

FES

3538 International Street
Fairbanks, Alaska 99701

Phone: (907) 452-1006
FAX: (907) 452-2692
Email: FES@Alaska.com

FAIRBANKS ENVIRONMENTAL SERVICES



DATE: July 29, 2013

TO: Mr. Russell Grandel, Alaska Railroad Corporation

FROM: Michael Boese, Fairbanks Environmental Services

RE: Groundwater Monitoring Report
Fairbanks Rail Yard
Fairbanks, Alaska
ADEC Hazard ID – 327 / File ID – 102.38.050

EXECUTIVE SUMMARY

On June 24 and 25, 2013, seven monitoring wells were sampled by Fairbanks Environmental Services (FES) to evaluate current groundwater conditions at the Alaska Railroad Corporation (ARRC) Fairbanks Rail Yard site. Analytical samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), gasoline range organics (GRO), diesel range organics (DRO), and residual range organics (RRO). Laboratory results from all wells except the two furthest downgradient wells (MW-8 and MW-9) exceeded the ADEC Table C cleanup level for DRO. In addition, wells MW-2 and MW-7 exceeded the ADEC cleanup level for RRO and wells MW-2 and MW-6 exceeded the ADEC cleanup level for benzene. A product thickness of 0.01 feet was measured in WC-3, and MW-1 was found damaged; neither well was sampled.

1.0 INTRODUCTION

1.1 Site Description and History

The ARRC Fairbanks Rail Yard is located off of Philips Field Road in Fairbanks, Alaska (Figure 1). The Fairbanks Rail Yard is a primary facility for northern ARRC operations. Site improvements include buried utilities, rail yard lighting, and multiple sets of railroad tracks, track crossings, and buildings. The site is underlain by a shallow unconfined aquifer.

Between 1949 and 1986, ARRC operated two 2,500-barrel diesel above ground storage tanks (ASTs), which served to provide fuel for locomotives and ARRC equipment. The AST system was taken out-of-service in 1988. In 2003, The ASTs were subsequently dismantled and removed from the site (Hart Crowser, 2004).

1.2 Previous Investigations

In 1986, a seven foot deep test pit was excavated between the two ASTs. ARRC observed four feet of diesel product on the surface of the water table (ADEC Contaminated Sites Database). Below is a summary of investigations performed at this site.

Summary of Previous Investigations

Year	Action	Description
1988	Soil Gas Survey	A soil-gas survey was conducted to determine petroleum hydrocarbon impacts to the soil and groundwater. The results of the survey indicated a potential impacted subsurface area of 400 feet long and 24 feet wide (Woodward-Clyde Consultants, 1988).
1988	Well Installation	Two 4-inch monitoring wells (WC-1 and WC-2), and one 8-inch monitoring well (WC-3) were installed at the Fairbanks Rail Yard. The wells were screened between 15 and 30 feet below ground surface (bgs). Free-phase product was observed in WC-2 and WC-3 at that time.
2003	Soil Boring and Well Installation	A soil and groundwater site investigation included advancing four soil borings that were completed as monitoring wells (MW-1, MW-2, MW-3, and MW-4). Free-phase hydrocarbons were measured in MW-1, MW-2, and MW-4. Subsurface observations indicated the presence of petroleum hydrocarbons throughout the vadose and smear zones near the ASTs. Petroleum hydrocarbons in soil from outlying borings (MW-2 and MW-4) were encountered only in the smear zone, thus indicating transport of the fuel by groundwater (Hart Crowser, 2004).
2005, 2006, 2010	Well Installation and Groundwater Monitoring	Wells MW-5 and MW-6 were installed to evaluate groundwater conditions downgradient of the existing well network (Hart Crowser, 2005). Free-phase product was consistently noted in well WC-3, and periodically in wells MW-1 and MW-2 (Hart Crowser, 2006). Results from these events indicate that petroleum hydrocarbon concentrations including benzene, DRO, and RRO exceeded applicable ADEC groundwater cleanup levels in several wells at the site (Clarus, 2010).
2011	Well Installation and Groundwater Monitoring	Monitoring well MW-7 was installed to replace WC-2. In addition to the free-phase product in WC-3 and MW-2, DRO and benzene exceeded ADEC groundwater cleanup levels in well MW-1 (Restoration Science & Engineering, 2011).
2012	Well Installation and Groundwater Monitoring	Monitoring wells MW-8 and MW-9 were installed to delineate the southern (downgradient) extent of the plume. Free-phase product was measured in WC-3. Sample results indicate that DRO exceeded the ADEC groundwater cleanup level in all wells, except the two newly installed wells furthest downgradient. In addition, RRO exceeded the cleanup level in MW-1, MW-2, and MW-7, and benzene exceeded the cleanup level in MW-2 and MW-6 (FES, 2012).

2.0 GROUNDWATER SAMPLE COLLECTION

Field work was performed in accordance with the ADEC approved Work Plan (FES, 2013). Vanessa Ritchie, a FES employee and ADEC qualified person, provided groundwater sampling services.

Seven monitoring wells (MW-2, MW-4, MW-5, MW-6, MW-7, MW-8, and MW-9) were sampled on June 24 and 25, 2013. A field duplicate sample (MW-X) was collected from MW-7. Well locations are shown on Figure 2. Eight monitoring wells were included in the sampling program; however, MW-1 could not be sampled due to a presumed broken casing at approximately 15.5 feet bgs (total depth measured in 2012 was 18.75 feet). Approximately 6 inches of water was initially measured in the casing. An attempt was made to collect a sample, but the well purged dry before a sufficient volume of water could be containerized. The water level was measured again later in the day, as well as the following day (June 25), to evaluate the rate of recharge. The well recharged to approximately 78% of its initial casing volume in 24 hours. To see if sediment could be removed from the casing, peristaltic pump tubing was lowered to the bottom of the well with the pump set at a high speed. The effort was not successful, in part due to the lack of water in the casing to mobilize sediment effectively.

Prior to sampling, the depth to water was measured in each of the wells. The depths were measured to within 0.01 foot from the top of the well casings using an oil/water interface probe. The wells were

purged and sampled with new disposable tubing and a peristaltic pump using a low-flow technique. Tubing intake was set approximately 1 foot below the top of the water column. Groundwater parameters were collected with a YSI Model 556 multi-parameter instrument equipped with a flow through cell. Turbidity readings were measured with an Oakton T-100 turbidimeter. Analytical samples were collected after water quality parameters had stabilized per the requirements in ADEC's field sampling guidance (ADEC, 2010). Groundwater samples were collected by disconnecting the flow through cell and pumping directly into sample containers at a low-flow rate to minimize sample aeration.

Water samples were placed in a cooler containing frozen gel ice and maintained at 4 degrees Celsius. Samples were submitted to SGS North America (SGS) in Fairbanks, Alaska and transferred to SGS's facility in Anchorage for analysis. Samples were analyzed for BTEX, GRO, DRO, and RRO using methods SW8021B, AK101, AK102, and AK103, respectively. A trip blank accompanied project samples to the laboratory and was analyzed for BTEX and GRO.

3.0 GROUNDWATER RESULTS

Depth to groundwater observed at the site varied between approximately 13.5 feet and 15.7 feet bgs. Relative groundwater elevations obtained were used to determine flow direction. Groundwater contours are displayed in Figure 2; inferred groundwater flow is fairly flat but trends to the southwest with a gradient of approximately 0.001. This direction and gradient are consistent with previous data (Clarus, 2010; Restoration Science and Engineering, 2011; FES, 2012). A total of 0.01 feet of floating product was identified in WC-3, which was not sampled.

Laboratory results from all wells, except the two furthest downgradient wells (MW-8 and MW-9), exceeded the ADEC Table C cleanup level for DRO (ADEC, 2012). In addition, wells MW-2 and MW-7 exceeded the ADEC cleanup level for RRO and wells MW-2 and MW-6 exceeded the cleanup level for benzene. These results are consistent with historical data.

Laboratory results for 2013 groundwater samples and associated groundwater field parameters are summarized in Tables 1 and 2, respectively. For comparison, historical groundwater data are included as Table 3. A copy of the laboratory report is included as Appendix A.

4.0 INVESTIGATION-DERIVED WASTE

A minimal amount of investigation-derived waste was generated during the sampling effort. Purge water obtained from monitoring well sampling activities was transferred to ARRC's oil water separator located on site in the Car Shop and Roundhouse.

5.0 DATA QUALITY SUMMARY

Samples were collected and analyzed in accordance with the approved Work Plan (FES, 2013). All project samples were analyzed by SGS of Anchorage, Alaska. The laboratory is approved by the State of Alaska through the Contaminated Sites Program for the contaminant methods employed. All samples were shipped in a single sample data group and assigned the SGS report number 1132693. A copy of the report is included as Appendix A.

The chemical data were evaluated in order to assess whether they met data quality objectives and were acceptable for project use. The findings of the review are documented in the ADEC Laboratory Data Review Checklist, which is included in Appendix B. Overall, the review process deemed the groundwater data acceptable for project use. No data were rejected pursuant to FES's data quality review, and all data may be used, as qualified, for project purposes. The following data quality issue was identified:

- DRO and RRO concentrations in field duplicate samples MW-7/MW-X did not meet the ADEC comparison criterion of 30%. The variance in DRO and RRO concentrations in these samples is likely due to high contaminant concentrations (above solubility limits and ADEC groundwater cleanup levels). Impact to data quality is minor as the DRO results for both field duplicate pair exceed the ADEC cleanup level by a minimum of 4 times, which is consistent with historic data for this well.

6.0 CONCLUSION AND RECOMMENDATIONS

Groundwater flows to the southwest with a fairly flat gradient. Laboratory results for groundwater samples collected from existing wells located near the source area confirm groundwater conditions are still above ADEC Table C cleanup levels for DRO, RRO and benzene and, therefore, do not meet ADEC 18 AAC 75 criteria. Results from downgradient wells were all non-detect except for a trace amount of RRO and indicating that contaminants are not leaving the site.

FES recommends continued periodic groundwater monitoring and another round of water level measurements at the ARRC Fairbanks Rail Yard.

