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January 16, 2019

Ms. Megan Roberts
Environmental Program Specialist
Alaska Department of Environmental Conservation
610 University Ave.
Fairbanks, AK 99709-3643

RE: 2018 Annual Groundwater Monitoring Report
Tesoro Fairbanks Petroleum Terminal
ADEC File No. 100.38.167

Dear Ms. Roberts:

Enclosed is the *2018 Annual Groundwater Monitoring Report* for the Tesoro Fairbanks Petroleum Terminal site located at 5250 Airport Industrial Road in Fairbanks, Alaska. This report was prepared by Trihydro Corporation on behalf of Tesoro Alaska Company to present the results of the 2018 groundwater monitoring activities.

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

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

Sincerely,

Kyle Waldron
Remediation Project Manager
Tesoro Companies, Inc.

Enclosure

cc: Joe McElroy, Trihydro
Chris Schultz, Trihydro
Ashley Jaramillo, ADOT&PF (Fairbanks Airport)

2018 ANNUAL GROUNDWATER MONITORING REPORT

FAIRBANKS PETROLEUM TERMINAL

TESORO ALASKA COMPANY

FAIRBANKS, ALASKA

January 16, 2019

Project #: 46K-001-003

ADEC File #: 100.38.167

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
BTEX	benzene, toluene, ethylbenzene, and xylenes
CSM	Conceptual Site Model
DRO	diesel-range organics
EPA	Environmental Protection Agency
FIA	Fairbanks International Airport
GRO	gasoline-range organics
LNAPL	light non-aqueous phase liquid
LOQ	limit of quantitation
mg/L	milligrams per liter
MSL	mean sea level
QA	quality assessment
QC	quality control
SGS	North America, Inc.
Tesoro	Tesoro Alaska Company
Trihydro	Trihydro Corporation
µg/L	micrograms per liter

EXECUTIVE SUMMARY

This report describes the 2018 groundwater monitoring and remediation for the Tesoro Fairbanks Petroleum Terminal.

In 2018, groundwater monitoring activities were performed, on behalf of Tesoro Alaska Company (Tesoro), by Trihydro Corporation (Trihydro) in accordance with the recommendations provided in the 2017 Annual Groundwater Monitoring Report, Tesoro Petroleum Terminal, Fairbanks International Airport (Trihydro 2017) and the 2018 Groundwater Sampling Work Plan (Trihydro 2018). Monitoring activities were completed in accordance with the 2017 ADEC Field Sampling Guidance (ADEC 2017).

Diesel range organics (DRO), gasoline range organics (GRO), or benzene, toluene, ethylbenzene, and xylenes (BTEX) were detected in groundwater samples collected from six of the onsite monitoring wells at concentrations exceeding cleanup levels. The light non-aqueous phase liquid (LNAPL) and dissolved phase plume appear to be stable as the lateral extent of benzene above the groundwater cleanup level is consistent with historical sampling results.

1.0 INTRODUCTION

This report summarizes the field activities and findings of the September 2018 groundwater monitoring event performed for Tesoro Alaska Company (Tesoro) Fairbanks by Trihydro Corporation (Trihydro) at the Fairbanks Petroleum Terminal in Fairbanks, Alaska. The groundwater monitoring activities comply with recommendations in the *2017 Annual Groundwater Sampling Report* by Trihydro. Monitoring activities were completed in accordance with the 2018 Groundwater Sampling Work Plan (Trihydro 2018). This monitoring event involved the gauging and collection of groundwater samples from each monitoring well, along with the preparation and submittal of a report summarizing the 2018 field activity results. Prior to gauging and collection, the top-of-casing elevation was resurveyed at each monitoring well.

2.0 BACKGROUND

The terminal is located west of the Fairbanks International Airport (FIA) and east of Dale Road at 5250 Airport Industrial Road (Figure 1). The site occupies approximately 3.5 acres encompassing Airport Block 2, Subdivision Lots 2 and 3. Previous investigations and historical sample results are presented in Appendix A.

3.0 FIELD ACTIVITIES

The following groundwater gauging/sampling activities were performed during the September 17 through 20, 2018, monitoring event. A site vicinity map is included as Figure 2.

- Gauging fluid levels at 23 monitoring wells. Groundwater elevation measurements are documented in Table 1. The groundwater potentiometric surface is displayed on Figure 3.
- Sampling groundwater at 23 monitoring wells, with three samples collected below light non-aqueous phase liquid (LNAPL) (MW-6R, MW-18R, and MW-24). Samples were analyzed for BTEX, GRO, and DRO. Table 2 summarizes the field parameter data collected during sample purging for each well and Table 3 summarizes the analytical data.
- Appendix B provides a detailed report of field methods and activities, along with groundwater sampling field data sheets and field notes.

In preparation for the sampling event, top-of-casing elevations were resurveyed at each of the 23 monitoring wells using differential leveling techniques. Monitoring well MW-10 was used as the reference point for the resurvey. Survey notes are included in Appendix B. The survey was conducted on August 7, 2018. The updated top-of-casing elevations are included in Table 1. The monitoring wells were resurveyed due to irregularities in many wells when compiling potentiometric surface maps during 2017. These irregularities were not considered when compiling potentiometric surface maps. The resurvey in 2018 was intended to correct this. Additional resurveys are not planned to be completed annually as historically groundwater flow direction is very consistent. Resurveys of monitoring wells will be completed as necessary when gauging data indicates sufficient vertical shifting of the monitoring wells.

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 1189782.

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 GROUNDWATER RESULTS

This section summarizes the results of groundwater sampling and gauging from the September sampling event.

5.1 GROUNDWATER FLOW CONDITIONS

Groundwater and LNAPL levels were measured during the groundwater monitoring event on September 17, 2018. Groundwater and LNAPL gauging data are presented in Table 1.

Figure 3 presents the potentiometric surface elevations for September 2018. Groundwater elevations ranged from 417.01 feet above mean sea level (MSL) to 418.75 feet above MSL. Seasonal variations in groundwater elevations indicate that groundwater elevations are lower in the winter and increase during spring into late summer. The groundwater flow across the site was to the west-northwest in 2018, which is consistent with historical groundwater flow directions, shown in Figure 3 based on groundwater gauging conducted during the annual sampling event. During completion of the 2017 reporting, groundwater elevations for numerous monitoring wells were not included when contouring the groundwater elevations (Trihydro 2017) due to measurements that are inconsistent with other water levels onsite. Inconsistent measurements were attributed to well casing frost heave, therefore all monitoring wells were resurveyed in 2018. This resurvey resulted in a correction of many monitoring well elevations and much more consistent groundwater elevations across the site.

5.2 LNAPL CONDITIONS

LNAPL was measured in three monitoring wells (MW-6R, MW 18R, and MW-24) at thicknesses of 0.07 feet, 0.32 feet, and 0.3 feet respectively. The occurrence and thickness of LNAPL in these wells is similar to historical measurements. In previous sampling events MW-1R also contained LNAPL, but none was detected in the September 2018 monitoring event. Groundwater samples were collected below LNAPL from monitoring wells containing LNAPL and data is considered qualitative only. The data is denoted as Below LNAPL in analytical data tables and denoted as collected below LNAPL in figures.

The following table summarizes historical LNAPL measurements from fall gauging events between 2012 and 2018.

Year	MW-1R LNAPL Thickness (ft)	MW-6R LNAPL Thickness (ft)	MW-18R LNAPL Thickness (ft)	MW-24 LNAPL Thickness (ft)
2012	--	--	Sheen	0.01
2013	0.06	--	Sheen	0.38
2014	Sheen	0.5	0.49	0.47
2015	0.01	Sheen	Sheen	0.10
2016	--	0.31	0.69	0.26
2017	--	0.01	--	0.16
2018	--	0.07	0.32	0.30

-- No LNAPL present; sample collected

5.3 ANALYTICAL RESULTS

Groundwater samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) compounds, gasoline-range organics (GRO), and diesel-range organics (DRO). Analytical results of the 2018 groundwater monitoring are included in Table 3 and presented on Figure 4. Historical analytical results collected between 1991 and 2018, are presented in Appendix A, Table A-1. Appendix C contains the laboratory reports, and Appendix D contains the ADEC laboratory data review checklist and data validation reports.

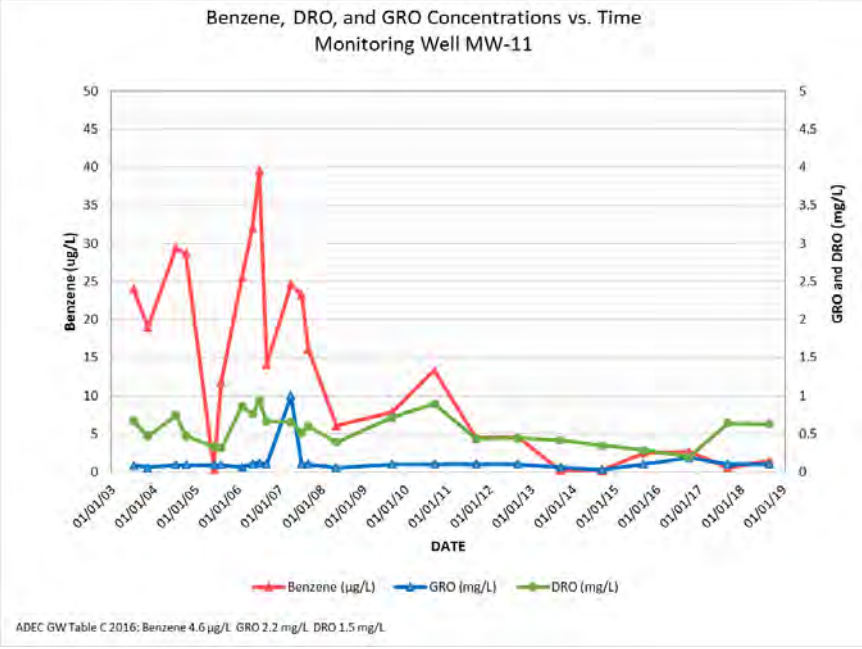
The 2018 data were compared to the ADEC cleanup levels and results for benzene, ethylbenzene, xylenes, GRO, or DRO exceeded the ADEC cleanup level in samples from six of the 23 monitoring wells. No samples from offsite monitoring wells had target constituent concentrations above the ADEC cleanup level. Benzene was detected in one offsite well (MW-11) at a concentration of 1.49 µg/L which is below the ADEC cleanup level of 4.6 µg/L, GRO and DRO were not detected in any offsite monitoring wells. Benzene has been detected in MW-11 but has remained below the ADEC cleanup level since 2011.

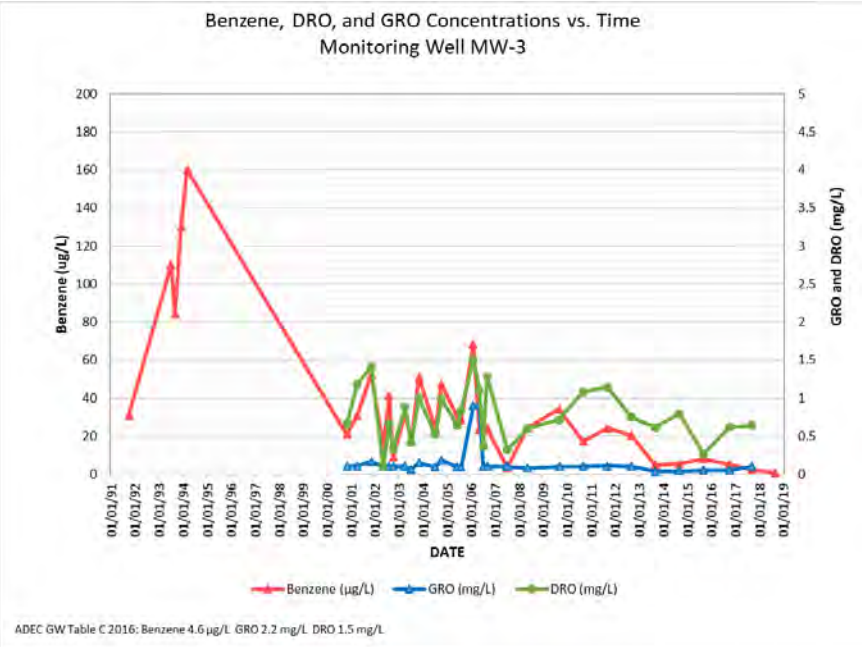
Benzene was detected in eight monitoring wells and was above the ADEC cleanup level in three of the monitoring wells. GRO was detected in five monitoring wells and was above the ADEC cleanup level in two of the monitoring wells. DRO was detected in five monitoring wells, and all were above the ADEC cleanup level. Either toluene, ethylbenzene or xylenes were detected in five monitoring wells. Ethylbenzene exceeded the ADEC cleanup level in two wells and xylenes in three wells and these wells had exceedances of either benzene, GRO, or DRO. Data from monitoring wells with sample concentrations above the ADEC groundwater cleanup level is summarized in the following inset table.

Well ID	Benzene (µg/L)	Ethylbenzene (µg/L)	Toluene (µg/L)	Xylenes (µg/L)	GRO (mg/L)	DRO (mg/L)
MW-1R	**771**	**113**	143	**665**	**3.88**	**5.89**
MW-2	**12.1**	ND (1)	ND (1)	ND (3)	ND (0.1)	ND (0.62)
MW-6R*	**8.76**	ND (1)	ND (1)	4.89	0.195	**28.9**
MW-10	0.58	8.91	1.76	**500**	1.13	**15.7**
MW-18R*	0.64	5.07	ND (1)	44.8	0.343	**8.73**
MW-24*	0.55	**158**	1.99	**2120**	**4.41**	**7.44**
ADEC Criteria	4.6	15	1,100	190	2.2	1.5

*Denotes sample collected below LNAPL
Results in **BOLD** exceed the ADEC 18 AAC 75 Groundwater Cleanup Level

Analytical results in September 2018 are consistent with historical sampling results, with the exception of MW-6R however MW-6R was sampled below LNAPL and has not been sampled in many of the past sampling events due to LNAPL. The DRO concentration in MW-6R is the highest observed but is likely due to LNAPL at MW-6R. As shown on Figure 4 there are two benzene plumes. One centered around MW-1R that appears to be decreasing in extent and concentration since 2016. Between 2012 and 2016 MW-1R was not sampled due to LNAPL in the well. Benzene, DRO, and GRO concentrations in wells MW-11 and MW-3 show a decreasing trend and these data trends are shown in the following inset graphs.





A second area of benzene impacts was observed around MW-6R. Benzene concentrations at MW-6R were higher in 2016 and 2018 than in 2017 and this is likely due to increased LNAPL thickness within MW-6R during the 2016 and 2018 sampling events. The benzene impacts at MW-6R appear to be stable and benzene concentrations at downgradient well MW-19 continue to be below the cleanup level or not detected. Overall groundwater impacts are consistent with historical concentrations and benzene concentrations appear to be decreasing. Overall, 2018 sampling results continue to suggest decreasing target constituent trends.

6.0 DRY WELL MANAGEMENT

In 2017 an investigation of the former dry well at the site was completed and results are summarized in the 2017 Dry well report (Trihydro 2018). On September 6th, 2018, the EPA regulator Evan Osborne replied to the 2018 Dry Well Investigation Report (Trihydro 2018) and recommendation that the dry well be conditionally closed. The letter from the EPA included as Appendix E stated that the EPA granted conditional closure of the dry well and that the closure is based on the condition that the owner, Tesoro Alaska Company, of this injection well continue to work with ADEC to address the contamination that remains near the suspected location of the abandoned injection well.

Based on sitewide BTEX, GRO, and DRO impacts in the groundwater and the presence of LNAPL in MW-6R and MW-24 Trihydro recommends that the impacts near this former dry well area continue to be monitored by collecting groundwater samples annually. Groundwater results from the dry well investigation and historical samples collected from MW-10 (Trihydro 2018) indicate that the remaining contaminants of concern are BTEX, GRO, and DRO. Arsenic was detected in the groundwater grab sample from DW-03 during dry well investigation but it is likely that this arsenic concentration is the result of natural groundwater conditions. Trihydro recommends that groundwater samples be collected and analyzed for BTEX, GRO, and DRO annually as part of the annual groundwater sampling program.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The following section discusses conclusions, recommendations, and planned 2019 Terminal work.

7.1 CONCLUSIONS

Based on groundwater sampling conducted in 2018 the benzene plume remains stable and there continues to be no off-site impacts above the ADEC cleanup level. Groundwater flow direction was consistent with historical gauging events. LNAPL is present at well locations consistent with past sampling events and LNAPL thickness was also consistent.

Monitoring well MW-1R continues to be the area of highest benzene concentration. LNAPL greater than 0.01 feet thick has not been measured in MW-1R well since 2013 indicating that LNAPL is likely no longer present or minimal in this area. The benzene plume downgradient of MW-1R at MW-3 and MW-11 appears to be decreasing in area and strength. Groundwater trends for wells MW-3 and MW-11 show stable decreasing trends along the leading edge of the benzene plume.

The EPA granted conditional closure of the Former Dry Well at the site with possible impacts to be managed by ADEC.

7.2 RECOMMENDATIONS

Trihydro proposes the following actions at the site during 2019.

- Monitor groundwater flow direction and velocity to assess site changes
- Continue groundwater monitoring to assess contaminant plume stability.
- Use groundwater monitoring to monitor for impacts from the Former Dry Well.
- Submit an annual report to present the results and findings of completed activities.

The activities and approximate timeframe for the 2019 work is presented below.

2018 Activity	Planned Timeframe
Annual ADEC Strategy Meeting	Winter/Early Spring 2019
Groundwater Monitoring and Gauging	Fall 2019
Reporting	Winter 2019

7.2.1 MONITORING PROGRAM

Tesoro plans to continue annual groundwater monitoring in 2019. Table 4 lists the proposed sampling locations, rationale, and sampling timeframe. Annual groundwater monitoring will be completed in accordance with the Sampling and Analysis Plan included in Appendix E. Any work outside of the annual groundwater monitoring will be completed under a separate standalone work plan. Monitoring activities include:

- Conducting routine monitoring during the late 3rd or early 4th quarter, consistent with previous sampling efforts and methods.
- Gauging monitoring wells prior to the monitoring event to assess groundwater flow.
- Analyzing groundwater samples for BTEX, GRO, and DRO as outlined in Table 4 and in accordance with the Sampling and Analysis plan in Appendix E.

8.0 REFERENCES

ADEC. 2017. Field Sampling Guidance.

Trihydro Corporation, Inc. 2018. *2018 Groundwater Sampling Work Plan*. Letter to Robert Burgess, ADEC. Tesoro Petroleum Terminal, Fairbanks International Airport. 27 August 2018.

Trihydro Corporation, Inc. 2017. *2017 Annual Groundwater Monitoring Report*. Tesoro Petroleum Terminal, Fairbanks International Airport.

Trihydro Corporation, Inc. 2018. *Final Fairbanks Petroleum Terminal Dry Well Investigation*. Fairbanks Petroleum Terminal, Tesoro Alaska Company, Fairbanks Alaska. 1 June.

Shannon & Wilson, Inc. 2009. *2008 Annual Report Groundwater Monitoring and Subsurface Investigations*. Flint Hills Resources Alaska Fuel Terminal, Fairbanks International Airport, Alaska.

TABLES

TABLE 1. 2018 GROUNDWATER ELEVATIONS
TESORO ALASKA COMPANY, FAIRBANKS PETROLEUM TERMINAL
FAIRBANKS, ALASKA

Location	Date Measured	TOC Elevation (ft-msl)	Depth to Product (ft-btoc)	Depth to Water (ft-btoc)	Product Thickness (ft)	Groundwater Elevation (ft-msl)	Corrected Water Elevation (ft-msl)
MW-1R	9/17/2018	428.48	ND	10.06	NA	418.42	418.42
MW-2	9/17/2018	433.66	ND	15.26	NA	418.40	418.40
MW-3	9/17/2018	434.33	ND	16.03	NA	418.30	418.30
MW-4	9/17/2018	433.19	ND	14.50	NA	418.69	418.69
MW-5	9/17/2018	426.24	ND	8.01	NA	418.23	418.23
MW-6R	9/17/2018	426.37	7.97	8.04	0.07	418.33	418.39
MW-7	9/17/2018	427.87	ND	10.86	NA	417.01	417.01
MW-8	9/17/2018	429.77	ND	11.33	NA	418.44	418.44
MW-9	9/17/2018	429.96	ND	11.95	NA	418.01	418.01
MW-10	9/17/2018	427.50	ND	9.08	NA	418.42	418.42
MW-11	9/17/2018	426.37	ND	8.12	NA	418.25	418.25
MW-15	9/17/2018	427.22	ND	8.96	NA	418.26	418.26
MW-16	9/17/2018	424.32	ND	5.97	NA	418.35	418.35
MW-17A	9/17/2018	425.91	ND	7.48	NA	418.43	418.43
MW-17B	9/17/2018	425.91	ND	7.48	NA	418.43	418.43
MW-18R	9/17/2018	429.05	10.36	10.68	0.32	418.37	418.63
MW-19	9/17/2018	425.53	ND	7.32	NA	418.21	418.21
MW-20	9/17/2018	428.18	ND	10.11	NA	418.07	418.07
MW-21	9/17/2018	427.04	ND	8.86	NA	418.18	418.18
MW-22	9/17/2018	425.62	ND	7.45	NA	418.17	418.17
MW-23	9/17/2018	426.99	ND	8.24	NA	418.75	418.75
MW-24	9/17/2018	426.63	8.05	8.35	0.30	418.28	418.53
MW-25	9/17/2018	424.75	ND	6.40	NA	418.35	418.35

TOC Top of Casing
btoc Below Top of Casing
msl Mean Sea Level
bgs Below Ground Surface
NA Not Applicable
ND Non-Detect

NOTES:
Monitoring wells MW-17A/B are within a single casing with two different screen intervals.
TOC Elevation survey completed 8/7/2018.

TABLE 2. SUMMARY OF 2018 GROUNDWATER SAMPLING FIELD DATA
TESORO ALASKA COMPANY,FAIRBANKS PETROLEUM TERMINAL TERMINAL
FAIRBANKS, ALASKA

Location ID	Date Sampled	Oxidation-Reduction Potential (mV)	Oxygen, Dissolved (mg/L)	pH (Std Units)	Temperature (°C)	Turbidity (NTU)	Specific Conductance @25C (mmhos/cm)
MW-1R	09/17/18	-59.2	0.14	6.66	10.01	1.98	0.941
MW-2	09/17/18	-54.3	0.08	6.95	9.17	0	0.63
MW-3	09/17/18	7.4	0.18	6.76	7.99	285	0.776
MW-4	09/18/18	91.9	1.36	7.24	7.87	6.19	0.56
MW-5	09/18/18	52.8	0.27	6.79	10.31	205.8	0.643
MW-6R	09/20/18	88.3	1.09	6.53	7.35	11.05	0.917
MW-7	09/18/18	76	0.33	6.79	7.34	871	0.705
MW-8	09/18/18	63.7	2.02	6.63	8.63	125	1.071
MW-9	09/19/18	15.5	2.03	6.81	7.98	311	0.643
MW-10	09/18/18	-105.6	0.51	6.46	9.89	8.31	1.03
MW-11	09/19/18	50.3	0.18	6.91	5.44	45.9	0.639
MW-15	09/18/18	80.1	1.36	6.74	8	1100	0.835
MW-16	09/18/18	68	4.59	6.69	8.39	250	0.938
MW-17A	09/19/18	33.1	0.16	6.99	5.8	1.24	0.609
MW-17B	09/19/18	-6.2	0.15	7	5.86	83.41	0.61
MW-18R	09/20/18	34.3	NA	6.55	6.64	4.77	1.019
MW-19	09/18/18	51	0.17	6.93	7.4	655	0.573
MW-20	09/18/18	86	4.47	6.74	8.32	30	0.9
MW-21	09/19/18	60.9	7.46	6.97	2.86	94.47	0.643
MW-22	09/18/18	81.5	0	6.54	2.85	48.52	0.587
MW-23	09/19/18	59.4	2.07	6.8	7.67	2.82	0.808
MW-24	09/20/18	18.2	13.31	6.58	8.31	7.22	0.532
MW-25	09/18/18	66.9	0.66	6.68	7.93	227	0.971

Notes:

mV	millivolts
mmhos/cm	millimhos per centimeter
mg/L	milligrams per liter
std units	standard units
°C	degrees celsius
ntu	nephelometric turbidity units
NA	Not Measured

TABLE 3. 2018 GROUNDWATER ANALYTICAL DATA
TESORO ALASKA COMPANY, FAIRBANKS PETROLEUM TERMINAL
FAIRBANKS, ALASKA

Location ID	Sample Date	Benzene (εg/L)	Toluene (εg/L)	Ethylbenzene (εg/L)	Xylenes, Total (εg/L)	GRO (mg/L)	DRO (mg/L)
MW-1R	09/17/18	**771**	143	**113**	**665**	**3.88**	**5.89**
MW-2	09/17/18	**12.1**	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.62)
MW-3	09/17/18	0.69	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.62)
MW-4	09/18/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.658)
MW-5	09/18/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.647)
MW-6R Below LNAPL	09/20/18	**8.76**	ND(1)	ND(1)	4.89	0.195	**28.9**
MW-7	09/18/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.625)
MW-8	09/18/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.62)
MW-9	09/19/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.641)
MW-10	09/18/18	0.58	1.76	8.91	**500**	1.13	**15.7**
MW-11	09/19/18	1.49	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.63)
MW-15	09/18/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.652)
MW-16	09/18/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.625)
MW-17A	09/19/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.615)
MW-17B	09/19/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.636)
MW-18R Below LNAPL	09/20/18	0.64	ND(1)	5.07	44.8	0.343	**8.73**
MW-19	09/18/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.67)
MW-20	09/18/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.641)
MW-21	09/19/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.605)
MW-22	09/18/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.625)
MW-23	09/19/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.615)
MW-24 Below LNAPL	09/20/18	0.55	1.99	**158**	**2120**	**4.41**	**7.44**
MW-25	09/18/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.652)
ADEC GW Table C 2016		4.6	1,100	15	190	2.2	1.5

Notes:
BOLD The concentration or reporting limit exceeds the 18 AAC 75, Table C Groundwater Cleanup Levels
GRO Gasoline Range Organics
DRO Diesel Range Organics
ND Not Detected
-- Not Sampled/Analyzed

TABLE 4. SUMMARY OF 2019 MONITORING PROGRAM
TESORO ALASKA COMPANY, FAIRBANKS PETROLEUM TERMINA
FAIRBANKS, ALASKA

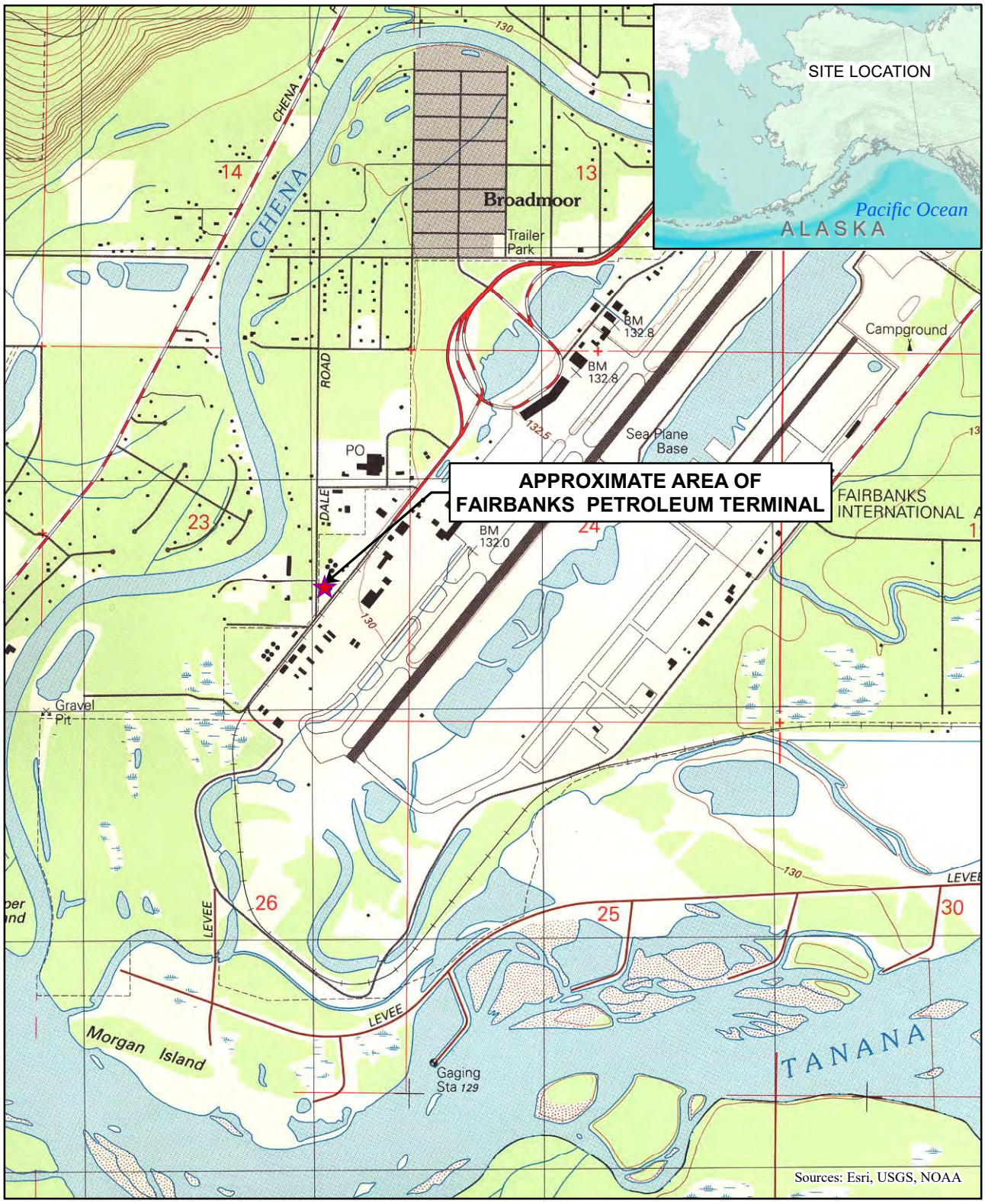
Sample Location	Sampling Rationale	Frequency
Monitoring Well sampling GRO/BTEX and DRO [1]		
MW-1R	Source Area/Near Source Area Benzene and DRO Plume Monitoring	Fall
MW-2		
MW-3		
MW-6R*		
MW-8		
MW-9		
MW-10		
MW-17A/B		
MW-18R*		
MW-24*		
MW-5	Upgradient	
MW-4		
MW-23		
MW-7		
MW-11	Downgradient	
MW-15		
MW-16		
MW-19		
MW-20		
MW-21		
MW-22		

Notes:

1. All accessible wells will be gauged

* Denotes well that may contain LNAPL.

