasons for qualification were retained. Data that would be qualified with both J+ and J- flags were evaluated based on validation criteria and assigned the appropriate flag. The hierarchy of qualifiers from the most to least severe is as follows:

- R > JB/U > NJ > J+/J- > J/UJ

Data qualifiers used during this validation are included in the following table.

Qualifier	Definition
J	Estimated concentration
J+	The result is an estimated concentration, but may be biased high
UJ	Estimated reporting limit

Data Completeness

The analyses were performed as requested on the CoC records. The associated samples were received by the laboratory and analyzed properly unless otherwise noted in the Criteria Checklist below. The complete data package consisted of 74 data points excluding the trip blank sample. No data points were rejected. The data completeness measure for this data package is calculated to be 100% and is acceptable.

VALIDATION CRITERIA CHECKLIST

1. Was the report free of non-conformances identified by the laboratory? No

Comments: The laboratory identified the following non-conformances regarding the analytical data.

Method 8021B: For sample MW-30, the surrogate recovery for 1,4-difluorobenzene does not meet QC criteria.

Method AK101: Surrogate recoveries for 4-bromofluorobenzene for samples MW-30, MW-33, and Dup-1 do not meet QC criteria.

LCSD recovery for GRO does not meet QC criteria. This analyte was not reported above the LOQ in the associated samples.

2. Were the data free of data qualification flags and/or notes used by the laboratory? If no, define. No

Comments: The laboratory applied the following data qualification flags to data in this report.

J – The quantitation is an estimation.

U – Indicates the analyte was analyzed for but not detected.

* – The analyte has exceeded allowable regulatory or control limits.

3. Were sample CoC forms and custody procedures complete? Yes

Comments: The CoC records from field to laboratory were complete, and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.

Custody seals were not present nor required since the samples were hand delivered to the SGS Anchorage laboratory by field personnel, and custody was maintained at all times.

4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable? Yes

Comments: The reporting limits for the data set were reviewed and appeared to be acceptable. The following dilutions were applied to project samples for the reported analyses.

Method	Sample(s)	Analyte(s)	Dilution Factor
8021B	SW-5	Benzene	5
AK101	SW-5	GRO	5
8260D TCLP	IDW	TCLP Benzene	50

5. Were the reported analytical methods and constituents in compliance with the QAPP, permit, or CoC? Yes

Comments: The reported analytical methods were in compliance with the CoC, and the laboratory reported the requested constituents in accordance with the CoC.

6. Were samples received in good condition within method-specified requirements? Yes

Comments: The samples were received at SGS-Anchorage in good condition, with the cooler temperature within the recommended temperature range of 4.0°C ± 2.0°C at 3.3°C as noted on the CoC and the Sample Receipt Form.

7. Were samples extracted/digested and analyzed within method-specified or technical holding times? Yes

Comments: The samples were extracted and analyzed within the method-specified holding times.

8. Were reported units appropriate for the sample matrix/matrices and analytical method(s)? Specify if wet or dry units were used for soil. Yes

Comments: The analytical results were reported in concentration units of micrograms per liter (µg/L) and milligrams per liter (mg/L), which were acceptable for the sample matrix and the analyses requested.

VALIDATION CRITERIA CHECKLIST	
9. Did the laboratory provide any specific initial and/or continuing calibration results?	No
Comments: The laboratory did not include specific initial and/or continuing calibration results as part of the report package.	
10. If initial and/or continuing calibration results were provided, were the results within acceptable limits?	N/A
Comments: The laboratory did not provide initial and/or continuing calibration results for the reported analytical methods.	
11. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method?	Yes
Comments: The total number of laboratory blank samples prepared and analyzed was equal to at least 5% of the total number of samples or analyzed as required by the method.	
12. Were target analytes reported as not detected in the laboratory blanks?	No
Comments: Target analytes were reported as not detected in the laboratory blank samples, with the following exception. Toluene was detected in the method blank for Method 8021B analytical batch VFC15394 at a concentration of 0.310 µg/L. Non-detections of toluene in the associated samples and results greater than 10 times the blank detection did not require qualification.	
13. Was the total number of MS samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method?	No
Comments: The total number of matrix spike samples prepared was not equal to at least 5% of the total number of samples. Matrix spikes were not prepared for the analyses in this data set.	
14. For MS/MSDs prepared from project samples, were percent recoveries and RPDs within data validation or laboratory quality control (QC) limits?	N/A
Comments: MS/MSD samples were not prepared using project samples as the sample source.	
15. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples or analyzed as required by the method?	Yes
Comments: The total number of LCS samples analyzed was equal to at least 5% of the total number of samples.	
16. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within data validation or laboratory QC limits?	No
Comments: The LCS and LCSD percent recoveries and LCS/LCSD RPDs were within laboratory QC limits, with the following exception. The LCSD recovery for GRO in Method AK101 batch VFC15394 was outside the acceptance limits of 60-120% at 122% indicating a potential high bias. GRO was not detected in the associated sample SW-2 and the result did not require qualification.	