7.0 REFERENCES

- Alaska Department of Environmental Conservation (ADEC), 2012. *Oil and Other Hazardous Substances Pollution Control, 18 AAC 75*. April 8.
- ADEC, 2010. *Draft Field Sampling Guidance*. May.
- Clarus Technologies LLC, 2010. *Groundwater Monitoring Report, Fairbanks Rail Yard, Fairbanks, Alaska*. October.
- Fairbanks Environmental Services (FES), 2013. *Groundwater Monitoring Work Plan, Fairbanks Rail Yard, Fairbanks, Alaska*. May 9.
- FES, 2012. *Groundwater Monitoring Report, Fairbanks Rail Yard, Fairbanks, AK*. November 26.
- Hart Crowser, 2006. *Groundwater Sampling at the Fairbanks Rail Yard, Fairbanks, Alaska*. November.
- Hart Crowser, 2005. *Fairbanks Rail Yard, Soil and Groundwater Assessment Report, Fairbanks, Alaska*. December.
- Hart Crowser, 2004. *Diesel Tanks and Sand Tower Dismantling, Soil and Groundwater Assessment Report, Alaska Railroad Yard, Fairbanks, Alaska*. May.
- Restoration Science & Engineering, LLC., 2011. *Site Characterization Report, Alaska Railroad Corporation, ARRC Fairbanks Rail Yard, Fairbanks, Alaska*. December.
- Woodward-Clyde Consultants, 1988. *Fairbanks Fuel Facility, Fairbanks, Alaska*. July 29.

Attachments

Table 1 – Groundwater Results

Table 2 – Field Parameters

Table 3 – Historical Groundwater Data

Figure 1 – Vicinity Map

Figure 2 – Site Map

Appendix A – Laboratory Report

Appendix B – ADEC Laboratory Review Checklist

**Table 1 - Groundwater Results
Fairbanks Rail Yard**

Location			Cleanup Level ¹	MW-2	MW-4	MW-5	MW-6	MW-7		MW-8	MW-9	Trip Blank
Sample ID				MW-2	MW-4	MW-5	MW-6	MW-7	MW-X	MW-8	MW-9	Trip Blank
Laboratory				SGSA	SGSA	SGSA	SGSA	SGSA	SGSA	SGSA	SGSA	SGSA
Lab Sample ID				1132693001	1132693002	1132693003	1132693004	1132693005	1132693006	1132693007	1132693008	1132693009
Collect Date				6/24/2013	6/24/2013	6/25/2013	6/25/2013	6/25/2013	6/25/2013	6/25/2013	6/25/2013	6/24/2013
Matrix				WG	WG	WG	WG	WG	WG	WG	WG	WG
Sample Type				Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary	Trip Blank
Analyte	Method	Units			Result [LOD] Qualifier	Result [LOD] Qualifier	Result [LOD] Qualifier	Result [LOD] Qualifier	Result [LOD] Qualifier	Result [LOD] Qualifier	Result [LOD] Qualifier	Result [LOD] Qualifier
GRO	AK101	mg/L	2.2	0.384 [0.062]	0.244 [0.062]	0.0459 [0.062] J	0.225 [0.062]	0.109 [0.062]	0.114 [0.062]	ND [0.0620]	ND [0.0620]	ND [0.0620]
DRO	AK102	mg/L	1.5	19.9 [0.376]	9.39 [0.346]	1.61 [0.346]	5.46 [0.376]	10.5 [0.368]	7.15 [0.376]	ND [0.368]	ND [0.382]	--
RRO	AK103	mg/L	1.1	2.11 [0.312]	1.00 [0.288]	0.484 [0.312] J	0.813 [0.312]	1.46 [0.306]	1.04 [0.312]	0.267 [0.306] J	0.165 [0.320] J	--
Benzene	SW8021B	µg/L	5	23.9 [0.300]	0.250 [0.300] J	ND [0.300]	5.77 [0.300]	1.26 [0.300]	1.22 [0.300]	ND [0.300]	ND [0.300]	ND [0.300]
Ethylbenzene	SW8021B	µg/L	1,000	5.59 [0.620]	8.22 [0.620]	ND [0.620]	4.86 [0.620]	0.360 [0.620] J	0.390 [0.620] J	ND [0.620]	ND [0.620]	ND [0.620]
Toluene	SW8021B	µg/L	700	0.330 [0.620] J	ND [0.620]	ND [0.620]	ND [0.620]	0.630 [0.620] J	0.710 [0.620] J	ND [0.620]	ND [0.620]	ND [0.620]
Xylene, Isomers m,p	SW8021B	µg/L	10,000 ²	18.0 [1.24]	16.1 [1.24]	ND [1.24]	12.3 [1.24]	1.26 [1.24] J	1.25 [1.24] J	ND [1.24]	ND [1.24]	ND [1.24]
o-Xylene	SW8021B	µg/L		9.02 [0.620]	6.47 [0.620]	ND [0.620]	6.27 [0.620]	0.440 [0.620] J	0.450 [0.620] J	ND [0.620]	ND [0.620]	ND [0.620]

Results in **bold** and yellow highlight exceed the cleanup level

¹ - Groundwater cleanup levels are from Table C, 18 AAC 75.345

² - Cleanup level is for total xylenes

DRO - diesel range organics

GRO - gasoline range organics

J - Result is estimated because it was reported below the LOQ

LOD - Limit of Detection

LOQ - Limit of Quantitation

µg/L - micrograms per liter

mg/L - milligrams per liter

ND - Analyte was not detected at the Detection Limit

RRO - residual range organics

Table 2 - Field Parameters
Fairbanks Rail Yard

Well	Date	Sheen or Odor?	Depth to Groundwater ¹ (feet BTOC)	Temperature (Degrees Celsius)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	pH	Potential (mV)	Turbidity (NTU)
MW-1	6/24/13	Strong Odor	15.51	not sampled; well presumed broken					
MW-2	6/24/13	Discontinuous Sheen and Strong Odor	15.15	9.52	1.106	4.63	6.64	-47.6	3.42
MW-4	6/24/13	Discontinuous Sheen and Strong Odor	15.68	8.97	1.215	2.88	6.67	-76.8	12.56
MW-5	6/25/13	Slight Odor	15.06	7.45	0.986	1.42	6.52	38.0	9.47
MW-6	6/25/13	Discontinuous Sheen and Strong Odor	14.93	4.32	1.205	2.43	6.60	-58.5	6.48
MW-7	6/25/13	Moderate Odor	14.74	5.46	1.135	2.20	6.60	-48.2	9.79
MW-8	6/25/13	None	13.45	6.01	1.178	2.08	6.76	89.8	3.21
MW-9	6/25/13	None	13.87	7.79	1.222	2.05	6.66	-7.3	6.99
WC-3	6/25/13	Free Product and Strong Odor	15.61 ²	not sampled due to 0.01 feet of floating product					

¹ - Water levels were all measured on 6/24/2013, prior to purging aquifer

² - Depth to product was 15.60 feet and depth to water was 15.61 feet

BTOC - below top of casing

mS/cm - milliSiemens per centimeter

mV - millivolts

NTU - nephelometric turbidity units

**Table 3 - Historical Groundwater Results
Fairbanks Rail Yard**

Well Number	Sample Date	Method AK101	Method AK102	Method AK103	EPA Method 8021B			
		GRO (mg/L)	DRO (mg/L)	RRO (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)
ADEC Groundwater Cleanup Level		2.2	1.5	1.1	0.005	1.0	0.7	10
MW-1	Nov-03	not sampled due to 0.05 feet of floating product						
	Sep-04	not sampled due to 0.02 feet of floating product						
	Sep-06	0.87/ 0.88	60.1/ 123	3.16/ 4.23	0.0049/ 0.0047	0.0014/ 0.0015	0.0087/ 0.0086	0.292/ 0.270
	Sep-10	not sampled due to 0.06 feet of floating product						
	Sep-11	0.839	99.5	-	0.00527	0.00472	0.0107	0.343
	Sep-12	1.06	69.5	4.38	0.00423	0.00423	0.00815	0.288
	Jun-13	not sampled due to broken well						
MW-2	Nov-03	not sampled due to 0.14 feet of floating product						
	Sep-04	not sampled due to 0.08 feet of floating product						
	Sep-06	not sampled due to 0.08 feet of floating product						
	Sep-10	0.234 J	187	6.81	0.0088	0.00103 J	0.00603	0.0302 J
	Sep-11	not sampled due to floating product						
	Sep-12	0.377	19.5	2.08	0.0187	0.0004 J	0.0097	0.0449
	Jun-13	0.384	19.9	2.11	0.0239	0.0003 J	0.00559	0.02702
MW-3	Nov-03	NA	5.30	NA	ND (0.00015)	ND (0.00024)	0.0010	0.0071
	Sep-04	ND (0.080)	2.71	0.992	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)
	Sep-06	ND (0.05)	0.94	0.43	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0020)
	Sep-10	ND (0.05)	ND (0.40)	ND (0.40)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0015)
	Sep-11	well could not be located						
	Sep-12	well could not be located						
	Jun-13	well could not be located						
MW-4	Nov-03	not sampled due to 0.03 feet of floating product						
	Sep-04	0.354	6.07 J	ND (0.48)	ND (0.0005)	ND (0.0005)	0.0073	0.0162
	Sep-06	0.17	18.5	0.58	ND (0.0010)	ND (0.0010)	0.0094	0.023
	Sep-10	1.48	43.0	0.484	ND (0.0005)	0.00434	0.0174	0.124 J
	Sep-11	0.0854 J	3.37	-	0.00018 J	0.0005 J	0.00928	0.0271
	Sep-12	0.278	3.82	0.4 J	0.00043 J	ND (0.00062)	0.0113	0.0339
	Jun-13	0.244	9.39	1.00	0.000250 J	ND (0.00062)	0.00822	0.02257
MW-5	Sep-04	0.228/ 0.159	3.36/ 4.21	ND (0.48)/ ND (0.522)	ND (0.0005)/ ND (0.0005)	ND (0.0005)/ ND (0.0005)	0.0032/ 0.0020	0.0039/ 0.0035
	Sep-06	0.06	3.44	ND (0.40)	ND (0.0010)	ND (0.0010)	0.0022	0.0020
	Sep-10	well could not be located						
	Sep-11	well could not be located						
	Sep-12	0.0716	3.14	0.431 J	0.00111	ND (0.00062)	0.00229	0.00312
	Jun-13	0.0459 J	1.61	0.484 J	ND (0.0003)	ND (0.00062)	ND (0.00062)	ND (0.00124)
	Sep-06	0.30	11.2	0.90	0.0076	ND (0.0020)	0.0155	0.0590
MW-6	Sep-10	0.172 J	12.7	0.636	0.00367	0.000838 J	0.00926	0.0382 J
	Sep-11	0.105	118	-	0.00418	0.000340 J	0.00418	0.01847
	Sep-12	0.479	8.36	1.09	0.00951	0.00039 J	0.0233	0.105
	Jun-13	0.225	5.46	0.813	0.00577	ND (0.00062)	0.00486	0.01857
	Sep-11	0.0854 J	19.6	-	0.00107	ND (0.001)	0.00048 J	0.00352
MW-7	Sep-12	0.0937/ 0.0903	8.11/ 12.4	0.49 J/ 1.85	0.00112/ 0.0012	ND (0.00062)/ ND (0.00062)	0.0005 J/ 0.00048 J	0.00139 J/ 0.00103 J
	Jun-13	0.109/ 0.114	10.5/ 7.15	1.46/ 1.04	0.00126/ 0.00122	0.00063 J/ 0.00071 J	0.000360 J/ 0.000390 J	0.0017 J/ 0.0017 J
	Sep-12	ND (0.062)	0.288 J	0.339 J	ND (0.0003)	0.00031 J	0.00035 J	ND (0.00186)
MW-8	Jun-13	ND (0.062)	ND (0.368)	0.267 J	ND (0.0003)	ND (0.00062)	ND (0.00062)	ND (0.00186)
MW-9	Sep-12	ND (0.062)	0.189 J	0.199 J	ND (0.0003)	ND (0.00062)	ND (0.00062)	ND (0.00186)
	Jun-13	ND (0.062)	ND (0.382)	0.165 J	ND (0.0003)	ND (0.00062)	ND (0.00062)	ND (0.00186)
WC-3	Nov-03	not sampled due to 0.03 feet of floating product						
	Sep-04	not sampled due to 0.04 feet of floating product						
	Sep-06	not sampled due to 0.02 feet of floating product						
	Sep-10	not sampled due to 0.04 feet of floating product						
	Sep-11	not sampled due to floating product						
	Sep-12	not sampled due to 0.01 feet of floating product						
	Jun-13	not sampled due to 0.01 feet of floating product						