FIGURES



N

0 200'

Trihydro CORPORATION

1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

FIGURE 1

SITE LOCATION MAP

TESORO FAIRBANKS TERMINAL
FAIRBANKS, ALASKA

Drawn By: PH	Checked By: CS	Scale: 1" = 200'	Date: 10/27/17	File: Fig1_TerminalLocationPT.mxd

EXPLANATION

- MONITORING WELL
- APPROXIMATE TERMINAL PROPERTY BOUNDARY

N

0 125'

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Laramie, WY 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

FIGURE 2

SITE PLAN AND MONITORING WELL LOCATIONS

TESORO FAIRBANKS PETROLEUM TERMINAL
FAIRBANKS, ALASKA

Drawn By: PH	Checked By: CS	Scale: 1 " = 125 '	Date: 11/12/18	File: TesoroPT_SitePlan_Fig2.mxd

EXPLANATION

- MONITORING WELL
- POTENTIOMETRIC SURFACE (DASHED WHERE INFERRED)
- APPROXIMATE TERMINAL PROPERTY BOUNDARY

N

0 125'

418.39 POTENTIOMETRIC SURFACE ELEVATION IN FEET MSL

0.07 LNAPL THICKNESS IN FEET

Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

FIGURE 3

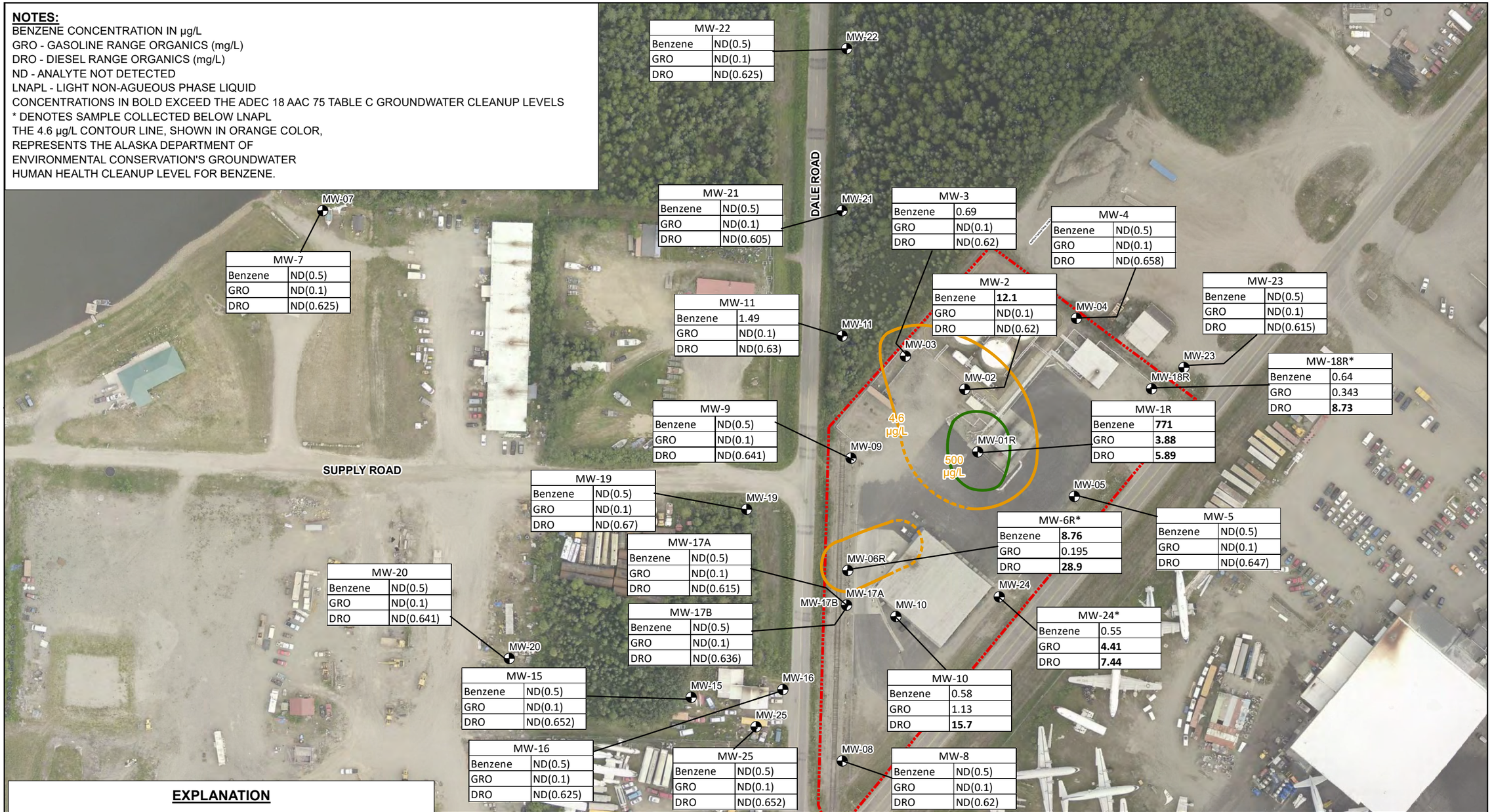
SEPTEMBER 2018 GROUNDWATER ELEVATION MAP

TESORO FAIRBANKS PETROLEUM TERMINAL FAIRBANKS, ALASKA

Drawn By: PH	Checked By: CS	Scale: 1 " = 125 '	Date: 11/13/18	File: 3_TesoroPT_SitePS.mxd

NOTES:

BENZENE CONCENTRATION IN µg/L
GRO - GASOLINE RANGE ORGANICS (mg/L)
DRO - DIESEL RANGE ORGANICS (mg/L)
ND - ANALYTE NOT DETECTED
LNAPL - LIGHT NON-AGUEOUS PHASE LIQUID
CONCENTRATIONS IN BOLD EXCEED THE ADEC 18 AAC 75 TABLE C GROUNDWATER CLEANUP LEVELS
* DENOTES SAMPLE COLLECTED BELOW LNAPL
THE 4.6 µg/L CONTOUR LINE, SHOWN IN ORANGE COLOR,
REPRESENTS THE ALASKA DEPARTMENT OF
ENVIRONMENTAL CONSERVATION'S GROUNDWATER
HUMAN HEALTH CLEANUP LEVEL FOR BENZENE.



EXPLANATION

- MONITORING WELL
- 4.6 µg/L BENZENE CONTOUR LINE OF EQUAL CONCENTRATION SHOWING GROUNDWATER (DASHED WHERE INFERRED)
- 500 µg/L BENZENE CONTOUR LINE OF EQUAL CONCENTRATION SHOWING GROUNDWATER
- APPROXIMATE TERMINAL PROPERTY BOUNDARY

N

0 125'

Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

FIGURE 4

2018 GROUNDWATER CONCENTRATIONS

TESORO FAIRBANKS PETROLEUM TERMINAL
FAIRBANKS, ALASKA

Drawn By: PH	Checked By: CS	Scale: 1 " = 125 '	Date: 1/16/19	File: Fig4_TesoroPT_SiteBenz.mxd

APPENDIX A

SITE HISTORY

APPENDIX A. SITE HISTORY

SITE HISTORY

Site Background

The terminal is located west of the Fairbanks International Airport (FIA) and east of Dale Road at 5250 Airport Industrial Road (Figure 1). The site occupies approximately 3.5 acres encompassing Airport Block 2, Subdivision Lots 2 and 3. The property is leased from the state of Alaska by Tesoro Alaska Company (Tesoro). Site facilities include a garage/pump room/office building, seven aboveground storage tanks (ASTs, four 5,000-barrel Jet storage tanks, one 10,000 gallon empty tank, one 20,000 gallon ultra-low diesel tank, and one 1,000 gallon double walled vapor recovery tank), two underground storage tanks (USTs, one 1,000 gallon tank and one 2,500 gallon tank), a pump building, aboveground/underground piping, truck loading/unloading facilities, and a closed railroad spur. The rail spur was operational from 1970 into the late 1980s and is located outside the perimeter fence along Dale Rd. In addition, the Terminal was served by an airport hydrant fueling system that was used for direct fuel transfer. Figure 2 shows the site facilities and aerial imagery. These facilities are within a locked chain-link fence and cover approximately 3.5 acres.

A total of 27 monitoring wells have been installed onsite (MW-1R, MW-2, MW-3, MW-4, MW-5, MW-6R, MW-8, MW-9, MW-10, MW-17A, MW-17B, MW-18R, and MW-24) and on nearby properties (MW-7, MW-11, MW-15, MW-16, MW-19, MW-20, MW-21, MW-22, MW-23, and MW-25) to monitor groundwater contaminant conditions and aid in subsurface investigations. Monitoring wells MW-1, MW-12, MW-13, and MW-14 (not listed above) have been decommissioned and are no longer used for monitoring investigations. Historical groundwater concentrations are recorded in Table A-1.

The Terminal tank farm was constructed in 1969. Tesoro acquired the Fairbanks Petroleum Terminal in 2016 from Flint Hills Resources Alaska (FHRA), who assumed the lease in 2004. Previous leaseholders are Williams Alaska Petroleum, Inc., Standard Oil Company, Chevron, and Mapco.

The Chena River is as close as 750 to 800 feet northwest of the tank farm area, and the confluence of the Chena and Tanana Rivers is approximately 6,000 feet southwest of the Terminal. The area between the Terminal and the Chena River includes undeveloped forested land, low-density residential properties, and light industrial properties.

The Terminal facilities, road, and railroad are built on several feet of engineered fill. The fill is on top of native soils that are typical of the Tanana and Chena River flood plain. Chena Alluvium sand and gravel underlie the shallow fine-grained soil to depths of at least 300 feet (Claar and Lilly, 1997). Groundwater occurs under unconfined and confined conditions depending on the thickness of the shallow fine-grained soil and seasonal water levels. The water table or potentiometric surface ranges from approximately 7 to 17 feet below ground surface (bgs) and fluctuates seasonally by 4 to 5 feet depending on water levels in the Chena and Tanana Rivers. The lowest levels occur in the winter, and peak levels coincide with high river levels in the spring and late summer. The general groundwater flow direction at low gradients is northwest, towards the Chena River, with a gradient of 0.0009 foot per foot (Shannon & Wilson, 2009). When the Chena River is at high stage, the local water-elevation gradient exhibits a reversal and groundwater flows southeast.

APPENDIX A. SITE HISTORY

Onsite Investigations

Numerous operation-related petroleum product releases occurred onsite from 1970 through the 1980s and resulted in several remedial actions involving soil excavations. The hydrant fueling system, used for fuel transfer, was taken out of service about 1984 and was followed by the closure of the underground pipelines in 1986 that supplied fuel to Fairbanks International Airport (FIA). In 1988, the Alaska Department of Environmental Conservation (ADEC) listed the terminal as a contaminated site (File ID 100.38.167) and began regulating the site, requiring groundwater investigations and monitoring activities. The fueling Terminal is listed by the United States Environmental Protection Agency (EPA) as a conditionally exempt small quantity generator of hazardous waste (Handler ID AKD000835033). Shannon & Wilson, Inc. began site characterization activities via soil and groundwater quality monitoring at locations on and near the Terminal in 2001 and continued through 2015 in efforts to delineate the extent of subsurface contamination and to assess possible contaminant migration off-site via the subsurface. Petroleum products that have been stored and/or transfer onsite include aviation gasoline, lead gasoline, Jet-A, Jet-B, JP-4, and diesel. Historical onsite localities of fuel spills and releases have been recorded at the Terminal, rail spur, and hydrant system. Four known operational spills over 50 gallons have occurred at the Terminal and included:

DATE	DESCRIPTION	PRODUCT	VOLUME (GALLONS)
1978	TANK OVERTOPPING	JP-4	1,500
1978	TANK OVERTOPPING	JP-4	300
1981	DIESEL FUEL	UNKNOWN	500-8,000
1985	OPEN VALVE ON TANK 14	JET A	7,386

Between 2001 and 2005, site activities and groundwater quality monitoring was completed by Shannon & Wilson, Inc. which entailed installation and sampling of monitoring wells, installation of soil vapor probes, sampling of residential wells for volatile organic compounds (VOC's), collection of water samples from temporary well points on surrounding properties along Dale Rd, and subsurface investigations near the onsite garage and filter building.

In 2004, site characterization efforts were performed by Shannon & Wilson to better classify the types and distribution of facilities contamination. At that time, site conditions signified three distinct groundwater hydrocarbon-contaminant plumes located at and around the Terminal; northern plume, middle plume, and southern plume. The northern plume is associated with light non-aqueous phase liquid (LNAPL) contaminated soil around MW-1, the middle contaminant plume is possibly related to contamination from the injection well near MW-10, and a southern plume interconnected with contaminated soil near the southern end of the rail spur (Shannon & Wilson, 2009).

Investigations pertaining to the former dry well, previously located in the parking lot west of the garage near MW-10, began in 2003, in an attempt to characterize the soil and groundwater contamination in the area surrounding the dry well. The former dry well is listed under the EPA's injection well inventory as having a well-operation status of "AN," indicating the well was "permanently abandoned and not approved by the state" (Shannon & Wilson, 2009). Soil and groundwater samples were analyzed from MW-10, along with groundwater samples from downgradient wells, MW-6, MW-8, and MW-9 to better define the contaminant plume. An additional groundwater monitoring well (MW-17A/B) was installed downgradient of MW-10, in October 2004, to monitor for the presence of contaminants possibly released from the dry well, such as dense non-aqueous phase

liquid (DNAPL) halogenated contaminants. Data collected from the monitoring wells located near the former dry well displayed consistent results throughout sampling. No evidence in support of DNAPL disposal through the dry well is documented and no traces of halogenated compounds were detected within any of the downgradient monitoring wells. Data results indicate that the contamination associated with the dry well has a limited extent and that the former disposal practice via the injection well did not result in extensive subsurface contamination (Shannon & Wilson, 2009).

The southernmost plume was extending offsite towards Dale Road and resulted in the Rail Spur Corrective Action that was mitigated in April of 2006. The Rail Spur Corrective Action was performed to address soil contamination along the southern portion of the Terminal's rail spur hydrant fueling system that was detected via soil gas probes during the 2004 site characterization efforts. Field activities performed during groundwater mitigation included the removal/replacement of a portion of rail, excavation of 475 tons of contaminated soil, field screening and segregation of contaminated soils, soil sampling, and excavation backfill (Shannon & Wilson, 2006). The soil excavation was completed north of MW-8 between MW-8 and MW-17A/B. Sampling data from nearby monitoring wells indicate that a significant amount of the contaminated soil was removed and the groundwater quality improved as a result of the corrective action.

In 2008, the Alaska Department of Environmental Conservation (ADEC), Flint Hills Resources representatives, and Shannon and Wilson, Inc. met to discuss the current conditions and the efforts performed to characterize the subsurface groundwater quality at and around the fueling Terminal. The benzene plume was determined to be stable. Following review of the 2008 groundwater data evaluation report, Mr. Neal Everson with the ADEC approved to reduce the quarterly monitoring schedule to an annual monitoring schedule, effective late-summer, 2009. Based on offsite detections of benzene in groundwater samples, an offsite investigation was completed to further evaluate the extent and possible source. Activities and results of this investigation are discussed below as part of the Off-site Property and Investigations section.

Dry well investigation activities, including a geophysical investigation and soil sampling, were performed by Trihydro in 2017, in an attempt to locate and investigate the dry well. A summary of investigation activities is presented in Section 6.0 of the 2017 Annual Groundwater Monitoring Report (Trihydro 2017). A detailed report of field activities and closure procedures, including all sampling results and waste disposal manifests, of the dry well investigation is included in the 2017 Dry Well Report (Trihydro 2018). Based on the 2017 Dry Well Investigation the EPA granted conditional closure of the Former Dry Well with any remaining impacts to be managed by ADEC.

Off-site Property and Investigations

The off-site portion of the groundwater monitoring and investigation activities occurred on lots 1, 2, 14, 15, and 16, located west-northwest of the Terminal.

- Lot 1 is owned by the Alaska State Airport and is situated north-northwest of the fueling Terminal. Monitoring wells MW-11, MW-21, and MW-22 are located on Lot 1, along Dale Road and were installed between 2003 and 2006.
- Lot 2, 5696 Supply Rd, and Lot 16, 5688 Rig Rd, are residential properties owned by Raymond Young and are located west and northwest of the Terminal. MW-7 was installed on Lot 2 in 2001 and MW-20 was installed in 2005 on Lot 16.

- Lot 14, 5670 Supply Rd, is owned by Reed Miller and west-northwest of the Terminal. The property is utilized as the business location for Reed's Snowmachine and Marine. MW-12, MW-13, MW-14, and four temporary monitoring wells were at one time installed on Lot 14, but were decommissioned in 2008.
- Lot 15 is west of the Terminal and is a residential lot owned by Everts Air. MW-15, MW-16, MW-19, and MW-25 were installed on Lot 15 between 2001 and 2008.
- The offsite monitoring wells have been below ADEC groundwater cleanup level for benzene, toluene, ethylbenzene, and xylenes (BTEX), diesel-range organics (DRO), and gasoline-range organics (GRO) since 2011. Additionally this holds true for the new ADEC groundwater cleanup levels released in November 2016.

In 2001, benzene concentrations were detected in an off-site monitoring well (MW-14) located at Reed's Snowmachine and Marine. The benzene contamination was originally suspected to have migrated from the Terminal and further investigations were required by the ADEC. Three monitoring wells (MW-12, MW-13, and MW-14) were installed on the property in 2004 to determine the nature and extent of the groundwater contamination in that area. Results compiled in 2007 suggested that the groundwater gradient within the area may vary and contamination could be migrating from a different source. In further support, two discrete contaminants (1,1-dichloroethane and dichloro-difluoro-methane), not reported in the Terminal facility's plume were detected on Mr. Miller's property. In 2008, four additional temporary monitoring wells were installed along the east side of the property with the purpose of sampling to further delineate the off-site contaminant source (Shannon & Wilson, 2008). The temporary monitoring wells were installed, sampled, and decommissioned on the same day in June of 2008. MW-12 and MW-13 were sampled and decommissioned at the same time in compliance with ADEC guidance. Benzene contamination detected in MW-14 was perhaps related to a source on properties west of Reed's Snowmachine and Marine or directly on that property (Shannon & Wilson, 2009).

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Claar, D. V. and Lilly, M. R. 1997. *Ground-water and surface-water elevations in the Fairbanks International Airport Area*, Alaska, 1990-96, and selected geohydrologic report references, U. S. Geological Survey Open-File Report 97-597, 154 p.

Abbreviations and Acronyms

ADEC	Alaska Department of Environmental Conservation
AST	above-ground storage tank
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
DNAPL	dense non-aqueous phase liquid
DRO	diesel-range organics
EPA	United States Environmental Protection Agency
FHRA	Flint Hills Resources Alaska
FIA	Fairbanks International Airport
GRO	gasoline-range organics
LNAPL	light non-aqueous phase liquid
mg/L	milligrams per liter
Terminal	Tesoro's Fairbanks Petroleum Terminal
Tesoro	Tesoro Alaska Company
µg/L	micrograms per liter
UST	underground storage tank
VOCs	volatile organic compounds

TABLE

TABLE A-1 HISTORICAL BTEX, GRO, AND DRO GROUNDWATER CONCENTRATIONS
TESORO ALASKA COMPANY, FAIRBANKS PETROLEUM TERMINAL
FAIRBANKS, ALASKA

Location ID	Date Sampled	Benzene (εg/L)	Toluene (εg/L)	Ethylbenzene (εg/L)	Xylenes (εg/L)	GRO (mg/L)	DRO (mg/L)
MW-1	10/02/91	**2500**	**2100**	**470**	**1600**	--	--
	12/29/93	**66**	190	**30**	190	--	--
	11/21/00	**76.4**	768	**67.6**	**1576**	**28.2**	**285**
	04/20/01	**165**	708	**74.9**	**1594**	**9.5**	**76.5**
	11/19/01	**197**	28.1	**45.3**	135.3	1.78	**3.67**
	05/21/02	**35**	53	ND(1)	59	1.7	**15**
	04/03/03	**31**	10	3.2	40	--	--
	07/28/06	**85.6**	216	**16.3**	167.39	1.65	1.03
	09/14/06	**78.7**	29.1	13.7	62.7	0.34	**1.77**
	07/13/07	**7.62**	22.4	2.4	29.4	0.173	0.442
	09/17/07	**38.8**	71.5	9.47	98.6	0.546	0.656
	05/24/08	**962**	142	**155**	**675**	**4.2**	**4.86**
MW-1R	09/27/12	**491**	216	**116**	**425**	**3.32**	**4.35**
	10/06/16	**1240**	792	**241**	**1613**	**7.56**	**11.9**
	09/21/17	**1300**	921	**284**	**1977**	**8.4**	**9.52**
	09/17/18	**771**	143	**113**	**665**	**3.88**	**5.89**
MW-2	10/01/91	**230**	ND(1)	5	64	--	--
	07/22/93	**29**	ND(1)	ND(1)	ND(2)	--	--
	09/30/93	ND(1)	ND(1)	ND(1)	ND(2)	--	--
	12/29/93	**170**	ND(1)	**38**	23	--	--
	03/31/94	**100**	ND(1)	9	8	--	--
	11/21/00	**31**	ND(1)	ND(1)	2.71	0.185	1.17
	04/20/01	**15.3**	ND(2)	ND(2)	ND(2)	0.0928	0.792
	11/19/01	**95.5**	ND(1)	2.93	7.9	0.195	**2.39**
	05/21/02	3	ND(1)	ND(1)	ND(2)	ND(0.1)	0.18
	08/01/02	**9.7**	ND(1)	ND(1)	2.4	ND(0.1)	ND(0.1)
	10/14/02	**52**	ND(1)	1.6	4.6	0.56	1.2
	04/01/03	**9.1**	ND(1)	ND(1)	ND(3)	ND(0.05)	0.32
	11/06/03	**220**	ND(5)	7.8	29	0.54	**2.5**
	07/08/04	**10.7**	ND(2)	ND(2)	ND(4)	ND(0.09)	0.374
	10/26/04	**108**	ND(1)	1.53	11.91	0.436	**1.6**
	06/07/05	**6.32**	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.309)
	08/30/05	4.31	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.306)
	02/08/06	**62.8**	ND(2)	ND(2)	17.78	0.216	0.928
	05/01/06	**24.8**	ND(2)	ND(2)	ND(2)	0.0919	0.302
	07/27/06	0.603	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.3)
	09/13/06	**8.53**	ND(2)	ND(2)	ND(2)	ND(0.1)	0.388
ADEC GW Table C 2016		4.6	1,100	15	190	2.2	1.5

TABLE A-1 HISTORICAL BTEX, GRO, AND DRO GROUNDWATER CONCENTRATIONS
TESORO ALASKA COMPANY, FAIRBANKS PETROLEUM TERMINAL
FAIRBANKS, ALASKA

Location ID	Date Sampled	Benzene (εg/L)	Toluene (εg/L)	Ethylbenzene (εg/L)	Xylenes (εg/L)	GRO (mg/L)	DRO (mg/L)
MW-2	07/12/07	2.14	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.317)
	05/23/08	**15**	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	ND(0.4)
	09/16/09	**56.4**	ND(2)	2.58	10.9	0.156	ND(0.714)
	09/23/10	3.49	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.769)
	09/30/11	**26.6**	ND(1)	1.51	5.8	ND(0.121)	ND(0.627)
	09/27/12	2.04	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	0.316
	09/19/13	3.14	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	ND(0.36)
	09/10/14	**15.3**	ND(0.5)	0.51	3.92	0.0757	0.583
	09/18/15	**48**	ND(1)	4.03	22.1	0.216	0.523
	10/05/16	**212**	1.29	10.2	88.6	0.706	**2.35 J**
	09/21/17	**249**	1.43	2.98	84.7	0.677	**1.91 JB**
	09/17/18	**12.1**	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.62)
MW-3	10/01/91	**31**	ND(1)	ND(1)	ND(1)	--	--
	07/22/93	**110**	ND(1)	**25**	7	--	--
	09/30/93	**84**	1	12	12	--	--
	12/29/93	**130**	ND(1)	**40**	13	--	--
	03/31/94	**160**	ND(1)	**45**	12	--	--
	11/21/00	**20.8**	ND(1)	ND(1)	ND(2)	ND(0.1)	0.664
	04/20/01	**30.9**	ND(2)	ND(2)	ND(2)	0.106	1.18
	11/19/01	**52.5**	ND(1)	**17.2**	14.87	0.169	1.41
	05/21/02	**15**	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.1)
	08/01/02	**41**	ND(1)	ND(1)	2.2	ND(0.1)	0.66
	10/14/02	**8.9**	ND(1)	ND(1)	ND(2)	ND(0.1)	0.33
	04/01/03	**32**	ND(1)	ND(1)	ND(3)	0.1	0.88
	07/23/03	**17**	ND(1)	ND(1)	ND(3)	0.064	0.41
	11/06/03	**51**	1.4	**17**	23	0.15	1
	07/09/04	**23.9**	ND(2)	ND(2)	ND(4)	ND(0.09)	0.519
	10/26/04	**47.2**	ND(1)	4.86	13.36	0.187	0.987
	06/07/05	**29.8**	ND(2)	ND(2)	ND(2)	ND(0.09)	0.639
	08/30/05	**28.6**	ND(2)	ND(2)	ND(2)	ND(0.09)	0.835
	02/08/06	**68.4**	ND(1)	5.73	4.48	ND(0.9)	**1.51**
	05/01/06	**23.1**	ND(2)	ND(2)	ND(2)	ND(0.9)	1.11
	07/27/06	**22.8**	ND(2)	ND(2)	5.27	0.103	0.375
	09/13/06	**24**	ND(2)	ND(2)	3.38	ND(0.1)	1.28
	07/12/07	3.54	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.323)
	05/23/08	**24.1**	ND(0.5)	ND(0.5)	2.83	0.082	0.602
	09/16/09	**34.1**	ND(2)	ND(2)	6.58	ND(0.1)	ND(0.714)
ADEC GW Table C 2016		4.6	1,100	15	190	2.2	1.5

TABLE A-1 HISTORICAL BTEX, GRO, AND DRO GROUNDWATER CONCENTRATIONS
TESORO ALASKA COMPANY, FAIRBANKS PETROLEUM TERMINAL
FAIRBANKS, ALASKA

Location ID	Date Sampled	Benzene (εg/L)	Toluene (εg/L)	Ethylbenzene (εg/L)	Xylenes (εg/L)	GRO (mg/L)	DRO (mg/L)
MW-3	09/23/10	**17.3**	ND(1)	ND(1)	ND(2)	ND(0.1)	1.08
	09/30/11	**24.1**	ND(1)	ND(1)	2.05	ND(0.105)	1.14
	09/27/12	**20.5**	ND(0.62)	ND(0.62)	1.73	ND(0.1)	0.751
	09/19/13	**4.82**	ND(0.62)	ND(0.62)	ND(1.24)	0.0398	0.613
	09/10/14	**5.39**	ND(0.5)	ND(0.5)	ND(1)	0.0446	0.796
	09/18/15	**7.98**	ND(0.5)	ND(0.5)	ND(1)	0.0542	ND(0.268)
	10/05/16	**5.26**	ND(0.5)	ND(0.5)	2.64 J	0.0504J/ND(0.0504) U*	0.619 J
	09/21/17	2.47	ND(1)	ND(1)	2.21	ND(0.1)	ND(0.641)
	09/17/18	0.69	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.62)
MW-4	12/03/91	2	ND(1)	ND(1)	ND(3)	--	--
	02/27/92	**6**	2	ND(1)	ND(3)	--	--
	07/23/93	**10**	60	9	57	--	--
	09/30/93	**9**	5	8	11	--	--
	12/29/93	**5**	ND(1)	2	6	--	--
	11/21/00	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.8)
	04/20/01	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.8)
	11/19/01	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.09)	ND(0.495)
	05/21/02	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.1)	0.26
	08/01/02	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.1)	0.22
	10/14/02	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.1)	0.15
	04/01/03	ND(1)	ND(1)	ND(1)	ND(3)	ND(0.05)	0.2
	07/23/03	ND(1)	ND(1)	ND(1)	ND(3)	ND(0.05)	0.17
	11/05/03	ND(1)	ND(1)	ND(1)	ND(3)	ND(0.05)	0.17
	07/08/04	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.09)	ND(0.306)
	10/26/04	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.09)	ND(0.313)
	06/07/05	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	0.311
	08/30/05	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.303)
	02/08/06	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.319)
	05/01/06	**48.1**	ND(2)	ND(2)	ND(2)	ND(0.174)	ND(0.3)
	07/28/06	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.3)
	09/13/06	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.3)
	07/12/07	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.373)
	05/23/08	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	ND(0.391)
	09/16/09	ND(2)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.714)
	09/24/10	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.784)
	09/30/11	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.6)
ADEC GW Table C 2016		4.6	1,100	15	190	2.2	1.5

TABLE A-1 HISTORICAL BTEX, GRO, AND DRO GROUNDWATER CONCENTRATIONS
TESORO ALASKA COMPANY, FAIRBANKS PETROLEUM TERMINAL
FAIRBANKS, ALASKA

Location ID	Date Sampled	Benzene (εg/L)	Toluene (εg/L)	Ethylbenzene (εg/L)	Xylenes (εg/L)	GRO (mg/L)	DRO (mg/L)
MW-4	09/27/12	0.13	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	0.248
	09/19/13	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	ND(0.36)
	09/10/14	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.271
	09/18/15	ND(0.2)	ND(1)	ND(0.5)	ND(1)	0.0364	0.175
	10/05/16	ND(0.25)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	ND(0.318)
	09/21/17	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.625)
	09/18/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.658)
MW-5	12/03/91	ND(1)	ND(1)	ND(1)	ND(2)	--	--
	02/27/92	ND(1)	ND(1)	ND(1)	ND(2)	--	--
	07/22/93	ND(1)	ND(1)	ND(1)	ND(2)	--	--
	09/30/93	ND(1)	ND(1)	ND(1)	ND(2)	--	--
	12/29/93	2	ND(1)	2	ND(2)	--	--
	03/31/94	ND(1)	ND(1)	ND(1)	ND(2)	--	--
	11/21/00	1.52	ND(1)	ND(1)	ND(2)	ND(0.09)	0.433
	11/19/01	1.87	ND(1)	ND(1)	ND(2)	ND(0.09)	0.595
	05/21/02	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.1)	0.53
	08/01/02	3.1	ND(1)	ND(1)	ND(2)	ND(0.1)	**1.7**
	10/14/02	ND(1)	ND(1)	ND(1)	ND(2)	0.1	0.99
	04/01/03	2	ND(1)	ND(1)	ND(3)	ND(0.05)	0.27
	07/23/03	1	ND(1)	ND(1)	ND(3)	ND(0.05)	0.75
	11/05/03	ND(1)	ND(1)	ND(1)	ND(3)	ND(0.05)	0.54
	07/08/04	1.5	ND(2)	ND(2)	ND(4)	ND(0.09)	0.474
	10/26/04	0.5	ND(1)	ND(1)	ND(2)	ND(0.09)	ND(0.313)
	06/07/05	1.35	ND(2)	ND(2)	ND(2)	ND(0.09)	0.468
	08/30/05	1.11	ND(2)	ND(2)	ND(2)	ND(0.09)	0.378
	02/08/06	1.52	ND(2)	ND(2)	ND(2)	ND(0.09)	0.337
	07/27/06	1.41	ND(2)	ND(2)	ND(2)	ND(0.1)	0.534
	09/13/06	0.709	ND(2)	ND(2)	ND(2)	ND(0.1)	0.532
	07/20/07	0.787	ND(2)	ND(2)	ND(2)	ND(0.1)	0.651
	09/15/09	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.714)
	09/24/10	0.73	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.714)
	09/30/11	0.37	ND(1)	ND(1)	ND(2)	ND(1)	ND(0.6)
	09/27/12	0.36	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	0.291
	09/19/13	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	0.206
	09/10/14	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.228
	09/18/15	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	0.0477	ND(0.268)
	10/05/16	0.16 J	ND(0.5)	ND(0.5)	ND(1)	0.0343J/ND(0.05)U*	0.313 J
ADEC GW Table C 2016		4.6	1,100	15	190	2.2	1.5