VALIDATION CRITERIA CHECKLIST

17. Were surrogate recoveries within laboratory QC limits? No

Comments: The surrogate recoveries for the analyses of the submitted samples were within method and laboratory QC limits, with the following exceptions.

Method	Sample	Surrogate	Surrogate Recovery	QC Limits
AK101	**MW-30**	**4-Bromofluorobenzene**	**184%**	**50-150%**
AK101	**MW-33**	**4-Bromofluorobenzene**	**190%**	**50-150%**
AK101	**Dup-1**	**4-Bromofluorobenzene**	**192%**	**50-150%**
8021B	**MW-30**	**1,4-Difluorobenzene**	**121%**	**77-115%**

The Method AK101 target analyte GRO was detected in samples MW-30, MW-33, and Dup-1 and these results were assigned J+ qualifiers due to evidence of potential high bias.

The Method 8021B target analyte benzene was detected in sample MW-30 and the result was assigned a J+ qualifier due to evidence of potential high bias. Non-detections of associated target analytes in sample MW-30 did not require qualification based on the non-conforming surrogate result.

18. Were the number of trip blank, field blank, and/or equipment blank samples collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? Yes

Comments: The number of trip, field, and equipment blanks collected was equal to at least 10% of the total number of samples. One trip blank sample, Trip Blank, was collected as part of this sample set.

19. Were target analytes reported as not detected in the trip blank, field blank, and/or equipment blank samples? Yes

Comments: Target analytes were reported as not detected in the trip blank sample.

20. Was the number of field duplicates collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? Yes

Comments: The number of field duplicates collected was equal to at least 10% of the number of samples. Sample DUP-1 was collected as a field duplicate of sample MW-30.

21. Were field duplicate RPD values within data validation QC limits (soil 0-50%, water 0-30%, or air 0-25%)? No

Comments: As indicated in the Field Duplicate Summary Table at the end of this report, field duplicate RPD values were within the data validation QC limits of 0-30% for water samples, with the following exceptions.

The RPD value for benzene exceeded the data validation limit of 30% at 42.6%. The benzene results were qualified as J for samples MW-30 and Dup-1 based on evidence of poor precision.

An RPD value could not be calculated for toluene for the field duplicate pairs MW-30 and Dup-1 since the analyte was detected in the duplicate sample and was undetected in the parent sample. As the detection in the duplicate sample was greater than two times the reporting limit, toluene was qualified as J and UJ for the duplicate and parent samples, respectively.

22. For laboratory duplicates prepared from project samples, were RPDs within laboratory QC limits? N/A

Comments: Laboratory duplicates were not prepared for the analytical batches reported in this data set.

VALIDATION CRITERIA CHECKLIST	
23. Were the following data relationships realistic and acceptable?	
• Target analytes were reported by more than one method (e.g., 8260/8270, EPH/8270), and the results were in agreement?	N/A
Comments: Target analytes were not reported by more than one method.	
• Both total and dissolved metals analyses were performed, and the total metals results were greater than or equal to the dissolved metals results?	N/A
Comments: Metals analyses were not performed for the samples in this data set.	

FIELD DUPLICATE SUMMARY

Client Sample ID: MW-30 Field Duplicate Sample ID: Dup-1				
Analyte	**Method**	**Laboratory Result**	**Duplicate Result**	**Relative Percent Difference (RPD)**
Benzene	**SW8021B**	**1.35 µg/L**	**2.08 µg/L**	**42.6%**
Toluene	**SW8021B**	**ND (1.00 µg/L)**	**3.42 µg/L**	**DL**
TPH GRO	AK 101	0.338 mg/L	0.337 mg/L	0.3%
TPH DRO	AK 102	11.0 mg/L	13.1 mg/L	17.4%

Field duplicate RPD control limits are not to exceed 30% for water as established by USEPA Region 1 - New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018.

DL – Indicates that the analyte was detected in one of the duplicate samples and was undetected in the other sample, and therefore an RPD could not be calculated. Data were not qualified since the detection was within two times the reporting limit. Non-detected results are indicated above with the applicable reporting limit as ND (RL).

The RPD value for benzene exceeded the data validation limit of 30% at 42.6%, which was evidence of poor precision. The benzene results were qualified as J for samples MW-30 and Dup-1.