Sources of historical data: Hart Crowser 2004, 2005, 2006; Clarus Technologies 2010; and Restoration Science & Engineering 2011

Results in bold and yellow highlight exceed the cleanup level

ADEC - Alaska Department of Environmental Conservation

DRO - diesel range organics

EPA - Environmental Protection Agency

GRO - gasoline range organics

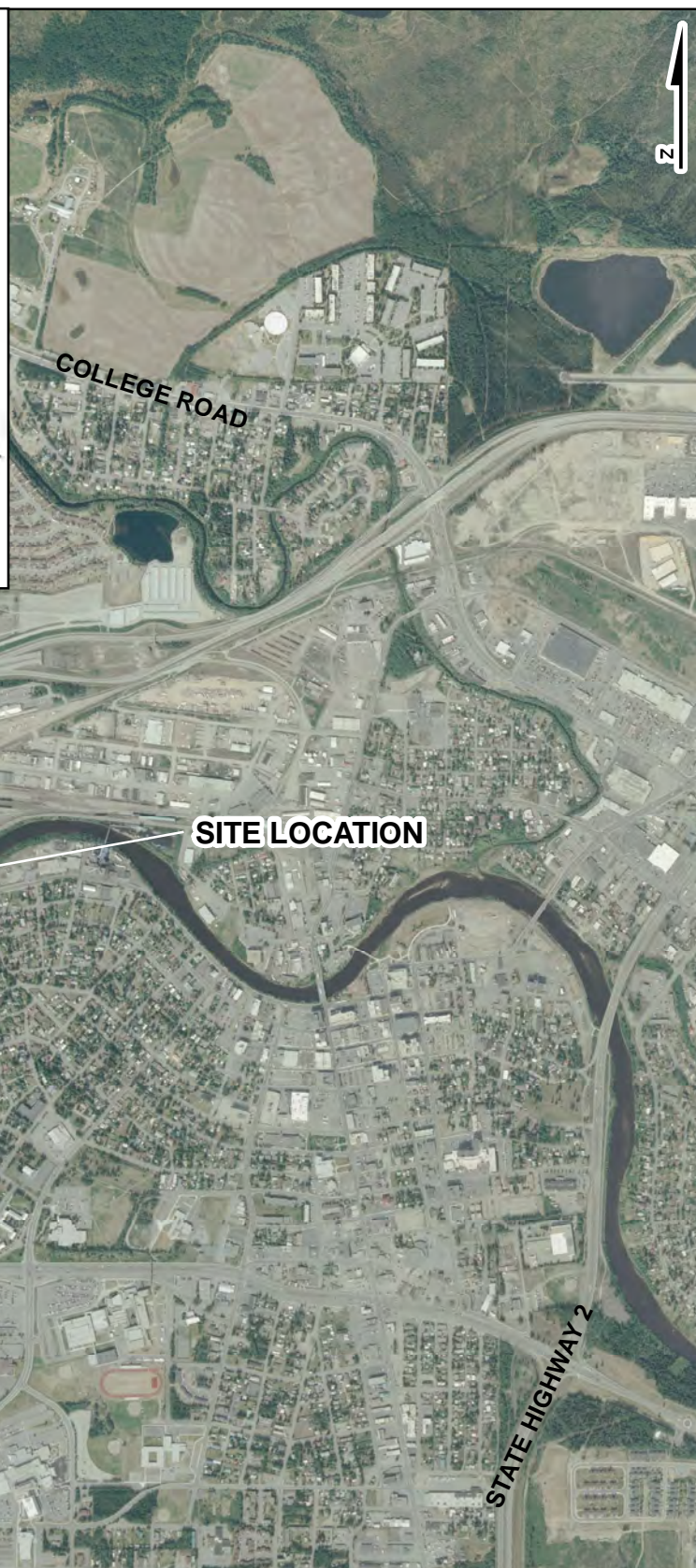
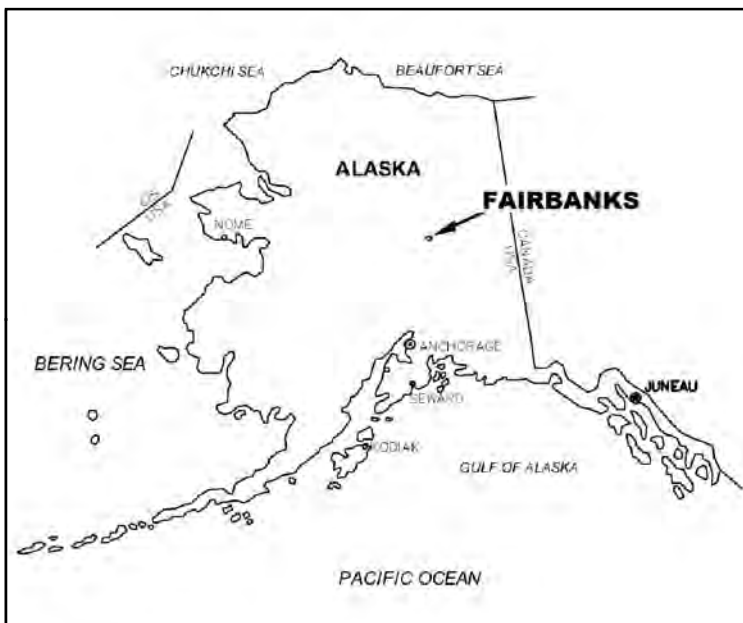
J - Result is an estimated value

mg/L - milligrams per liter

NA - not analyzed

ND - analyte was not detected

RRO - residual range organics



NOTE:

Source: Aerial Imagery was provided by Alaska Mapped (UAF-GINA/SDMI <http://alaskamapped.org/bdl>).

Fairbanks Environmental Services
3538 International Street
Fairbanks, Alaska 99701



**ALASKA RAILROAD
CORPORATION**

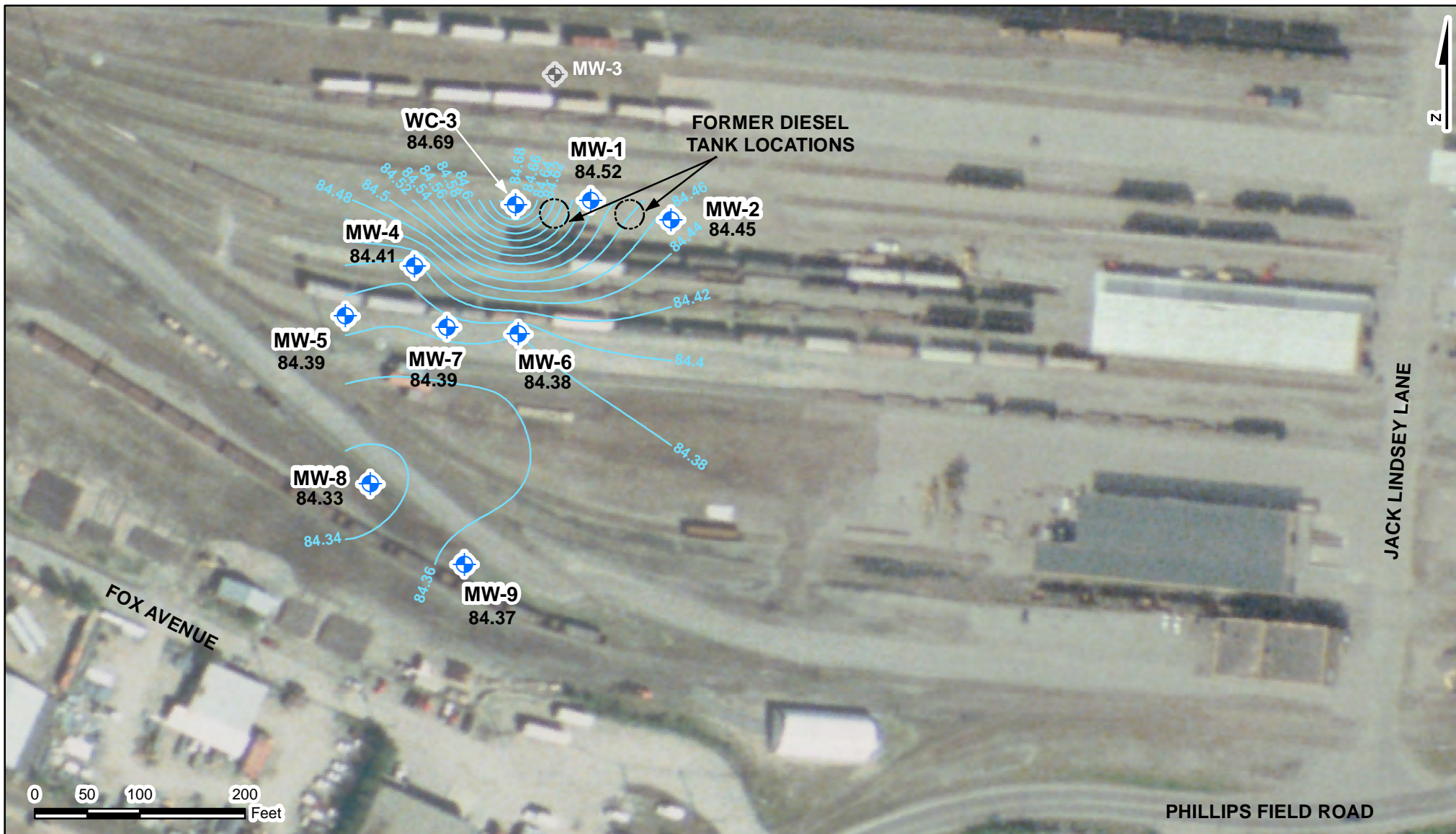
Vicinity Map

Report
Fairbanks Rail Yard
Fairbanks, Alaska

CONTRACT:
85304

FIGURE:
1

DATE:
7/13






NOTES:

1. Locations of former diesel tanks are approximate; monitoring wells were surveyed during 2012 field work. Well MW-3 could not be located.