TABLE A-1 HISTORICAL BTEX, GRO, AND DRO GROUNDWATER CONCENTRATIONS
TESORO ALASKA COMPANY, FAIRBANKS PETROLEUM TERMINAL
FAIRBANKS, ALASKA

Location ID	Date Sampled	Benzene (εg/L)	Toluene (εg/L)	Ethylbenzene (εg/L)	Xylenes (εg/L)	GRO (mg/L)	DRO (mg/L)
MW-5	09/21/17	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.652)
	09/18/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.647)
MW-6	12/03/91	1	ND(1)	ND(1)	7	--	--
	02/27/92	**17**	ND(1)	ND(1)	ND(2)	--	--
	07/22/93	**6**	ND(1)	ND(1)	ND(2)	--	--
	09/30/93	**15**	ND(1)	ND(1)	ND(2)	--	--
	12/29/93	ND(1)	ND(1)	ND(1)	ND(2)	--	--
	04/01/94	ND(1)	ND(1)	ND(1)	ND(2)	--	--
	04/20/01	ND(0.5)	ND(2)	ND(2)	3.64	0.149	**3.53**
	11/19/01	1.37	ND(1)	ND(1)	ND(2)	ND(0.09)	1.12
	05/21/02	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.1)	0.34
	08/01/02	**5.2**	ND(1)	ND(1)	ND(2)	ND(0.1)	0.72
	10/14/02	2.8	ND(1)	ND(1)	ND(2)	ND(0.1)	**2**
	04/02/03	ND(1)	2.7	ND(1)	4.1	0.07	0.39
	07/24/03	ND(2)	ND(2)	ND(2)	ND(4)	ND(0.05)	0.21
	11/07/03	ND(2)	ND(2)	ND(2)	ND(2)	ND(0.05)	0.36
	07/09/04	**30.1**	ND(10)	ND(10)	ND(30)	ND(0.09)	0.56
	10/27/04	2.22	ND(1)	ND(1)	ND(2)	ND(0.09)	**2.77**
	06/09/05	**17.8**	ND(2)	ND(2)	2.23	0.115	**3.98**
	08/16/05	**12**	ND(2)	ND(2)	ND(2)	ND(0.09)	**4.01**
	02/08/06	1.49	ND(1)	ND(1)	ND(2)	0.0397	1.25
	05/01/06	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	0.807
	07/24/06	1.26	ND(2)	ND(2)	ND(2)	ND(0.1)	1.38
	09/12/06	1.3	ND(2)	ND(2)	ND(2)	ND(0.1)	**1.52**
	04/04/07	**12.3**	ND(1)	ND(1)	ND(2)	ND(0.1)	1.09
	07/13/07	**12.1**	ND(1)	ND(1)	ND(2)	ND(0.1)	1.45
	09/13/07	**8.94**	ND(1)	ND(1)	ND(2)	ND(0.1)	**2.62**
	05/22/08	**6.58**	ND(2)	ND(2)	ND(4)	0.0814	**2.7**
	09/15/09	**19.9**	ND(1)	ND(1)	ND(2)	ND(0.1)	**2.02**
	09/23/10	**11.2**	ND(1)	ND(1)	ND(2)	ND(0.1)	**2.12**
	09/30/11	0.22	ND(1)	ND(1)	ND(2)	ND(1)	0.57
MW-6R	09/27/12	0.35	ND(0.62)	ND(0.62)	0.73	ND(0.1)	0.595
	09/18/13	**17.4**	ND(0.62)	0.31	3.65	0.125	0.823
MW-7	07/02/01	**7.48**	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.495)
	05/21/02	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.1)	0.2
	08/01/02	3.3	ND(1)	ND(1)	ND(2)	ND(0.1)	0.19
	10/14/02	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.1)	0.12
ADEC GW Table C 2016		4.6	1,100	15	190	2.2	1.5

TABLE A-1 HISTORICAL BTEX, GRO, AND DRO GROUNDWATER CONCENTRATIONS
TESORO ALASKA COMPANY, FAIRBANKS PETROLEUM TERMINAL
FAIRBANKS, ALASKA

Location ID	Date Sampled	Benzene (εg/L)	Toluene (εg/L)	Ethylbenzene (εg/L)	Xylenes (εg/L)	GRO (mg/L)	DRO (mg/L)
MW-7	04/02/03	ND(1)	ND(1)	ND(1)	ND(3)	ND(1)	0.16
	07/23/03	3.3	ND(1)	ND(1)	ND(3)	ND(0.05)	0.17
	11/07/03	ND(1)	ND(1)	ND(1)	ND(3)	ND(0.05)	ND(0.1)
	07/09/04	1.92	ND(2)	ND(2)	ND(4)	ND(0.09)	0.303
	10/27/04	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.09)	ND(0.319)
	06/09/05	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.326)
	09/01/05	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.3)
	02/08/06	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	0.321
	05/03/06	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.3)
	07/24/06	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.3)
	09/11/06	0.521	ND(2)	ND(2)	ND(2)	ND(0.1)	0.332
	03/21/07	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.323)
	07/10/07	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.319)
	09/06/07	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.309)
	05/21/08	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.05)	ND(0.391)
	09/15/09	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.769)
	09/21/10	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.714)
	09/29/11	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(1)	0.231
	09/26/12	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	0.239
	09/17/13	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	ND(0.372)
	09/10/14	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.191
	09/18/15	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	ND(0.273)
	10/04/16	ND(0.25)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	ND(0.305)
	09/20/17	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.61)
	09/18/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.625)
MW-8	05/21/02	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.1)
	08/01/02	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.1)	1.5
	10/14/02	ND(1)	1.8	ND(1)	ND(2)	ND(0.1)	0.51
	04/02/03	ND(1)	ND(1)	ND(1)	ND(3)	ND(0.05)	0.17
	07/24/03	ND(2)	ND(2)	ND(2)	ND(4)	ND(0.05)	ND(0.12)
	11/07/03	ND(1)	ND(1)	ND(1)	ND(3)	ND(0.05)	0.52
	07/09/04	ND(0.5)	ND(2)	ND(2)	ND(4)	ND(0.09)	ND(0.303)
	10/26/04	ND(0.4)	ND(1)	1.39	14.15	ND(0.9)	0.542
	06/09/05	0.751	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.313)
	08/16/05	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	0.369
	02/08/06	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	0.395
	05/01/06	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.3)
ADEC GW Table C 2016		4.6	1,100	15	190	2.2	1.5

TABLE A-1 HISTORICAL BTEX, GRO, AND DRO GROUNDWATER CONCENTRATIONS
TESORO ALASKA COMPANY, FAIRBANKS PETROLEUM TERMINAL
FAIRBANKS, ALASKA

Location ID	Date Sampled	Benzene (εg/L)	Toluene (εg/L)	Ethylbenzene (εg/L)	Xylenes (εg/L)	GRO (mg/L)	DRO (mg/L)
MW-8	07/24/06	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.3)
	09/12/06	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	1.29
	04/04/07	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.319)
	07/13/07	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.314)
	09/06/07	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	0.954
	05/22/08	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.05)	ND(0.391)
	09/15/09	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.714)
	09/23/10	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.8)
	09/29/11	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(1)	0.489
	09/26/12	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	0.262
	09/18/13	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	0.211
	09/10/14	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	1.4
	09/21/15	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.939
	10/05/16	ND(0.25)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.887
	09/21/17	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.61)
	09/18/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.62)
MW-9	05/21/02	**ND(5)**	ND(5)	ND(5)	ND(5)	0.4	**2.7**
	08/01/02	3.6	1.7	1	ND(2)	2.1	**3.3**
	10/14/02	**ND(5)**	ND(5)	ND(5)	13	1.6	**5**
	04/02/03	ND(1)	ND(1)	ND(1)	ND(3)	0.15	**1.7**
	07/24/03	2.8	ND(2)	2.8	2.4	2.1	**18**
	11/07/03	1.4	ND(1)	2.1	6.7	0.43	**7.1**
	07/09/04	1.57	ND(2)	ND(2)	ND(4)	0.575	**6.54**
	10/27/04	1.49	ND(1)	1.46	ND(2)	1.04	**5.39**
	06/09/05	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.313)
	08/16/05	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	0.383
	02/08/06	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.39)
	05/02/06	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	0.563
	07/24/06	1.73	ND(1)	ND(1)	ND(2)	0.509	**3.27**
	09/12/06	1.2	ND(0.5)	0.57	ND(0.5)	ND(1)	**5.62**
	04/04/07	ND(0.4)	ND(1)	ND(1)	ND(2)	0.161	0.988
	07/13/07	ND(0.4)	ND(1)	ND(1)	ND(2)	0.839	**6.61**
	09/13/07	1.78	ND(1)	1.51	ND(2)	0.602	**8.5**
	05/22/08	ND(2)	ND(2)	ND(2)	ND(4)	1.7	**10.4**
	09/15/09	ND(0.5)	ND(2)	ND(2)	ND(2)	0.261	**2.39**
	09/23/10	ND(0.4)	ND(1)	ND(1)	ND(2)	0.144	0.866
	09/30/11	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(1)	0.189
ADEC GW Table C 2016		4.6	1,100	15	190	2.2	1.5

TABLE A-1 HISTORICAL BTEX, GRO, AND DRO GROUNDWATER CONCENTRATIONS
TESORO ALASKA COMPANY, FAIRBANKS PETROLEUM TERMINAL
FAIRBANKS, ALASKA

Location ID	Date Sampled	Benzene (εg/L)	Toluene (εg/L)	Ethylbenzene (εg/L)	Xylenes (εg/L)	GRO (mg/L)	DRO (mg/L)
MW-9	09/26/12	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	0.211
	09/19/13	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	0.0333	ND(0.36)
	09/11/14	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	0.0373	0.287
	09/18/15	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.1)	0.401
	10/05/16	ND(0.25)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.347 J
	09/20/17	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.636)
	09/19/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.641)
MW-10	07/24/03	0.7	14	**40**	**291**	**2.3**	**1.9**
	11/06/03	**7.2**	150	**170**	**1570**	**5.3**	**13**
	07/08/04	ND(4)	17.4	**61.3**	**492**	1.71	**2.53**
	10/26/04	ND(4)	82.2	**156**	**1480**	**4.28**	**6.19**
	06/07/05	1.69	14.3	**58.4**	**506**	**2.43**	**3.69**
	09/01/05	**4.72**	66.4	**101**	**1094**	**3.26**	**11**
	02/08/06	1.84	7.82	**86.7**	**774**	**2.51**	**3.05**
	07/27/06	1.42	11.2	**64.2**	**410**	2.11	**2.25**
	09/13/06	3	40	**63**	**1050**	**2.82**	**10.1**
	07/13/07	ND(0.4)	1.87	**40.1**	**398**	1.91	**2.19**
	09/17/07	2.71	22.5	**ND(25)**	**938**	**2.93**	**15.1**
	05/23/08	**ND(10)**	22.4	**97.8**	**1137**	**3.03**	**7.8**
	09/15/09	ND(4)	16.3	**61.6**	**1063**	**3.42**	**15.9**
	09/23/10	0.95	4.47	**41**	**649**	1.85	**12.3**
	09/30/11	0.69	2.25	**41.1**	**644**	**2.28**	**67.7**
	09/27/12	0.42	0.86	**15.6**	**412**	1.48	**18.8**
	09/19/13	0.2	0.43	10.3	**293.9**	1.5	**29.3**
	09/10/14	0.18	0.66	8.1	**306**	1.19	**14.6**
	09/18/15	0.31	ND(1.12)	10.7	**345**	1.21	**8.62**
	10/05/16	1.16	2.8	14.3	**467**	1.78	**34.3**
	09/22/17	0.76	1.32	11.6	**373**	1.17	**33.9**
	09/18/18	0.58	1.76	8.91	**500**	1.13	**15.7**
MW-11	07/24/03	**24**	ND(1)	ND(1)	ND(3)	0.086	0.67
	11/06/03	**19**	ND(1)	ND(1)	ND(3)	0.058	0.47
	07/09/04	**29.4**	ND(2)	ND(2)	ND(4)	ND(0.09)	0.74
	10/27/04	**28.7**	ND(1)	ND(1)	ND(2)	ND(0.09)	0.474
	06/08/05	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.09)	ND(0.33)
	08/16/05	**11.8**	ND(2)	ND(2)	ND(2)	ND(0.09)	0.311
	02/08/06	**25.5**	ND(2)	ND(2)	ND(2)	0.064	0.86
	05/03/06	**32**	ND(2)	ND(2)	ND(2)	0.109	0.759
ADEC GW Table C 2016		4.6	1,100	15	190	2.2	1.5

TABLE A-1 HISTORICAL BTEX, GRO, AND DRO GROUNDWATER CONCENTRATIONS
TESORO ALASKA COMPANY, FAIRBANKS PETROLEUM TERMINAL
FAIRBANKS, ALASKA

Location ID	Date Sampled	Benzene (εg/L)	Toluene (εg/L)	Ethylbenzene (εg/L)	Xylenes (εg/L)	GRO (mg/L)	DRO (mg/L)
MW-11	07/27/06	**39.5**	ND(2)	ND(2)	ND(2)	0.117	0.928
	09/12/06	**14.1**	ND(2)	ND(2)	ND(2)	ND(0.1)	0.661
	04/03/07	**24.6**	ND(1)	ND(1)	ND(2)	ND(1)	0.654
	07/12/07	**23.2**	ND(1)	ND(1)	ND(2)	ND(0.1)	0.515
	09/17/07	**16**	ND(1)	ND(1)	ND(2)	ND(0.1)	0.598
	05/22/08	**6.04**	ND(1)	ND(1)	ND(2)	ND(0.05)	ND(0.391)
	09/16/09	**7.88**	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.714)
	09/22/10	**13.3**	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.893)
	09/29/11	4.47	ND(1)	ND(1)	ND(2)	ND(0.1)	0.437
	09/26/12	4.55	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.1)	0.445
	09/18/13	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	0.418
	09/11/14	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	0.0343	0.348
	09/17/15	2.5	ND(0.5)	ND(0.5)	ND(1)	ND(0.1)	0.286
	10/04/16	2.65	ND(0.5)	ND(0.5)	2.34	0.187 JB	0.196 J
	09/20/17	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.641)
	09/19/18	1.49	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.63)
MW-12	11/03/04	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.09)	ND(0.306)
	06/08/05	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.09)	**1.68**
	09/02/05	**14.6**	516	**ND(20)**	38.8	1.18	1.33
	10/03/05	ND(0.4)	257	ND(1)	ND(2)	0.454	0.617
	02/08/06	ND(0.4)	54.5	ND(1)	ND(2)	0.097	ND(0.345)
	05/24/06	ND(0.4)	11	ND(1)	ND(2)	ND(0.09)	ND(0.3)
	07/26/06	ND(0.4)	4.93	ND(1)	ND(2)	ND(0.1)	ND(0.3)
	09/11/06	ND(0.5)	2	ND(0.5)	ND(0.5)	ND(0.1)	ND(0.309)
	04/03/07	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(1)	ND(0.323)
	07/12/07	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.319)
	09/06/07	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	0.341
	06/11/08	**ND(20)**	897	**ND(20)**	ND(40)	1.44	**1.92**
MW-13	11/03/04	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.09)	ND(0.323)
	06/08/05	1.07	ND(1)	ND(1)	ND(2)	ND(0.09)	0.413
	09/02/05	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.313)
	02/08/06	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.326)
	05/02/06	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.3)
	07/26/06	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	0.427
	09/12/06	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.1)	ND(0.309)
	03/22/07	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	0.334
	07/11/07	3.37	ND(1)	ND(1)	ND(2)	ND(0.1)	0.532
ADEC GW Table C 2016		4.6	1,100	15	190	2.2	1.5

TABLE A-1 HISTORICAL BTEX, GRO, AND DRO GROUNDWATER CONCENTRATIONS
TESORO ALASKA COMPANY, FAIRBANKS PETROLEUM TERMINAL
FAIRBANKS, ALASKA

Location ID	Date Sampled	Benzene (εg/L)	Toluene (εg/L)	Ethylbenzene (εg/L)	Xylenes (εg/L)	GRO (mg/L)	DRO (mg/L)
MW-13	09/06/07	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	0.316
	06/11/08	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.05)	ND(0.391)
MW-14	11/03/04	**20.5**	ND(1)	ND(1)	ND(2)	ND(0.09)	0.459
	06/08/05	**13.7**	ND(1)	ND(1)	ND(2)	ND(0.09)	0.463
	09/02/05	**12.8**	ND(2)	ND(2)	ND(2)	ND(0.09)	0.441
	02/08/06	**6.78**	ND(1)	ND(1)	ND(2)	ND(0.09)	0.338
	05/24/06	**10.2**	ND(1)	ND(1)	ND(2)	ND(0.09)	0.573
	07/26/06	**9.8**	ND(1)	ND(1)	ND(2)	ND(0.1)	0.818
	09/11/06	**11**	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.1)	0.756
	03/22/07	**5.9**	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.521)
	07/11/07	**6.01**	ND(1)	ND(1)	ND(2)	ND(0.1)	0.499
	09/06/07	**7.27**	ND(1)	ND(1)	ND(2)	ND(0.1)	0.649
	06/11/08	**4.91**	ND(1)	ND(1)	ND(2)	ND(0.05)	0.443
MW-15	11/02/04	2.78	ND(1)	ND(1)	ND(2)	ND(0.09)	ND(0.313)
	06/08/05	2.43	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.313)
	09/01/05	1.1	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.309)
	02/08/06	1.79	ND(2)	ND(2)	ND(2)	0.029	ND(0.345)
	05/03/06	1.78	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.3)
	07/24/06	1.39	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.3)
	09/13/06	1.13	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.313)
	03/23/07	1.49	ND(2)	ND(2)	ND(2)	ND(0.1)	0.347
	07/13/07	1.18	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.3)
	09/07/07	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.3)
	05/23/08	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.05)	ND(0.391)
	09/16/09	0.865	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.714)
	09/23/10	0.58	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.714)
	09/30/11	0.89	ND(1)	ND(1)	ND(2)	ND(0.1)	0.337
	09/26/12	0.95	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	ND(0.36)
	09/17/13	0.42	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	ND(0.376)
	09/10/14	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.248
	09/17/15	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.184
	10/04/16	0.2 J	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	ND(0.305)
	09/20/17	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.625)
	09/18/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.652)
MW-16	11/02/04	**7.31**	ND(1)	6.69	2.36	0.105	1.41
	06/08/05	**11.8**	ND(2)	**15.2**	7.93	0.163	1.37
	09/01/05	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.09)	0.429
ADEC GW Table C 2016		4.6	1,100	15	190	2.2	1.5

TABLE A-1 HISTORICAL BTEX, GRO, AND DRO GROUNDWATER CONCENTRATIONS
TESORO ALASKA COMPANY, FAIRBANKS PETROLEUM TERMINAL
FAIRBANKS, ALASKA

Location ID	Date Sampled	Benzene (εg/L)	Toluene (εg/L)	Ethylbenzene (εg/L)	Xylenes (εg/L)	GRO (mg/L)	DRO (mg/L)
MW-16	10/03/05	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.09)	0.344
	02/08/06	**5.82**	ND(2)	3.6	4.68	0.079	0.936
	05/24/06	**5.94**	ND(2)	8.29	7.34	0.163	0.824
	07/24/06	2.19	ND(2)	ND(2)	2.47	ND(0.1)	0.513
	09/13/06	1.18	ND(2)	2.05	ND(2)	ND(0.1)	0.827
	03/22/07	**11.9**	ND(2)	4.86	6.39	0.117	**2.44**
	07/12/07	**5.56**	ND(2)	7.12	5.25	0.106	0.83
	09/07/07	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	0.606
	05/23/08	**6.67**	ND(1)	ND(1)	ND(2)	0.534	1.15
	09/16/09	1.58	ND(2)	ND(2)	ND(2)	ND(0.1)	0.991
	09/23/10	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.714)
	09/30/11	1.37	ND(1)	0.61	ND(2)	ND(0.1)	0.906
	09/26/12	0.98	ND(0.62)	1.4	ND(1.24)	ND(0.1)	1.15
	09/17/13	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	0.449
	09/10/14	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	ND(0.3)
	09/17/15	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.315
	10/04/16	0.2 J	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.385 J
	09/20/17	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.1)	0.79 JB
	09/18/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.625)
MW-17A	11/03/04	2.04	ND(1)	ND(1)	ND(2)	ND(0.09)	ND(0.353)
	06/09/05	1.39	ND(1)	ND(1)	ND(2)	ND(0.09)	ND(0.306)
	08/16/05	1.33	ND(1)	ND(1)	ND(2)	ND(0.09)	ND(0.303)
	05/03/06	0.54	ND(1)	ND(1)	ND(2)	ND(0.09)	ND(0.3)
	07/24/06	0.71	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.3)
	09/14/06	0.83	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.1)	ND(0.313)
	04/04/07	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.357)
	07/13/07	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.373)
	09/13/07	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.3)
	05/22/08	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.05)	ND(0.391)
	09/15/09	ND(0.4)	ND(1)	ND(1)	ND(1)	ND(0.1)	ND(0.769)
	09/24/10	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.714)
	09/30/11	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	0.258
	09/26/12	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	ND(0.36)
	09/18/13	ND(0.24)	0.31	ND(0.62)	ND(1.24)	ND(0.062)	ND(0.36)
	09/10/14	0.17	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.397
	09/21/15	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	ND(0.278)
	10/05/16	ND(0.25)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.217 J
ADEC GW Table C 2016		4.6	1,100	15	190	2.2	1.5

TABLE A-1 HISTORICAL BTEX, GRO, AND DRO GROUNDWATER CONCENTRATIONS
TESORO ALASKA COMPANY, FAIRBANKS PETROLEUM TERMINAL
FAIRBANKS, ALASKA

Location ID	Date Sampled	Benzene (εg/L)	Toluene (εg/L)	Ethylbenzene (εg/L)	Xylenes (εg/L)	GRO (mg/L)	DRO (mg/L)
MW-17A	09/21/17	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.625)
	09/19/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.615)
MW-17B	11/03/04	1.79	ND(1)	ND(1)	ND(2)	ND(0.09)	ND(0.341)
	06/09/05	1.29	ND(1)	ND(1)	ND(2)	ND(0.09)	ND(0.309)
	08/16/05	1.33	ND(1)	ND(1)	ND(2)	ND(0.09)	ND(0.3)
	05/03/06	0.49	ND(1)	ND(1)	ND(2)	ND(0.09)	ND(0.3)
	07/24/06	0.63	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.3)
	09/14/06	0.63	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.1)	ND(0.313)
	04/04/07	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.333)
	07/13/07	ND(0.4)	ND(1)	ND(1)	ND(1)	ND(0.1)	ND(0.33)
	09/13/07	1.24	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.331)
	05/22/08	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.05)	ND(0.391)
	09/15/09	ND(0.4)	ND(1)	ND(1)	ND(1)	ND(0.1)	ND(0.714)
	09/24/10	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.755)
	09/30/11	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.6)
	09/26/12	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	ND(0.36)
	09/18/13	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	ND(0.372)
	09/10/14	0.17	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.511
	09/21/15	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.1)	ND(0.288)
	10/05/16	ND(0.25)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.304 J
	09/21/17	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.615)
	09/19/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.636)
MW-18	11/02/04	0.57	ND(1)	**19.1**	74.2	0.78	**4.37**
	06/07/05	2.04	ND(2)	**35.8**	101	0.96	**8.68**
	08/30/05	**ND(5)**	ND(20)	**21.3**	104.5	1.03	**15.4**
	05/03/06	2.63	3.56	**35.9**	**208**	1.61	**8.48**
	07/28/06	2.68	ND(2)	**39.7**	5.55	1.02	**7.5**
	09/14/06	ND(0.5)	ND(2)	2.58	12.58	ND(0.1)	**10.3**
	07/13/07	1.86	8.71	**52**	98.4	0.849	**6.86**
	09/17/07	3.23	5.53	**28.5**	86.3	1.02	**17.1**
	05/24/08	ND(0.5)	ND(0.5)	0.67	24.2	0.51	**8.18**
MW-18R	10/06/16	0.43 J	ND(0.5)	4.89	44.9	0.584	**5.99**
	09/21/17	0.5	ND(1)	2.71	31.5	0.419	**8.72**
MW-19	06/08/05	0.733	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.319)
	08/30/05	0.896	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.323)
	02/08/06	0.74	ND(2)	ND(2)	ND(2)	ND(0.09)	ND(0.316)
	05/02/06	0.51	ND(1)	ND(1)	ND(2)	ND(0.09)	ND(0.3)
ADEC GW Table C 2016		4.6	1,100	15	190	2.2	1.5

TABLE A-1 HISTORICAL BTEX, GRO, AND DRO GROUNDWATER CONCENTRATIONS
TESORO ALASKA COMPANY, FAIRBANKS PETROLEUM TERMINAL
FAIRBANKS, ALASKA

Location ID	Date Sampled	Benzene (εg/L)	Toluene (εg/L)	Ethylbenzene (εg/L)	Xylenes (εg/L)	GRO (mg/L)	DRO (mg/L)
MW-19	07/24/06	0.72	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.3)
	09/11/06	0.52	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.1)	ND(0.314)
	03/22/07	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.323)
	07/10/07	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.313)
	09/06/07	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.323)
	05/21/08	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.05)	ND(0.391)
	09/16/09	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.714)
	09/22/10	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.784)
	09/29/11	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	0.205
	09/26/12	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	0.192
	09/17/13	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	ND(0.36)
	09/10/14	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.312
	09/17/15	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	ND(0.278)
	10/04/16	0.16 J	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	ND(0.315)
	09/20/17	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.615)
	09/18/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.67)
MW-20	02/08/06	1.13	ND(1)	ND(1)	ND(2)	ND(0.09)	ND(0.33)
	05/02/06	2.16	ND(1)	ND(1)	ND(2)	ND(0.09)	ND(0.3)
	07/24/06	2.36	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.3)
	09/11/06	1	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.1)	ND(0.309)
	03/21/07	2.05	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.309)
	07/11/07	2.22	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.331)
	09/17/07	1.65	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.326)
	05/22/08	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.05)	ND(0.391)
	09/15/09	0.68	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.714)
	09/21/10	0.73	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.714)
	09/29/11	0.41	ND(1)	ND(1)	ND(2)	ND(1)	0.202
	09/26/12	0.68	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	0.18
	09/17/13	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	ND(0.36)
	09/10/14	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.212
	09/17/15	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.148)	ND(0.278)
	10/04/16	ND(0.25)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	ND(0.302)
	09/20/17	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.62)
	09/18/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.641)
MW-21	02/08/06	**7.95**	ND(1)	ND(1)	ND(2)	ND(0.09)	0.489
	05/24/06	4.48	ND(1)	ND(1)	ND(2)	ND(0.09)	0.416
	07/27/06	**8.62**	ND(1)	ND(1)	ND(2)	ND(0.1)	0.728
ADEC GW Table C 2016		4.6	1,100	15	190	2.2	1.5

TABLE A-1 HISTORICAL BTEX, GRO, AND DRO GROUNDWATER CONCENTRATIONS
TESORO ALASKA COMPANY, FAIRBANKS PETROLEUM TERMINAL
FAIRBANKS, ALASKA

Location ID	Date Sampled	Benzene (εg/L)	Toluene (εg/L)	Ethylbenzene (εg/L)	Xylenes (εg/L)	GRO (mg/L)	DRO (mg/L)
MW-21	09/12/06	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.1)	ND(0.306)
	04/03/07	**9.99**	ND(1)	ND(1)	ND(2)	ND(0.1)	0.881
	07/12/07	**10.4**	ND(1)	ND(1)	ND(2)	ND(0.1)	0.643
	09/17/07	4.42	ND(1)	ND(1)	ND(2)	ND(1)	0.806
	10/10/07	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	0.557
	05/22/08	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.05)	ND(0.391)
	09/15/09	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.741)
	09/22/10	1.14	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.714)
	09/29/11	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	0.31
	09/26/12	0.3	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	0.194
	09/18/13	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	0.233
	09/11/14	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.302
	09/17/15	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.1)	0.218
	10/04/16	ND(0.25)	ND(0.5)	ND(0.5)	ND(1)	0.0315J/ND(0.05)U*	ND(0.31)
	09/20/17	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.636)
	09/19/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.605)
MW-22	07/26/06	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.3)
	09/14/06	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.1)	ND(0.306)
	04/03/07	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.33)
	07/12/07	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.341)
	09/06/07	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.323)
	05/21/08	ND(0.5)	ND(0.5)	ND(0.5)	ND(1.5)	ND(0.05)	ND(0.391)
	09/16/09	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.714)
	09/21/10	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.769)
	09/29/11	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.6)
	09/26/12	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	0.276
	09/18/13	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	0.211
	09/11/14	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.802
	09/17/15	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.1)	ND(0.278)
	10/04/16	ND(0.25)	0.31 J	ND(0.5)	ND(1)	ND(0.05)	ND(0.308)
	09/20/17	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.62)
	09/18/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.625)
MW-23	06/03/08	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.08)	1.11
	09/16/09	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(0.1)	ND(0.714)
	09/24/10	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.714)
	09/30/11	ND(0.4)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.817)
	09/27/12	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	0.719
ADEC GW Table C 2016		4.6	1,100	15	190	2.2	1.5

TABLE A-1 HISTORICAL BTEX, GRO, AND DRO GROUNDWATER CONCENTRATIONS
TESORO ALASKA COMPANY, FAIRBANKS PETROLEUM TERMINAL
FAIRBANKS, ALASKA

Location ID	Date Sampled	Benzene (εg/L)	Toluene (εg/L)	Ethylbenzene (εg/L)	Xylenes (εg/L)	GRO (mg/L)	DRO (mg/L)
MW-23	09/20/13	ND(0.24)	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	0.4
	09/10/14	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.549
	09/17/15	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.357
	10/05/16	ND(0.25)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.348 J
	09/20/17	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.636)
	09/19/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.615)
MW-24	06/04/08	**ND(10)**	ND(10)	**326**	**1556**	**6.23**	**7.83**
	09/16/09	ND(4)	ND(10)	**403**	**2671**	**7.56**	**5.19**
	09/23/10	0.5	3.83	**515**	**3111**	**6.45**	**5.66**
MW-25	06/03/08	1.57	ND(1)	2.07	34.8	0.131	**1.58**
	09/16/09	1.65	ND(2)	ND(2)	137.9	0.397	ND(0.755)
	09/30/11	0.49	ND(1)	ND(1)	12.44	ND(0.1)	1.45
	09/26/12	1.06	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	0.477
	09/17/13	0.74	ND(0.62)	ND(0.62)	ND(1.24)	ND(0.062)	0.31
	09/10/14	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.493
	09/17/15	ND(0.2)	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.313
	10/04/16	0.16 J	ND(0.5)	ND(0.5)	ND(1)	ND(0.05)	0.408 J
	09/21/17	ND(0.5)	ND(1)	ND(1)	ND(2)	ND(0.1)	ND(0.63)
	09/18/18	ND(0.5)	ND(1)	ND(1)	ND(3)	ND(0.1)	ND(0.652)
WP-1A (13 ft)	06/11/08	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.05)	ND(0.391)
WP-1B (19 ft)	06/11/08	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.05)	ND(0.394)
WP-2A (15 ft)	06/11/08	1.31	ND(1)	ND(1)	ND(2)	ND(0.05)	0.532
WP-2B (20 ft)	06/12/08	**15.9**	ND(1)	ND(1)	ND(2)	0.0507	0.586
WP-3A (11 ft)	06/12/08	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.05)	ND(0.391)
WP-3B (19 ft)	06/12/08	ND(1)	ND(1)	ND(1)	ND(2)	ND(0.05)	ND(0.391)
ADEC GW Table C 2016		4.6	1,100	15	190	2.2	1.5

TABLE A-1 HISTORICAL BTEX, GRO, AND DRO GROUNDWATER CONCENTRATIONS
TESORO ALASKA COMPANY, FAIRBANKS PETROLEUM TERMINAL
FAIRBANKS, ALASKA

Notes:
Historic data results collected (prior 2016) by Shannon & Wilson, Inc. are not validated by Trihydro.
BOLD The concentration or reporting limit exceeds the 18 AAC 75, Table C Groundwater Cleanup Levels
GRO Gasoline Range Organics
DRO Diesel Range Organics
MTBE Methyl-tert-Butyl Ether
EDC 1,2-Dichloroethane
ND Not Detected
-- Not Sampled/Analyzed
J+ - Estimated concentration, possibly biased high
J- - Estimated concentration, possibly biased low
J - Estimated concentration
UJ - Estimated reporting limit
JB - Estimated concentration due to blank contamination
* - The first result represents the laboratory reported concentration. The second result was evaluated to be undetected at the reported concentration by the data validator. The result was determined to be a false positive.