An RPD value could not be calculated for toluene for the field duplicate pairs MW-30 and Dup-1 since the analyte was detected in the duplicate sample and was undetected in the parent sample. As the detection in the duplicate sample was greater than two times the reporting limit, toluene was qualified as J and UJ for the duplicate and parent samples, respectively.

DATA QUALIFICATION SUMMARY

Abbreviation	Reason
ERPD-FD	High field duplicate RPD.
HR-SUR	The surrogate percent recovery was greater than the upper acceptable limit indicating a possible high bias.

Analyte	Method	Field Sample ID	Lab Sample ID	Result	Limit	Units	Reviewer Qualifier	DV Flag Reasons
Benzene	SW8021B	Dup-1	1205603009	2.08	0.500	µg/L	J	ERPD-FD
Benzene	SW8021B	MW-30	1205603001	1.35	0.500	µg/L	J+	ERPD-FD, HR-SUR
Toluene	SW8021B	Dup-1	1205603009	3.42	1.00	µg/L	J	ERPD-FD
Toluene	SW8021B	MW-30	1205603001	ND	1.00	µg/L	UJ	ERPD-FD
TPH GRO	AK 101	MW-30	1205603001	0.338	0.100	mg/L	J+	HR-SUR
TPH GRO	AK 101	MW-33	1205603002	0.645	0.100	mg/L	J+	HR-SUR
TPH GRO	AK 101	Dup-1	1205603009	0.337	0.100	mg/L	J+	HR-SUR

Laboratory Data Review Checklist

Completed By:

Daran O'Hollearn

Title:

Lead Project Scientist

Date:

12/01/2020

Consultant Firm:

Trihydro Corporation

Laboratory Name:

SGS North America

Laboratory Report Number:

1205603

Laboratory Report Date:

11/02/2020

CS Site Name:

Andeavor / Tesoro – Anchorage Terminal 1

ADEC File Number:

2100.38.311

Hazard Identification Number:

1205603

Laboratory Report Date:

11/02/2020

CS Site Name:

Andeavor / Tesoro – Anchorage Terminal 1

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

   SGS Anchorage (17-021 / AK00971)

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   Receipt temperature = 3.3°C

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☒ No☐ N/A☐ Comments:

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c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☒ No☐ N/A☐ Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes☐ No☐ N/A☒ Comments:

No discrepancies in sample conditions noted.

e. Data quality or usability affected?

Comments:

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☒ No☐ N/A☐ Comments:

Surrogate recoveries were outside acceptance limits for sample MW-30 in Method 8021B and samples MW-30, MW-33, and Dup-1 in Method AK101. Laboratory control sample duplicate recovery was outside the acceptance limits for GRO.

c. Were all corrective actions documented?

Yes☒ No☐ N/A☐ Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

None indicated.

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5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes☒ No☐ N/A☐ Comments:

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

c. All soils reported on a dry weight basis?

Yes☐ No☐ N/A☒ Comments:

Aqueous samples

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☐ No☐ N/A☐ Comments:

Unsure

e. Data quality or usability affected?

No

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☐ No☒ N/A☐ Comments:

Toluene was detected in the method blank for Method 8021B. Please see Data Validation report for details.

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iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

Please see Data Validation report for details.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

v. Data quality or usability affected?

Comments:

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☒ No☐ N/A☐ Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Metals/Inorganics not analyzed for this data set.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☐ No☒ N/A☐ Comments:

Please see Data Validation report for details.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

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v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☐ Comments:

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☐ Comments:

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☐ No☐ N/A☐ Comments:

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iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☐ No☐ N/A☐ Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☐ Comments:

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☒ No☐ N/A☐ Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

Yes☐ No☒ N/A☐ Comments:

The recoveries of individual Method AK101 and Method 8021B surrogates were outside the laboratory and method-defined limits. Please see Data Validation report for details.

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

Please see Data Validation report for details.

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iv. Data quality or usability affected?

Comments:

Please see Data Validation report for details.

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☒ No☐ N/A☐ Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☐ No☐ N/A☒ Comments:

One cooler, one trip blank.

iii. All results less than LOQ and project specified objectives?

Yes☒ No☐ N/A☐ Comments:

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

v. Data quality or usability affected?

Comments:

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☒ No☐ N/A☐ Comments:

Please see Data Validation report for details.

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ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☐ No☒ N/A☐ Comments:

Please see Data Validation report for details.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

No, please see Data Validation report for details.

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☒ N/A☐ Comments:

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

iii. Data quality or usability affected?

Comments:

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7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

   a. Defined and appropriate?