2. Sources: Aerial Imagery was provided by Alaska Mapped (UAF-GINA/SDMI <http://alaskamapped.org/bdl>).

LEGEND:

-  Existing Monitoring Well
-  Well Location Unknown
-  Groundwater Contour (0.2 foot)

Fairbanks Environmental Services
3538 International Street
Fairbanks, Alaska 99701



ALASKA RAILROAD
CORPORATION

Site Map

Report
Fairbanks Rail Yard
Fairbanks, Alaska

CONTRACT:
85304

FIGURE:
2

DATE:
7/13

APPENDIX A
LABORATORY REPORT

Laboratory Report of Analysis

To: AK Railroad Corp
2400 Spenard Road, Suite 300
Anchorage, AK 99503
(907)277-7111

Report Number: **1132693**

Client Project: **Fairbanks Rail Yard**

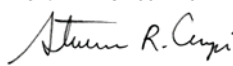
Dear Mike Boese,

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 five 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 Steve 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
Project Manager

Steven Crupi
2013.07.08
14:44:34 -08'00'

Steve Crupi
Project Manager
steven.crupi@sgs.com

Date

Print Date: 07/03/2013 3:48:13PM

Case Narrative

SGS Client: **AK Railroad Corp**
 SGS Project: **1132693**
 Project Name/Site: **Fairbanks Rail Yard**
 Project Contact: **Mike Boese**

Refer to sample receipt form for information on sample condition.

MW-2 (1132693001) PS

AK102 - The pattern is consistent with a weathered middle distillate.
 AK103 - Unknown hydrocarbon with several peaks is present.

MW-4 (1132693002) PS

AK102 - The pattern is consistent with a weathered middle distillate.
 AK103 - Unknown hydrocarbon with several peaks is present.

MW-5 (1132693003) PS

AK102 - The pattern is consistent with a weathered middle distillate.

MW-6 (1132693004) PS

AK102 - The pattern is consistent with a weathered middle distillate.
 AK103 - Unknown hydrocarbon with several peaks is present.

MW-7 (1132693005) PS

AK102 - The pattern is consistent with a weathered middle distillate.
 AK103 - Unknown hydrocarbon with several peaks is present.

MW-X (1132693006) PS

AK102 - The pattern is consistent with a weathered middle distillate.
 AK103 - Unknown hydrocarbon with several peaks is present.

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

Print Date: 07/03/2013 3:48:14PM

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. If you have any questions regarding this report, or if we can be of any other assistance, please contact your SGS Project Manager at 907-562-2343. All work is provided under SGS general terms and conditions (<http://www.sgs.com/terms_and_conditions.htm>), unless other written agreements have been accepted by both parties.

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) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020A, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035B, 6020, 7470A, 7471B, 8021B, 8082A, 8260B, 8270D, 8270D-SIM, 9040B, 9045C, 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	Continuing Calibration Verification
CL	Control Limit
D	The analyte concentration is the result of a dilution.
DF	Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
F	Indicates value that is greater than or equal to the DL
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
JL	The analyte was positively identified, but the quantitation is a low estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LOD	Limit of Detection (i.e., 2xDL)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
M	A matrix effect was present.
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
Q	QC parameter out of acceptance range.
R	Rejected
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.

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
MW-2	1132693001	06/24/2013	06/27/2013	Water (Surface, Eff., Ground)
MW-4	1132693002	06/24/2013	06/27/2013	Water (Surface, Eff., Ground)
MW-5	1132693003	06/25/2013	06/27/2013	Water (Surface, Eff., Ground)
MW-6	1132693004	06/25/2013	06/27/2013	Water (Surface, Eff., Ground)
MW-7	1132693005	06/25/2013	06/27/2013	Water (Surface, Eff., Ground)
MW-X	1132693006	06/25/2013	06/27/2013	Water (Surface, Eff., Ground)
MW-8	1132693007	06/25/2013	06/27/2013	Water (Surface, Eff., Ground)
MW-9	1132693008	06/25/2013	06/27/2013	Water (Surface, Eff., Ground)
Trip Blank	1132693009	06/24/2013	06/27/2013	Water (Surface, Eff., Ground)

<u>Method</u>	<u>Method Description</u>
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.
AK102	DRO/RRO Low Volume Water
AK103	DRO/RRO Low Volume Water

Print Date: 07/03/2013 3:48:15PM

Detectable Results Summary

Client Sample ID: **MW-2**
 Lab Sample ID: 1132693001
Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	19.9	mg/L
Residual Range Organics	2.11	mg/L
Benzene	23.9	ug/L
Ethylbenzene	5.59	ug/L
Gasoline Range Organics	0.384	mg/L
o-Xylene	9.02	ug/L
P & M -Xylene	18.0	ug/L
Toluene	0.330J	ug/L

Client Sample ID: **MW-4**
 Lab Sample ID: 1132693002
Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	9.39	mg/L
Residual Range Organics	1.00	mg/L
Benzene	0.250J	ug/L
Ethylbenzene	8.22	ug/L
Gasoline Range Organics	0.244	mg/L
o-Xylene	6.47	ug/L
P & M -Xylene	16.1	ug/L

Client Sample ID: **MW-5**
 Lab Sample ID: 1132693003
Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	1.61	mg/L
Residual Range Organics	0.484J	mg/L
Gasoline Range Organics	0.0459J	mg/L

Client Sample ID: **MW-6**
 Lab Sample ID: 1132693004
Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	5.46	mg/L
Residual Range Organics	0.813	mg/L
Benzene	5.77	ug/L
Ethylbenzene	4.86	ug/L
Gasoline Range Organics	0.225	mg/L
o-Xylene	6.27	ug/L
P & M -Xylene	12.3	ug/L

Client Sample ID: **MW-7**
 Lab Sample ID: 1132693005
Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	10.5	mg/L
Residual Range Organics	1.46	mg/L
Benzene	1.26	ug/L
Ethylbenzene	0.360J	ug/L
Gasoline Range Organics	0.109	mg/L
o-Xylene	0.440J	ug/L
P & M -Xylene	1.26J	ug/L
Toluene	0.630J	ug/L

Detectable Results Summary

Client Sample ID: **MW-X**
 Lab Sample ID: 1132693006
Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	7.15	mg/L
Residual Range Organics	1.04	mg/L
Benzene	1.22	ug/L
Ethylbenzene	0.390J	ug/L
Gasoline Range Organics	0.114	mg/L
o-Xylene	0.450J	ug/L
P & M -Xylene	1.25J	ug/L
Toluene	0.710J	ug/L

Client Sample ID: **MW-8**
 Lab Sample ID: 1132693007
Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Residual Range Organics	0.267J	mg/L

Client Sample ID: **MW-9**
 Lab Sample ID: 1132693008
Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Residual Range Organics	0.165J	mg/L

Results of MW-2

Client Sample ID: **MW-2**
 Client Project ID: **Fairbanks Rail Yard**
 Lab Sample ID: 1132693001
 Lab Project ID: 1132693

Collection Date: 06/24/13 12:05
 Received Date: 06/27/13 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics	19.9		0.625	0.188	mg/L	1	07/03/13 05:47
Surrogates							
5a Androstane	81.6		50-150		%	1	07/03/13 05:47

Batch Information

Analytical Batch: XFC10945
 Analytical Method: AK102
 Analyst: EAB
 Analytical Date/Time: 07/03/13 05:47
 Container ID: 1132693001-D

Prep Batch: XXX29293
 Prep Method: SW3520C
 Prep Date/Time: 07/01/13 10:25
 Prep Initial Wt./Vol.: 240 mL
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Residual Range Organics	2.11		0.521	0.156	mg/L	1	07/03/13 05:47
Surrogates							
n-Triacontane-d62	83.5		50-150		%	1	07/03/13 05:47

Batch Information

Analytical Batch: XFC10945
 Analytical Method: AK103
 Analyst: EAB
 Analytical Date/Time: 07/03/13 05:47
 Container ID: 1132693001-D

Prep Batch: XXX29293
 Prep Method: SW3520C
 Prep Date/Time: 07/01/13 10:25
 Prep Initial Wt./Vol.: 240 mL
 Prep Extract Vol: 1 mL

Print Date: 07/03/2013 3:48:16PM

Results of MW-2

Client Sample ID: **MW-2**
 Client Project ID: **Fairbanks Rail Yard**
 Lab Sample ID: 1132693001
 Lab Project ID: 1132693

Collection Date: 06/24/13 12:05
 Received Date: 06/27/13 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):

Results by Volatile Fuels

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Gasoline Range Organics	0.384		0.100	0.0310	mg/L	1	07/02/13 15:15

Surrogates

4-Bromofluorobenzene	90.2		50-150		%	1	07/02/13 15:15
----------------------	------	--	--------	--	---	---	----------------

Batch Information

Analytical Batch: VFC11487
 Analytical Method: AK101
 Analyst: ST
 Analytical Date/Time: 07/02/13 15:15
 Container ID: 1132693001-A

Prep Batch: VXX24884
 Prep Method: SW5030B
 Prep Date/Time: 07/02/13 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Benzene	23.9		0.500	0.150	ug/L	1	07/02/13 15:15
Ethylbenzene	5.59		1.00	0.310	ug/L	1	07/02/13 15:15
o-Xylene	9.02		1.00	0.310	ug/L	1	07/02/13 15:15
P & M -Xylene	18.0		2.00	0.620	ug/L	1	07/02/13 15:15
Toluene	0.330	J	1.00	0.310	ug/L	1	07/02/13 15:15

Surrogates

1,4-Difluorobenzene	97		77-115		%	1	07/02/13 15:15
---------------------	----	--	--------	--	---	---	----------------

Batch Information

Analytical Batch: VFC11487
 Analytical Method: SW8021B
 Analyst: ST
 Analytical Date/Time: 07/02/13 15:15
 Container ID: 1132693001-A