APPENDIX B

FIELD ACTIVITIES

FIELD ACTIVITIES

Groundwater Monitoring

Groundwater sampling and water level and light non-aqueous phase liquid (LNAPL) gauging was completed September 17th through 20th, 2018. Prior to purging, all wells were gauged to record depth to groundwater and presence of LNAPL. Groundwater elevation measurements are documented in Table 1. Groundwater temperature, pH, conductivity, dissolved oxygen (DO), oxidation-reduction potential (ORP), and turbidity were recorded during purging and immediately prior to collecting samples. The measurements were taken using a YSI model 556 multiparameter sonde with a flow-through cell and a Hatch 2100P turbidity meter. Table 2 summarizes the field parameter data for sample purging and purge volume for each well.

Groundwater samples were collected using a SS mega monsoon pump with a low flow controller for wells without LNAPL and a peristaltic pump for wells containing LNAPL. The pumps were decontaminated before use in each well by washing in an Alconox solution, rinsing twice in potable water, and rinsing a final time with distilled water. New disposable polyethylene tubing was used for each well. Two equipment blanks samples (Equip Blank-1 and Equip Blank-2) were collected to ensure equipment was thoroughly decontaminated. Sample collection followed Alaska Department of Environmental Conservation (ADEC) field sampling guidance for QA/QC.

Samples were collected using low-flow sampling techniques, with the goal of maintaining drawdown of less than 0.3 feet and a target purge rates will be between 50 and 500 mL/min. Wells were purged until groundwater quality parameters were stable or a minimum of three well volumes had been purged and then samples were collected. As outlined in the 2017 ADEC Field Sampling Guidance water quality parameters will be considered stable when three successive readings, collected 3-5 minutes apart are within:

- ± 3% for temperature (minimum of ± 0.2ºC)
- ± 0.1 for pH
- ± 3% for conductivity
- ± 10 mv for redox potential
- ± 10% for dissolved oxygen
- ± 10% for turbidity (or less than or equal to 10 NTU)

These water quality parameters were monitored and recorded. A minimum of three (minimum of four if using temperature as an indicator) of these parameters was used to evaluate groundwater stability. The submersible pump was set at the midpoint of the submersed screen interval.

Wells containing LNAPL were sampled by freezing one end of a length of sample tubing and lowering tubing below the LNAPL. Tubing was left in place until thawed, and the wells were sampled using a peristaltic pump the following day.

Purge water from wells was disposed of consistent with past sampling activities by disposing in the onsite oil-water separator. No purge water displayed a visible sheen or the presence of LNAPL.

APPENDIX B. FIELD ACTIVITIES

The groundwater samples were hand-delivered to SGS North America, Inc. (SGS) in Fairbanks, Alaska. SGS delivered the samples to their Anchorage laboratory for analysis:

- Benzene, toluene, ethylbenzene, and xylenes (BTEX)
  - Environmental Protection Agency (EPA) Method 8021
- Gasoline range organics (GRO)
  - State of Alaska Method AK101
- Diesel range organics (DRO)
  - State of Alaska Method AK102

References

Shannon & Wilson, Inc. 2015. *2015 Annual Groundwater Monitoring Report*. Flint Hills Resources Alaska Fuel Terminal, Fairbanks International Airport, Alaska.

Abbreviations and Acronyms

µg/L	micrograms per liter
ADEC	Alaska Department of Environmental Conservation
bgs	below ground surface
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
mL/min	milliliters per minute
ORP	oxidation-reduction potential
SGS	SGS North America, Inc.
Terminal	Tesoro's Fairbanks Petroleum Terminal

ATTACHMENT A

FIELD FORMS

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: MW-1R

Client:	TESORO	**Static Water Level:**	10.06
Project Number:	46K-001-003	**Well Diameter (in):**	4
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	23.90
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	16.4
Sample Date:	9/17/18	**Approx. Screen Interval (ft bgs):**	3.9 – 23.3
Weather:	Sunny	**Expected Purge Rate (mL/min):**	50-500 mL/min
Field Personnel:	BJ / JS	**Expected Purge Volume to Stability (gal):**	
		Laboratory Analysis:	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

SAMPLE ID: MW-1R **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 3 30 PM **Duplicate ID:** **Time:**

Total Volume of Water Purged (gal): 1.2

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.
15:21	260	10.08	9.53	0.939	0.60	6.66	-20.8	5.03	clear
15:24		~~10.07~~	9.73	0.937	0.23	6.65	-43.3	2.11	
15:27		10.07	10.00	0.935	0.11	6.66	-52.7	1.92	
15:30		~~10.07~~	10.01	0.941	0.14	6.66	-59.2	1.98	

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: MW-2

Client:	TESORO	**Static Water Level:**	15.26
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	32.02
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	21.2
Sample Date:	9/17/2018	**Approx. Screen Interval (ft bgs):**	8.4 – 27.8
Weather:	Sunny	**Expected Purge Rate (mL/min):**	50-500 mL/min
Field Personnel:	BJ / JS	**Expected Purge Volume to Stability (gal):**	
		Laboratory Analysis:	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

SAMPLE ID: MW-2 **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 2:50 PM **Duplicate ID:** DUP-1 **Time:** 9:00 AM

Total Volume of Water Purged (gal): 1.2

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.
14:38	400		9.25	0.648	0.30	6.95	8.2	15.69	clear
14:41		15.27	8.80	0.634	0.09	6.96	-19.9	0.00	
14:44	250	15.27	9.06	0.631	0.09	6.95	-41.9	0.00	
14:47		15.27	9.17	0.630	0.08	6.95	-54.3	0.00	

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: **MW-3**

Client:	TESORO	**Static Water Level:**	16.03
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	30.00
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	22.5
Sample Date:	9/17/2018	**Approx. Screen Interval (ft bgs):**	8.9 – 28.2
Weather:	Sunny	**Expected Purge Rate (mL/min):**	50-500 mL/min
Field Personnel:	BJ / JS	**Expected Purge Volume to Stability (gal):**	
		Laboratory Analysis:	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

SAMPLE ID: MW-3 **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 13:54 **Duplicate ID:** **Time:**

Total Volume of Water Purged (gal): 1.8

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.
13:45	400	16.08	8.35	.778	.26	6.72	52.8	535	Orange
13:48		16.09	7.99	.783	-.13	6.75	31.3	523	
13:51	350	16.09	7.67	.786	0.34	6.76	16.7	377	
13:54		16.09	7.99	.776	0.18	6.76	7.4	285	

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: MW-4

Client:	TESORO	**Static Water Level:**	14.5
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	24.58
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	16.1
Sample Date:	9/18/2018	**Approx. Screen Interval (ft bgs):**	8.7 – 18.1
Weather:	Cloudy	**Expected Purge Rate (mL/min):**	50-500 mL/min
Field Personnel:	BJ / JS	**Expected Purge Volume to Stability (gal):**	
		Laboratory Analysis:	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

SAMPLE ID: MW-4 **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 9:20 AM **Duplicate ID:** **Time:**

Total Volume of Water Purged (gal): 1.2

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.
9:08	300	14.70	6.81	0.575	2.01	7.28	103	107.4	
9:11		14.80	6.99	0.575	1.47	7.25	98.4	43.45	
9:14		14.80	7.62	0.564	1.45	7.24	94.4	12.71	
9:17		14.80	7.87	0.560	1.36	7.24	91.9	6.19	

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: **MW-5**

Client:	TESORO	**Static Water Level:**	8.01
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	15.92
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	17.6
Sample Date:	9/18/18	**Approx. Screen Interval (ft bgs):**	12.3 – 21.7
Weather:	Cloudy	**Expected Purge Rate (mL/min):**	50-500 mL/min
Field Personnel:	BJ / JS	**Expected Purge Volume to Stability (gal):**	
		Laboratory Analysis:	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

SAMPLE ID: MW-5 **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 2:10 PM **Duplicate ID:** **Time:**

Total Volume of Water Purged (gal): 1.0

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.
14:01	300	8.14	9.78	0.614	0.90	6.80	71.3	268.9	
14:04		8.14	10.02	0.635	0.20	6.79	58.4	225.5	
14:07			10.31	0.643	0.27	6.79	52.8	205.8	

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: **MW-6R**

Client:	TESORO	**Static Water Level:**	8.17
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	20.00
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	
		Approx. Screen Interval (ft bgs):	5.0 – 19.8
Sample Date:	9-20-18	**Expected Purge Rate (mL/min):**	50-500 mL/min
Weather:	Light Rain	**Expected Purge Volume to Stability (gal):**	
Field Personnel:	BJ / JS	**Laboratory Analysis:**	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

*contained LNAPL in 2017

SAMPLE ID: MW-6R **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 1030 **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.
10:30			7.35	0.917	1.09	6.53	88.3	11.05	slight odor, slight color NO SHEEN

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: **MW-7**

Client:	TESORO	**Static Water Level:**	10.96
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	26.72
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	20.4
		Approx. Screen Interval (ft bgs):	5.1 – 24.1
Sample Date:	9-18-18	**Expected Purge Rate (mL/min):**	50-500 mL/min
Weather:	Cloudy	**Expected Purge Volume to Stability (gal):**	
Field Personnel:	BJ / JS	**Laboratory Analysis:**	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

[redacted]

SAMPLE ID: MW-7 **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 1530 **Duplicate ID:** **Time:**

Total Volume of Water Purged (gal): 1.2

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.
15:21	300	16.98	7.36	0.704	2.40	6.83	84	1100+	Heavy Iron
15:24	300	11.02	7.22	0.705	.77	6.80	80	1100+	" "
15:27	300	11.03	7.34	0.705	0.33	6.79	76	~~1100+~~ 971	" "

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: **MW-8**

Client:	TESORO	**Static Water Level:**	11.33
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	19.22
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	16.1
		Approx. Screen Interval (ft bgs):	7.0 – 17.0
Sample Date:	9/18/18	**Expected Purge Rate (mL/min):**	50-500 mL/min
Weather:	Cloudy	**Expected Purge Volume to Stability (gal):**	
Field Personnel:	BJ / JS	**Laboratory Analysis:**	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

[redacted]

SAMPLE ID: MW-8 **Duplicate Sample?** (yes) (~~no~~) **MS/MSD** **Total Volume of Water Purged (gal):** 1.2

SAMPLE TIME: 9:18 **Duplicate ID:** **Time:**

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.
9:09	300	11.47	8.41	1.063	3.01	6.65	70.6	164	clear
9:12	250	11.47	8.49	1.070	2.21	6.63	65.6	143	
9:15	250	11.46	8.63	1.071	2.02	6.63	63.7	125	

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: **MW-9**

Client:	TESORO	**Static Water Level:**	11.95
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	19.86
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	14.2
Sample Date:	9/19/2018	**Approx. Screen Interval (ft bgs):**	7.0 – 17.0
Weather:		**Expected Purge Rate (mL/min):**	50-500 mL/min
Field Personnel:	BJ / JS	**Expected Purge Volume to Stability (gal):**	
		Laboratory Analysis:	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

SAMPLE ID: MW-9 **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 10:40 **Duplicate ID:** **Time:**

Total Volume of Water Purged (gal): 1.5

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.
10:31	350	11.75	7.80	0.556	0.83	6.89	27.3	653.2	Orange
10:34		11.81	7.77	0.592	0.44	6.83	27.9	435.4	
10:37			7.79	0.634	2.52	6.81	22.2	311.0	
10:40			7.98	0.643	2.03	6.81	15.5		

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: MW-10

Client:	TESORO	**Static Water Level:**	9.08
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	15.84
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	12
Sample Date:	9/18/18	**Approx. Screen Interval (ft bgs):**	6.3 – 15.9
Weather:		**Expected Purge Rate (mL/min):**	50-500 mL/min
Field Personnel:	BJ / JS	**Expected Purge Volume to Stability (gal):**	
		Laboratory Analysis:	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

SAMPLE ID: MW-10 **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 10:00 **Duplicate ID:** **Time:**

Total Volume of Water Purged (gal): 1.6

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.
9:48	400	9.15	9.33	1.034	0.23	6.46	-58.6	14.09	Smells of sewage
9:51	300	9.11	9.51	1.033	0.08	6.46	-84.5	10.86	
9:54		9.16	9.70	1.036	0.73	6.45	-87.3	8.12	
9:57		9.16	9.76	1.033	0.31	6.46	-99.5	8.17	
10:00			9.89	1.030	0.51	6.46	-105.6	8.31	

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: **MW-11**

Client:	TESORO	**Static Water Level:**	8.30
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	17.03
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	14.2
Sample Date:	9/19/18	**Approx. Screen Interval (ft bgs):**	6.0 – 16.0
Weather:		**Expected Purge Rate (mL/min):**	50-500 mL/min
Field Personnel:	BJ / JS	**Expected Purge Volume to Stability (gal):**	
		Laboratory Analysis:	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

SAMPLE ID: MW-11 **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 11:15 **Duplicate ID:** DUP-2 **Time:** 8:00 AM

Total Volume of Water Purged (gal): 1.4

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.
11:06	400	8.30	5.32	0.620	3.72	7.03	71.5	136.7	
11:09		8.30	5.49	0.629	0.20	6.90	63.1	91.08	
11:12			5.43	0.635	0.13	6.90	55.3	48.51	
11:15		8.30	5.44	0.639	0.18	6.91	50.3	45.90	

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: MW-15

Client:	TESORO	**Static Water Level:**	8.96
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	16.57
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	11.5
Sample Date:	9/18/18	**Approx. Screen Interval (ft bgs):**	5.0 – 14.5
Weather:		**Expected Purge Rate (mL/min):**	50-500 mL/min
Field Personnel:	BJ / JS	**Expected Purge Volume to Stability (gal):**	
		Laboratory Analysis:	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

SAMPLE ID: MW-15 **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 1:20 PM **Duplicate ID:** **Time:**

Total Volume of Water Purged (gal): 1.5

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.
13:11	350	9.07	8.37	0.830	7.05	6.86	85.6	1100+	Orange
13:14		9.05	8.28	0.835	1.52	6.75	81.7	1100+	
13:17		9.06	8.00	0.835	1.36	6.74	80.1	1100+	

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: MW-16

Client:	TESORO	**Static Water Level:**	5.97
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	14.09
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	10.2
		Approx. Screen Interval (ft bgs):	5.0 – 14.5
Sample Date:	9/18/18	**Expected Purge Rate (mL/min):**	50-500 mL/min
Weather:	cloudy	**Expected Purge Volume to Stability (gal):**	
Field Personnel:	BJ / JS	**Laboratory Analysis:**	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

SAMPLE ID: MW-16 **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 1150 **Duplicate ID:** **Time:**

Total Volume of Water Purged (gal): 1.5

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.
11:38	300	6.07	7.99	0.939	3.47	6.7	74	1100 +	Heavy Iron
11:41	250	6.10	8.08	.935	3.80	6.69	67	1100+	" "
11:44	300	6.10	8.36	0.930	5.10	6.73	67	781	
11:47	300	6.10	8.34	0.935	4.66	6.7	68	356	
11:50	300	6.10	8.39	0.938	4.59	6.69	68	250	

LOW-FLOW GROUNDWATER SAMPLING LOG 10.70 depth @ sample

MONITORING WELL ID: MW-17A

Client:	TESORO	**Static Water Level:**	7.48
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	29.66
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	16.7
Sample Date:	9/19/18	**Approx. Screen Interval (ft bgs):**	5.0 – 15.0
Weather:	Cloudy	**Expected Purge Rate (mL/min):**	50-500 mL/min
Field Personnel:	BJ / JS	**Expected Purge Volume to Stability (gal):**	
		Laboratory Analysis:	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

SAMPLE ID: 17A **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 9:45 **Duplicate ID:** **Time:**

Total Volume of Water Purged (gal): 1.5

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.
9:33	400	7.66 ~~10.70~~	6.10	0.608	1.54	7.06	74.5	29.2	clear
9:36			5.90	0.608	0.24	6.98	53.4	4.72	
9:39		7.66	5.88	0.608	0.16	6.99	42.9	1.71	
9:42			5.80	0.609	0.16	6.99	33.1	1.24	

LOW-FLOW GROUNDWATER SAMPLING LOG

27.00 Sample depth

MONITORING WELL ID: MW-17B

Client:	TESORO	**Static Water Level:**	7.49
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	29.66
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	27
Sample Date:	9/19/18	**Approx. Screen Interval (ft bgs):**	25.0 – 30.0
Weather:		**Expected Purge Rate (mL/min):**	50-500 mL/min
Field Personnel:	BJ / JS	**Expected Purge Volume to Stability (gal):**	
		Laboratory Analysis:	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

SAMPLE ID: MW-17B **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 10:00 **Duplicate ID:** **Time:**

Total Volume of Water Purged (gal): 1.8

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.
9:51	350	7.66	5.68	0.612	0.80	6.98	26.9	99.29	
9:54		7.66	5.77	0.611	0.15	6.99	12.2	77.13	
9:57			5.91	0.609	0.09	6.99	2.2	93.93	
10:00		7.66	5.86	0.610	0.15	7.00	-6.2	83.41	

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: **MW-18R**

Client: TESORO
Project Number: 46K-001-003
Project Name: 2018 Groundwater Monitoring
Project Location: Tesoro Fairbanks Petroleum Terminal

Sample Date: 9-20-18
Weather: Light Rain
Field Personnel: BJ / JS

LNAPL

Static Water Level:
Well Diameter (in): 4
Depth to Bottom (ft BTOC): 19.17
Pump Depth:
Approx. Screen Interval (ft bgs): 4.0 – 19.0
Expected Purge Rate (mL/min): 50-500 mL/min
Expected Purge Volume to Stability (gal):
Laboratory Analysis: BTEX/GRO & DRO
Containers/Preservatives: 40 mL VOAs / HCl
250mL amber / HCl

SAMPLE ID: MW-18R
Duplicate Sample? (yes) (no)
SAMPLE TIME: 1000
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.
10:00			6.64	1,019	21.25	6.55	34.3	4.77	clear, odor, no sheen

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: MW-19

Client:	TESORO	**Static Water Level:**	7.32
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	17.96
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	~~15.0~~ 12.2
		Approx. Screen Interval (ft bgs):	6.8 – 15.9
Sample Date:	9/18/18	**Expected Purge Rate (mL/min):**	50-500 mL/min
Weather:	Cloudy	**Expected Purge Volume to Stability (gal):**	
Field Personnel:	BJ / JS	**Laboratory Analysis:**	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

SAMPLE ID: MW-19 **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 16:50 **Duplicate ID:** **Time:**

Total Volume of Water Purged (gal): 1.0

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.
16:41	300	7.5	7.48	0.565	0.34	6.93	76	496	Iron
16:44		7.6	7.43	0.571	0.27	6.93	60	646	
16:47	300	7.48	7.40	0.573	0.17	6.93	51	655	

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: **MW-20**

Client:	TESORO	**Static Water Level:**	16.25
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	16.46
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	13.4
		Approx. Screen Interval (ft bgs):	5.0 – 14.9
Sample Date:	9-14-18	**Expected Purge Rate (mL/min):**	50-500 mL/min
Weather:	Cloudy	**Expected Purge Volume to Stability (gal):**	
Field Personnel:	BJ / JS	**Laboratory Analysis:**	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

SAMPLE ID: MW-20 **Duplicate Sample?** (yes) (~~no~~) (MS/MSD) **Total Volume of Water Purged (gal):** 2.0

SAMPLE TIME: 1600 **Duplicate ID:** **Time:**

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.
15:42	350	10.3	8.15	0.969	6.3	6.77	91	644	Iron
15:45	300	10.3	8.4	0.964	5.93	6.76	90	328	
15:48	300	10.3	8.52	0.953	5.78	6.75	88	242	
15:51	300	10.3	8.36	0.940	5.40	6.74	87.4	75	
15:54	300	16.3	8.20	0.916	4.88	6.74	87	46	
15:57	300	10.3	8.26	0.908	4.60	6.74	86	33	
16:00	301	10.3	8.32	0.900	4.47	6.74	86	30	

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: **MW-21**

Client:	TESORO	**Static Water Level:**	~~12.12~~ ~~11.98~~
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	17.13
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	15.0
Sample Date:	9/19/18	**Approx. Screen Interval (ft bgs):**	5.0 – 14.5
Weather:	cloudy	**Expected Purge Rate (mL/min):**	50-500 mL/min
Field Personnel:	BJ / JS	**Expected Purge Volume to Stability (gal):**	
		Laboratory Analysis:	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

Probe issue something on water?

SAMPLE ID: MW-21 **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 11:50 **Duplicate ID:** **Time:**

Total Volume of Water Purged (gal): 2.0

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.
11:41	400	9.18	3.04	~~3~~ 0.631	7.17	6.97	59.4	189.7	iron
11:44			3.27	0.632	6.73	6.96	59.9	169.6	
11:47		9.22	2.86	0.643	7.46	6.97	60.9	94.47	

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: MW-22

Client:	TESORO	**Static Water Level:**	7.65
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	15.78
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	11.7
Sample Date:	9/18/18	**Approx. Screen Interval (ft bgs):**	4.5 – 14.5
Weather:	Cloudy	**Expected Purge Rate (mL/min):**	50-500 mL/min
Field Personnel:	BJ / JS	**Expected Purge Volume to Stability (gal):**	
		Laboratory Analysis:	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

SAMPLE ID: MW-22 **Duplicate Sample?** (yes) (no) **Total Volume of Water Purged (gal):** 1.2

SAMPLE TIME: 2:40 PM **Duplicate ID:** DUP-3 **Time:** 8:30AM

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.
14:31	400	7.88	2.79	0.668	0.20	6.70	84.8	447.7	
14:34		7.90	2.93	0.592	0.02	6.57	83.3	132.3	
14:37		7.88	2.85	0.587	-0.01	6.54	81.5	48.52	

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: MW-23

Client:	TESORO	**Static Water Level:**	8.42
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	13.98
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	10.3
Sample Date:	9/19/18	**Approx. Screen Interval (ft bgs):**	4.5 – 14.5
Weather:		**Expected Purge Rate (mL/min):**	50-500 mL/min
Field Personnel:	BJ / JS	**Expected Purge Volume to Stability (gal):**	
		Laboratory Analysis:	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

SAMPLE ID: MW-23 **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 12:20 **Duplicate ID:** **Time:**

Total Volume of Water Purged (gal): 1.2

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.
12:11	300	8.50	7.62	0.822	4.91	6.86	62.5	36.12	trace iron visible
12:14			7.78	0.817	2.56	6.81	61.0	8.20	
12:17		8.50	7.67	0.808	2.07	6.80	59.4	2.82	

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: **MW-24**

Client:	TESORO	**Static Water Level:**	
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	14.42
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	
		Approx. Screen Interval (ft bgs):	5.0 – 14.0
Sample Date:	9-20-18	**Expected Purge Rate (mL/min):**	50-500 mL/min
Weather:	Light Rain	**Expected Purge Volume to Stability (gal):**	
Field Personnel:	BJ / JS	**Laboratory Analysis:**	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

*contained LNAPL in 2017 LNAPL

SAMPLE ID: MW-24 **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 1045 **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.
1045			8.31	0.532	13.31	6.58	18.2	7.22	odor, clear, No sheen

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: MW-25

Client:	TESORO	**Static Water Level:**	6.4
Project Number:	46K-001-003	**Well Diameter (in):**	2
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	13.71
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	10.0
Sample Date:	9/18/18	**Approx. Screen Interval (ft bgs):**	4.5 – [redacted] 14.5
Weather:		**Expected Purge Rate (mL/min):**	50-500 mL/min
Field Personnel:	BJ / JS	**Expected Purge Volume to Stability (gal):**	
		Laboratory Analysis:	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

SAMPLE ID: MW-25 **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 1:45 PM **Duplicate ID:** **Time:**

Total Volume of Water Purged (gal): 1.5

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.
13:36	350	6.53	8.02	0.980	5.81	6.70	72.8	437.5	
13:39		6.55	7.97	0.978	1.18	6.68	69.5	318.8	
13:42	350	6.57	7.93	0.971	0.66	6.68	66.9	227.0	

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: **Equip Blank-1**

Client:	TESORO	**Static Water Level:**	N/A
Project Number:	46K-001-003	**Well Diameter (in):**	N/A
Project Name:	2018 Groundwater Monitoring	**Depth to Bottom (ft BTOC):**	N/A
Project Location:	Tesoro Fairbanks Petroleum Terminal	**Pump Depth:**	N/A
		Approx. Screen Interval (ft bgs):	N/A
Sample Date:	9-19-18	**Expected Purge Rate (mL/min):**	N/A
Weather:	Cloudy	**Expected Purge Volume to Stability (gal):**	N/A
Field Personnel:	BJ / JS	**Laboratory Analysis:**	BTEX/GRO & DRO
		Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

SAMPLE ID: EQ1 **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 1800 **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.
1800									EQ1

LOW-FLOW GROUNDWATER SAMPLING LOG

MONITORING WELL ID: **Equip Blank-2**

Client:	TESORO
Project Number:	46K-001-003
Project Name:	2018 Groundwater Monitoring
Project Location:	Tesoro Fairbanks Petroleum Terminal
Sample Date:	9-19-18
Weather:	Cloudy
Field Personnel:	BJ / JS

Static Water Level:	N/A
Well Diameter (in):	N/A
Depth to Bottom (ft BTOC):	N/A
Pump Depth:	N/A
Approx. Screen Interval (ft bgs):	N/A
Expected Purge Rate (mL/min):	N/A
Expected Purge Volume to Stability (gal):	N/A
Laboratory Analysis:	BTEX/GRO & DRO
Containers/Preservatives:	40 mL VOAs / HCl 250mL amber / HCl

SAMPLE ID: EQ2 **Duplicate Sample?** (yes) (no)

SAMPLE TIME: 13:10 **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.
13:10									EQ2

ATTACHMENT B

FIELD NOTES

FBX Petroleum Terminal 8/7/18

Point	BS	FS	Elve
MW-10	4.365		427.50
MW-24	5.709	5.233	426.632
MW-1R	~~3.864~~ 6.253	3.864	428.477
MW-2	2.380	1.073	433.657
MW-3	0.986	1.709	434.328
TP-1	5.815	8.122	427.192
MW-10		5.502	427.505 ✓
	25.508 ✓	25.503	
MW-1R	3.869		428.477
~~MW-18R~~ TP-1	4.332	2.059	430.287
MW-18R	5.663	5.572	429.047
MW-4	1.237	1.518	433.192
MW-1R		5.951	428.478 ✓
	15.101 ✓	15.100	

CS Level

JS Rod

Could not locate MW-23
MW-05 under 8" water

Fairbanks Petroleum 8/7/18

Point	BS		FS	Elve
MW-10	3.670			427.50
MW-08	1.483		1.405	429.765
MW-25	5.658		6.496	429.752
MW-15	3.146		3.189	427.221
MW-16	6.972		6.047	424.32
MW-17A/B	5.375		5.382	425.91
MW-6R	4.964		4.920	426.365
TP-1	6.227		4.814	426.515
MW-9	2.878		2.782	429.96
MW-10			5.337	427.501 ✓
	40.373	✓	40.372	

FBX PT

CS Level
JS Rod

FBX PT 8/7/18

Point	BS		FS	Elve
MW-6R	4.182			426.365
MW-19	3.913		5.016	425.531
TP-1	5.223		4.378	425.066
MW-20	2.152		2.107	428.182
TP-1	6.738		5.743	424.591
TP-2	3.180		3.211	428.118
MW-7	3.019		3.424	427.874
TP-3	5.707		5.979	424.914
TP-4	6.226		6.112	424.509
MW-6R			4.362	426.373 ✓
	40.34	✓	40.332	
			40.332	

FBX PT

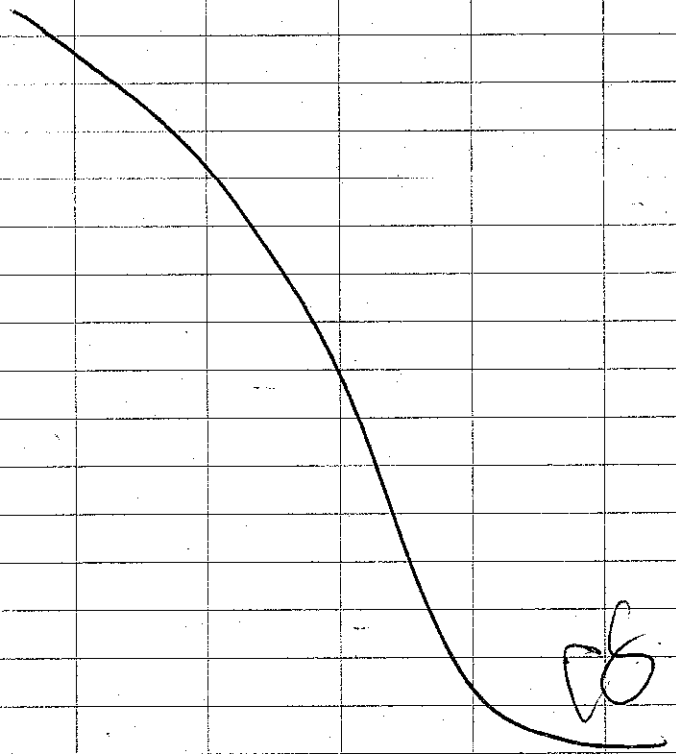
CS Level
JS Rod

Fairbanks Petroleum Term 8/7/18

	BS		FS	Elve
MW-6R	4.362			426.365
			~~4.614~~	
TP-1	4.596		4.614	426.113
MW-11	3.738		4.344	426.365
TP-2	4.653		3.945	426.158
MW-21	3.686		3.776	427.035
TP-3	4.321		4.262	426.459
MW-22	4.210		5.159	425.621
TP-4	4.371		3.411	426.420
TP-5	4.262		4.610	426.181
MW-6R			4.068	426.375
	38.199	✓	38.189	

CS Leve
JS Rod

point	BS		FS	Elevation	8/18/18
MW-10	4.445			422.50	
MW-5	6.336		6.339	425.606	
MW-10			4.441	427.501	

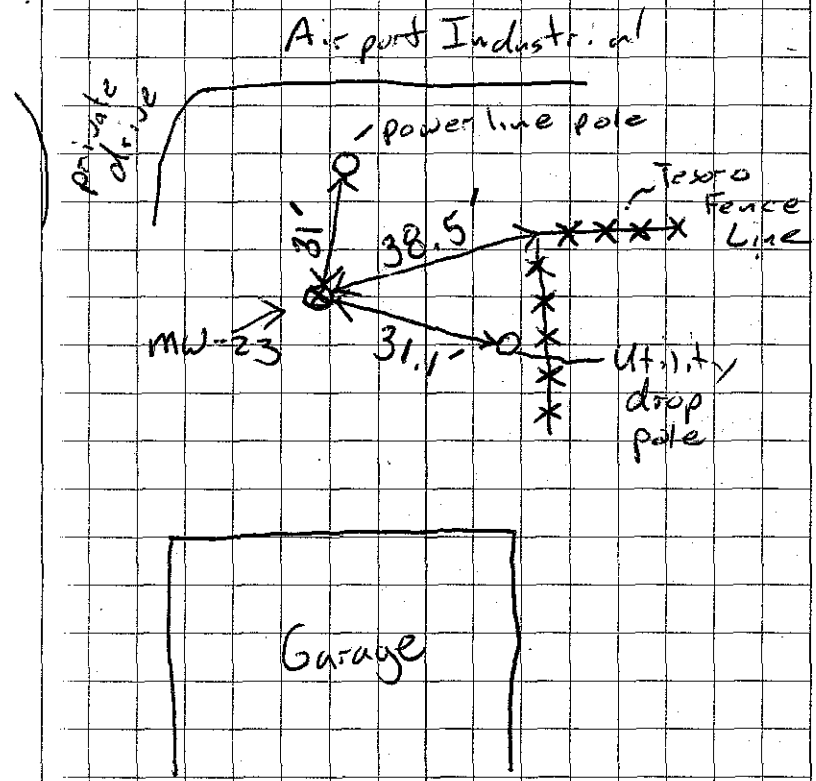


Level + Leica Digital CS-15
C. Schultz, J Schmetzer

12 C. Schulte FBX Petroleum Term 8/9/18
J. Schuster

Point	BS		FS	Elve	
MW-1R	3.880			428.477	
MW-23	5.387		5.368	426.989	
MW-1R			3,897	428.479	✓
	9.267	✓	9.265		

Located MW-23 with metal detector. Will collect swing ties to telephone poles



APPENDIX C

LABORATORY REPORT

Laboratory Report of Analysis

To: Trihydro Corporation
312 Tyee Street
Soldotna, AK 99669
(907)262-2315

Report Number: **1189782**

Client Project: **Fairbanks**

Dear Brianna Force,

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.