      Yes☒ No☐ N/A☐ Comments:

APPENDIX E

SAMPLING ANALYSIS PLAN

APPENDIX E. SAMPLING ANALYSIS PLAN

ANCHORAGE TERMINAL 1

TESORO ALASKA COMPANY

ANCHORAGE, ALASKA

March 23, 2020

Project #: 42H-001-001

PREPARED BY: Trihydro Corporation

312 Tyee St., Soldotna, AK 99669

PREPARED FOR: Tesoro Environmental Resources Company

3450 South 344th Way, Suite 201, Auburn, WA 98001

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1.0 INTRODUCTION

This sampling and laboratory analysis plan (SAP) establishes the technical standards and procedures for groundwater monitoring at the Tesoro Alaska Anchorage Terminal 1 located in Anchorage, Alaska. In 2017, Tesoro sold the Terminal to Petro Star, Inc. However, Tesoro maintains environmental remediation responsibilities and is continuing with previously proposed cleanup efforts. Sampling is intended to be completed in accordance with the ADEC Field Sampling Guidance (ADEC 2017A) and to be consistent with historical sampling at the site. Anchorage Terminal 1 is filed under ADEC File # 2100.38.447.

1.1 SCOPE

This SAP contains the procedures and requirements for implementing the groundwater monitoring in general accordance with Alaska Department of Environmental Conservation (ADEC) requirements and detailed in Title 18 Alaska Administrative Code (AAC), chapter 75 (18 AAC 75). The SAP does not address all potential sampling or remedial activities but is intended for use for annual and semiannual groundwater sampling. Sample collection in addition to annual or semiannual groundwater sampling will be described and approved under a standalone work plan. The anticipated sampling methods for the Terminal are outlined in the following inset Table.

Terminal Location	Sampling Method	Well ID	Comments
Anchorage Terminal 1 (AT1)	Disposal Bailer [1]	MW-30, MW-33	
	Peristaltic Pump [1]	RW-PL, PW-18	Pump required due to small well diameter
	Dipper [2]	SW-2, SW-5, SDMH-S, SDMH-N	Surface water samples

1. Monitoring wells will be sampled using purge and no-purge sampling methods. Wells with the water table within the well screen will be sampled using no-purge methods. Wells with submerged well screens will be sampled by purging three well volumes prior to sample collection.
2. Surface water samples may not be collected each year

1.2 TARGET ANALYTES

The target analytes include benzene, toluene, ethylbenzene, and total xylenes (BTEX), gasoline-range organics (GRO), and diesel-range organics (DRO). Table 1 identifies the target analytes, associated ADEC cleanup levels, required laboratory Limits of Quantification (LOQ), bottle types, and preservatives.

1.3 COMPARISON CRITERIA

Sample results are compared to groundwater cleanup criteria contained in 18 AAC 75. If alternative cleanup levels are determined, they will be identified in an appropriately updated SAP or site specific planning documents.

2.0 QUALITY ASSURANCE / QUALITY CONTROL

The quality assurance/quality control plan establishes a basis to demonstrate that field and laboratory data are technically sound, statistically valid, and properly documented. The acceptance criteria for the data quality indicators are expressed in terms of precision, accuracy, and completeness that represent an acceptable level of uncertainty for current and future uses of the data.

The following Table outlines the anticipated quality control samples that will be collected or used during sampling.

Minimum Field QC Samples	Frequency	Applicability	Allowable Tolerance
Temperature Blank	One per cooler	All sample shipments	Temperature range of 0º to 6ºC
Equipment Blank	One per set of twenty samples when non-disposable equipment is used; minimum of one	Per project specifications	Less than practical quantitation limit
Field Duplicate	One per ten field samples for each matrix sampled; minimum of one	All water samples collected per event	Relative percent differences (RPD) less than 30% water
Trip Blank - Water	One per analysis and cooler	All samples being analyzed for BTEX, GRO, or VOCs	Less than practical quantitation limit

2.1 DATA USES

Groundwater data collected under this plan are to be used for corrective action and target analyte monitoring. Data use includes:

- Assessing trends in contaminant levels, pathways, and migration.
- Monitoring effectiveness of remediation systems.
- Evaluating alternative remediation and/or sampling activities.
- Assessing groundwater quality for the presence of contaminants of concern (COCs) and natural attenuation parameters.

2.2 DATA QUALITY OBJECTIVES (DQOS)

The DQOs for the monitoring program are to:

- Ensure that monitoring data are within acceptable limits of precision and accuracy for the uses described under Data Uses.
- Minimize the possibility of loss, damage, or tampering with the data.
- Generate and maintain sufficient records to document the collection, transport, and analysis of each sample.

2.3 DATA QUALITY INDICATORS (DQIS)

Data quality indicators refer to quality control criteria established for various aspects of data gathering, sampling, or analysis activity. The allowable levels of uncertainty associated with each measurement (acceptance criteria) are defined in the following paragraphs. The following sections describe the DQIs that may be used for this project.