Prep Batch: VXX24884
 Prep Method: SW5030B
 Prep Date/Time: 07/02/13 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of MW-4

Client Sample ID: **MW-4**
 Client Project ID: **Fairbanks Rail Yard**
 Lab Sample ID: 1132693002
 Lab Project ID: 1132693

Collection Date: 06/24/13 13:50
 Received Date: 06/27/13 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics	9.39		0.577	0.173	mg/L	1	07/03/13 06:07
Surrogates							
5a Androstane	89.7		50-150		%	1	07/03/13 06:07

Batch Information

Analytical Batch: XFC10945
 Analytical Method: AK102
 Analyst: EAB
 Analytical Date/Time: 07/03/13 06:07
 Container ID: 1132693002-D

Prep Batch: XXX29293
 Prep Method: SW3520C
 Prep Date/Time: 07/01/13 10:25
 Prep Initial Wt./Vol.: 260 mL
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Residual Range Organics	1.00		0.481	0.144	mg/L	1	07/03/13 06:07
Surrogates							
n-Triacontane-d62	90.6		50-150		%	1	07/03/13 06:07

Batch Information

Analytical Batch: XFC10945
 Analytical Method: AK103
 Analyst: EAB
 Analytical Date/Time: 07/03/13 06:07
 Container ID: 1132693002-D

Prep Batch: XXX29293
 Prep Method: SW3520C
 Prep Date/Time: 07/01/13 10:25
 Prep Initial Wt./Vol.: 260 mL
 Prep Extract Vol: 1 mL

Print Date: 07/03/2013 3:48:16PM

Results of MW-4

Client Sample ID: **MW-4**
 Client Project ID: **Fairbanks Rail Yard**
 Lab Sample ID: 1132693002
 Lab Project ID: 1132693

Collection Date: 06/24/13 13:50
 Received Date: 06/27/13 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):

Results by Volatile Fuels

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Gasoline Range Organics	0.244		0.100	0.0310	mg/L	1	07/02/13 15:33

Surrogates

4-Bromofluorobenzene	110		50-150		%	1	07/02/13 15:33
----------------------	-----	--	--------	--	---	---	----------------

Batch Information

Analytical Batch: VFC11487
 Analytical Method: AK101
 Analyst: ST
 Analytical Date/Time: 07/02/13 15:33
 Container ID: 1132693002-A

Prep Batch: VXX24884
 Prep Method: SW5030B
 Prep Date/Time: 07/02/13 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Benzene	0.250	J	0.500	0.150	ug/L	1	07/02/13 15:33
Ethylbenzene	8.22		1.00	0.310	ug/L	1	07/02/13 15:33
o-Xylene	6.47		1.00	0.310	ug/L	1	07/02/13 15:33
P & M -Xylene	16.1		2.00	0.620	ug/L	1	07/02/13 15:33
Toluene	0.620	U	1.00	0.310	ug/L	1	07/02/13 15:33

Surrogates

1,4-Difluorobenzene	96.2		77-115		%	1	07/02/13 15:33
---------------------	------	--	--------	--	---	---	----------------

Batch Information

Analytical Batch: VFC11487
 Analytical Method: SW8021B
 Analyst: ST
 Analytical Date/Time: 07/02/13 15:33
 Container ID: 1132693002-A

Prep Batch: VXX24884
 Prep Method: SW5030B
 Prep Date/Time: 07/02/13 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of MW-5

Client Sample ID: **MW-5**
 Client Project ID: **Fairbanks Rail Yard**
 Lab Sample ID: 1132693003
 Lab Project ID: 1132693

Collection Date: 06/25/13 08:55
 Received Date: 06/27/13 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics	1.61		0.625	0.188	mg/L	1	07/03/13 06:27
Surrogates							
5a Androstane	82.2		50-150		%	1	07/03/13 06:27

Batch Information

Analytical Batch: XFC10945
 Analytical Method: AK102
 Analyst: EAB
 Analytical Date/Time: 07/03/13 06:27
 Container ID: 1132693003-D

Prep Batch: XXX29293
 Prep Method: SW3520C
 Prep Date/Time: 07/01/13 10:25
 Prep Initial Wt./Vol.: 240 mL
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Residual Range Organics	0.484	J	0.521	0.156	mg/L	1	07/03/13 06:27
Surrogates							
n-Triacontane-d62	86.2		50-150		%	1	07/03/13 06:27

Batch Information

Analytical Batch: XFC10945
 Analytical Method: AK103
 Analyst: EAB
 Analytical Date/Time: 07/03/13 06:27
 Container ID: 1132693003-D

Prep Batch: XXX29293
 Prep Method: SW3520C
 Prep Date/Time: 07/01/13 10:25
 Prep Initial Wt./Vol.: 240 mL
 Prep Extract Vol: 1 mL

Print Date: 07/03/2013 3:48:16PM

Results of MW-5

Client Sample ID: **MW-5**
 Client Project ID: **Fairbanks Rail Yard**
 Lab Sample ID: 1132693003
 Lab Project ID: 1132693

Collection Date: 06/25/13 08:55
 Received Date: 06/27/13 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):

Results by Volatile Fuels

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Gasoline Range Organics	0.0459	J	0.100	0.0310	mg/L	1	07/02/13 13:05

Surrogates

4-Bromofluorobenzene	91.5		50-150		%	1	07/02/13 13:05
----------------------	------	--	--------	--	---	---	----------------

Batch Information

Analytical Batch: VFC11487
 Analytical Method: AK101
 Analyst: ST
 Analytical Date/Time: 07/02/13 13:05
 Container ID: 1132693003-A

Prep Batch: VXX24884
 Prep Method: SW5030B
 Prep Date/Time: 07/02/13 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Benzene	0.300	U	0.500	0.150	ug/L	1	07/02/13 13:05
Ethylbenzene	0.620	U	1.00	0.310	ug/L	1	07/02/13 13:05
o-Xylene	0.620	U	1.00	0.310	ug/L	1	07/02/13 13:05
P & M -Xylene	1.24	U	2.00	0.620	ug/L	1	07/02/13 13:05
Toluene	0.620	U	1.00	0.310	ug/L	1	07/02/13 13:05

Surrogates

1,4-Difluorobenzene	97.2		77-115		%	1	07/02/13 13:05
---------------------	------	--	--------	--	---	---	----------------

Batch Information

Analytical Batch: VFC11487
 Analytical Method: SW8021B
 Analyst: ST
 Analytical Date/Time: 07/02/13 13:05
 Container ID: 1132693003-A

Prep Batch: VXX24884
 Prep Method: SW5030B
 Prep Date/Time: 07/02/13 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of MW-6

Client Sample ID: **MW-6**
 Client Project ID: **Fairbanks Rail Yard**
 Lab Sample ID: 1132693004
 Lab Project ID: 1132693

Collection Date: 06/25/13 06:45
 Received Date: 06/27/13 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics	5.46		0.625	0.188	mg/L	1	07/03/13 06:48
Surrogates							
5a Androstane	79.7		50-150		%	1	07/03/13 06:48

Batch Information

Analytical Batch: XFC10945
 Analytical Method: AK102
 Analyst: EAB
 Analytical Date/Time: 07/03/13 06:48
 Container ID: 1132693004-D

Prep Batch: XXX29293
 Prep Method: SW3520C
 Prep Date/Time: 07/01/13 10:25
 Prep Initial Wt./Vol.: 240 mL
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Residual Range Organics	0.813		0.521	0.156	mg/L	1	07/03/13 06:48
Surrogates							
n-Triacontane-d62	83.1		50-150		%	1	07/03/13 06:48

Batch Information

Analytical Batch: XFC10945
 Analytical Method: AK103
 Analyst: EAB
 Analytical Date/Time: 07/03/13 06:48
 Container ID: 1132693004-D

Prep Batch: XXX29293
 Prep Method: SW3520C
 Prep Date/Time: 07/01/13 10:25
 Prep Initial Wt./Vol.: 240 mL
 Prep Extract Vol: 1 mL

Print Date: 07/03/2013 3:48:16PM

Results of MW-6

Client Sample ID: **MW-6**
 Client Project ID: **Fairbanks Rail Yard**
 Lab Sample ID: 1132693004
 Lab Project ID: 1132693

Collection Date: 06/25/13 06:45
 Received Date: 06/27/13 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):

Results by Volatile Fuels

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Gasoline Range Organics	0.225		0.100	0.0310	mg/L	1	07/02/13 13:24

Surrogates

4-Bromofluorobenzene	94		50-150		%	1	07/02/13 13:24
----------------------	----	--	--------	--	---	---	----------------

Batch Information

Analytical Batch: VFC11487
 Analytical Method: AK101
 Analyst: ST
 Analytical Date/Time: 07/02/13 13:24
 Container ID: 1132693004-A

Prep Batch: VXX24884
 Prep Method: SW5030B
 Prep Date/Time: 07/02/13 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Benzene	5.77		0.500	0.150	ug/L	1	07/02/13 13:24
Ethylbenzene	4.86		1.00	0.310	ug/L	1	07/02/13 13:24
o-Xylene	6.27		1.00	0.310	ug/L	1	07/02/13 13:24
P & M -Xylene	12.3		2.00	0.620	ug/L	1	07/02/13 13:24
Toluene	0.620	U	1.00	0.310	ug/L	1	07/02/13 13:24

Surrogates

1,4-Difluorobenzene	94.8		77-115		%	1	07/02/13 13:24
---------------------	------	--	--------	--	---	---	----------------

Batch Information

Analytical Batch: VFC11487
 Analytical Method: SW8021B
 Analyst: ST
 Analytical Date/Time: 07/02/13 13:24
 Container ID: 1132693004-A

Prep Batch: VXX24884
 Prep Method: SW5030B
 Prep Date/Time: 07/02/13 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of MW-7

Client Sample ID: **MW-7**
 Client Project ID: **Fairbanks Rail Yard**
 Lab Sample ID: 1132693005
 Lab Project ID: 1132693

Collection Date: 06/25/13 07:40
 Received Date: 06/27/13 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics	10.5		0.612	0.184	mg/L	1	07/03/13 07:09
Surrogates							
5a Androstane	77.5		50-150		%	1	07/03/13 07:09

Batch Information

Analytical Batch: XFC10945
 Analytical Method: AK102
 Analyst: EAB
 Analytical Date/Time: 07/03/13 07:09
 Container ID: 1132693005-D

Prep Batch: XXX29293
 Prep Method: SW3520C
 Prep Date/Time: 07/01/13 10:25
 Prep Initial Wt./Vol.: 245 mL
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Residual Range Organics	1.46		0.510	0.153	mg/L	1	07/03/13 07:09
Surrogates							
n-Triacontane-d62	80.4		50-150		%	1	07/03/13 07:09