SGS North America
Environmental Services – Alaska Division
General Manager

Charles Homestead
2018.10.03 14:08:24 -08'00'

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: **1189782**
Project Name/Site: **Fairbanks**
Project Contact: **Brianna Force**

Refer to sample receipt form for information on sample condition.

MW-20 MS (1189782023) BMS

AK101- More than 20 samples injected between QC samples, OK per QA due to non-detect for analytes.

MB for HBN 1786499 [VXX/33167] (1477437) MB

8021B- MB has Benzene and Toluene above LOQ and do not meet QC criteria however these analytes in the associated samples are non detect

*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. 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, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). 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
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-1R	1189782001	09/17/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-2	1189782002	09/17/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-3	1189782005	09/17/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-4	1189782006	09/18/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-5	1189782007	09/18/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-6R	1189782008	09/20/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-7	1189782009	09/18/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-8	1189782010	09/18/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-8 MS	1189782011	09/18/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-8 MSD	1189782012	09/18/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-9	1189782013	09/19/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-10	1189782014	09/18/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-11	1189782015	09/19/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-15	1189782016	09/18/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-16	1189782017	09/18/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-17A	1189782018	09/19/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-17B	1189782019	09/19/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-18R	1189782020	09/20/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-19	1189782021	09/18/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-20	1189782022	09/18/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-20 MS	1189782023	09/18/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-20 MSD	1189782024	09/18/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-21	1189782025	09/19/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-22	1189782026	09/18/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-23	1189782027	09/19/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-24	1189782028	09/20/2018	09/21/2018	Water (Surface, Eff., Ground)
MW-25	1189782029	09/18/2018	09/21/2018	Water (Surface, Eff., Ground)
Equip Blank-1	1189782030	09/18/2018	09/21/2018	Water (Surface, Eff., Ground)
Equip Blank-2	1189782031	09/19/2018	09/21/2018	Water (Surface, Eff., Ground)
Dup-1	1189782032	09/17/2018	09/21/2018	Water (Surface, Eff., Ground)
Dup-2	1189782033	09/19/2018	09/21/2018	Water (Surface, Eff., Ground)
Dup-3	1189782034	09/18/2018	09/21/2018	Water (Surface, Eff., Ground)
Trip Blank	1189782035	09/17/2018	09/21/2018	Water (Surface, Eff., Ground)

Method	Method Description
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.
AK102	DRO Low Volume (W)

Print Date: 10/03/2018 1:05:23PM

Detectable Results Summary

Client Sample ID: **MW-1R**
Lab Sample ID: 1189782001
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	5.89	mg/L
Benzene	771	ug/L
Ethylbenzene	113	ug/L
Gasoline Range Organics	3.88	mg/L
o-Xylene	162	ug/L
P & M -Xylene	503	ug/L
Toluene	143	ug/L
Xylenes (total)	665	ug/L

Client Sample ID: **MW-2**
Lab Sample ID: 1189782002
Volatile Fuels

Parameter	Result	Units
Benzene	12.1	ug/L

Client Sample ID: **MW-3**
Lab Sample ID: 1189782005
Volatile Fuels

Parameter	Result	Units
Benzene	0.690	ug/L

Client Sample ID: **MW-6R**
Lab Sample ID: 1189782008
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	28.9	mg/L
Benzene	8.76	ug/L
Gasoline Range Organics	0.195	mg/L
o-Xylene	3.33	ug/L
Xylenes (total)	4.89	ug/L

Client Sample ID: **MW-10**
Lab Sample ID: 1189782014
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	15.7	mg/L
Benzene	0.580	ug/L
Ethylbenzene	8.91	ug/L
Gasoline Range Organics	1.13	mg/L
o-Xylene	342	ug/L
P & M -Xylene	158	ug/L
Toluene	1.76	ug/L
Xylenes (total)	500	ug/L

Client Sample ID: **MW-11**
Lab Sample ID: 1189782015
Volatile Fuels

Parameter	Result	Units
Benzene	1.49	ug/L

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Detectable Results Summary

Client Sample ID: **MW-18R**
Lab Sample ID: 1189782020
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	8.73	mg/L
Benzene	0.640	ug/L
Ethylbenzene	5.07	ug/L
Gasoline Range Organics	0.343	mg/L
o-Xylene	18.6	ug/L
P & M -Xylene	26.2	ug/L
Xylenes (total)	44.8	ug/L

Client Sample ID: **MW-24**
Lab Sample ID: 1189782028
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	7.44	mg/L
Benzene	0.550	ug/L
Ethylbenzene	158	ug/L
Gasoline Range Organics	4.41	mg/L
o-Xylene	791	ug/L
P & M -Xylene	1330	ug/L
Toluene	1.99	ug/L
Xylenes (total)	2120	ug/L

Client Sample ID: **Dup-1**
Lab Sample ID: 1189782032
Volatile Fuels

Parameter	Result	Units
Benzene	11.8	ug/L

Client Sample ID: **Dup-2**
Lab Sample ID: 1189782033
Volatile Fuels

Parameter	Result	Units
Benzene	1.39	ug/L

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Results of **MW-1R**

Client Sample ID: **MW-1R**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782001
Lab Project ID: 1189782

Collection Date: 09/17/18 13:30
Received Date: 09/21/18 10:07
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	5.89		0.630	0.189	mg/L	1		09/24/18 13:22
Surrogates								
5a Androstane (surr)	85.6		50-150		%	1		09/24/18 13:22

Batch Information

Analytical Batch: XFC14635
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 09/24/18 13:22
Container ID: 1189782001-D

Prep Batch: XXX40552
Prep Method: SW3520C
Prep Date/Time: 09/23/18 08:19
Prep Initial Wt./Vol.: 238 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-1R**

Client Sample ID: **MW-1R**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782001
Lab Project ID: 1189782

Collection Date: 09/17/18 13:30
Received Date: 09/21/18 10:07
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	3.88		0.500	0.155	mg/L	5		09/28/18 07:59
Surrogates								
4-Bromofluorobenzene (surr)	101		50-150		%	5		09/28/18 07:59

Batch Information

Analytical Batch: VFC14460
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/28/18 07:59
Container ID: 1189782001-C

Prep Batch: VXX33218
Prep Method: SW5030B
Prep Date/Time: 09/27/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	771		2.50	0.750	ug/L	5		09/28/18 07:59
Ethylbenzene	113		5.00	1.55	ug/L	5		09/28/18 07:59
o-Xylene	162		5.00	1.55	ug/L	5		09/28/18 07:59
P & M -Xylene	503		10.0	3.10	ug/L	5		09/28/18 07:59
Toluene	143		5.00	1.55	ug/L	5		09/28/18 07:59
Xylenes (total)	665		15.0	4.65	ug/L	5		09/28/18 07:59
Surrogates								
1,4-Difluorobenzene (surr)	108		77-115		%	5		09/28/18 07:59

Batch Information

Analytical Batch: VFC14460
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/28/18 07:59
Container ID: 1189782001-C

Prep Batch: VXX33218
Prep Method: SW5030B
Prep Date/Time: 09/27/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-2**

Client Sample ID: **MW-2**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782002
Lab Project ID: 1189782

Collection Date: 09/17/18 14:50
Received Date: 09/21/18 10:07
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	0.620	U	0.620	0.186	mg/L	1		09/24/18 13:32
Surrogates								
5a Androstane (surr)	77.3		50-150		%	1		09/24/18 13:32

Batch Information

Analytical Batch: XFC14635
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 09/24/18 13:32
Container ID: 1189782002-D

Prep Batch: XXX40552
Prep Method: SW3520C
Prep Date/Time: 09/23/18 08:19
Prep Initial Wt./Vol.: 242 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-2**

Client Sample ID: **MW-2**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782002
Lab Project ID: 1189782

Collection Date: 09/17/18 14:50
Received Date: 09/21/18 10:07
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		09/28/18 07:23
Surrogates								
4-Bromofluorobenzene (surr)	80.2		50-150		%	1		09/28/18 07:23

Batch Information

Analytical Batch: VFC14460
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/28/18 07:23
Container ID: 1189782002-C

Prep Batch: VXX33218
Prep Method: SW5030B
Prep Date/Time: 09/27/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	12.1		0.500	0.150	ug/L	1		09/28/18 07:23
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/28/18 07:23
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/28/18 07:23
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/28/18 07:23
Toluene	1.00	U	1.00	0.310	ug/L	1		09/28/18 07:23
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/28/18 07:23
Surrogates								
1,4-Difluorobenzene (surr)	94.1		77-115		%	1		09/28/18 07:23

Batch Information

Analytical Batch: VFC14460
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/28/18 07:23
Container ID: 1189782002-C

Prep Batch: VXX33218
Prep Method: SW5030B
Prep Date/Time: 09/27/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-3**

Client Sample ID: **MW-3**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782005
Lab Project ID: 1189782

Collection Date: 09/17/18 13:54
Received Date: 09/21/18 10:07
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	0.620	U	0.620	0.186	mg/L	1		09/24/18 13:43
Surrogates								
5a Androstane (surr)	75.6		50-150		%	1		09/24/18 13:43

Batch Information

Analytical Batch: XFC14635
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 09/24/18 13:43
Container ID: 1189782005-D

Prep Batch: XXX40552
Prep Method: SW3520C
Prep Date/Time: 09/23/18 08:19
Prep Initial Wt./Vol.: 242 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-3**

Client Sample ID: **MW-3**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782005
Lab Project ID: 1189782

Collection Date: 09/17/18 13:54
Received Date: 09/21/18 10:07
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		09/28/18 07:41
Surrogates								
4-Bromofluorobenzene (surr)	76.8		50-150		%	1		09/28/18 07:41

Batch Information

Analytical Batch: VFC14460
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/28/18 07:41
Container ID: 1189782005-C

Prep Batch: VXX33218
Prep Method: SW5030B
Prep Date/Time: 09/27/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.690		0.500	0.150	ug/L	1		09/28/18 07:41
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/28/18 07:41
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/28/18 07:41
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/28/18 07:41
Toluene	1.00	U	1.00	0.310	ug/L	1		09/28/18 07:41
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/28/18 07:41
Surrogates								
1,4-Difluorobenzene (surr)	96.7		77-115		%	1		09/28/18 07:41

Batch Information

Analytical Batch: VFC14460
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/28/18 07:41
Container ID: 1189782005-C

Prep Batch: VXX33218
Prep Method: SW5030B
Prep Date/Time: 09/27/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **MW-4**

Client Sample ID: **MW-4**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782006
Lab Project ID: 1189782

Collection Date: 09/18/18 09:20
Received Date: 09/21/18 10:07
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	0.658	U	0.658	0.197	mg/L	1		09/24/18 13:53
Surrogates								
5a Androstane (surr)	86.9		50-150		%	1		09/24/18 13:53

Batch Information

Analytical Batch: XFC14635
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 09/24/18 13:53
Container ID: 1189782006-D

Prep Batch: XXX40552
Prep Method: SW3520C
Prep Date/Time: 09/23/18 08:19
Prep Initial Wt./Vol.: 228 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-4**

Client Sample ID: **MW-4**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782006
Lab Project ID: 1189782

Collection Date: 09/18/18 09:20
Received Date: 09/21/18 10:07
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		09/22/18 09:47
Surrogates								
4-Bromofluorobenzene (surr)	84.6		50-150		%	1		09/22/18 09:47

Batch Information

Analytical Batch: VFC14447
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/22/18 09:47
Container ID: 1189782006-A

Prep Batch: VXX33167
Prep Method: SW5030B
Prep Date/Time: 09/21/18 08:00
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		09/22/18 09:47
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/22/18 09:47
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/22/18 09:47
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/22/18 09:47
Toluene	1.00	U	1.00	0.310	ug/L	1		09/22/18 09:47
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/22/18 09:47
Surrogates								
1,4-Difluorobenzene (surr)	93.6		77-115		%	1		09/22/18 09:47

Batch Information

Analytical Batch: VFC14447
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/22/18 09:47
Container ID: 1189782006-A

Prep Batch: VXX33167
Prep Method: SW5030B
Prep Date/Time: 09/21/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-5**

Client Sample ID: **MW-5**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782007
Lab Project ID: 1189782

Collection Date: 09/18/18 14:10
Received Date: 09/21/18 10:07
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	0.647	U	0.647	0.194	mg/L	1		09/25/18 13:47
Surrogates								
5a Androstane (surr)	81.2		50-150		%	1		09/25/18 13:47

Batch Information

Analytical Batch: XFC14646
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 09/25/18 13:47
Container ID: 1189782007-D

Prep Batch: XXX40554
Prep Method: SW3520C
Prep Date/Time: 09/23/18 08:57
Prep Initial Wt./Vol.: 232 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-5**

Client Sample ID: **MW-5**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782007
Lab Project ID: 1189782

Collection Date: 09/18/18 14:10
Received Date: 09/21/18 10:07
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		09/22/18 10:05
Surrogates								
4-Bromofluorobenzene (surr)	84.8		50-150		%	1		09/22/18 10:05

Batch Information

Analytical Batch: VFC14447
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/22/18 10:05
Container ID: 1189782007-A

Prep Batch: VXX33167
Prep Method: SW5030B
Prep Date/Time: 09/21/18 08:00
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		09/22/18 10:05
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/22/18 10:05
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/22/18 10:05
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/22/18 10:05
Toluene	1.00	U	1.00	0.310	ug/L	1		09/22/18 10:05
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/22/18 10:05
Surrogates								
1,4-Difluorobenzene (surr)	94.1		77-115		%	1		09/22/18 10:05

Batch Information

Analytical Batch: VFC14447
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/22/18 10:05
Container ID: 1189782007-A

Prep Batch: VXX33167
Prep Method: SW5030B
Prep Date/Time: 09/21/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-6R**

Client Sample ID: **MW-6R**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782008
Lab Project ID: 1189782

Collection Date: 09/20/18 10:30
Received Date: 09/21/18 10:07
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	28.9		0.620	0.186	mg/L	1		09/26/18 19:26
Surrogates								
5a Androstane (surr)	83.8		50-150		%	1		09/26/18 19:26

Batch Information

Analytical Batch: XFC14651
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 09/26/18 19:26
Container ID: 1189782008-D

Prep Batch: XXX40554
Prep Method: SW3520C
Prep Date/Time: 09/23/18 08:57
Prep Initial Wt./Vol.: 242 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-6R**

Client Sample ID: **MW-6R**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782008
Lab Project ID: 1189782

Collection Date: 09/20/18 10:30
Received Date: 09/21/18 10:07
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	0.195		0.100	0.0310	mg/L	1		09/26/18 08:19
Surrogates								
4-Bromofluorobenzene (surr)	104		50-150		%	1		09/26/18 08:19

Batch Information

Analytical Batch: VFC14456
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/26/18 08:19
Container ID: 1189782008-A

Prep Batch: VXX33198
Prep Method: SW5030B
Prep Date/Time: 09/25/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	8.76		0.500	0.150	ug/L	1		09/26/18 08:19
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/26/18 08:19
o-Xylene	3.33		1.00	0.310	ug/L	1		09/26/18 08:19
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/26/18 08:19
Toluene	1.00	U	1.00	0.310	ug/L	1		09/26/18 08:19
Xylenes (total)	4.89		3.00	0.930	ug/L	1		09/26/18 08:19
Surrogates								
1,4-Difluorobenzene (surr)	91.7		77-115		%	1		09/26/18 08:19

Batch Information

Analytical Batch: VFC14456
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/26/18 08:19
Container ID: 1189782008-A

Prep Batch: VXX33198
Prep Method: SW5030B
Prep Date/Time: 09/25/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **MW-7**

Client Sample ID: **MW-7**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782009
Lab Project ID: 1189782

Collection Date: 09/18/18 15:30
Received Date: 09/21/18 10:07
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	0.625	U	0.625	0.188	mg/L	1		09/25/18 13:57
Surrogates								
5a Androstane (surr)	85.8		50-150		%	1		09/25/18 13:57

Batch Information

Analytical Batch: XFC14646
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 09/25/18 13:57
Container ID: 1189782009-D

Prep Batch: XXX40554
Prep Method: SW3520C
Prep Date/Time: 09/23/18 08:57
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-7**

Client Sample ID: **MW-7**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782009
Lab Project ID: 1189782

Collection Date: 09/18/18 15:30
Received Date: 09/21/18 10:07
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		09/26/18 02:04
Surrogates								
4-Bromofluorobenzene (surr)	79.3		50-150		%	1		09/26/18 02:04

Batch Information

Analytical Batch: VFC14455
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/26/18 02:04
Container ID: 1189782009-A

Prep Batch: VXX33194
Prep Method: SW5030B
Prep Date/Time: 09/25/18 08:00
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		09/26/18 02:04
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/26/18 02:04
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/26/18 02:04
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/26/18 02:04
Toluene	1.00	U	1.00	0.310	ug/L	1		09/26/18 02:04
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/26/18 02:04
Surrogates								
1,4-Difluorobenzene (surr)	88.4		77-115		%	1		09/26/18 02:04

Batch Information

Analytical Batch: VFC14455
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/26/18 02:04
Container ID: 1189782009-A

Prep Batch: VXX33194
Prep Method: SW5030B
Prep Date/Time: 09/25/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **MW-8**

Client Sample ID: **MW-8**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782010
Lab Project ID: 1189782

Collection Date: 09/18/18 09:18
Received Date: 09/21/18 10:07
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	0.620	U	0.620	0.186	mg/L	1		09/27/18 12:08
Surrogates								
5a Androstane (surr)	77		50-150		%	1		09/27/18 12:08

Batch Information

Analytical Batch: XFC14658
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 09/27/18 12:08
Container ID: 1189782010-D

Prep Batch: XXX40584
Prep Method: SW3520C
Prep Date/Time: 09/26/18 09:06
Prep Initial Wt./Vol.: 242 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-8**

Client Sample ID: **MW-8**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782010
Lab Project ID: 1189782

Collection Date: 09/18/18 09:18
Received Date: 09/21/18 10:07
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		09/26/18 02:58
Surrogates								
4-Bromofluorobenzene (surr)	53.9		50-150		%	1		09/26/18 02:58

Batch Information

Analytical Batch: VFC14456
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/26/18 02:58
Container ID: 1189782010-A

Prep Batch: VXX33198
Prep Method: SW5030B
Prep Date/Time: 09/25/18 08:00
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		09/26/18 02:58
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/26/18 02:58
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/26/18 02:58
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/26/18 02:58
Toluene	1.00	U	1.00	0.310	ug/L	1		09/26/18 02:58
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/26/18 02:58
Surrogates								
1,4-Difluorobenzene (surr)	95.7		77-115		%	1		09/26/18 02:58

Batch Information

Analytical Batch: VFC14456
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/26/18 02:58
Container ID: 1189782010-A

Prep Batch: VXX33198
Prep Method: SW5030B
Prep Date/Time: 09/25/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **MW-9**

Client Sample ID: **MW-9**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782013
Lab Project ID: 1189782

Collection Date: 09/19/18 10:40
Received Date: 09/21/18 10:07
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	0.641	U	0.641	0.192	mg/L	1		09/27/18 12:39
Surrogates								
5a Androstane (surr)	82.5		50-150		%	1		09/27/18 12:39

Batch Information

Analytical Batch: XFC14658
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 09/27/18 12:39
Container ID: 1189782013-D

Prep Batch: XXX40584
Prep Method: SW3520C
Prep Date/Time: 09/26/18 09:06
Prep Initial Wt./Vol.: 234 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-9**

Client Sample ID: **MW-9**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782013
Lab Project ID: 1189782

Collection Date: 09/19/18 10:40
Received Date: 09/21/18 10:07
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		09/26/18 06:32
Surrogates								
4-Bromofluorobenzene (surr)	78.6		50-150		%	1		09/26/18 06:32

Batch Information

Analytical Batch: VFC14456
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/26/18 06:32
Container ID: 1189782013-A

Prep Batch: VXX33198
Prep Method: SW5030B
Prep Date/Time: 09/25/18 08:00
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		09/26/18 06:32
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/26/18 06:32
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/26/18 06:32
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/26/18 06:32
Toluene	1.00	U	1.00	0.310	ug/L	1		09/26/18 06:32
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/26/18 06:32
Surrogates								
1,4-Difluorobenzene (surr)	94.8		77-115		%	1		09/26/18 06:32

Batch Information

Analytical Batch: VFC14456
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/26/18 06:32
Container ID: 1189782013-A

Prep Batch: VXX33198
Prep Method: SW5030B
Prep Date/Time: 09/25/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **MW-10**

Client Sample ID: **MW-10**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782014
Lab Project ID: 1189782

Collection Date: 09/18/18 10:00
Received Date: 09/21/18 10:07
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	15.7		0.630	0.189	mg/L	1		09/27/18 12:49
Surrogates								
5a Androstane (surr)	82.1		50-150		%	1		09/27/18 12:49

Batch Information

Analytical Batch: XFC14658
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 09/27/18 12:49
Container ID: 1189782014-D

Prep Batch: XXX40584
Prep Method: SW3520C
Prep Date/Time: 09/26/18 09:06
Prep Initial Wt./Vol.: 238 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-10**

Client Sample ID: **MW-10**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782014
Lab Project ID: 1189782

Collection Date: 09/18/18 10:00
Received Date: 09/21/18 10:07
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	1.13		0.100	0.0310	mg/L	1		09/26/18 06:50
Surrogates								
4-Bromofluorobenzene (surr)	116		50-150		%	1		09/26/18 06:50

Batch Information

Analytical Batch: VFC14456
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/26/18 06:50
Container ID: 1189782014-A

Prep Batch: VXX33198
Prep Method: SW5030B
Prep Date/Time: 09/25/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.580		0.500	0.150	ug/L	1		09/26/18 06:50
Ethylbenzene	8.91		1.00	0.310	ug/L	1		09/26/18 06:50
o-Xylene	342		1.00	0.310	ug/L	1		09/26/18 06:50
P & M -Xylene	158		2.00	0.620	ug/L	1		09/26/18 06:50
Toluene	1.76		1.00	0.310	ug/L	1		09/26/18 06:50
Xylenes (total)	500		3.00	0.930	ug/L	1		09/26/18 06:50
Surrogates								
1,4-Difluorobenzene (surr)	100		77-115		%	1		09/26/18 06:50

Batch Information

Analytical Batch: VFC14456
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/26/18 06:50
Container ID: 1189782014-A

Prep Batch: VXX33198
Prep Method: SW5030B
Prep Date/Time: 09/25/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-11**

Client Sample ID: **MW-11**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782015
Lab Project ID: 1189782

Collection Date: 09/19/18 11:15
Received Date: 09/21/18 10:07
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	0.630	U	0.630	0.189	mg/L	1		09/27/18 13:00
Surrogates								
5a Androstane (surr)	82.3		50-150		%	1		09/27/18 13:00

Batch Information

Analytical Batch: XFC14658
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 09/27/18 13:00
Container ID: 1189782015-D

Prep Batch: XXX40584
Prep Method: SW3520C
Prep Date/Time: 09/26/18 09:06
Prep Initial Wt./Vol.: 238 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-11**

Client Sample ID: **MW-11**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782015
Lab Project ID: 1189782

Collection Date: 09/19/18 11:15
Received Date: 09/21/18 10:07
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		09/26/18 07:08
Surrogates								
4-Bromofluorobenzene (surr)	80.5		50-150		%	1		09/26/18 07:08

Batch Information

Analytical Batch: VFC14456
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/26/18 07:08
Container ID: 1189782015-A

Prep Batch: VXX33198
Prep Method: SW5030B
Prep Date/Time: 09/25/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	1.49		0.500	0.150	ug/L	1		09/26/18 07:08
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/26/18 07:08
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/26/18 07:08
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/26/18 07:08
Toluene	1.00	U	1.00	0.310	ug/L	1		09/26/18 07:08
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/26/18 07:08
Surrogates								
1,4-Difluorobenzene (surr)	92.6		77-115		%	1		09/26/18 07:08

Batch Information

Analytical Batch: VFC14456
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/26/18 07:08
Container ID: 1189782015-A

Prep Batch: VXX33198
Prep Method: SW5030B
Prep Date/Time: 09/25/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **MW-15**

Client Sample ID: **MW-15**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782016
Lab Project ID: 1189782

Collection Date: 09/18/18 13:20
Received Date: 09/21/18 10:07
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	0.652	U	0.652	0.196	mg/L	1		09/27/18 13:10
Surrogates								
5a Androstane (surr)	79		50-150		%	1		09/27/18 13:10

Batch Information

Analytical Batch: XFC14658
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 09/27/18 13:10
Container ID: 1189782016-D

Prep Batch: XXX40584
Prep Method: SW3520C
Prep Date/Time: 09/26/18 09:06
Prep Initial Wt./Vol.: 230 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-15**

Client Sample ID: **MW-15**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782016
Lab Project ID: 1189782

Collection Date: 09/18/18 13:20
Received Date: 09/21/18 10:07
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		09/26/18 07:25
Surrogates								
4-Bromofluorobenzene (surr)	81.1		50-150		%	1		09/26/18 07:25

Batch Information

Analytical Batch: VFC14456
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/26/18 07:25
Container ID: 1189782016-A

Prep Batch: VXX33198
Prep Method: SW5030B
Prep Date/Time: 09/25/18 08:00
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		09/26/18 07:25
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/26/18 07:25
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/26/18 07:25
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/26/18 07:25
Toluene	1.00	U	1.00	0.310	ug/L	1		09/26/18 07:25
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/26/18 07:25
Surrogates								
1,4-Difluorobenzene (surr)	93.5		77-115		%	1		09/26/18 07:25

Batch Information

Analytical Batch: VFC14456
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/26/18 07:25
Container ID: 1189782016-A

Prep Batch: VXX33198
Prep Method: SW5030B
Prep Date/Time: 09/25/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **MW-16**

Client Sample ID: **MW-16**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782017
Lab Project ID: 1189782

Collection Date: 09/18/18 11:50
Received Date: 09/21/18 10:07
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	0.625	U	0.625	0.188	mg/L	1		09/27/18 13:21
Surrogates								
5a Androstane (surr)	84.4		50-150		%	1		09/27/18 13:21

Batch Information

Analytical Batch: XFC14658
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 09/27/18 13:21
Container ID: 1189782017-D

Prep Batch: XXX40584
Prep Method: SW3520C
Prep Date/Time: 09/26/18 09:06
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

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Results of **MW-16**

Client Sample ID: **MW-16**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782017
Lab Project ID: 1189782

Collection Date: 09/18/18 11:50
Received Date: 09/21/18 10:07
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		09/26/18 07:43
Surrogates								
4-Bromofluorobenzene (surr)	87.8		50-150		%	1		09/26/18 07:43

Batch Information

Analytical Batch: VFC14456
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/26/18 07:43
Container ID: 1189782017-A

Prep Batch: VXX33198
Prep Method: SW5030B
Prep Date/Time: 09/25/18 08:00
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		09/26/18 07:43
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/26/18 07:43
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/26/18 07:43
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/26/18 07:43
Toluene	1.00	U	1.00	0.310	ug/L	1		09/26/18 07:43
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/26/18 07:43
Surrogates								
1,4-Difluorobenzene (surr)	95		77-115		%	1		09/26/18 07:43

Batch Information

Analytical Batch: VFC14456
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/26/18 07:43
Container ID: 1189782017-A

Prep Batch: VXX33198
Prep Method: SW5030B
Prep Date/Time: 09/25/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **MW-17A**

Client Sample ID: **MW-17A**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782018
Lab Project ID: 1189782

Collection Date: 09/19/18 09:45
Received Date: 09/21/18 10:07
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	0.615	U	0.615	0.184	mg/L	1		09/27/18 13:31
Surrogates								
5a Androstane (surr)	82.2		50-150		%	1		09/27/18 13:31