2.3.1 CROSS-CONTAMINATION

Trip Blank Samples

Trip blanks are analyzed to confirm that volatile samples are not cross contaminated by vapor migrating through the septa. Trip blanks must not contain detectable analytes or corrective actions are initiated.

Equipment Blank Samples

Equipment blanks are used to assess potential impacts from sample collection and handling. Equipment blanks must not contain detectable analytes or corrective actions are initiated. Equipment blanks are collected and analyzed when non-disposable sampling equipment is used to collect a sample and are generally analyzed for the same analytes being evaluated.

Method Blank Samples

Method blanks are used to confirm that samples are not cross contaminated during sample extraction or analysis. Method blanks must not contain detectable analytes or corrective actions are initiated.

2.3.2 ACCURACY

Matrix Spike Samples

Accuracy is a measure of the closeness of a measured value to the true value. Bias associated with sampling, the analysis, and the matrix is assessed by analyzing duplicate matrix spike samples and calculating matrix spike recovery to evaluate overall accuracy. Matrix spike and matrix spike duplicates (MS/MSDs) consist of a known quantity of a

National Institute of Standard and Technology (NIST) traceable standard containing all analytes of interest that is added to the sample matrix (i.e. groundwater collected in association with this project). Matrix spike samples with recoveries that exceed the control limits are subject to corrective actions.

Lab Control Samples (LCS)

Lab control samples are reagent water that is fortified with a known quantity of the analytes of interest and are used to assess the method efficiency. The analytical process is considered to be in control if recovery values for the added compounds fall within specified limits. Recovery values that are not within specified limits signal the need for procedure evaluation.

Temperature Blanks and Holding Times

Temperature blanks and holding times are used to determine the integrity of the samples. Samples for volatile analysis must be held at 0º to 6ºC, and all samples must be analyzed within technical holding times. Professional judgment is used to evaluate the effect of any exceedance of sample hold temperatures or hold times and the need for corrective action.

2.3.3 PRECISION

Field Duplicate Samples

Precision is a measure of the reproducibility of replicate data. Overall groundwater monitoring precision is assessed with field duplicates, which include variability in sampling, the matrix, and the analysis. Field duplicates are used to determine overall precision of sampling and analysis as well as matrix heterogeneity. Field duplicate precision is assessed by calculating the relative percent difference (RPD) of two detectable duplicate sample measurements. Control limits for RPD are statistically derived each sampling event using Shewhart control charts constructed from cumulative historical data. Field duplicate samples that exceed the upper control limit for RPD are subject to corrective action.

2.3.4 COMPLETENESS

Completeness is expressed as percent of valid usable data actually obtained relative to the amount that was expected. A variety of circumstances (inability to access a well due to snow and ice, broken bottles, lost samples, instrument failure, laboratory mistakes, etc.) can result in acquiring less than 100 percent of the planned data. The minimum percent of completed data acquisition depends on how much information is needed for decision making. Generally, completeness goals increase when fewer number of samples are taken per event or the data are critical for decision making. EPA

(2000) reports that completeness goals are typically in the 75 to 95 percent range. The completeness goals for this project are 85 percent for analytical data.

2.3.5 METHOD REPORTING LIMITS

Analytes are monitored at levels equal to or less than the comparison criteria discussed in Section 1.3 to enable meaningful comparisons to be made. Limits of Quantification (LOQs) for COCs are less than or equal to the ADEC cleanup criteria in 18 AAC 75. Current laboratory LOQs are contained in Table 1 (LOQs are based on current SGS-North America criteria).

2.4 ANALYTICAL METHODS

Analytical method selection for this monitoring program is a performance based measurement system and is intended to allow the laboratory flexibility to use current, accepted, analytical technologies, and methods. Table 1 lists methods selected for this project. These are "suggested" methods and are not intended to be restrictive. Equivalent or superior methods may be substituted for those listed in Table 1 if the data quality objectives of this SAP are met. An equivalent method, for the purpose of this plan, is defined as any widely accepted standard method that uses the same analysis and detection scheme as the suggested method. Superior methods may be substituted in some cases to improve data quality (e.g. substituting a gas chromatography/mass selective detector method (8260) for a gas chromatography/photoionization detector method (8021) which provides more selective detection with the same reporting limits).