Batch Information

Analytical Batch: XFC10945
 Analytical Method: AK103
 Analyst: EAB
 Analytical Date/Time: 07/03/13 07:09
 Container ID: 1132693005-D

Prep Batch: XXX29293
 Prep Method: SW3520C
 Prep Date/Time: 07/01/13 10:25
 Prep Initial Wt./Vol.: 245 mL
 Prep Extract Vol: 1 mL

Print Date: 07/03/2013 3:48:16PM

Results of MW-7

Client Sample ID: **MW-7**
 Client Project ID: **Fairbanks Rail Yard**
 Lab Sample ID: 1132693005
 Lab Project ID: 1132693

Collection Date: 06/25/13 07:40
 Received Date: 06/27/13 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):

Results by Volatile Fuels

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Gasoline Range Organics	0.109		0.100	0.0310	mg/L	1	07/02/13 14:56

Surrogates

4-Bromofluorobenzene	82.8		50-150		%	1	07/02/13 14:56
----------------------	------	--	--------	--	---	---	----------------

Batch Information

Analytical Batch: VFC11487
 Analytical Method: AK101
 Analyst: ST
 Analytical Date/Time: 07/02/13 14:56
 Container ID: 1132693005-A

Prep Batch: VXX24884
 Prep Method: SW5030B
 Prep Date/Time: 07/02/13 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Benzene	1.26		0.500	0.150	ug/L	1	07/02/13 14:56
Ethylbenzene	0.360	J	1.00	0.310	ug/L	1	07/02/13 14:56
o-Xylene	0.440	J	1.00	0.310	ug/L	1	07/02/13 14:56
P & M -Xylene	1.26	J	2.00	0.620	ug/L	1	07/02/13 14:56
Toluene	0.630	J	1.00	0.310	ug/L	1	07/02/13 14:56

Surrogates

1,4-Difluorobenzene	92.8		77-115		%	1	07/02/13 14:56
---------------------	------	--	--------	--	---	---	----------------

Batch Information

Analytical Batch: VFC11487
 Analytical Method: SW8021B
 Analyst: ST
 Analytical Date/Time: 07/02/13 14:56
 Container ID: 1132693005-A

Prep Batch: VXX24884
 Prep Method: SW5030B
 Prep Date/Time: 07/02/13 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of MW-X

Client Sample ID: **MW-X**
 Client Project ID: **Fairbanks Rail Yard**
 Lab Sample ID: 1132693006
 Lab Project ID: 1132693

Collection Date: 06/25/13 07:55
 Received Date: 06/27/13 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics	7.15		0.625	0.188	mg/L	1	07/03/13 07:30
Surrogates							
5a Androstane	66.3		50-150		%	1	07/03/13 07:30

Batch Information

Analytical Batch: XFC10945
 Analytical Method: AK102
 Analyst: EAB
 Analytical Date/Time: 07/03/13 07:30
 Container ID: 1132693006-D

Prep Batch: XXX29293
 Prep Method: SW3520C
 Prep Date/Time: 07/01/13 10:25
 Prep Initial Wt./Vol.: 240 mL
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Residual Range Organics	1.04		0.521	0.156	mg/L	1	07/03/13 07:30
Surrogates							
n-Triacontane-d62	68.2		50-150		%	1	07/03/13 07:30

Batch Information

Analytical Batch: XFC10945
 Analytical Method: AK103
 Analyst: EAB
 Analytical Date/Time: 07/03/13 07:30
 Container ID: 1132693006-D

Prep Batch: XXX29293
 Prep Method: SW3520C
 Prep Date/Time: 07/01/13 10:25
 Prep Initial Wt./Vol.: 240 mL
 Prep Extract Vol: 1 mL

Print Date: 07/03/2013 3:48:16PM

Results of MW-X

Client Sample ID: **MW-X**
 Client Project ID: **Fairbanks Rail Yard**
 Lab Sample ID: 1132693006
 Lab Project ID: 1132693

Collection Date: 06/25/13 07:55
 Received Date: 06/27/13 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):

Results by Volatile Fuels

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Gasoline Range Organics	0.114		0.100	0.0310	mg/L	1	07/02/13 14:38

Surrogates

4-Bromofluorobenzene	91.5		50-150		%	1	07/02/13 14:38
----------------------	------	--	--------	--	---	---	----------------

Batch Information

Analytical Batch: VFC11487
 Analytical Method: AK101
 Analyst: ST
 Analytical Date/Time: 07/02/13 14:38
 Container ID: 1132693006-A

Prep Batch: VXX24884
 Prep Method: SW5030B
 Prep Date/Time: 07/02/13 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Benzene	1.22		0.500	0.150	ug/L	1	07/02/13 14:38
Ethylbenzene	0.390	J	1.00	0.310	ug/L	1	07/02/13 14:38
o-Xylene	0.450	J	1.00	0.310	ug/L	1	07/02/13 14:38
P & M -Xylene	1.25	J	2.00	0.620	ug/L	1	07/02/13 14:38
Toluene	0.710	J	1.00	0.310	ug/L	1	07/02/13 14:38

Surrogates

1,4-Difluorobenzene	94.4		77-115		%	1	07/02/13 14:38
---------------------	------	--	--------	--	---	---	----------------

Batch Information

Analytical Batch: VFC11487
 Analytical Method: SW8021B
 Analyst: ST
 Analytical Date/Time: 07/02/13 14:38
 Container ID: 1132693006-A

Prep Batch: VXX24884
 Prep Method: SW5030B
 Prep Date/Time: 07/02/13 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of MW-8

Client Sample ID: **MW-8**
 Client Project ID: **Fairbanks Rail Yard**
 Lab Sample ID: 1132693007
 Lab Project ID: 1132693

Collection Date: 06/25/13 11:55
 Received Date: 06/27/13 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.368	U	0.612	0.184	mg/L	1	07/03/13 07:51
Surrogates							
5a Androstane	78.2		50-150		%	1	07/03/13 07:51

Batch Information

Analytical Batch: XFC10945
 Analytical Method: AK102
 Analyst: EAB
 Analytical Date/Time: 07/03/13 07:51
 Container ID: 1132693007-D

Prep Batch: XXX29293
 Prep Method: SW3520C
 Prep Date/Time: 07/01/13 10:25
 Prep Initial Wt./Vol.: 245 mL
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Residual Range Organics	0.267	J	0.510	0.153	mg/L	1	07/03/13 07:51
Surrogates							
n-Triacontane-d62	80.6		50-150		%	1	07/03/13 07:51

Batch Information

Analytical Batch: XFC10945
 Analytical Method: AK103
 Analyst: EAB
 Analytical Date/Time: 07/03/13 07:51
 Container ID: 1132693007-D

Prep Batch: XXX29293
 Prep Method: SW3520C
 Prep Date/Time: 07/01/13 10:25
 Prep Initial Wt./Vol.: 245 mL
 Prep Extract Vol: 1 mL

Print Date: 07/03/2013 3:48:16PM

Results of MW-8

Client Sample ID: **MW-8**
 Client Project ID: **Fairbanks Rail Yard**
 Lab Sample ID: 1132693007
 Lab Project ID: 1132693

Collection Date: 06/25/13 11:55
 Received Date: 06/27/13 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):

Results by Volatile Fuels

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Gasoline Range Organics	0.0620	U	0.100	0.0310	mg/L	1	07/02/13 13:42

Surrogates

4-Bromofluorobenzene	89.3		50-150		%	1	07/02/13 13:42
----------------------	------	--	--------	--	---	---	----------------

Batch Information

Analytical Batch: VFC11487
 Analytical Method: AK101
 Analyst: ST
 Analytical Date/Time: 07/02/13 13:42
 Container ID: 1132693007-A

Prep Batch: VXX24884
 Prep Method: SW5030B
 Prep Date/Time: 07/02/13 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Benzene	0.300	U	0.500	0.150	ug/L	1	07/02/13 13:42
Ethylbenzene	0.620	U	1.00	0.310	ug/L	1	07/02/13 13:42
o-Xylene	0.620	U	1.00	0.310	ug/L	1	07/02/13 13:42
P & M -Xylene	1.24	U	2.00	0.620	ug/L	1	07/02/13 13:42
Toluene	0.620	U	1.00	0.310	ug/L	1	07/02/13 13:42

Surrogates

1,4-Difluorobenzene	97.4		77-115		%	1	07/02/13 13:42
---------------------	------	--	--------	--	---	---	----------------

Batch Information

Analytical Batch: VFC11487
 Analytical Method: SW8021B
 Analyst: ST
 Analytical Date/Time: 07/02/13 13:42
 Container ID: 1132693007-A

Prep Batch: VXX24884
 Prep Method: SW5030B
 Prep Date/Time: 07/02/13 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of MW-9

Client Sample ID: **MW-9**
 Client Project ID: **Fairbanks Rail Yard**
 Lab Sample ID: 1132693008
 Lab Project ID: 1132693

Collection Date: 06/25/13 10:55
 Received Date: 06/27/13 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.382	U	0.638	0.191	mg/L	1	07/03/13 08:12
Surrogates							
5a Androstane	79.8		50-150		%	1	07/03/13 08:12

Batch Information

Analytical Batch: XFC10945
 Analytical Method: AK102
 Analyst: EAB
 Analytical Date/Time: 07/03/13 08:12
 Container ID: 1132693008-D

Prep Batch: XXX29293
 Prep Method: SW3520C
 Prep Date/Time: 07/01/13 10:25
 Prep Initial Wt./Vol.: 235 mL
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Residual Range Organics	0.165	J	0.532	0.160	mg/L	1	07/03/13 08:12
Surrogates							
n-Triacontane-d62	82.6		50-150		%	1	07/03/13 08:12

Batch Information

Analytical Batch: XFC10945
 Analytical Method: AK103
 Analyst: EAB
 Analytical Date/Time: 07/03/13 08:12
 Container ID: 1132693008-D

Prep Batch: XXX29293
 Prep Method: SW3520C
 Prep Date/Time: 07/01/13 10:25
 Prep Initial Wt./Vol.: 235 mL
 Prep Extract Vol: 1 mL

Print Date: 07/03/2013 3:48:16PM

Results of MW-9

Client Sample ID: **MW-9**
 Client Project ID: **Fairbanks Rail Yard**
 Lab Sample ID: 1132693008
 Lab Project ID: 1132693

Collection Date: 06/25/13 10:55
 Received Date: 06/27/13 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):

Results by Volatile Fuels

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Gasoline Range Organics	0.0620	U	0.100	0.0310	mg/L	1	07/02/13 12:46