Batch Information

Analytical Batch: XFC14658
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 09/27/18 13:31
Container ID: 1189782018-D

Prep Batch: XXX40584
Prep Method: SW3520C
Prep Date/Time: 09/26/18 09:06
Prep Initial Wt./Vol.: 244 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-17A**

Client Sample ID: **MW-17A**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782018
Lab Project ID: 1189782

Collection Date: 09/19/18 09:45
Received Date: 09/21/18 10:07
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		09/26/18 08:01
Surrogates								
4-Bromofluorobenzene (surr)	84.2		50-150		%	1		09/26/18 08:01

Batch Information

Analytical Batch: VFC14456
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/26/18 08:01
Container ID: 1189782018-A

Prep Batch: VXX33198
Prep Method: SW5030B
Prep Date/Time: 09/25/18 08:00
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		09/26/18 08:01
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/26/18 08:01
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/26/18 08:01
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/26/18 08:01
Toluene	1.00	U	1.00	0.310	ug/L	1		09/26/18 08:01
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/26/18 08:01
Surrogates								
1,4-Difluorobenzene (surr)	91.8		77-115		%	1		09/26/18 08:01

Batch Information

Analytical Batch: VFC14456
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/26/18 08:01
Container ID: 1189782018-A

Prep Batch: VXX33198
Prep Method: SW5030B
Prep Date/Time: 09/25/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-17B**

Client Sample ID: **MW-17B**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782019
Lab Project ID: 1189782

Collection Date: 09/19/18 10:00
Received Date: 09/21/18 10:07
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	0.636	U	0.636	0.191	mg/L	1		09/27/18 13:41
Surrogates								
5a Androstane (surr)	81.6		50-150		%	1		09/27/18 13:41

Batch Information

Analytical Batch: XFC14658
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 09/27/18 13:41
Container ID: 1189782019-D

Prep Batch: XXX40584
Prep Method: SW3520C
Prep Date/Time: 09/26/18 09:06
Prep Initial Wt./Vol.: 236 mL
Prep Extract Vol: 1 mL

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Results of **MW-17B**

Client Sample ID: **MW-17B**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782019
Lab Project ID: 1189782

Collection Date: 09/19/18 10:00
Received Date: 09/21/18 10:07
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		09/28/18 09:10
Surrogates								
4-Bromofluorobenzene (surr)	78.8		50-150		%	1		09/28/18 09:10

Batch Information

Analytical Batch: VFC14460
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/28/18 09:10
Container ID: 1189782019-B

Prep Batch: VXX33218
Prep Method: SW5030B
Prep Date/Time: 09/27/18 08:00
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		09/28/18 09:10
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/28/18 09:10
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/28/18 09:10
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/28/18 09:10
Toluene	1.00	U	1.00	0.310	ug/L	1		09/28/18 09:10
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/28/18 09:10
Surrogates								
1,4-Difluorobenzene (surr)	91.3		77-115		%	1		09/28/18 09:10

Batch Information

Analytical Batch: VFC14460
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/28/18 09:10
Container ID: 1189782019-B

Prep Batch: VXX33218
Prep Method: SW5030B
Prep Date/Time: 09/27/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-18R**

Client Sample ID: **MW-18R**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782020
Lab Project ID: 1189782

Collection Date: 09/20/18 10:00
Received Date: 09/21/18 10:07
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	8.73		0.664	0.199	mg/L	1		09/27/18 14:13
Surrogates								
5a Androstane (surr)	77.8		50-150		%	1		09/27/18 14:13

Batch Information

Analytical Batch: XFC14658
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 09/27/18 14:13
Container ID: 1189782020-D

Prep Batch: XXX40584
Prep Method: SW3520C
Prep Date/Time: 09/26/18 09:06
Prep Initial Wt./Vol.: 226 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-18R**

Client Sample ID: **MW-18R**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782020
Lab Project ID: 1189782

Collection Date: 09/20/18 10:00
Received Date: 09/21/18 10:07
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	0.343		0.100	0.0310	mg/L	1		09/28/18 09:28
Surrogates								
4-Bromofluorobenzene (surr)	101		50-150		%	1		09/28/18 09:28

Batch Information

Analytical Batch: VFC14460
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/28/18 09:28
Container ID: 1189782020-B

Prep Batch: VXX33218
Prep Method: SW5030B
Prep Date/Time: 09/27/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.640		0.500	0.150	ug/L	1		09/28/18 09:28
Ethylbenzene	5.07		1.00	0.310	ug/L	1		09/28/18 09:28
o-Xylene	18.6		1.00	0.310	ug/L	1		09/28/18 09:28
P & M -Xylene	26.2		2.00	0.620	ug/L	1		09/28/18 09:28
Toluene	1.00	U	1.00	0.310	ug/L	1		09/28/18 09:28
Xylenes (total)	44.8		3.00	0.930	ug/L	1		09/28/18 09:28
Surrogates								
1,4-Difluorobenzene (surr)	99.3		77-115		%	1		09/28/18 09:28

Batch Information

Analytical Batch: VFC14460
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/28/18 09:28
Container ID: 1189782020-B

Prep Batch: VXX33218
Prep Method: SW5030B
Prep Date/Time: 09/27/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-19**

Client Sample ID: **MW-19**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782021
Lab Project ID: 1189782

Collection Date: 09/18/18 16:50
Received Date: 09/21/18 10:07
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	0.670	U	0.670	0.201	mg/L	1		09/27/18 14:23
Surrogates								
5a Androstane (surr)	80.4		50-150		%	1		09/27/18 14:23

Batch Information

Analytical Batch: XFC14658
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 09/27/18 14:23
Container ID: 1189782021-D

Prep Batch: XXX40584
Prep Method: SW3520C
Prep Date/Time: 09/26/18 09:06
Prep Initial Wt./Vol.: 224 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-19**

Client Sample ID: **MW-19**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782021
Lab Project ID: 1189782

Collection Date: 09/18/18 16:50
Received Date: 09/21/18 10:07
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		09/29/18 06:51
Surrogates								
4-Bromofluorobenzene (surr)	74.6		50-150		%	1		09/29/18 06:51

Batch Information

Analytical Batch: VFC14463
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/29/18 06:51
Container ID: 1189782021-B

Prep Batch: VXX33223
Prep Method: SW5030B
Prep Date/Time: 09/28/18 08:00
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		09/29/18 06:51
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/29/18 06:51
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/29/18 06:51
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/29/18 06:51
Toluene	1.00	U	1.00	0.310	ug/L	1		09/29/18 06:51
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/29/18 06:51
Surrogates								
1,4-Difluorobenzene (surr)	92.8		77-115		%	1		09/29/18 06:51

Batch Information

Analytical Batch: VFC14463
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/29/18 06:51
Container ID: 1189782021-B

Prep Batch: VXX33223
Prep Method: SW5030B
Prep Date/Time: 09/28/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-20**

Client Sample ID: **MW-20**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782022
Lab Project ID: 1189782

Collection Date: 09/18/18 16:00
Received Date: 09/21/18 10:07
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	0.641	U	0.641	0.192	mg/L	1		09/27/18 14:33
Surrogates								
5a Androstane (surr)	84.3		50-150		%	1		09/27/18 14:33

Batch Information

Analytical Batch: XFC14658
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 09/27/18 14:33
Container ID: 1189782022-D

Prep Batch: XXX40584
Prep Method: SW3520C
Prep Date/Time: 09/26/18 09:06
Prep Initial Wt./Vol.: 234 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-20**

Client Sample ID: **MW-20**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782022
Lab Project ID: 1189782

Collection Date: 09/18/18 16:00
Received Date: 09/21/18 10:07
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		09/27/18 08:26
Surrogates								
4-Bromofluorobenzene (surr)	81.2		50-150		%	1		09/27/18 08:26

Batch Information

Analytical Batch: VFC14458
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/27/18 08:26
Container ID: 1189782022-A

Prep Batch: VXX33213
Prep Method: SW5030B
Prep Date/Time: 09/26/18 08:00
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		09/27/18 08:26
Ethylbenzene	1.00 U		1.00	0.310	ug/L	1		09/27/18 08:26
o-Xylene	1.00 U		1.00	0.310	ug/L	1		09/27/18 08:26
P & M -Xylene	2.00 U		2.00	0.620	ug/L	1		09/27/18 08:26
Toluene	1.00 U		1.00	0.310	ug/L	1		09/27/18 08:26
Xylenes (total)	3.00 U		3.00	0.930	ug/L	1		09/27/18 08:26
Surrogates								
1,4-Difluorobenzene (surr)	98.8		77-115		%	1		09/27/18 08:26

Batch Information

Analytical Batch: VFC14458
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/27/18 08:26
Container ID: 1189782022-A

Prep Batch: VXX33213
Prep Method: SW5030B
Prep Date/Time: 09/26/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-21**

Client Sample ID: **MW-21**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782025
Lab Project ID: 1189782

Collection Date: 09/19/18 11:50
Received Date: 09/21/18 10:07
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	0.605	U	0.605	0.181	mg/L	1		09/27/18 15:04
Surrogates								
5a Androstane (surr)	79.7		50-150		%	1		09/27/18 15:04

Batch Information

Analytical Batch: XFC14658
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 09/27/18 15:04
Container ID: 1189782025-D

Prep Batch: XXX40584
Prep Method: SW3520C
Prep Date/Time: 09/26/18 09:06
Prep Initial Wt./Vol.: 248 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-21**

Client Sample ID: **MW-21**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782025
Lab Project ID: 1189782

Collection Date: 09/19/18 11:50
Received Date: 09/21/18 10:07
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		09/29/18 07:09
Surrogates								
4-Bromofluorobenzene (surr)	80.7		50-150		%	1		09/29/18 07:09

Batch Information

Analytical Batch: VFC14463
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/29/18 07:09
Container ID: 1189782025-C

Prep Batch: VXX33223
Prep Method: SW5030B
Prep Date/Time: 09/28/18 08:00
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		09/29/18 07:09
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/29/18 07:09
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/29/18 07:09
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/29/18 07:09
Toluene	1.00	U	1.00	0.310	ug/L	1		09/29/18 07:09
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/29/18 07:09
Surrogates								
1,4-Difluorobenzene (surr)	97.4		77-115		%	1		09/29/18 07:09

Batch Information

Analytical Batch: VFC14463
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/29/18 07:09
Container ID: 1189782025-C

Prep Batch: VXX33223
Prep Method: SW5030B
Prep Date/Time: 09/28/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-22**

Client Sample ID: **MW-22**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782026
Lab Project ID: 1189782

Collection Date: 09/18/18 14:40
Received Date: 09/21/18 10:07
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	0.625	U	0.625	0.188	mg/L	1		09/27/18 15:15
Surrogates								
5a Androstane (surr)	78.2		50-150		%	1		09/27/18 15:15

Batch Information

Analytical Batch: XFC14658
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 09/27/18 15:15
Container ID: 1189782026-D

Prep Batch: XXX40584
Prep Method: SW3520C
Prep Date/Time: 09/26/18 09:06
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-22**

Client Sample ID: **MW-22**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782026
Lab Project ID: 1189782

Collection Date: 09/18/18 14:40
Received Date: 09/21/18 10:07
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		09/27/18 10:49
Surrogates								
4-Bromofluorobenzene (surr)	80.2		50-150		%	1		09/27/18 10:49

Batch Information

Analytical Batch: VFC14458
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/27/18 10:49
Container ID: 1189782026-A

Prep Batch: VXX33213
Prep Method: SW5030B
Prep Date/Time: 09/26/18 08:00
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		09/27/18 10:49
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/27/18 10:49
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/27/18 10:49
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/27/18 10:49
Toluene	1.00	U	1.00	0.310	ug/L	1		09/27/18 10:49
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/27/18 10:49
Surrogates								
1,4-Difluorobenzene (surr)	98		77-115		%	1		09/27/18 10:49

Batch Information

Analytical Batch: VFC14458
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/27/18 10:49
Container ID: 1189782026-A

Prep Batch: VXX33213
Prep Method: SW5030B
Prep Date/Time: 09/26/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **MW-23**

Client Sample ID: **MW-23**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782027
Lab Project ID: 1189782

Collection Date: 09/19/18 12:20
Received Date: 09/21/18 10:07
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	0.615	U	0.615	0.184	mg/L	1		09/27/18 15:25
Surrogates								
5a Androstane (surr)	75.5		50-150		%	1		09/27/18 15:25

Batch Information

Analytical Batch: XFC14658
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 09/27/18 15:25
Container ID: 1189782027-D

Prep Batch: XXX40584
Prep Method: SW3520C
Prep Date/Time: 09/26/18 09:06
Prep Initial Wt./Vol.: 244 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-23**

Client Sample ID: **MW-23**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782027
Lab Project ID: 1189782

Collection Date: 09/19/18 12:20
Received Date: 09/21/18 10:07
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		09/27/18 11:07
Surrogates								
4-Bromofluorobenzene (surr)	79.5		50-150		%	1		09/27/18 11:07

Batch Information

Analytical Batch: VFC14458
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/27/18 11:07
Container ID: 1189782027-A

Prep Batch: VXX33213
Prep Method: SW5030B
Prep Date/Time: 09/26/18 08:00
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		09/27/18 11:07
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/27/18 11:07
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/27/18 11:07
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/27/18 11:07
Toluene	1.00	U	1.00	0.310	ug/L	1		09/27/18 11:07
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/27/18 11:07
Surrogates								
1,4-Difluorobenzene (surr)	90.3		77-115		%	1		09/27/18 11:07

Batch Information

Analytical Batch: VFC14458
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/27/18 11:07
Container ID: 1189782027-A

Prep Batch: VXX33213
Prep Method: SW5030B
Prep Date/Time: 09/26/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-24**

Client Sample ID: **MW-24**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782028
Lab Project ID: 1189782

Collection Date: 09/20/18 10:45
Received Date: 09/21/18 10:07
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	7.44		0.636	0.191	mg/L	1		09/27/18 15:36
Surrogates								
5a Androstane (surr)	75.5		50-150		%	1		09/27/18 15:36

Batch Information

Analytical Batch: XFC14658
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 09/27/18 15:36
Container ID: 1189782028-D

Prep Batch: XXX40584
Prep Method: SW3520C
Prep Date/Time: 09/26/18 09:06
Prep Initial Wt./Vol.: 236 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-24**

Client Sample ID: **MW-24**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782028
Lab Project ID: 1189782

Collection Date: 09/20/18 10:45
Received Date: 09/21/18 10:07
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	4.41		0.500	0.155	mg/L	5		10/02/18 07:37
Surrogates								
4-Bromofluorobenzene (surr)	113		50-150		%	5		10/02/18 07:37

Batch Information

Analytical Batch: VFC14470
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 10/02/18 07:37
Container ID: 1189782028-C

Prep Batch: VXX33249
Prep Method: SW5030B
Prep Date/Time: 10/01/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.550		0.500	0.150	ug/L	1		09/29/18 10:07
Ethylbenzene	158		1.00	0.310	ug/L	1		09/29/18 10:07
o-Xylene	791		5.00	1.55	ug/L	5		10/02/18 07:37
P & M -Xylene	1330		10.0	3.10	ug/L	5		10/02/18 07:37
Toluene	1.99		1.00	0.310	ug/L	1		09/29/18 10:07
Xylenes (total)	2120		15.0	4.65	ug/L	5		10/02/18 07:37
Surrogates								
1,4-Difluorobenzene (surr)	101		77-115		%	1		09/29/18 10:07

Batch Information

Analytical Batch: VFC14470
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 10/02/18 07:37
Container ID: 1189782028-C

Prep Batch: VXX33249
Prep Method: SW5030B
Prep Date/Time: 10/01/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VFC14463
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/29/18 10:07
Container ID: 1189782028-A

Prep Batch: VXX33223
Prep Method: SW5030B
Prep Date/Time: 09/28/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-25**

Client Sample ID: **MW-25**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782029
Lab Project ID: 1189782

Collection Date: 09/18/18 13:45
Received Date: 09/21/18 10:07
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	0.652	U	0.652	0.196	mg/L	1		09/27/18 15:46
Surrogates								
5a Androstane (surr)	80.9		50-150		%	1		09/27/18 15:46

Batch Information

Analytical Batch: XFC14658
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 09/27/18 15:46
Container ID: 1189782029-D

Prep Batch: XXX40584
Prep Method: SW3520C
Prep Date/Time: 09/26/18 09:06
Prep Initial Wt./Vol.: 230 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **MW-25**

Client Sample ID: **MW-25**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782029
Lab Project ID: 1189782

Collection Date: 09/18/18 13:45
Received Date: 09/21/18 10:07
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		09/28/18 07:05
Surrogates								
4-Bromofluorobenzene (surr)	76.5		50-150		%	1		09/28/18 07:05

Batch Information

Analytical Batch: VFC14460
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/28/18 07:05
Container ID: 1189782029-A

Prep Batch: VXX33218
Prep Method: SW5030B
Prep Date/Time: 09/27/18 08:00
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		09/28/18 07:05
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/28/18 07:05
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/28/18 07:05
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/28/18 07:05
Toluene	1.00	U	1.00	0.310	ug/L	1		09/28/18 07:05
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/28/18 07:05
Surrogates								
1,4-Difluorobenzene (surr)	94.4		77-115		%	1		09/28/18 07:05

Batch Information

Analytical Batch: VFC14460
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/28/18 07:05
Container ID: 1189782029-A

Prep Batch: VXX33218
Prep Method: SW5030B
Prep Date/Time: 09/27/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **Equip Blank-1**

Client Sample ID: **Equip Blank-1**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782030
Lab Project ID: 1189782

Collection Date: 09/18/18 18:00
Received Date: 09/21/18 10:07
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	0.630	U	0.630	0.189	mg/L	1		09/27/18 15:56
Surrogates								
5a Androstane (surr)	78.4		50-150		%	1		09/27/18 15:56

Batch Information

Analytical Batch: XFC14658
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 09/27/18 15:56
Container ID: 1189782030-D

Prep Batch: XXX40584
Prep Method: SW3520C
Prep Date/Time: 09/26/18 09:06
Prep Initial Wt./Vol.: 238 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **Equip Blank-1**

Client Sample ID: **Equip Blank-1**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782030
Lab Project ID: 1189782

Collection Date: 09/18/18 18:00
Received Date: 09/21/18 10:07
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		09/28/18 09:46
Surrogates								
4-Bromofluorobenzene (surr)	79.7		50-150		%	1		09/28/18 09:46

Batch Information

Analytical Batch: VFC14460
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/28/18 09:46
Container ID: 1189782030-A

Prep Batch: VXX33218
Prep Method: SW5030B
Prep Date/Time: 09/27/18 08:00
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		09/28/18 09:46
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/28/18 09:46
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/28/18 09:46
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/28/18 09:46
Toluene	1.00	U	1.00	0.310	ug/L	1		09/28/18 09:46
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/28/18 09:46
Surrogates								
1,4-Difluorobenzene (surr)	91.5		77-115		%	1		09/28/18 09:46

Batch Information

Analytical Batch: VFC14460
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/28/18 09:46
Container ID: 1189782030-A

Prep Batch: VXX33218
Prep Method: SW5030B
Prep Date/Time: 09/27/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:25PM

Results of **Equip Blank-2**

Client Sample ID: **Equip Blank-2**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782031
Lab Project ID: 1189782

Collection Date: 09/19/18 13:10
Received Date: 09/21/18 10:07
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	0.652	U	0.652	0.196	mg/L	1		09/28/18 15:02
Surrogates								
5a Androstane (surr)	88		50-150		%	1		09/28/18 15:02

Batch Information

Analytical Batch: XFC14659
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 09/28/18 15:02
Container ID: 1189782031-D

Prep Batch: XXX40593
Prep Method: SW3520C
Prep Date/Time: 09/27/18 07:53
Prep Initial Wt./Vol.: 230 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **Equip Blank-2**

Client Sample ID: **Equip Blank-2**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782031
Lab Project ID: 1189782

Collection Date: 09/19/18 13:10
Received Date: 09/21/18 10:07
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		09/28/18 10:04
Surrogates								
4-Bromofluorobenzene (surr)	81		50-150		%	1		09/28/18 10:04

Batch Information

Analytical Batch: VFC14460
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/28/18 10:04
Container ID: 1189782031-A

Prep Batch: VXX33218
Prep Method: SW5030B
Prep Date/Time: 09/27/18 08:00
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		09/28/18 10:04
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/28/18 10:04
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/28/18 10:04
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/28/18 10:04
Toluene	1.00	U	1.00	0.310	ug/L	1		09/28/18 10:04
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/28/18 10:04
Surrogates								
1,4-Difluorobenzene (surr)	90.1		77-115		%	1		09/28/18 10:04

Batch Information

Analytical Batch: VFC14460
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/28/18 10:04
Container ID: 1189782031-A

Prep Batch: VXX33218
Prep Method: SW5030B
Prep Date/Time: 09/27/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:25PM

Results of **Dup-1**

Client Sample ID: **Dup-1**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782032
Lab Project ID: 1189782

Collection Date: 09/17/18 09:00
Received Date: 09/21/18 10:07
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	0.625	U	0.625	0.188	mg/L	1		09/28/18 15:13
Surrogates								
5a Androstane (surr)	87.3		50-150		%	1		09/28/18 15:13

Batch Information

Analytical Batch: XFC14659
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 09/28/18 15:13
Container ID: 1189782032-D

Prep Batch: XXX40593
Prep Method: SW3520C
Prep Date/Time: 09/27/18 07:53
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **Dup-1**

Client Sample ID: **Dup-1**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782032
Lab Project ID: 1189782

Collection Date: 09/17/18 09:00
Received Date: 09/21/18 10:07
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		09/28/18 10:22
Surrogates								
4-Bromofluorobenzene (surr)	86.6		50-150		%	1		09/28/18 10:22

Batch Information

Analytical Batch: VFC14460
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/28/18 10:22
Container ID: 1189782032-A

Prep Batch: VXX33218
Prep Method: SW5030B
Prep Date/Time: 09/27/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	11.8		0.500	0.150	ug/L	1		09/28/18 10:22
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/28/18 10:22
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/28/18 10:22
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/28/18 10:22
Toluene	1.00	U	1.00	0.310	ug/L	1		09/28/18 10:22
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/28/18 10:22
Surrogates								
1,4-Difluorobenzene (surr)	94.1		77-115		%	1		09/28/18 10:22

Batch Information

Analytical Batch: VFC14460
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/28/18 10:22
Container ID: 1189782032-A

Prep Batch: VXX33218
Prep Method: SW5030B
Prep Date/Time: 09/27/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:25PM

Results of **Dup-2**

Client Sample ID: **Dup-2**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782033
Lab Project ID: 1189782

Collection Date: 09/19/18 08:00
Received Date: 09/21/18 10:07
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	0.615	U	0.615	0.184	mg/L	1		09/28/18 15:23
Surrogates								
5a Androstane (surr)	89.4		50-150		%	1		09/28/18 15:23

Batch Information

Analytical Batch: XFC14659
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 09/28/18 15:23
Container ID: 1189782033-D

Prep Batch: XXX40593
Prep Method: SW3520C
Prep Date/Time: 09/27/18 07:53
Prep Initial Wt./Vol.: 244 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **Dup-2**

Client Sample ID: **Dup-2**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782033
Lab Project ID: 1189782

Collection Date: 09/19/18 08:00
Received Date: 09/21/18 10:07
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		09/29/18 11:37
Surrogates								
4-Bromofluorobenzene (surr)	83.3		50-150		%	1		09/29/18 11:37

Batch Information

Analytical Batch: VFC14463
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/29/18 11:37
Container ID: 1189782033-A

Prep Batch: VXX33223
Prep Method: SW5030B
Prep Date/Time: 09/28/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	1.39		0.500	0.150	ug/L	1		09/29/18 11:37
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/29/18 11:37
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/29/18 11:37
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/29/18 11:37
Toluene	1.00	U	1.00	0.310	ug/L	1		09/29/18 11:37
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/29/18 11:37
Surrogates								
1,4-Difluorobenzene (surr)	90.9		77-115		%	1		09/29/18 11:37

Batch Information

Analytical Batch: VFC14463
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/29/18 11:37
Container ID: 1189782033-A

Prep Batch: VXX33223
Prep Method: SW5030B
Prep Date/Time: 09/28/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:25PM

Results of **Dup-3**

Client Sample ID: **Dup-3**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782034
Lab Project ID: 1189782

Collection Date: 09/18/18 08:30
Received Date: 09/21/18 10:07
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	0.605	U	0.605	0.181	mg/L	1		09/28/18 15:33
Surrogates								
5a Androstane (surr)	86.7		50-150		%	1		09/28/18 15:33

Batch Information

Analytical Batch: XFC14659
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 09/28/18 15:33
Container ID: 1189782034-D

Prep Batch: XXX40593
Prep Method: SW3520C
Prep Date/Time: 09/27/18 07:53
Prep Initial Wt./Vol.: 248 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:05:25PM

Results of **Dup-3**

Client Sample ID: **Dup-3**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782034
Lab Project ID: 1189782

Collection Date: 09/18/18 08:30
Received Date: 09/21/18 10:07
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		09/29/18 11:55
Surrogates								
4-Bromofluorobenzene (surr)	80.9		50-150		%	1		09/29/18 11:55

Batch Information

Analytical Batch: VFC14463
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/29/18 11:55
Container ID: 1189782034-A

Prep Batch: VXX33223
Prep Method: SW5030B
Prep Date/Time: 09/28/18 08:00
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		09/29/18 11:55
Ethylbenzene	1.00 U		1.00	0.310	ug/L	1		09/29/18 11:55
o-Xylene	1.00 U		1.00	0.310	ug/L	1		09/29/18 11:55
P & M -Xylene	2.00 U		2.00	0.620	ug/L	1		09/29/18 11:55
Toluene	1.00 U		1.00	0.310	ug/L	1		09/29/18 11:55
Xylenes (total)	3.00 U		3.00	0.930	ug/L	1		09/29/18 11:55
Surrogates								
1,4-Difluorobenzene (surr)	95.7		77-115		%	1		09/29/18 11:55

Batch Information

Analytical Batch: VFC14463
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/29/18 11:55
Container ID: 1189782034-A

Prep Batch: VXX33223
Prep Method: SW5030B
Prep Date/Time: 09/28/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:25PM

Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **Fairbanks**
Lab Sample ID: 1189782035
Lab Project ID: 1189782

Collection Date: 09/17/18 08:00
Received Date: 09/21/18 10:07
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		09/27/18 06:04
Surrogates								
4-Bromofluorobenzene (surr)	82.2		50-150		%	1		09/27/18 06:04

Batch Information

Analytical Batch: VFC14458
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 09/27/18 06:04
Container ID: 1189782035-A

Prep Batch: VXX33213
Prep Method: SW5030B
Prep Date/Time: 09/26/18 08:00
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		09/27/18 06:04
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		09/27/18 06:04
o-Xylene	1.00	U	1.00	0.310	ug/L	1		09/27/18 06:04
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		09/27/18 06:04
Toluene	1.00	U	1.00	0.310	ug/L	1		09/27/18 06:04
Xylenes (total)	3.00	U	3.00	0.930	ug/L	1		09/27/18 06:04
Surrogates								
1,4-Difluorobenzene (surr)	96.7		77-115		%	1		09/27/18 06:04

Batch Information

Analytical Batch: VFC14458
Analytical Method: SW8021B
Analyst: ACL
Analytical Date/Time: 09/27/18 06:04
Container ID: 1189782035-A

Prep Batch: VXX33213
Prep Method: SW5030B
Prep Date/Time: 09/26/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:25PM

Method Blank

Blank ID: MB for HBN 1786499 [VXX/33167]
Blank Lab ID: 1477437

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189782006, 1189782007

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	84.9	50-150		%

Batch Information

Analytical Batch: VFC14447
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ACL
Analytical Date/Time: 9/22/2018 3:31:00AM

Prep Batch: VXX33167
Prep Method: SW5030B
Prep Date/Time: 9/21/2018 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:30PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1189782 [VXX33167]
Blank Spike Lab ID: 1477440
Date Analyzed: 09/22/2018 00:14

Spike Duplicate ID: LCSD for HBN 1189782 [VXX33167]
Spike Duplicate Lab ID: 1477441
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189782006, 1189782007

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	0.976	98	1.00	0.996	100	(60-120)	2.10	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	93.1	93	0.0500	94.3	94	(50-150)	1.30	

Batch Information

Analytical Batch: **VFC14447**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ACL**

Prep Batch: **VXX33167**
Prep Method: **SW5030B**
Prep Date/Time: **09/21/2018 08:00**
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 1786499 [VXX/33167]
Blank Lab ID: 1477437

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189782006, 1189782007

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.690*	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	1.29*	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	0.930	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	95.7	77-115		%

Batch Information

Analytical Batch: VFC14447
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ACL
Analytical Date/Time: 9/22/2018 3:31:00AM

Prep Batch: VXX33167
Prep Method: SW5030B
Prep Date/Time: 9/21/2018 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1189782 [VXX33167]
Blank Spike Lab ID: 1477438
Date Analyzed: 09/21/2018 23:56

Spike Duplicate ID: LCSD for HBN 1189782 [VXX33167]
Spike Duplicate Lab ID: 1477439
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189782006, 1189782007

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	105	105	100	101	101	(80-120)	3.70	(< 20)
Ethylbenzene	100	107	107	100	104	104	(75-125)	3.00	(< 20)
o-Xylene	100	107	107	100	103	103	(80-120)	3.30	(< 20)
P & M -Xylene	200	212	106	200	206	103	(75-130)	3.00	(< 20)
Toluene	100	102	102	100	104	104	(75-120)	2.10	(< 20)
Xylenes (total)	300	318	106	300	309	103	(79-121)	3.10	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50	103	103	50	93.4	93	(77-115)	10.00	

Batch Information

Analytical Batch: **VFC14447**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ACL**

Prep Batch: **VXX33167**
Prep Method: **SW5030B**
Prep Date/Time: **09/21/2018 08:00**
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 1786754 [VXX/33194]
Blank Lab ID: 1478254

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189782009

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	80.6	50-150		%

Batch Information

Analytical Batch: VFC14455
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ACL
Analytical Date/Time: 9/25/2018 10:34:00AM

Prep Batch: VXX33194
Prep Method: SW5030B
Prep Date/Time: 9/25/2018 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1189782 [VXX33194]
Blank Spike Lab ID: 1478257
Date Analyzed: 09/25/2018 11:27

Spike Duplicate ID: LCSD for HBN 1189782 [VXX33194]
Spike Duplicate Lab ID: 1478258
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189782009

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	0.931	93	1.00	0.947	95	(60-120)	1.70	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	92.5	93	0.0500	94.7	95	(50-150)	2.40	

Batch Information

Analytical Batch: **VFC14455**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ACL**

Prep Batch: **VXX33194**
Prep Method: **SW5030B**
Prep Date/Time: **09/25/2018 08:00**
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: 10/03/2018 1:05:38PM

Method Blank

Blank ID: MB for HBN 1786754 [VXX/33194]
Blank Lab ID: 1478254

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189782009

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)	95.9	77-115		%

Batch Information

Analytical Batch: VFC14455
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ACL
Analytical Date/Time: 9/25/2018 10:34:00AM