2.5 LABORATORY QUALITY ASSURANCE AND REPORTING REQUIREMENTS

Due to the complexity and long-term nature of the monitoring programs, multiple laboratories are likely needed to meet the goals of this plan. Trihydro will select laboratories that are ADEC certified laboratories and maintain quality assurance programs that conform to the policies and procedures set forth in a laboratory quality assurance plan (QAP). SGS-North America, Inc. currently perform the analyses described in this plan. The laboratory QAP is provided upon request. A laboratory QAP must contain, at a minimum, the following elements:

- Statement of QA policy and objectives
- QA management and responsibilities
- Personnel qualifications and training
- Facilities and equipment
- Documentation and records

- Sample control
- Analytical methods
- Instrument control
- Data reduction, reporting and verification
- Quality control sample analysis and evaluation
- Corrective actions.

The laboratory reports will contain at minimum the items outlined in the March 2017 ADEC Technical Memo for Quality Assessment (ADEC 2017B).

2.6 DATA VALIDATION

Data validation is performed by Trihydro as outlined in the ADEC Technical Memo (ADEC 2017B). Data validation will include a review and summary of the following:

- Precision
- Accuracy
- Representativeness
- Comparability (if applicable)
- Sensitivity and Quantitation Limits

3.0 FIELD EQUIPMENT

3.1 EQUIPMENT TYPE

Various types of sampling equipment are used depending on sample media, well diameter, and sampling goals. Sampling equipment will be used in accordance with ADEC Field Sampling Guidance (ADEC 2017A), manufacturer's specifications, and individual work plans. Sampling methods are discussed in Section 5. Typical field equipment used in regards to this sampling plan include, but not limited to the following:

- Disposable bailers
- Submersible and peristaltic pumps
- Water level and interface meters
- Field parameter meter with flow through cell or sample cup (e.g., pH, temperature, conductivity, dissolved oxygen, oxygen reduction potential, and turbidity)

3.2 EQUIPMENT CALIBRATION AND MAINTENANCE

Routine calibration and maintenance of field equipment is performed to ensure consistent accurate results. Specific calibration procedures recommended by the instrument manufacturer are followed. Each field instrument is assigned a unique identifier. Calibrations and maintenance are completed prior to sampling and documented along with the instrument identifier in the field logbook or calibration form.

3.3 EQUIPMENT DECONTAMINATION

Non-disposable sampling equipment, including water level meters, interface probes, pumps, and non-disposable bailers are decontaminated after each well is sampled ("between-well decon") and after each sampling event and when high levels of contamination are encountered ("extended decon"). For between-well decon, sample equipment is cleaned with an alconox/water mixture, followed by two rinse sequences in water. Extended decon entails an extensive cleaning process in the alconox/water mixture, including extra scrubbing of interior parts, followed by two rinse sequences water. If contamination levels are high (i.e. unexpected presence of LNAPL), the decon water will be replaced and the extended decon process will be repeated. Proper decontamination is confirmed by analysis of an equipment blank.

4.0 SAMPLE COLLECTION PROCEDURES

The following sections outline the anticipated sampling procedures for groundwater. To provide directly comparable data, the groundwater sampling procedure for routine monitoring are consistent with past sampling events.

4.1 PERSONAL PROTECTIVE EQUIPMENT

Field personnel will comply with Trihydro and Tesoro health and safety procedures while performing sampling. Appropriate personal protective equipment include at a minimum are described below.

Industrial work gloves are utilized to protect hands and prevent lacerations, pinch points, and hand injuries as necessary. Disposable nitrile gloves are worn during sampling, and changed prior to sample collection. Safety glasses must also be worn during sample to protect eyes from possible liquid splash.

4.2 MONITORING WELL GAUGING

The static water level and total well depth are measured prior to purging or sampling activities. If gauging is being conducted to monitor or evaluate groundwater flow direction at a site, each of the wells will be gauged within 24 hours, either before purging and sampling activities, or 48 hours after purging activities. The well casing has a reference point (usually a V-cut or indelible mark in the well casing) that has been surveyed for correction of groundwater elevations. The depth to water and total depth of the well from the reference point are measured using a water level meter or interface probe to the nearest 0.01 foot. If LNAPL is suspected, an interface probe will be used to measure the depth to water and the depth to LNAPL from the reference point is measured to the nearest 0.01 foot. Generally, the total depth of a monitoring well containing LNAPL is not measured unless the well is not to be sampled or the level is measured following sample collection.

4.3 GROUNDWATER SAMPLING

Groundwater sampling is initiated at the well expected to have the least contamination based on previous results, and it proceeds systematically to the well expected to contain the most contamination. Wells containing LNAPL or hydrocarbon sheens are not always sampled and if sampled new disposable equipment will be used. Samples from each well are collected in order of volatility. First, samples for volatile organic analyses are collected; next, samples for semi-volatile organic analyses are collected; then, samples for inorganic analyses are collected. The following subsections describe the procedures for collecting groundwater samples with various equipment and identify the required sample containers, preservation, and holding times. Field water quality measurements (temperature,

conductivity, dissolved oxygen, turbidity, redox potential, and pH) are collected throughout purging and directly prior to sample collection.