Surrogates

4-Bromofluorobenzene	82.7		50-150		%	1	07/02/13 12:46
----------------------	------	--	--------	--	---	---	----------------

Batch Information

Analytical Batch: VFC11487
 Analytical Method: AK101
 Analyst: ST
 Analytical Date/Time: 07/02/13 12:46
 Container ID: 1132693008-A

Prep Batch: VXX24884
 Prep Method: SW5030B
 Prep Date/Time: 07/02/13 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Benzene	0.300	U	0.500	0.150	ug/L	1	07/02/13 12:46
Ethylbenzene	0.620	U	1.00	0.310	ug/L	1	07/02/13 12:46
o-Xylene	0.620	U	1.00	0.310	ug/L	1	07/02/13 12:46
P & M -Xylene	1.24	U	2.00	0.620	ug/L	1	07/02/13 12:46
Toluene	0.620	U	1.00	0.310	ug/L	1	07/02/13 12:46

Surrogates

1,4-Difluorobenzene	96.9		77-115		%	1	07/02/13 12:46
---------------------	------	--	--------	--	---	---	----------------

Batch Information

Analytical Batch: VFC11487
 Analytical Method: SW8021B
 Analyst: ST
 Analytical Date/Time: 07/02/13 12:46
 Container ID: 1132693008-A

Prep Batch: VXX24884
 Prep Method: SW5030B
 Prep Date/Time: 07/02/13 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of Trip Blank

Client Sample ID: **Trip Blank**
 Client Project ID: **Fairbanks Rail Yard**
 Lab Sample ID: 1132693009
 Lab Project ID: 1132693

Collection Date: 06/24/13 08:00
 Received Date: 06/27/13 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):

Results by Volatile Fuels

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Gasoline Range Organics	0.0620	U	0.100	0.0310	mg/L	1	07/02/13 16:48

Surrogates

4-Bromofluorobenzene	86.8		50-150		%	1	07/02/13 16:48
----------------------	------	--	--------	--	---	---	----------------

Batch Information

Analytical Batch: VFC11487
 Analytical Method: AK101
 Analyst: ST
 Analytical Date/Time: 07/02/13 16:48
 Container ID: 1132693009-A

Prep Batch: VXX24884
 Prep Method: SW5030B
 Prep Date/Time: 07/02/13 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Benzene	0.300	U	0.500	0.150	ug/L	1	07/02/13 16:48
Ethylbenzene	0.620	U	1.00	0.310	ug/L	1	07/02/13 16:48
o-Xylene	0.620	U	1.00	0.310	ug/L	1	07/02/13 16:48
P & M -Xylene	1.24	U	2.00	0.620	ug/L	1	07/02/13 16:48
Toluene	0.620	U	1.00	0.310	ug/L	1	07/02/13 16:48

Surrogates

1,4-Difluorobenzene	97.6		77-115		%	1	07/02/13 16:48
---------------------	------	--	--------	--	---	---	----------------

Batch Information

Analytical Batch: VFC11487
 Analytical Method: SW8021B
 Analyst: ST
 Analytical Date/Time: 07/02/13 16:48
 Container ID: 1132693009-A

Prep Batch: VXX24884
 Prep Method: SW5030B
 Prep Date/Time: 07/02/13 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1458366 [VXX/24884]
Blank Lab ID: 1156965

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1132693001, 1132693002, 1132693003, 1132693004, 1132693005, 1132693006, 1132693007, 1132693008, 1132693009

Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	0.0620U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene	92.7	50-150		%

Batch Information

Analytical Batch: VFC11487
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 7/2/2013 9:41:00AM

Prep Batch: VXX24884
Prep Method: SW5030B
Prep Date/Time: 7/2/2013 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 07/03/2013 3:48:18PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1132693 [VXX24884]
 Blank Spike Lab ID: 1156968
 Date Analyzed: 07/02/2013 10:37

Spike Duplicate ID: LCSD for HBN 1132693 [VXX24884]
 Spike Duplicate Lab ID: 1156969
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1132693001, 1132693002, 1132693003, 1132693004, 1132693005, 1132693006, 1132693007, 1132693008, 1132693009

Results by AK101

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	1.00	0.922	92	1.00	1.01	101	(60-120)	8.70	(< 20)
Surrogates									
4-Bromofluorobenzene	0.0500	96.7	97	0.0500	89.9	90	(50-150)	7.30	

Batch Information

Analytical Batch: VFC11487
 Analytical Method: AK101
 Instrument: Agilent 7890 PID/FID
 Analyst: ST

Prep Batch: VXX24884
 Prep Method: SW5030B
 Prep Date/Time: 07/02/2013 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: 07/03/2013 3:48:19PM

Method Blank

Blank ID: MB for HBN 1458366 [VXX/24884]
Blank Lab ID: 1156965

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1132693001, 1132693002, 1132693003, 1132693004, 1132693005, 1132693006, 1132693007, 1132693008, 1132693009

Results by SW8021B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.300U	0.500	0.150	ug/L
Ethylbenzene	0.620U	1.00	0.310	ug/L
o-Xylene	0.620U	1.00	0.310	ug/L
P & M -Xylene	1.24U	2.00	0.620	ug/L
Toluene	0.620U	1.00	0.310	ug/L
Surrogates				
1,4-Difluorobenzene	96.7	77-115		%

Batch Information

Analytical Batch: VFC11487
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 7/2/2013 9:41:00AM

Prep Batch: VXX24884
Prep Method: SW5030B
Prep Date/Time: 7/2/2013 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1132693 [VXX24884]
 Blank Spike Lab ID: 1156966
 Date Analyzed: 07/02/2013 10:18

Spike Duplicate ID: LCSD for HBN 1132693 [VXX24884]
 Spike Duplicate Lab ID: 1156967
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1132693001, 1132693002, 1132693003, 1132693004, 1132693005, 1132693006, 1132693007, 1132693008, 1132693009

Results by SW8021B

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	100	111	111	100	115	115	(80-120)	3.30	(< 20)
Ethylbenzene	100	108	108	100	111	111	(75-125)	3.30	(< 20)
o-Xylene	100	105	105	100	108	108	(80-120)	3.50	(< 20)
P & M -Xylene	200	212	106	200	221	110	(75-130)	4.00	(< 20)
Toluene	100	111	111	100	114	114	(75-120)	3.10	(< 20)
Surrogates									
1,4-Difluorobenzene	50	101	101	50	101	101	(77-115)	0.36	

Batch Information

Analytical Batch: VFC11487
 Analytical Method: SW8021B
 Instrument: Agilent 7890 PID/FID
 Analyst: ST

Prep Batch: VXX24884
 Prep Method: SW5030B
 Prep Date/Time: 07/02/2013 08:00
 Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1458165 [XXX/29293]
Blank Lab ID: 1156378

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1132693001, 1132693002, 1132693003, 1132693004, 1132693005, 1132693006, 1132693007, 1132693008

Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	0.360U	0.600	0.180	mg/L
Surrogates				
5a Androstane	86.7	60-120		%

Batch Information

Analytical Batch: XFC10945
Analytical Method: AK102
Instrument: HP 7890A FID SV E R
Analyst: EAB
Analytical Date/Time: 7/3/2013 4:44:00AM

Prep Batch: XXX29293
Prep Method: SW3520C
Prep Date/Time: 7/1/2013 10:25:00AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 07/03/2013 3:48:21PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1132693 [XXX29293]
 Blank Spike Lab ID: 1156379
 Date Analyzed: 07/03/2013 05:05

Spike Duplicate ID: LCSD for HBN 1132693 [XXX29293]
 Spike Duplicate Lab ID: 1156380
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1132693001, 1132693002, 1132693003, 1132693004, 1132693005, 1132693006, 1132693007, 1132693008

Results by AK102

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	20	17.5	88	20	16.5	83	(75-125)	5.90	(< 20)
Surrogates									
5a Androstane	0.4	89.4	89	0.4	85.8	86	(60-120)	4.10	

Batch Information

Analytical Batch: **XFC10945**
 Analytical Method: **AK102**
 Instrument: **HP 7890A** **FID SV E R**
 Analyst: **EAB**

Prep Batch: **XXX29293**
 Prep Method: **SW3520C**
 Prep Date/Time: **07/01/2013 10:25**
 Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

Print Date: 07/03/2013 3:48:21PM

Method Blank

Blank ID: MB for HBN 1458165 [XXX/29293]
Blank Lab ID: 1156378

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1132693001, 1132693002, 1132693003, 1132693004, 1132693005, 1132693006, 1132693007, 1132693008

Results by AK103

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Residual Range Organics	0.300U	0.500	0.150	mg/L
Surrogates				
n-Triacontane-d62	88.9	60-120		%

Batch Information

Analytical Batch: XFC10945
Analytical Method: AK103
Instrument: HP 7890A FID SV E R
Analyst: EAB
Analytical Date/Time: 7/3/2013 4:44:00AM

Prep Batch: XXX29293
Prep Method: SW3520C
Prep Date/Time: 7/1/2013 10:25:00AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 07/03/2013 3:48:22PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1132693 [XXX29293]
 Blank Spike Lab ID: 1156379
 Date Analyzed: 07/03/2013 05:05

Spike Duplicate ID: LCSD for HBN 1132693 [XXX29293]
 Spike Duplicate Lab ID: 1156380
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1132693001, 1132693002, 1132693003, 1132693004, 1132693005, 1132693006, 1132693007, 1132693008

Results by AK103

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Residual Range Organics	20	18.5	93	20	17.4	87	(60-120)	6.50	(< 20)
Surrogates									
n-Triacontane-d62	0.4	85.8	86	0.4	82.7	83	(60-120)	3.70	

Batch Information

Analytical Batch: **XFC10945**
 Analytical Method: **AK103**
 Instrument: **HP 7890A** **FID SV E R**
 Analyst: **EAB**

Prep Batch: **XXX29293**
 Prep Method: **SW3520C**
 Prep Date/Time: **07/01/2013 10:25**
 Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