Prep Batch: VXX33194
Prep Method: SW5030B
Prep Date/Time: 9/25/2018 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:39PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1189782 [VXX33194]
Blank Spike Lab ID: 1478255
Date Analyzed: 09/25/2018 11:09

Spike Duplicate ID: LCSD for HBN 1189782 [VXX33194]
Spike Duplicate Lab ID: 1478256
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189782009

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	97.4	97	100	99.6	100	(80-120)	2.30	(< 20)
Ethylbenzene	100	90.3	90	100	96.0	96	(75-125)	6.10	(< 20)
o-Xylene	100	93.8	94	100	98.4	98	(80-120)	4.80	(< 20)
P & M -Xylene	200	182	91	200	191	95	(75-130)	4.70	(< 20)
Toluene	100	91.4	91	100	94.5	95	(75-120)	3.30	(< 20)
Xylenes (total)	300	276	92	300	289	96	(79-121)	4.70	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50	104	104	50	99.6	100	(77-115)	4.40	

Batch Information

Analytical Batch: **VFC14455**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ACL**

Prep Batch: **VXX33194**
Prep Method: **SW5030B**
Prep Date/Time: **09/25/2018 08:00**
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 1786764 [VXX/33198]
Blank Lab ID: 1478304

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189782008, 1189782010, 1189782013, 1189782014, 1189782015, 1189782016, 1189782017, 1189782018

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	81.2	50-150		%

Batch Information

Analytical Batch: VFC14456
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ACL
Analytical Date/Time: 9/26/2018 2:22:00AM

Prep Batch: VXX33198
Prep Method: SW5030B
Prep Date/Time: 9/25/2018 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1189782 [VXX33198]
Blank Spike Lab ID: 1478320
Date Analyzed: 09/25/2018 23:59

Spike Duplicate ID: LCSD for HBN 1189782 [VXX33198]
Spike Duplicate Lab ID: 1478321
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189782008, 1189782010, 1189782013, 1189782014, 1189782015, 1189782016, 1189782017, 1189782018

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	0.915	92	1.00	0.838	84	(60-120)	8.80	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	86.3	86	0.0500	88.3	88	(50-150)	2.30	

Batch Information

Analytical Batch: **VFC14456**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ACL**

Prep Batch: **VXX33198**
Prep Method: **SW5030B**
Prep Date/Time: **09/25/2018 08:00**
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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Billable Matrix Spike Summary

Original Sample ID: 1189782010
MS Sample ID: 1189782011 BMS
MSD Sample ID: 1189782012 BMSD

Analysis Date: 09/26/2018 2:58
Analysis Date: 09/26/2018 3:51
Analysis Date: 09/26/2018 3:34
Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by **AK101**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	0.100U	1.00	0.885	89				60-120		
Surrogates										
4-Bromofluorobenzene (surr)		0.0500	0.0445	89				50-150		

Batch Information

Analytical Batch: VFC14456
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ACL
Analytical Date/Time: 9/26/2018 3:51:00AM

Prep Batch: VXX33198
Prep Method: Volatile Fuels Extraction (W)
Prep Date/Time: 9/25/2018 8:00:00AM
Prep Initial Wt./Vol.: 5.00mL
Prep Extract Vol: 5.00mL

Print Date: 10/03/2018 1:05:44PM

Method Blank

Blank ID: MB for HBN 1786764 [VXX/33198]
Blank Lab ID: 1478304

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189782008, 1189782010, 1189782013, 1189782014, 1189782015, 1189782016, 1189782017, 1189782018

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)	92.3	77-115		%

Batch Information

Analytical Batch: VFC14456
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ACL
Analytical Date/Time: 9/26/2018 2:22:00AM

Prep Batch: VXX33198
Prep Method: SW5030B
Prep Date/Time: 9/25/2018 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1189782 [VXX33198]
Blank Spike Lab ID: 1478305
Date Analyzed: 09/25/2018 23:41

Spike Duplicate ID: LCSD for HBN 1189782 [VXX33198]
Spike Duplicate Lab ID: 1478306
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189782008, 1189782010, 1189782013, 1189782014, 1189782015, 1189782016, 1189782017, 1189782018

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	102	102	100	99.7	100	(80-120)	2.30	(< 20)
Ethylbenzene	100	96.4	96	100	93.4	93	(75-125)	3.10	(< 20)
o-Xylene	100	98.8	99	100	97.4	97	(80-120)	1.50	(< 20)
P & M -Xylene	200	191	96	200	189	94	(75-130)	1.50	(< 20)
Toluene	100	95.7	96	100	92.6	93	(75-120)	3.30	(< 20)
Xylenes (total)	300	290	97	300	286	95	(79-121)	1.50	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50	103	103	50	104	104	(77-115)	1.20	

Batch Information

Analytical Batch: **VFC14456**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ACL**

Prep Batch: **VXX33198**
Prep Method: **SW5030B**
Prep Date/Time: **09/25/2018 08:00**
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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Billable Matrix Spike Summary

Original Sample ID: 1189782010
MS Sample ID: 1189782011 BMS
MSD Sample ID: 1189782012 BMSD

Analysis Date: 09/26/2018 2:58
Analysis Date: 09/26/2018 3:16
Analysis Date: 09/26/2018 3:34
Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by **SW8021B**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	0.500U	100	100	100	100	101	101	80-120	0.96	(< 20)
Ethylbenzene	1.00U	100	97	97	100	95.1	95	75-125	2.00	(< 20)
o-Xylene	1.00U	100	99.9	100	100	98.0	98	80-120	1.90	(< 20)
P & M -Xylene	2.00U	200	194	97	200	189	94	75-130	2.50	(< 20)
Toluene	1.00U	100	95.5	96	100	94.3	94	75-120	1.20	(< 20)
Xylenes (total)	3.00U	300	293	98	300	287	96	79-121	2.30	(< 20)
Surrogates										
1,4-Difluorobenzene (surr)		50.0	51.6	103	50.0	50.1	100	77-115	2.80	

Batch Information

Analytical Batch: VFC14456
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ACL
Analytical Date/Time: 9/26/2018 3:16:00AM

Prep Batch: VXX33198
Prep Method: Volatile Fuels Extraction (W)
Prep Date/Time: 9/25/2018 8:00:00AM
Prep Initial Wt./Vol.: 5.00mL
Prep Extract Vol: 5.00mL

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Method Blank

Blank ID: MB for HBN 1786867 [VXX/33213]
Blank Lab ID: 1478715

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189782022, 1189782026, 1189782027, 1189782035

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	81.8	50-150		%

Batch Information

Analytical Batch: VFC14458
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ACL
Analytical Date/Time: 9/27/2018 5:46:00AM

Prep Batch: VXX33213
Prep Method: SW5030B
Prep Date/Time: 9/26/2018 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:05:48PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1189782 [VXX33213]
Blank Spike Lab ID: 1478718
Date Analyzed: 09/27/2018 01:18

Spike Duplicate ID: LCSD for HBN 1189782 [VXX33213]
Spike Duplicate Lab ID: 1478719
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189782022, 1189782026, 1189782027, 1189782035

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	0.876	88	1.00	0.887	89	(60-120)	1.20	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	89.5	90	0.0500	91.5	92	(50-150)	2.10	

Batch Information

Analytical Batch: **VFC14458**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ACL**

Prep Batch: **VXX33213**
Prep Method: **SW5030B**
Prep Date/Time: **09/26/2018 08:00**
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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Billable Matrix Spike Summary

Original Sample ID: 1189782022
MS Sample ID: 1189782023 BMS
MSD Sample ID: 1189782024 BMSD

Analysis Date: 09/27/2018 8:26
Analysis Date: 09/27/2018 8:44
Analysis Date: 09/27/2018 9:02
Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by **AK101**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	0.100U	1.00	0.848	85	1.00	0.851	85	60-120	0.35	(< 20)
Surrogates										
4-Bromofluorobenzene (surr)		0.0500	0.0439	88	0.0500	0.0455	91	50-150	3.60	

Batch Information

Analytical Batch: VFC14458
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ACL
Analytical Date/Time: 9/27/2018 8:44:00AM

Prep Batch: VXX33213
Prep Method: Volatile Fuels Extraction (W)
Prep Date/Time: 9/26/2018 8:00:00AM
Prep Initial Wt./Vol.: 5.00mL
Prep Extract Vol: 5.00mL

Print Date: 10/03/2018 1:05:50PM

Method Blank

Blank ID: MB for HBN 1786867 [VXX/33213]
Blank Lab ID: 1478715

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189782022, 1189782026, 1189782027, 1189782035

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.290J	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	0.890J	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)	96.7	77-115		%

Batch Information

Analytical Batch: VFC14458
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ACL
Analytical Date/Time: 9/27/2018 5:46:00AM

Prep Batch: VXX33213
Prep Method: SW5030B
Prep Date/Time: 9/26/2018 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1189782 [VXX33213]
Blank Spike Lab ID: 1478716
Date Analyzed: 09/27/2018 01:00

Spike Duplicate ID: LCSD for HBN 1189782 [VXX33213]
Spike Duplicate Lab ID: 1478717
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189782022, 1189782026, 1189782027, 1189782035

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	96.6	97	100	96.0	96	(80-120)	0.69	(< 20)
Ethylbenzene	100	91.8	92	100	94.1	94	(75-125)	2.50	(< 20)
o-Xylene	100	96.6	97	100	98.6	99	(80-120)	2.00	(< 20)
P & M -Xylene	200	186	93	200	190	95	(75-130)	2.00	(< 20)
Toluene	100	91.5	92	100	93.0	93	(75-120)	1.70	(< 20)
Xylenes (total)	300	283	94	300	288	96	(79-121)	2.00	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50	101	101	50	104	104	(77-115)	2.80	

Batch Information

Analytical Batch: **VFC14458**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ACL**

Prep Batch: **VXX33213**
Prep Method: **SW5030B**
Prep Date/Time: **09/26/2018 08:00**
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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Billable Matrix Spike Summary

Original Sample ID: 1189782022
MS Sample ID: 1189782023 BMS
MSD Sample ID: 1189782024 BMSD

Analysis Date: 09/27/2018 8:26
Analysis Date: 09/27/2018 9:56
Analysis Date: 09/27/2018 10:13
Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by **SW8021B**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	0.500U	100	98.7	99	100	103	103	80-120	4.10	(< 20)
Ethylbenzene	1.00U	100	90	90	100	96.6	97	75-125	7.10	(< 20)
o-Xylene	1.00U	100	93	93	100	98.4	98	80-120	5.60	(< 20)
P & M -Xylene	2.00U	200	180	90	200	190	95	75-130	5.60	(< 20)
Toluene	1.00U	100	92.5	93	100	95.4	95	75-120	3.00	(< 20)
Xylenes (total)	3.00U	300	273	91	300	289	96	79-121	5.60	(< 20)
Surrogates										
1,4-Difluorobenzene (surr)		50.0	51.3	103	50.0	52.4	105	77-115	2.00	

Batch Information

Analytical Batch: VFC14458
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ACL
Analytical Date/Time: 9/27/2018 9:56:00AM

Prep Batch: VXX33213
Prep Method: Volatile Fuels Extraction (W)
Prep Date/Time: 9/26/2018 8:00:00AM
Prep Initial Wt./Vol.: 5.00mL
Prep Extract Vol: 5.00mL

Print Date: 10/03/2018 1:05:53PM

Method Blank

Blank ID: MB for HBN 1786925 [VXX/33218]
Blank Lab ID: 1479020

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189782001, 1189782002, 1189782005, 1189782019, 1189782020, 1189782029, 1189782030, 1189782031, 1189782032

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	77.3	50-150		%

Batch Information

Analytical Batch: VFC14460
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ACL
Analytical Date/Time: 9/27/2018 1:14:00PM

Prep Batch: VXX33218
Prep Method: SW5030B
Prep Date/Time: 9/27/2018 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1189782 [VXX33218]
Blank Spike Lab ID: 1479021
Date Analyzed: 09/27/2018 13:50

Spike Duplicate ID: LCSD for HBN 1189782 [VXX33218]
Spike Duplicate Lab ID: 1479022
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189782001, 1189782002, 1189782005, 1189782019, 1189782020, 1189782029, 1189782030, 1189782031, 1189782032

Results by **AK101**

	Blank Spike (%)			Spike Duplicate (%)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Surrogates									
4-Bromofluorobenzene (surr)	50	84.9	85				(50-150)		

Batch Information

Analytical Batch: **VFC14460**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ACL**

Prep Batch: **VXX33218**
Prep Method: **SW5030B**
Prep Date/Time: **09/27/2018 08:00**
Spike Init Wt./Vol.: 50 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1189782 [VXX33218]
Blank Spike Lab ID: 1479023
Date Analyzed: 09/27/2018 14:08

Spike Duplicate ID: LCSD for HBN 1189782 [VXX33218]
Spike Duplicate Lab ID: 1479024
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189782001, 1189782002, 1189782005, 1189782019, 1189782020, 1189782029, 1189782030, 1189782031, 1189782032

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	0.911	91	1.00	0.904	90	(60-120)	0.73	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	91.2	91	0.0500	88.4	88	(50-150)	3.20	

Batch Information

Analytical Batch: **VFC14460**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ACL**

Prep Batch: **VXX33218**
Prep Method: **SW5030B**
Prep Date/Time: **09/27/2018 08:00**
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 1786925 [VXX/33218]
Blank Lab ID: 1479020

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189782001, 1189782002, 1189782005, 1189782019, 1189782020, 1189782029, 1189782030, 1189782031, 1189782032

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)	97.7	77-115		%

Batch Information

Analytical Batch: VFC14460
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ACL
Analytical Date/Time: 9/27/2018 1:14:00PM

Prep Batch: VXX33218
Prep Method: SW5030B
Prep Date/Time: 9/27/2018 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1189782 [VXX33218]
Blank Spike Lab ID: 1479021
Date Analyzed: 09/27/2018 13:50

Spike Duplicate ID: LCSD for HBN 1189782 [VXX33218]
Spike Duplicate Lab ID: 1479022
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189782001, 1189782002, 1189782005, 1189782019, 1189782020, 1189782029, 1189782030, 1189782031, 1189782032

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	95.0	95	100	98.5	99	(80-120)	3.60	(< 20)
Ethylbenzene	100	87.6	88	100	92.1	92	(75-125)	4.90	(< 20)
o-Xylene	100	90.8	91	100	94.6	95	(80-120)	4.10	(< 20)
P & M -Xylene	200	175	88	200	184	92	(75-130)	5.20	(< 20)
Toluene	100	91.1	91	100	90.4	90	(75-120)	0.69	(< 20)
Xylenes (total)	300	266	89	300	279	93	(79-121)	4.80	(< 20)

Batch Information

Analytical Batch: **VFC14460**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ACL**

Prep Batch: **VXX33218**
Prep Method: **SW5030B**
Prep Date/Time: **09/27/2018 08:00**
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 1786979 [VXX/33223]
Blank Lab ID: 1479351

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189782021, 1189782025, 1189782028, 1189782033, 1189782034

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	78.9	50-150		%

Batch Information

Analytical Batch: VFC14463
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ACL
Analytical Date/Time: 9/28/2018 12:21:00PM

Prep Batch: VXX33223
Prep Method: SW5030B
Prep Date/Time: 9/28/2018 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1189782 [VXX33223]
Blank Spike Lab ID: 1479354
Date Analyzed: 09/28/2018 12:57

Spike Duplicate ID: LCSD for HBN 1189782 [VXX33223]
Spike Duplicate Lab ID: 1479355
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189782021, 1189782025, 1189782028, 1189782033, 1189782034

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	0.895	90	1.00	0.909	91	(60-120)	1.60	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	91	91	0.0500	91.5	92	(50-150)	0.57	

Batch Information

Analytical Batch: **VFC14463**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ACL**

Prep Batch: **VXX33223**
Prep Method: **SW5030B**
Prep Date/Time: **09/28/2018 08:00**
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 1786979 [VXX/33223]
Blank Lab ID: 1479351

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189782021, 1189782025, 1189782028, 1189782033, 1189782034

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)	98.7	77-115		%

Batch Information

Analytical Batch: VFC14463
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ACL
Analytical Date/Time: 9/28/2018 12:21:00PM

Prep Batch: VXX33223
Prep Method: SW5030B
Prep Date/Time: 9/28/2018 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/03/2018 1:06:01PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1189782 [VXX33223]
Blank Spike Lab ID: 1479352
Date Analyzed: 09/28/2018 18:56

Spike Duplicate ID: LCSD for HBN 1189782 [VXX33223]
Spike Duplicate Lab ID: 1479353
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189782021, 1189782025, 1189782028, 1189782033, 1189782034

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	99.6	100	(80-120)	1.70	(< 20)
Ethylbenzene	100	95.2	95	100	92.8	93	(75-125)	2.50	(< 20)
o-Xylene	100	98.3	98	100	94.6	95	(80-120)	3.80	(< 20)
P & M -Xylene	200	191	96	200	185	93	(75-130)	3.20	(< 20)
Toluene	100	94.3	94	100	94.3	94	(75-120)	0.02	(< 20)
Xylenes (total)	300	289	96	300	280	93	(79-121)	3.40	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50	105	105	50	101	101	(77-115)	3.50	

Batch Information

Analytical Batch: **VFC14463**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ACL**

Prep Batch: **VXX33223**
Prep Method: **SW5030B**
Prep Date/Time: **09/28/2018 08:00**
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 1787124 [VXX/33249]
Blank Lab ID: 1480053

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189782028

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	75.3	50-150		%

Batch Information

Analytical Batch: VFC14470
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ACL
Analytical Date/Time: 10/1/2018 5:18:00PM

Prep Batch: VXX33249
Prep Method: SW5030B
Prep Date/Time: 10/1/2018 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1189782 [VXX33249]
Blank Spike Lab ID: 1480056
Date Analyzed: 10/01/2018 18:12

Spike Duplicate ID: LCSD for HBN 1189782 [VXX33249]
Spike Duplicate Lab ID: 1480057
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189782028

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	0.928	93	1.00	0.877	88	(60-120)	5.60	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	84.5	85	0.0500	83.7	84	(50-150)	1.00	

Batch Information

Analytical Batch: **VFC14470**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ACL**

Prep Batch: **VXX33249**
Prep Method: **SW5030B**
Prep Date/Time: **10/01/2018 08:00**
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 1787124 [VXX/33249]
Blank Lab ID: 1480053

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189782028

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Xylenes (total)	1.50U	3.00	0.930	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	94.5	77-115		%

Batch Information

Analytical Batch: VFC14470
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ACL
Analytical Date/Time: 10/1/2018 5:18:00PM

Prep Batch: VXX33249
Prep Method: SW5030B
Prep Date/Time: 10/1/2018 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1189782 [VXX33249]
Blank Spike Lab ID: 1480054
Date Analyzed: 10/01/2018 17:54

Spike Duplicate ID: LCSD for HBN 1189782 [VXX33249]
Spike Duplicate Lab ID: 1480055
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189782028

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
o-Xylene	100	95.4	95	100	94.0	94	(80-120)	1.50	(< 20)
P & M -Xylene	200	186	93	200	184	92	(75-130)	1.20	(< 20)
Xylenes (total)	300	282	94	300	278	93	(79-121)	1.30	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50	103	103	50	103	103	(77-115)	0.10	

Batch Information

Analytical Batch: **VFC14470**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ACL**

Prep Batch: **VXX33249**
Prep Method: **SW5030B**
Prep Date/Time: **10/01/2018 08:00**
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 1786564 [XXX/40552]
Blank Lab ID: 1477459

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189782001, 1189782002, 1189782005, 1189782006

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	89.2	60-120		%

Batch Information

Analytical Batch: XFC14635
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: CMS
Analytical Date/Time: 9/24/2018 11:08:00AM

Prep Batch: XXX40552
Prep Method: SW3520C
Prep Date/Time: 9/23/2018 8:19:49AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:06:09PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1189782 [XXX40552]
Blank Spike Lab ID: 1477460
Date Analyzed: 09/24/2018 11:18

Spike Duplicate ID: LCSD for HBN 1189782 [XXX40552]
Spike Duplicate Lab ID: 1477461
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189782001, 1189782002, 1189782005, 1189782006

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	19.7	99	20	18.4	92	(75-125)	6.70	(< 20)
Surrogates									
5a Androstane (surr)	0.4	106	106	0.4	101	101	(60-120)	4.70	

Batch Information

Analytical Batch: **XFC14635**
Analytical Method: **AK102**
Instrument: **Agilent 7890B R**
Analyst: **CMS**

Prep Batch: **XXX40552**
Prep Method: **SW3520C**
Prep Date/Time: **09/23/2018 08:19**
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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Method Blank

Blank ID: MB for HBN 1786566 [XXX/40554]
Blank Lab ID: 1477465

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189782007, 1189782008, 1189782009

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	79.2	60-120		%

Batch Information

Analytical Batch: XFC14646
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: CMS
Analytical Date/Time: 9/25/2018 12:12:00PM

Prep Batch: XXX40554
Prep Method: SW3520C
Prep Date/Time: 9/23/2018 8:57:29AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 10/03/2018 1:06:11PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1189782 [XXX40554]
Blank Spike Lab ID: 1477466
Date Analyzed: 09/25/2018 12:22

Spike Duplicate ID: LCSD for HBN 1189782 [XXX40554]
Spike Duplicate Lab ID: 1477467
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189782007, 1189782008, 1189782009

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	20.2	101	20	20.4	102	(75-125)	0.69	(< 20)
Surrogates									
5a Androstane (surr)	0.4	94.9	95	0.4	99.1	99	(60-120)	4.30	

Batch Information

Analytical Batch: **XFC14646**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **CMS**

Prep Batch: **XXX40554**
Prep Method: **SW3520C**
Prep Date/Time: **09/23/2018 08:57**
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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Method Blank

Blank ID: MB for HBN 1786749 [XXX/40584]
Blank Lab ID: 1478241

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189782010, 1189782013, 1189782014, 1189782015, 1189782016, 1189782017, 1189782018, 1189782019, 1189782020, 1189782021, 1189782022, 1189782025, 1189782026, 1189782027, 1189782028, 1189782029, 1189782030

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	81.2	60-120		%

Batch Information

Analytical Batch: XFC14658
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: VDL
Analytical Date/Time: 9/27/2018 11:37:00AM

Prep Batch: XXX40584
Prep Method: SW3520C
Prep Date/Time: 9/26/2018 9:06:19AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1189782 [XXX40584]
Blank Spike Lab ID: 1478242
Date Analyzed: 09/27/2018 11:47

Spike Duplicate ID: LCSD for HBN 1189782 [XXX40584]
Spike Duplicate Lab ID: 1478243
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189782010, 1189782013, 1189782014, 1189782015, 1189782016, 1189782017, 1189782018, 1189782019, 1189782020, 1189782021, 1189782022, 1189782025, 1189782026, 1189782027, 1189782028, 1189782029, 1189782030

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	18.8	94	20	17.7	88	(75-125)	6.00	(< 20)
Surrogates									
5a Androstane (surr)	0.4	92.5	93	0.4	90.7	91	(60-120)	1.90	

Batch Information

Analytical Batch: **XFC14658**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **VDL**

Prep Batch: **XXX40584**
Prep Method: **SW3520C**
Prep Date/Time: **09/26/2018 09:06**
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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Billable Matrix Spike Summary

Original Sample ID: 1189782010
MS Sample ID: 1189782011 BMS
MSD Sample ID: 1189782012 BMSD

Analysis Date: 09/27/2018 12:08
Analysis Date: 09/27/2018 12:18
Analysis Date: 09/27/2018 12:29
Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by **AK102**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	0.620U	21.2	18.8	89	21.4	19.0	89	75-125	0.97	(< 30)
Surrogates										
5a Androstane (surr)		0.424	.377	89	0.427	0.382	90	50-150	1.40	

Batch Information

Analytical Batch: XFC14658
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: VDL
Analytical Date/Time: 9/27/2018 12:18:00PM

Prep Batch: XXX40584
Prep Method: Cont. Liq/Liq Ext. for AK102 Low Volume
Prep Date/Time: 9/26/2018 9:06:19AM
Prep Initial Wt./Vol.: 236.00mL
Prep Extract Vol: 1.00mL

Print Date: 10/03/2018 1:06:15PM

Billable Matrix Spike Summary

Original Sample ID: 1189782022
MS Sample ID: 1189782023 BMS
MSD Sample ID: 1189782024 BMSD

Analysis Date: 09/27/2018 14:33
Analysis Date: 09/27/2018 14:44
Analysis Date: 09/27/2018 14:54
Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by **AK102**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	0.641U	21.6	20.4	95	21.4	20.1	94	75-125	1.60	(< 30)
Surrogates										
5a Androstane (surr)		0.431	.409	95	0.427	0.400	94	50-150	2.20	

Batch Information

Analytical Batch: XFC14658
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: VDL
Analytical Date/Time: 9/27/2018 2:44:00PM

Prep Batch: XXX40584
Prep Method: Cont. Liq/Liq Ext. for AK102 Low Volume
Prep Date/Time: 9/26/2018 9:06:19AM
Prep Initial Wt./Vol.: 232.00mL
Prep Extract Vol: 1.00mL

Print Date: 10/03/2018 1:06:15PM

Method Blank

Blank ID: MB for HBN 1786817 [XXX/40593]
Blank Lab ID: 1478523

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189782031, 1189782032, 1189782033, 1189782034

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	94.1	60-120		%

Batch Information

Analytical Batch: XFC14659
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: CMS
Analytical Date/Time: 9/28/2018 11:44:00AM

Prep Batch: XXX40593
Prep Method: SW3520C
Prep Date/Time: 9/27/2018 7:53:20AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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t 907.562.2343 f 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1189782 [XXX40593]
Blank Spike Lab ID: 1478524
Date Analyzed: 09/28/2018 11:54

Spike Duplicate ID: LCSD for HBN 1189782 [XXX40593]
Spike Duplicate Lab ID: 1478525
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189782031, 1189782032, 1189782033, 1189782034

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	100	20	19.7	99	(75-125)	1.10	(< 20)
Surrogates									
5a Androstane (surr)	0.4	94.6	95	0.4	101	101	(60-120)	6.70	

Batch Information

Analytical Batch: **XFC14659**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **CMS**

Prep Batch: **XXX40593**
Prep Method: **SW3520C**
Prep Date/Time: **09/27/2018 07:53**
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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Page 1 of 3

Section 1

CLIENT: Trihydro

CONTACT: Brianna Force — PHONE #: 573-239-2434

PROJECT NAME: Fairbanks — Project/ PWSID/ PERMIT#:

REPORTS TO: Brianna Force — E-MAIL: bforce@trihydro.com

INVOICE TO: Trihydro — QUOTE #: 18-340WO-L — P.O. #: 17-282WO-L

Section 3 — Preservative

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Pres: Type: Comp Grab MI (Multi-incre-mental)	BTEX / GRO 8021B/AK101 Combo (HCl)	Low Volume DRO AK 102 (HCl)	REMARKS/ LOC ID
(1) A-E	MW-1R	9/17/18	13:30	water	5	6	3	2	
(2) A-E	MW-2	9/17/18	14:50		15		9	6	MS/MSD
(5) A-E	MW-3	9-17-18	13:54		5		3	2	
(6) A-E	MW-4	9-18-18	9:20		5		3	2	
(7) A-E	MW-5	9-18-18	14:10		5		3	2	
(8) A-E	MW-6R	9-20-18	10:30		5		3	2	Below LNAPL
(9) A-E	MW-7	9-18-18	15:30		5		3	2	
(10)(11)(12) A-E	MW-8	9-18-18	9:18		15		9	6	MS/MSD
(13) A-E	MW-9	9-19-18	10:40		5		3	2	
(14) A-E	MW-10	9-18-18	10:00		5		3	2	

Section 5

	Date	Time	
Relinquished By: (1)	9/20/18	1140	Received By: 9/20/18 1330
Relinquished By: (2)	9/20/18	1500	Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	9/21/18	10:07	Received For Laboratory By: KGT

KGT 9/21

Section 4 — DOD Project? Yes No

Cooler ID:

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 1.4°C 4.7°C
or Ambient [ ]
(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT
(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

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ANCH: TEMP: 2.1 D44, 5.2 D45
CS: 1F1B

F083-Kit_Request_and_COC_Templates-Blank
Revised 2013-03-24

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Section 1

CLIENT: Trihydro
CONTACT: Brianna Force
PHONE #: 573-239-2434
PROJECT NAME: Fairbanks
Project/ PWSID/ PERMIT#:
REPORTS TO: Brianna Force
E-MAIL: bforce@trihydro.com
INVOICE TO: Trihydro
QUOTE #: 18-340WO-L
P.O. #: 17-202WO-L

Section 3 — Preservative

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Pres: Type: Comp Grab MI (Multi-Incremental)	HCl: BTEX / GRO 8021B/AK101 Combo	HCl: Low Volume DRO AK 102	REMARKS/ LOC ID
(15)	MW-11	9-19-18	11:15	water	5	G	3	2	
(16)	MW-15	9-18-18	13:20		5		3	2	
(17)	MW-14	9-18-18	11:50		5		3	2	
(18)	MW-17A	9-19-18	9:45		5		3	2	
(19)	MW-17B	9-19-18	10:00		5		3	2	
(20)	MW-18R	9-20-18	10:00		5		3	2	Below LNAPL
(21)	MW-19	9-18-18	16:50		5		3	2	
(22)(23)(24)	MW-20	9-18-18	16:00		15		9	6	MS/MSD
(25)	MW-21	9-19-18	11:50		5		3	2	
(26)	MW-[illegible]	9-18-18	14:40		5		3	2	

Section 5

	Date	Time	
Relinquished By: (1)	9/20/18	1140	Received By: 9/20/18 1330
Relinquished By: (2)	9/20/18	1500	Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	9/21/18	1007	Received For Laboratory By: ker

Section 4
DOD Project? Yes No
Cooler ID:

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 1.4, 4.7°C
or Ambient [ ]
(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT
(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

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AWC: TB=2.1 D44, 5.2 D45
CS = 1F 1B

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

Page 3 of 3

Section 1

CLIENT: Trihydro
CONTACT: Brianna Force
PHONE #: 573-239-2434
PROJECT NAME: Fairbanks
Project/ PWSID/ PERMIT#:
REPORTS TO: Brianna Force
E-MAIL: bforce@trihydro.com
INVOICE TO: Trihydro
QUOTE #: 18-340WO-L
P.O. #: 17-282WO-L

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Pres: Type: Comp Grab MI (Multi-Incremental)	BTEX / GRO 8021B/AK101 Combo (HCl)	Low Volume DRO AK 102 (HCl)	REMARKS/ LOC ID
27 A-E	MW-23	9-19-18	1220	water	5	6	3	2	
28 A-E	MW-24	9-20-18	1045		5		3	2	Below LNAPL
29 A-E	MW-25	9-18-18	1345		5		3	2	
30 A-E	Equip Blank-1	9-18-18	1800		5		3	2	
31 A-E	Equip Blank-2	9-19-18	1710		5		3	2	
32 A-E	Dup-1	9-17-18	900		5		3	2	
33 A-E	Dup-2	9-19-18	800		5		3	2	
34 A-E	Dup-3	9-18-18	830		5		3	2	
35 A-F	Trip Blank	9-17-18	800		3		3		

Section 5

	Date	Time	
Relinquished By: (1)	9/20/18	11:40	Received By: 9/20/18 1330
Relinquished By: (2)	9/20/18	1500	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	9/21/18	10:07	Received For Laboratory By:

Section 4

DOD Project? Yes No

Data Deliverable Requirements:

Cooler ID:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 4.1, 9.7°C
or Ambient [ ]
(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT
(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

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ANC: TB = 2.1 D44, 5.2 D43
CS: 1F 1B

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FAIRBANKS SAMPLE RECEIPT FORM

Note: This form is to be completed by Fairbanks Receiving Staff for all samples

Review Criteria:	Condition:	Comments/Actions Taken
Were **custody seals** intact? Note # & location, if applicable.	(Yes) No N/A	□*Exemption permitted if sampler hand carries/delivers.*
COC accompanied samples?	(Yes) No N/A	
Temperature blank compliant* (i.e., 0-6°C)	(Yes) No	□*Exemption permitted if chilled & collected <8hrs ago*
If >6°C, were samples collected <8 hours ago?	Yes No (N/A)	
If <0°C, were all sample containers ice free?	Yes No (N/A)	
Cooler ID:_____ @ 1.4°C w/Therm. ID:_____		
Cooler ID:_____ @ 4.7°C w/Therm. ID:_____		
Cooler ID:_____ @_____ w/Therm. ID:_____		
Cooler ID:_____ @_____ w/Therm. ID:_____		
Cooler ID:_____ @_____ w/Therm. ID:_____		
If samples are received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank and "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note ambient ( ) or chilled ( ). Please check one.		***Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is needed.***
Delivery Method: (Client) (hand carried) Other:_____	Tracking/AB# : Or see attached Or (N/A)	
→For samples received with payment, note amount ($) and whether cash / check / CC (**circle one**) was received.		
Were samples in **good condition** (no leaks/cracks/breakage)?	(Yes) No N/A	***Note: some samples are sent to Anchorage without inspection by SGS Fairbanks personnel.***
Packing material used (specify all that apply): (Bubble) Wrap		
Separate plastic bags Vermiculite Other:_____		
Were **Trip Blanks** (i.e., VOAs, LL-Hg) in cooler with samples?	(Yes) No N/A	
For **RUSH/SHORT Hold Time**, were COC/Bottles flagged	Yes No (N/A)	
accordingly? Was Rush/Short HT email sent, if applicable?	Yes No (N/A)	

Additional notes (if applicable):

Profile #:

Note to Client: any "no" circled above indicates non-compliance with standard procedures and may impact data quality.

e-Sample Receipt Form

SGS Workorder #: 1189782

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		N/A Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	YES	1F 1B
COC accompanied samples?	YES	
N/A **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 @ 2.1 °C Therm. ID: D44
	YES	Cooler ID: 2 @ 5.2 °C Therm. ID: D45
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	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	
If samples received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
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)? **Note: If times differ <1hr, record details & login per COC.	NO	**Sample MW-2 arrived with only 5 containers instead of the 15 listed on the COC. Logged in w/o MS/MSD per CGH.**
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	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):

Samples 3 and 4 do not exist due to lab login error.