Purging and sampling procedures will generally be consistent with historical routine monitoring practices at the site to maintain consistency with past sampling events. Purging is required for all groundwater samples collected from wells that are not screened across the water table. Purging will not be required for wells that are screened across the water table; consistent with historical sampling methods for the site. If the samples are to be analyzed for closure demonstrations, a site specific work plan will be prepared to identify appropriate sampling procedures.

Purging is performed in a manner that minimizes aeration of the groundwater and does not disrupt sediments that may have accumulated in the well. Purging with a bailer is accomplished by gently lowering the bailer into the water and allowing it to sink just enough to fill from the bottom up without touching the bottom of the well. Purging with a pump is accomplished by gently lowering it approximately three feet below the water surface or to the midpoint of the saturated wells screen, but not more than two feet above the bottom of the well to prevent disturbance and re-suspension of any sediment in the bottom.

No-purge sampling procedures are considered appropriate for routine monitoring of unconfined aquifers where groundwater flows freely through the well and is consistent with historical sampling at the Terminal. Recent studies by Tesoro plus others around the country show a strong correlation (r^2 = ~0.99 for Tesoro; r^2 = ~0.71 nationally) between sample pairs collected from unconfined aquifer wells before and after well purging (KSI, 2004; API, 2000). No-purge sampling procedures can be used under the following conditions for the sites identified in Section 1:

- The groundwater sample is to be analyzed as part of routine monitoring.
- The groundwater sample is to be analyzed as part of remediation system monitoring.
- The well screen intersects the water table.
- Field measurements (temperature, conductivity, pH, etc.) are recorded prior to the start of sampling.

4.3.1 SAMPLING WITH A BAILER

In general groundwater samples will be collected using bailers; however, at times, collection of groundwater samples will require the use of a peristaltic pump. A new or dedicated disposable bailer will be used to sample the well, and groundwater samples are collected without aeration to minimize analyte volatilization. This is accomplished by gently lowering the bailer into the water and allowing it to fill from the bottom. Field water quality measurements

(temperature, conductivity, dissolved oxygen, turbidity, redox potential, and pH) are collected throughout bailing and directly prior to sample collection.

4.3.2 SAMPLING BELOW LNAPL

Generally wells containing LNAPL will not be sampled, however wells containing LNAPL may be sampled by freezing one end of a length of sample tubing and lowering tubing below the LNAPL. Tubing is left in place until thawed (approximately 24 hours), and the wells are sampled using a peristaltic pump the following day. If LNAPL is observed in the sample tubing prior to collecting the groundwater samples, the well will be resampled with new tubing. No-purge sampling is used when collecting samples below LNAPL. Groundwater quality parameters are not collected to protect the groundwater sampling equipment form damage due to potential contact with LNAPL. Therefore, data results are considered qualitative and will not be used for major decision-making purposes.

4.3.3 LNAPL SAMPLING

Sampling of LNAPL will not regularly be completed. However, if necessary LNAPL sampling may be completed using a peristaltic pump with new tubing or with a disposable bailer if necessary. Only the required sample volume of LNAPL shall be purged. Headspace will remain in the sample bottle per laboratory requirements. No LNAPL samples will be stored in the same sample cooler as groundwater or soil samples. LNAPL samples are not required to be temperature preserved and shall not be stored in a sample refrigerator used for storing soil or groundwater samples. In general, LNAPL sampling is not a common practice, but LNAPL samples are occasionally collected to aid in remedial system design and assessment.

4.3.4 SAMPLE CONTAINERS, PRESERVATION, AND HOLDING TIMES

Groundwater samples collected for organic analyses are preserved to prevent analyte loss as a result of volatilization, thermal degradation, photocatalytic degradation or biodegradation. Analytical methods specify sample preservation procedures for the class of compounds within the scope of the method. Table 1 shows chemical compound classes, suggested methods, preservation techniques, and holding times. Sample containers are placed in a cooler containing ice (e.g. gel ice packs or wet ice) immediately after collection. Samples are stored in a refrigerator or sample cooler maintained at 0º to 6ºC prior to shipment. Different coolers will be used for each sampling medium.

5.0 DOCUMENTATION AND SHIPMENT

Complete documentation is maintained to provide data defensibility and traceability for all samples. The following sections describe procedures intended to permit sample tracking from the time of collection through submittal to the laboratory, to allow sampling locations to be located in the future, to record sampling methods and equipment, and to identify field personnel responsibilities.