Print Date: 07/03/2013 3:48:23PM



SGS North America Inc.
CHAIN OF CUSTODY RECORD

www.sgs.com Nationwide

1132693



www.sgs.com

CLIENT: Fairbanks Environmental Services				SGS Reference #:				page 1 of 1			
CONTACT: Mike Boese				PHONE NO: 907-452-1006							
PROJECT/SITE: Fairbanks Rail Yard (ARRC)											
REPORTS TO: Mike Boese				E-MAIL: MBoese@FESalaska.com							
INVOICE TO: ARRC				Project: ARRC							
CONTRACT NUMBER: ARRC - 265-2429											
LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX/MATRIX CODE	Preservative	MI = Multi Incremental Samples	GRAB	GRAB	GRAB	GRAB	REMARKS
1A-E	MW-2	6/24/2013	1205	Water	G						
2A-E	MW-4	6/24/2013	1350	Water	G						
3A-E	MW-5	6/25/2013	855	Water	G						
4A-E	MW-6	6/25/2013	645	Water	G						
5A-E	MW-7	6/25/2013	740	Water	G						
6A-E	MW-X	6/25/2013	755	Water	G						
7A-E	MW-8	6/25/2013	1155	Water	G						
8A-E	MW-9	6/25/2013	1055	Water	G						
9A-C	Trip Blank	6/24/2013	800	Water	G						
Collected/Relinquished By: (1)				Received By:				DOD Project? NO			
6/26/13				1345				Cooler ID 062601			
Relinquished By: (2)				Received By:				Cooler Temp °C			
Relinquished By: (3)				Received By:				Requested Turnaround Time and/or Special Instructions:			
Relinquished By: (4)				Received For Laboratory By:				Quote 10659A, Normal TAT, Bill ARRC directly (265-2429)			
6/27/13 0920				Received For Laboratory By:				Chain of Custody Seal: (Circle)			
								INTACT/BROKEN ABSENT			
								1F71B			

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

http://www.sgs.com/terms_and_conditions.htm



SAMPLE RECEIPT FORM

Review Criteria:	Condition:	Comments/Action Taken:
Were custody seals intact? Note # & location, if applicable. COC accompanied samples?	<input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No N/A	IF + IB
Temperature blank compliant* (i.e., 0-6°C after CF)? * Note: Exemption permitted for chilled samples collected less than 8 hours ago. Cooler ID: 062601 @ 0.5 w/ Therm.ID: 35 Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Note: If non-compliant, use form FS-0029 to document affected samples/analyses. If samples are 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." If temperature(s) <0°C, were all sample containers ice free?	<input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No N/A	
Delivery method (specify all that apply): Client USPS Alert Courier C&D Delivery AK Air <input checked="" type="radio"/> Lynden Carlile ERA PenAir FedEx UPS NAC Other: → For WO# with airbills, was the WO# & airbill info recorded in the Front Counter eLog?	Note ABN/ tracking # See Attached or N/A <input checked="" type="radio"/> Yes No N/A	
→ For samples received with payment, note amount (\$) and cash / check / CC (circle one) or note: → For samples received in FBKS, ANCH staff will verify all criteria are reviewed.		N/A SRF Initiated by: HZG N/A
Were samples received within hold time? Note: Refer to form F-083 "Sample Guide" for hold time information. Do samples match COC* (i.e., sample IDs, dates/times collected)? * Note: Exemption permitted if times differ <1hr; in that case, use times on COC. Were analyses requested unambiguous?	<input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No N/A	
Were samples in good condition (no leaks/cracks/breakage)? Packing material used (specify all that apply): Bubble Wrap Separate plastic bags Vermiculite Other:	<input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No N/A	
Were all VOA vials free of headspace (i.e., bubbles ≤6 mm)? Were all soil VOAs field extracted with MeOH+BFB?	<input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No N/A	
Were proper containers (type/mass/volume/preservative*) used? * Note: Exemption permitted for waters to be analyzed for metals. Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	<input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No N/A	
For special handling (e.g., "MI" or foreign soils, lab filter, limited volume, Ref Lab), were bottles/paperwork flagged (e.g., sticker)?	<input checked="" type="radio"/> Yes No N/A	
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was pH verified and compliant? If pH was adjusted, were bottles flagged (i.e., stickers)?	<input checked="" type="radio"/> Yes No N/A Yes No N/A	
For RUSH/SHORT Hold Time, were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	Yes No N/A	
For SITE-SPECIFIC QC, e.g. BMS/BMSD/BDUP, were containers / paperwork flagged accordingly?	Yes No N/A	
For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?	Yes No N/A	SRF Completed by: HZG PM = N/A
Was PEER REVIEW of sample numbering/labeling completed?	Yes No N/A	Peer Reviewed by: N/A
Additional notes (if applicable):		

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

APPENDIX B
ADEC LABORATORY DATA REVIEW CHECKLIST

Laboratory Data Review Checklist

Completed by: Vanessa Ritchie

Title: Chemist Date: July 17, 2013

CS Report Name: Groundwater Monitoring Report,
Fairbanks Rail Yard Report Date: July 2013

Fairbanks Environmental Services

Consultant Firm:

Laboratory Name: SGS – Anchorage, AK Laboratory Report Number: 1132693

ADEC File Number: 102.38.050 ADEC RecKey Number: 327

1. Laboratory

- a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?
 ☒ Yes No NA (Please explain.) Comments:

- 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 ☒ NA (Please explain.) Comments:

No samples were transferred or sub-contracted to a different laboratory.

2. Chain of Custody (COC)

- a. COC information completed, signed, and dated (including released/received by)?
 ☒ Yes No NA (Please explain.) Comments:

- b. Correct analyses requested?
 ☒ Yes No NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation

- a. Sample/cooler temperature documented and within range at receipt ($4^{\circ} \pm 2^{\circ} \text{C}$)?
 Yes ☒ No NA (Please explain.) Comments:

Cooler 062601 was received at SGS with a temperature blank (0.5°C) reading below the accepted temperature range ($4^{\circ} \pm 2^{\circ} \text{C}$). Since the temperature is above freezing temperature and the samples were reportedly received in good condition, data quality was not affected.

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

■Yes No NA (Please explain.)

Comments:

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

■Yes No NA (Please explain.)

Comments:

With exception to temperature, all samples were in acceptable 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 NA (Please explain.)

Comments:

All samples were documented to be in acceptable condition.

- e. Data quality or usability affected? (Please explain.)

Comments:

No adverse impact to data quality. The temperature blank was below acceptable range, but all samples were in good condition.

4. Case Narrative

- a. Present and understandable?

■Yes No NA (Please explain.)

Comments:

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

■Yes No NA (Please explain.)

Comments:

- c. Were all corrective actions documented?

■Yes No NA (Please explain.)

Comments:

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

Comments:

The case narrative only described the laboratory qualifications made to the data based on problems encountered during sample receiving and analysis.

5. Samples Results

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

■Yes No NA (Please explain.)

Comments:

b. All applicable holding times met?

☒ Yes No NA (Please explain.)

Comments:

c. All soils reported on a dry weight basis?

Yes No ☒ NA (Please explain.)

Comments:

No soil samples submitted or analysis.

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

☒ Yes No NA (Please explain.)

Comments:

e. Data quality or usability affected?

Comments:

Not applicable. No data adversely impacted.

6. QC Samples

a. Method Blank

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

☒ Yes No NA (Please explain.)

Comments:

ii. All method blank results less than PQL?

Yes No ☒ NA (Please explain.)

Comments:

No analytes were detected in method blank samples.

iii. If above PQL, what samples are affected?

Comments:

Not applicable. No analytes were detected in method blank samples.

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

Yes No ☒ NA (Please explain.)

Comments:

Not applicable. No analytes were detected in method blank samples.

v. Data quality or usability affected? (Please explain.)

Comments:

Not applicable. No analytes were detected in method blank 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 NA (Please explain.) Comments:

LCS and LCSD samples were performed for every analytical batch. LCS accuracy and precision was evaluated.

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

Yes No ■NA (Please explain.) Comments:

No metals or inorganics analyses were performed.

- 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 NA (Please explain.) 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 NA (Please explain.) Comments:

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

Comments:

Batch precision and accuracy were acceptable.

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

Yes No ■NA (Please explain.) Comments:

Batch precision and accuracy were acceptable. No data flags were required.

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

Comments:

Batch precision and accuracy were acceptable. No data flags were required.

c. Surrogates – Organics Only

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

■Yes No NA (Please explain.) 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 NA (Please explain.)

Comments:

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

Yes No ■NA (Please explain.)

Comments:

No samples had failed surrogate recoveries.

- iv. Data quality or usability affected? (Use the comment box to explain.)

Comments:

Data quality was not impacted. No samples had failed surrogate recoveries.

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 NA (Please explain.)

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 NA (Please explain.)

Comments:

- iii. All results less than PQL?

Yes No ■NA (Please explain.)

Comments:

No analytes were detected in the trip blank sample.

- iv. If above PQL, what samples are affected?

Comments:

No analytes were detected in the trip blank sample.

- v. Data quality or usability affected? (Please explain.)

Comments:

Data quality was not impacted. No analytes were detected in the trip blank sample.

e. Field Duplicate

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

■ Yes No NA (Please explain.)

Comments:

Sample MW-X was a field duplicate sample for project sample MW-7.

Field duplicates were collected at a minimum frequency of 10% for all analyses, per contractual requirement.

- ii. Submitted blind to lab?

■ Yes No NA (Please explain.)

Comments:

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

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

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

Yes ■ No NA (Please explain.)

Comments:

All field duplicate sample results were comparable ($\text{RPD} \leq 30\%$) to project sample results, with the exception of DRO (38%) and RRO (34%) (identified in gray highlight in the table below). The well's high level of DRO/RRO contamination is the suspected reason for the imprecision. Impact to data quality is minor as the DRO results for both field duplicate pair exceed the ADEC cleanup level by a minimum of 4 times, which is consistent with historic data for this well. Although the RRO result of the primary sample was just above the cleanup level and the duplicate result was just below the cleanup level, the cleanup level exceedance is consistent with historic data.

Analyte	Method	Units	MW-7	Qualifier	MW-X	Qualifier	RPD
GRO	AK101	mg/L	0.109		0.114		4
DRO	AK102	mg/L	10.5		7.15		38
RRO	AK103	mg/L	1.46		1.04		34
Benzene	8021B	µg/L	1.26		1.22		3
Ethylbenzene	8021B	µg/L	0.360	J	0.390	J	8
o-Xylene	8021B	µg/L	0.440	J	0.450	J	2
m,p-Xylene	8021B	µg/L	1.26	J	1.25	J	1
Toluene	8021B	µg/L	0.630	J	0.710	J	12

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

Comments:

Impact to data quality is minor. See comment above (section 6eiii).

f. Decontamination or Equipment Blank (If not used explain why).

Yes ☒ No NA (Please explain.) Comments:

Samples were collected using a peristaltic pump and new, disposable tubing at each well, so a rinsate sample was not required.

i. All results less than PQL?

Yes No ☒ NA (Please explain.) Comments:

A rinsate sample was not submitted.

ii. If above PQL, what samples are affected?

Comments:

Not applicable. A rinsate sample was not submitted.

iii. Data quality or usability affected? (Please explain.)

Comments:

Not applicable. A rinsate sample was not submitted.

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

a. Defined and appropriate?

☒ Yes No NA (Please explain.) Comments:

--