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1189782001-A	HCL to pH < 2	OK	1189782013-A	HCL to pH < 2	OK
1189782001-B	HCL to pH < 2	OK	1189782013-B	HCL to pH < 2	OK
1189782001-C	HCL to pH < 2	OK	1189782013-C	HCL to pH < 2	OK
1189782001-D	HCL to pH < 2	OK	1189782013-D	HCL to pH < 2	OK
1189782001-E	HCL to pH < 2	OK	1189782013-E	HCL to pH < 2	OK
1189782002-A	HCL to pH < 2	OK	1189782014-A	HCL to pH < 2	OK
1189782002-B	HCL to pH < 2	OK	1189782014-B	HCL to pH < 2	OK
1189782002-C	HCL to pH < 2	OK	1189782014-C	HCL to pH < 2	OK
1189782002-D	HCL to pH < 2	OK	1189782014-D	HCL to pH < 2	OK
1189782002-E	HCL to pH < 2	OK	1189782014-E	HCL to pH < 2	OK
1189782005-A	HCL to pH < 2	OK	1189782015-A	HCL to pH < 2	OK
1189782005-B	HCL to pH < 2	OK	1189782015-B	HCL to pH < 2	OK
1189782005-C	HCL to pH < 2	OK	1189782015-C	HCL to pH < 2	OK
1189782005-D	HCL to pH < 2	OK	1189782015-D	HCL to pH < 2	OK
1189782005-E	HCL to pH < 2	OK	1189782015-E	HCL to pH < 2	OK
1189782006-A	HCL to pH < 2	OK	1189782016-A	HCL to pH < 2	OK
1189782006-B	HCL to pH < 2	OK	1189782016-B	HCL to pH < 2	OK
1189782006-C	HCL to pH < 2	OK	1189782016-C	HCL to pH < 2	OK
1189782006-D	HCL to pH < 2	OK	1189782016-D	HCL to pH < 2	OK
1189782006-E	HCL to pH < 2	OK	1189782016-E	HCL to pH < 2	OK
1189782007-A	HCL to pH < 2	OK	1189782017-A	HCL to pH < 2	OK
1189782007-B	HCL to pH < 2	OK	1189782017-B	HCL to pH < 2	OK
1189782007-C	HCL to pH < 2	OK	1189782017-C	HCL to pH < 2	OK
1189782007-D	HCL to pH < 2	OK	1189782017-D	HCL to pH < 2	OK
1189782007-E	HCL to pH < 2	OK	1189782017-E	HCL to pH < 2	OK
1189782008-A	HCL to pH < 2	OK	1189782018-A	HCL to pH < 2	OK
1189782008-B	HCL to pH < 2	OK	1189782018-B	HCL to pH < 2	OK
1189782008-C	HCL to pH < 2	OK	1189782018-C	HCL to pH < 2	OK
1189782008-D	HCL to pH < 2	OK	1189782018-D	HCL to pH < 2	OK
1189782008-E	HCL to pH < 2	OK	1189782018-E	HCL to pH < 2	OK
1189782009-A	HCL to pH < 2	OK	1189782019-A	HCL to pH < 2	OK
1189782009-B	HCL to pH < 2	OK	1189782019-B	HCL to pH < 2	OK
1189782009-C	HCL to pH < 2	OK	1189782019-C	HCL to pH < 2	OK
1189782009-D	HCL to pH < 2	OK	1189782019-D	HCL to pH < 2	OK
1189782009-E	HCL to pH < 2	OK	1189782019-E	HCL to pH < 2	OK
1189782010-A	HCL to pH < 2	OK	1189782020-A	HCL to pH < 2	OK
1189782010-B	HCL to pH < 2	OK	1189782020-B	HCL to pH < 2	OK
1189782010-C	HCL to pH < 2	OK	1189782020-C	HCL to pH < 2	OK
1189782010-D	HCL to pH < 2	OK	1189782020-D	HCL to pH < 2	OK
1189782010-E	HCL to pH < 2	OK	1189782020-E	HCL to pH < 2	OK
1189782011-A	HCL to pH < 2	OK	1189782021-A	HCL to pH < 2	OK
1189782011-B	HCL to pH < 2	OK	1189782021-B	HCL to pH < 2	OK
1189782011-C	HCL to pH < 2	OK	1189782021-C	HCL to pH < 2	OK
1189782011-D	HCL to pH < 2	OK	1189782021-D	HCL to pH < 2	OK
1189782011-E	HCL to pH < 2	OK	1189782021-E	HCL to pH < 2	OK
1189782012-A	HCL to pH < 2	OK	1189782022-A	HCL to pH < 2	OK
1189782012-B	HCL to pH < 2	OK	1189782022-B	HCL to pH < 2	OK
1189782012-C	HCL to pH < 2	OK	1189782022-C	HCL to pH < 2	OK
1189782012-D	HCL to pH < 2	OK	1189782022-D	HCL to pH < 2	OK
1189782012-E	HCL to pH < 2	OK	1189782022-E	HCL to pH < 2	OK

Container Id	Preservative	Container Condition
1189782023-A	HCL to pH < 2	OK
1189782023-B	HCL to pH < 2	OK
1189782023-C	HCL to pH < 2	OK
1189782023-D	HCL to pH < 2	OK
1189782023-E	HCL to pH < 2	OK
1189782024-A	HCL to pH < 2	OK
1189782024-B	HCL to pH < 2	OK
1189782024-C	HCL to pH < 2	OK
1189782024-D	HCL to pH < 2	OK
1189782024-E	HCL to pH < 2	OK
1189782025-A	HCL to pH < 2	OK
1189782025-B	HCL to pH < 2	OK
1189782025-C	HCL to pH < 2	OK
1189782025-D	HCL to pH < 2	OK
1189782025-E	HCL to pH < 2	OK
1189782026-A	HCL to pH < 2	OK
1189782026-B	HCL to pH < 2	OK
1189782026-C	HCL to pH < 2	OK
1189782026-D	HCL to pH < 2	OK
1189782026-E	HCL to pH < 2	OK
1189782027-A	HCL to pH < 2	OK
1189782027-B	HCL to pH < 2	OK
1189782027-C	HCL to pH < 2	OK
1189782027-D	HCL to pH < 2	OK
1189782027-E	HCL to pH < 2	OK
1189782028-A	HCL to pH < 2	OK
1189782028-B	HCL to pH < 2	OK
1189782028-C	HCL to pH < 2	OK
1189782028-D	HCL to pH < 2	OK
1189782028-E	HCL to pH < 2	OK
1189782029-A	HCL to pH < 2	OK
1189782029-B	HCL to pH < 2	OK
1189782029-C	HCL to pH < 2	OK
1189782029-D	HCL to pH < 2	OK
1189782029-E	HCL to pH < 2	OK
1189782030-A	HCL to pH < 2	OK
1189782030-B	HCL to pH < 2	OK
1189782030-C	HCL to pH < 2	OK
1189782030-D	HCL to pH < 2	OK
1189782030-E	HCL to pH < 2	OK
1189782031-A	HCL to pH < 2	OK
1189782031-B	HCL to pH < 2	OK
1189782031-C	HCL to pH < 2	OK
1189782031-D	HCL to pH < 2	OK
1189782031-E	HCL to pH < 2	OK
1189782032-A	HCL to pH < 2	OK
1189782032-B	HCL to pH < 2	OK
1189782032-C	HCL to pH < 2	OK
1189782032-D	HCL to pH < 2	OK
1189782032-E	HCL to pH < 2	OK
1189782033-A	HCL to pH < 2	OK
1189782033-B	HCL to pH < 2	OK
1189782033-C	HCL to pH < 2	OK
1189782033-D	HCL to pH < 2	OK
1189782033-E	HCL to pH < 2	OK
1189782034-A	HCL to pH < 2	OK
1189782034-B	HCL to pH < 2	OK
1189782034-C	HCL to pH < 2	OK
1189782034-D	HCL to pH < 2	OK
1189782034-E	HCL to pH < 2	OK
1189782035-A	HCL to pH < 2	OK
1189782035-B	HCL to pH < 2	OK
1189782035-C	HCL to pH < 2	OK
1189782035-D	HCL to pH < 2	OK
1189782035-E	HCL to pH < 2	OK
1189782035-F	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.
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.

APPENDIX D

LABORATORY DATA REVIEW CHECKLISTS AND DATA VALIDATION REPORTS

Laboratory Data Review Checklist

Completed By:

Brianna Force

Title:

Associate Geologist

Date:

10/29/2018

CS Report Name:

Fairbanks Petroleum Terminal

Report Date:

10/03/2018

Consultant Firm:

Trihydro Corporation

Laboratory Name:

SGS North America Inc.

Laboratory Report Number:

1189782

ADEC File Number:

100.26.016

Hazard Identification Number:

1189782

1. Laboratory

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

   (•) Yes ( ) No Comments:

   SGS North America – Anchorage, AK

   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 Comments:

   N/A

2. Chain of Custody (CoC)

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

   (•) Yes ( ) No Comments:

   b. Correct Analyses requested?

   (•) Yes ( ) No Comments:

3. Laboratory Sample Receipt Documentation

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

   (•) Yes ( ) No Comments:

   2/2 cooler temperatures were documented within range at receipt; 2.1°C & 5.2°C

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

   (•) Yes ( ) No Comments:

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

   (•) Yes ( ) No Comments:

   Samples arrive intact and in good condition.

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 Comments:

Sample count did not match COC. Incorrect MS/MSD listing on COC. MW-2 was listed as an MS/MSD but was not actually an MS/MSD sample. Data quality or usability not affected.

e. Data quality or usability affected?

Comments:

No effect on data quality or usability.

4. Case Narrative

a. Present and understandable?

(•) Yes ( ) No Comments:

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

(•) Yes ( ) No Comments:

AK101-More than 20 samples injected between QC samples. Data not affected due to no-detect for analytes.

c. Were all corrective actions documented?

(•) Yes ( ) No Comments:

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

Comments:

The laboratory case narrative identifies any QA/QC deficiencies. Data quality/usability were determined by the Project Team; data usability not affected.

5. Samples Results

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

(•) Yes ( ) No Comments:

b. All applicable holding times met?

(•) Yes ( ) No Comments:

c. All soils reported on a dry weight basis?

○ Yes ◉ No Comments:

N/A; All submitted samples are water matrix.

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

◉ Yes ○ No Comments:

e. Data quality or usability affected?

○ Yes ◉ No Comments:

Quality and usability evaluated by project team; data usability not affected.

6. QC Samples

a. Method Blank

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

◉ Yes ○ No Comments:

ii. All method blank results less than limit of quantitation (LOQ)?

○ Yes ◉ No Comments:

8021B-MB has benzene and toluene above LOQ and do not meet QC criteria. However these analytes in associated samples are non-detect, therefore no samples affected.

iii. If above LOQ, what samples are affected?

Comments:

No samples were affected due to non-detect values in samples.

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

◉ Yes ○ No Comments:

v. Data quality or usability affected?

Comments:

No data quality or usability effects observed for associated samples.

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 Comments:

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

( ) Yes ( ) No Comments:

N/A; No metal or inorganic analysis requested.

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

(●) Yes ( ) No Comments:

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

(●) Yes ( ) No Comments:

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

Comments:

N/A

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

( ) Yes (●) No Comments:

N/A; no samples were affected

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

Comments:

No data quality or usability effects observed for associated samples.

c. Surrogates – Organics Only

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

(•) Yes ( ) No Comments:

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

(•) Yes ( ) No Comments:

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

( ) Yes (•) No Comments:

N/A; no samples were affected.

iv. Data quality or usability affected?

Comments:

No data quality or usability effects observed for associated samples.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

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

(•) Yes ( ) No 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 Comments:

iii. All results less than LOQ?

(•) Yes ( ) No Comments:

iv. If above LOQ, what samples are affected?

Comments:

N/A

v. Data quality or usability affected?

Comments:

No data quality or usability effects observed for associated samples.

e. Field Duplicate

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

(•) Yes ( ) No Comments:

ii. Submitted blind to lab?

(•) Yes ( ) No Comments:

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

RPD (%) = 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 Comments:

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

Comments:

No data quality or usability effects observed for associated samples.

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

(•) Yes ( ) No ( ) Not Applicable

i. All results less than LOQ?

(•) Yes ( ) No Comments:

ii. If above LOQ, what samples are affected?

Comments:

N/A; No data quality or usability effects observed for associated samples.

iii. Data quality or usability affected?

Comments:

No data quality or usability effects observed for associated samples.

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

a. Defined and appropriate?

(•) Yes ( ) No Comments:

There were no additional data quality or usability effects observed.

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 are presented in the ADEC Laboratory Data Review Checklist. The sample results are reported under SGS project number 1189782. September 17th through 20th, 2018, twenty-three groundwater samples, with the addition of three duplicates, two equipment blanks, one trip blank, and two matrix spike/matrix spike duplicate sample were submitted in one batch to the laboratory. Sample Dup-1 was collected as a duplicate of sample MW-2, sample Dup-2 was a duplicate of sample MW-11, and sample Dup-3 was a duplicate sample of MW-22. Samples MW-8 and MW-20 were designated as matrix spike/matrix spike duplicate (MS/MSD) sample. The samples were received at SGS in good condition, preserved and at a temperature of 2.1°C and 5.2°C. Samples were within the ADEC range of 2 to 6 °C and were deemed acceptable.

Sample results were reviewed to determine overall precision of sampling and analysis as well as matrix homogeneity for GRO, DRO, and VOCs. All relative percent differenced (RPD) from laboratory control sample/duplicate (LCS/LCSD) and MS/MSD were within range with the exception of 8021B-MB which had benzene and toluene above LOQ and do not meet QC criteria. However, analytes in associated samples were non-detect and therefore no samples were affected. In addition, sample MW-20 MS AK101 had more than 20 samples injected between QC samples; data was not affected due to no-detect for analytes. All duplicated sample RPDs were well below the recommended percentage (30% water). Data quality and usability was not affected. The following summary highlights the data evaluation findings for this sampling event:

- No data are rejected.
- The completeness objectives (greater than 85 percent complete) for this project are met with 100% completeness.
- The precision and accuracy of the laboratory data, as measured by laboratory quality control indicators, demonstrate 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.

APPENDIX E

EPA DRY WELL CLOSURE REQUEST LETTER

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 155
Seattle, Washington 98101-3140

SEP 06 2018

OFFICE OF
COMPLIANCE AND ENFORCEMENT

Reply To: OCE-201

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

Mr. Kyle Waldron
Remediation Project Manager
Tesoro Companies, Inc.
3450 S 344th Way, Suite 201
Auburn, Washington 98001-5931

Re: Approval for Conditional Closure of the Motor Vehicle Waste Disposal Well at the Tesoro Fairbanks Petroleum Terminal, Fairbanks International Airport, UIC ID No. AK232S5-30-1375

Dear Mr. Waldron:

The Underground Injection Control (UIC) program at the U.S. Environmental Protection Agency (EPA or, "the Agency"), Region 10, has received your letter dated June 1, 2018, requesting closure of a Class V motor vehicle waste disposal well (MVWDW) located at the Fairbanks Petroleum Terminal, 5500 Airport Industrial Road ("Fuel Terminal") in Fairbanks, Alaska. EPA has reviewed your request, which includes a report that details the actions taken during the summer of 2017 by the Tesoro Alaska Company ("Tesoro") to locate the dry well and, if found, close it according to EPA guidance. Based on the information you have provided, EPA approves your well with the condition that Tesoro continues to coordinate with the Alaska Department of Environmental Conservation (ADEC) to address remaining contamination at this site. This correspondence describes your attempt to find the well, briefly summarizes additional information you have provided related to the soil and groundwater contamination at this site, and provides the basis for the conditional closure being granted.

Well Description and Location

On September 3, 2015, Flint Hills Resources ("Flint Hills"), a previous site owner, requested closure of the MVWDW that was abandoned in the late 1990's. The request provided an approximate location of the well, evidence that the floor drains connecting the shop to the well were disconnected and groundwater and soil sampling data from nearby monitoring wells. Flint Hills informed EPA that the exact location of the dry well was unknown, but the suspected location was under an asphalt pad near the Fuel Terminal. Flint Hills also described how the MVWDW was part of a larger, site-wide cleanup effort headed by ADEC and was included in their Contaminated Sites Program (CSP). EPA responded on June 9, 2016, informing Flint Hills that, "[w]hat is unknown at this point is the extent of contamination caused by operation of this dry well, the plugging and backfill completed on the dry well, and if any contaminated soil needs to be removed from the site. Without this knowledge, EPA was unable to approve a formal closure of this injection well..."

In 2016, the facility and all environmental liability associated with the dry well were transferred from Flint Hills to Tesoro. Following the acquisition of the Fuel Terminal, Trihydro, on behalf of Tesoro, drafted and shared with EPA a three-step work plan to locate the dry well and satisfy EPA's previous request for an end-point sample of the abandoned dry well:

1) Attempt to locate the dry well using nonintrusive geophysical tools,
2) Investigate the soil and groundwater conditions using a direct push drill rig and,
3) Propose either a closure plan or a request for closure based on the findings.

This phased approach was conducted in the summer of 2017 and documented in the report submitted to EPA on June 1, 2018, as a component of your request for closure.

A Description of Actions by Trihydro in the Summer of 2017

To locate the dry well using noninvasive techniques, Trihydro contracted GeoTek Alaska, Inc. to perform a geophysical study. On August 17, 2017, Ground Penetrating Radar (GPR) and electromagnetic data were collected across a survey area but did not definitively locate the dry well or the pipes that may have connected the dry well. The GPR results did show evidence that an excavation may have taken place, but it could not be confirmed that this excavation was undertaken to remove the dry well nor the removal of materials that could have been contaminated by the dry well. Trihydro moved onto phase two of the dry well investigation.

Soil sampling was performed by Trihydro on September 18, 2017. Three soil borings (DW-01, DW-02, DW-03) were advanced to approximately 15 feet (ft) below ground surface (bgs) and soil samples were collected at multiple depths at each boring location. The soil boring locations were based on the suspected area of the former dry well from the 1971 shop drawings and findings from the GPR and EM surveys. A reinforced concrete spill pad and drainage strip located on the surface to the west and the northwest of the suspected location of the dry well was an impediment to the investigation. Soil borings did not contain material that would confirm the location of the dry well (i.e., backfill material or evidence of the dry well's construction).

All seven soil samples (two at DW-01, two at DW-02, three at DW-03) were analyzed for:

- Volatile Organic Compounds (VOCs) by EPA method SW 8260
- Semi-Volatile Organic Compounds (SVOCs) by EPA method SW 8270
- Gasoline Range Organics (GRO) by ADEC method AK101
- Diesel Range Organics (DRO) by ADEC method AK102, and
- Arsenic, total cadmium, total chromium, and lead by EPA method 6020

No VOCs were detected in borings DW-01 and DW-02. Ethylbenzene, naphthalene, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, and total xylenes concentrations exceeded the ADEC migration to groundwater levels in at least one soil sample taken from DW-03. No soil sample VOC concentrations from DW-03 exceeded the ADEC human health criteria or US EPA Regional Screening Levels. Tetrachloroethene (PCE) was detected in soil collected from six to seven and eight to nine ft bgs at boring DW-03 at 85.2 and 110 µg/kg respectively, and was not detected in the soil sample collected from thirteen to fourteen ft bgs. The concentrations were below ADEC and EPA screening/cleanup

criteria. GRO and DRO were detected above the ADEC migration to groundwater criteria in boring DW-03, and DRO was detected above the ADEC human health criteria in the DW-03 sample collected from eight to nine ft bgs. Four SVOC compounds were detected in soil samples from boring DW-03, three of which (1-Methyl-naphthalene, naphthalene, and 2-Methylnaphthalene) were found above ADEC migration to groundwater levels. Arsenic was detected above the ADEC migration to groundwater level in all seven soil samples ranging from 2.56 to 10.6 mg/kg and was above the ADEC human health criteria and US EPA Regional Screening Level (RSL) in six of the seven soil samples.

Groundwater samples were also collected on September 18, 2017. Samples were taken from a screened section in each boring set at a depth of approximately 10-14 feet bgs. Groundwater samples were analyzed for the same set of contaminants using the same methods as for the soil sample analysis, above. No VOCs, SVOCs, GRO, DRO, or metals were detected above screening levels in boreholes DW-01 and DW-02. In DW-03, arsenic was detected at 72.4 ppb, above ADEC cleanup levels and EPA maximum contaminant levels (MCLs). VOCs were detected in DW-03, but not above MCLs. GRO was detected at 1.55 mg/L and DRO was detected 1.84 mg/L, the latter of which was above the ADEC cleanup level.

Further Investigation

EPA requires owners and operators of MVWDWs to protect Underground Sources of Drinking Water (USDWs) from contamination even after the well has been disconnected from the source of injected fluids. Sampling at this site shows that operation of the dry well may have contributed to soil contamination and that this contamination remains to this day. The soil samples taken from a soil boring near the drywell (DW-03) exceeded ADEC migration to groundwater levels for ethylbenzene, naphthalene, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, and total xylenes (VOCs); 1-Methyl-naphthalene, and 2-Methylnaphthalene (SVOCs); GRO and DRO; and arsenic. Soil contamination above ADEC limits indicates that contaminants could leach to shallow groundwater and contaminate USDWs. Of the ten contaminants found above ADEC's migration to groundwater levels in the soil samples, three (ethylbenzene, xylene, and arsenic) are also listed under EPA's primary drinking water regulations. These three contaminants were found in groundwater samples taken from that same soil boring location (DW-03): [ethylbenzene (58.1 ug/L, MCL of 700 ug/L), xylene (470 ug/L, MCL of 10,000 ug/L) and arsenic (72.4 ug/L, MCL of 10 ug/L)]. Of these, only arsenic was found in groundwater samples at levels above EPA's MCLs, but this may be attributable to natural groundwater contamination[1,2]. GRO and DRO have been detected in groundwater across the site as part of a larger clean-up effort.

Your report states that "site infrastructure and operation are not conducive to a large excavation effort without significant disruption to facility operations, utilities and the structural integrity of the site building," and EPA understands that it may not be feasible to perform this kind of invasive investigation. This being said, Tesoro will remain liable for any groundwater contamination caused by, or in the future may be caused by, the MVWDW. Tesoro must continue to work with ADEC to manage the site.

---

[1] USGS Fact Sheet FS-111-01 November 2001. .https://pubs.usgs.gov/fs/fs-0111-01/fs-0111-01.pdf

[2] Common Alaska Contaminants and their Sources (PDF). June 2009. http://dec.alaska.gov/spar/csp/guidance/common_cont.pdf

Based on the attempts to find the well, site-wide soil and groundwater sampling results, and the risks that invasive investigation poses to the structural integrity of the site building, EPA grants a conditional closure of the MVWDW at the Fuel Terminal pursuant with authorities under 40 CFR §§ 144 and 146. This closure is based on the condition that the owner of this injection well continue to work with ADEC to address the contamination that remains near the suspected location of the abandoned injection well.

Tesoro is responsible for meeting all applicable UIC requirements under the Safe Drinking Water Act. Please note, that this approval does not impact Tesoro's obligation to comply with other federal, state local laws, or the EPA's authority to take future enforcement actions at this facility. If additional information becomes available indicating that the abandonment of this injection well was inadequate, then you will be required to provide additional information and perhaps take additional actions. For example, if later the asphalt pad above the suspected location of the injection well is removed, you may be required to complete additional investigatory actions to ensure that soil contaminants are not mobilized into groundwater. If you have any questions, please contact Evan Osborne of my staff at (206) 553-1747.

Sincerely,

Peter Contreras, Manager
Ground Water Unit

cc: Mr. Robert Burgess
ADEC Contaminated Sites Program

APPENDIX F

SAMPLING AND ANALYSIS PLAN

SAMPLING ANALYSIS PLAN

FAIRBANKS PETROLEUM TERMINAL

TESORO ALASKA COMPANY

FAIRBANKS, ALASKA

January 16, 2019

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. Summary of Analytical Methods and Parameters

1.0 INTRODUCTION

This sampling and laboratory analysis plan (SAP) establishes the technical standards and procedures for groundwater monitoring at the Tesoro Alaska Fairbanks Petroleum Terminal located in Fairbanks, Alaska. 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. The Fairbanks Petroleum Terminal is filed under ADEC File # 100.26.016.

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 sample list for the next year is presented in Table 4 of the main report. The anticipated sampling methods for the Terminal are outlined in the following inset Table.

Terminal Location	Sampling Method	Well ID	Comments
Fairbanks Petroleum Terminal (FPT)	Low-Flow Sampling	MW-2, MW-3, MW-4, MW-5, MW-7, MW-8, MW-9, MW-10, MW-11, MW-15, MW-16, MW-17A, MW-17B, MW-19, MW-20, MW-21, MW-22, MW-23, MW-25	
	Below LNAPL Sampling[1]	MW-1R, MW-6R, MW-18R, MW-24	LNAPL occasionally present; may be sampled using frozen tubing and peristaltic pump when LNAPL is present. Low-Flow Sampling used otherwise.

1. Samples may be collected below LNAPL and data will be denoted as collected below LNAPL and will be considered screening level only data.

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 0ºC 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 0ºC 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 (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 thoroughly after each sampling event and when high levels of contamination are encountered ("extended decon"). 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. See site-specific Health and Safety Plan (HASP) for additional personal protective equipment (PPE).

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 if the well is not being sampled.

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 while purging at low flow utilizing a

flow-through-cell. Water quality parameters, with the exception of turbidity, will be collected using a flow-through-cell when conducting low flow sampling. Turbidity measurements will be obtained before the water enters the flow-through-cell.

4.3.1 SAMPLING WITH A BAILER

In general groundwater samples are not collected using bailers; however, at times, collection of a groundwater grab sample may require the use of a disposable bailer. If so, three well volumes will be purged prior to collection of a groundwater sample and if a bailer is used to collect an LNAPL sample, no purging of the well will be completed. 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.

4.3.2 LOW-FLOW SAMPLING

Wells sampled as part of the annual groundwater sampling will be sampled using low-flow sampling techniques in accordance with the ADEC Field Sampling Guidance (ADEC 2017). Groundwater drawdown will be maintained at less than 0.3 feet. Groundwater samples will be collected using a low-flow controlled submersible pump (e.g., centrifugal pump or bladder pump) and multi-parameter meter with a flow-through cell (e.g., YSI 556). Target purge rates need to be between 50 and 500 mL/min. If drawdown greater than 0.3 feet occurs, three well volumes will be purged prior to sampling. In this case, flow rates will remain below 3.5 L/min. If the well is purged dry before thee well volumes are purged then the well will be allowed to recharge to 80% and then the sample will be collected. During sample collection purge rates will be maintained between 50 and 500 mL/min. For low flow sampling, wells are purged until groundwater quality parameters are stable or a minimum of three well volumes has been purged. Before samples are collected, any devises used for data collection (i.e., flow-through cell) must be removed from sample chain.

As outlined in the ADEC Field Sampling Guidance, water quality parameters are considered stable when three successive readings, collected 3-5 minutes apart are within:

- ± 3% for temperature (minimum of ± 0.2ºC)
- ± 0.1 for pH
- ± 3% for conductivity
- ± 10 mv for redox potential

- ± 10% for dissolved oxygen (DO)
- ± 10% for turbidity (or less than or equal to 10 NTU)

Generally, these water quality parameters are monitored and recorded. A minimum of three (minimum of four if using temperature as an indicator) of these parameters will be used to evaluate groundwater stability. When the well is screened across the water table, the submersible pump will be set approximately three feet below the static water level, and when a well screen is fully submersed or the well screen is unknown the pump will be set at the midpoint of the submersed screen interval. The pump will be lowered if poor recharge is observed.

4.3.3 SAMPLING BELOW LNAPL

Wells containing LNAPL are 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. Groundwater quality parameters are not collected to protect the groundwater sampling equipment form damage due to potential contact with LNAPL. Below LNAPL data results are considered qualitative and will not be used for major decision-making purposes.

4.3.4 LNAPL SAMPLING

Sampling of LNAPL from monitoring wells is 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 maintained cooled to 0ºC to 6ºC and should never be stored in a sample refrigerator this is used for storing soil or groundwater samples. LNAPL samples are occasionally collected to aid in remedial system design and assessment.

4.3.5 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 4 $\pm$2° C 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.

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