5.1 FIELD NOTES

The following paragraphs describe the minimum level of documentation for gauging, sampling, field investigations, and remediation activities. Documentation in field logbooks and field forms will include documentation of daily activities by the field team each day including the date of sampling, sample location, and sample identification on field forms. Corrective actions or alterations of the prescribed preparation and/or sampling procedures will also be noted. A single stroke should be used to cross out incorrect information and initialed by the sampler. A single stroke with the field personnel's initials shall be used to manage unused space left on a page.

5.2 PHOTOGRAPHS

Photographs will be used to substantiate and augment the field notes. Photographs will be numbered and a description of each will be recorded in the field book or photograph log form (if applicable).

5.3 SAMPLE LABELING

A waterproof label is attached to each sample. The labels are marked with indelible ink and at a minimum indicate the project name, sample identification, analysis requested, sample date, sample time, initials of the person collecting the sample, and chemical preservation.

5.4 CHAIN OF CUSTODY

Chain of custody (CoC) documents are completed for all samples submitted to the laboratory. The CoC indicates the name and address of the laboratory, the laboratory accession number, requested turnaround time, data deliverable formats, name of the person who collected the samples, sample identifications, sample matrices, sample collection dates and times, analyses requested, the number of containers collected for each analysis, and comments or special instructions to the laboratory. Sample custody transmittals are documented on the CoC with a signature, date and time from the relinquisher and the recipient for each transaction. Shipping consignees need not sign the CoC.

5.5 SAMPLE SHIPMENT

Generally, samples will be hand delivered to the laboratory. Hand delivered coolers are packed with ice to maintain appropriate sample preservation. Hand delivered coolers are not required to have custody seals. For samples requiring shipment, samples are packaged in bubble wrap and placed in cooled ice chests for shipment which are then taped shut with custody seals. Coolers are shipped to the laboratory by an overnight priority shipping method. The cooler temperature is measured from a temperature blank upon receipt at the laboratory and recorded on the CoC. Sample inspection is performed at the laboratory. A sample receipt acknowledgment is sent to Trihydro that confirms the arrival of the samples and indicates the condition of the samples on receipt. The laboratory must immediately notify the Trihydro of any conditions that may affect the analyses.

6.0 REFERENCES

Alaska Department of Environmental Conservation (ADEC). 2017A. *Field Sampling Guidance* (updated August 2017).

ADEC. 2017B. *Technical Memorandum Data Quality Objectives, Checklists, Quality Assurance Requirements for Laboratory Data, and Sample Handling*. March 2017

American Petroleum Institute. 2000. *No-Purge Groundwater Sampling, An Approach for Long-Term Monitoring*, October 2000.

Kent & Sullivan, Inc. 2004. *No-Purge Groundwater Sampling Evaluation and Plan*, prepared for Tesoro Alaska Company, August 4, 2004.

TABLE

TABLE 1. SUMMARY OF ANALYTICAL METHODS AND PARAMETERS
SAMPLING AND ANALYSIS PLAN

Parameter	Sample Medium	Analyte	ADEC Cleanup Level[1,2]	Limit of Quantification (LOQ)	Analytical Method	Sample Container	Preservation	Holding Time	Other Notes
BTEX	**Water**	Benzene	4.6 µg/L	0.5 µg/L	SW 8021B	3x40 ml amber VOA vials w/ septa	HCl; 0-6° C	14 days	Allow no headspace; TB required
		Toluene	1,100 µg/L	1 µg/L					
		Ethylbenzene	15 µg/L	1 µg/L					
		P & M-Xylene	NA	2 µg/L					
		o-Xylene	NA	1 µg/L					
		Total Xylenes	190 µg/L	--					
Gasoline Range Organics (GRO)	Water	--	2,200 µg/L	100 µg/L	AK 101	3x40 ml amber VOA vials w/ septa	HCl; 0-6° C	14 days	Allow no headspace; TB required
Diesel Range Organics (DRO)	Water	--	1,500 µg/L	600 µg/L	AK 102	2 x 1 L glass amber	HCl; 0-6° C	14 days	
Residual Range Organics (RRO)	Water	--	1,100 µg/L	500 µg/L	AK 103	2x1 L amber glass	HCl; 0-6° C	14 days	

Notes:

[1] 18 AAC 75 Oil and Hazardous Substances Pollution Control Revised as of November 6, 2016

LOQ Limit of Quantitation
N/A Not Applicable
L Liter
mL milliliter
mg/kg milligrams per kilogram
°C Degrees Celsius
mg/L milligrams per liter
HCl Hydrochloric acid
µg/L micrograms per liter
µg/kg micrograms per kilogram