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**FAIRBANKS ENVIRONMENTAL SERVICES**

DATE: September 29, 2015

TO: Mr. Russell Grandel, Alaska Railroad Corporation

FROM: Michael Boese, Fairbanks Environmental Services

RE: 2015 Groundwater Monitoring Report  
Fairbanks Rail Yard  
Fairbanks, Alaska  
ADEC Hazard ID – 327 / File ID – 102.38.050

## EXECUTIVE SUMMARY

On September 1, 2015, eight monitoring wells were sampled by Fairbanks Environmental Services (FES) to evaluate current groundwater conditions at the Alaska Railroad Corporation (ARRC) Fairbanks Rail Yard site. Groundwater levels measured during September 2015 were similar but slightly lower than levels measured during August 2014, and were significantly higher (approximately 2.5 feet higher) than during previous sampling events in September 2012 and June 2013. Inferred groundwater flow during the 2014 and 2015 monitoring events was predominately to the west/northwest, whereas the flow direction during 2012 and 2013 was more to the southwest.

Groundwater samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), gasoline range organics (GRO), diesel range organics (DRO), and residual range organics (RRO). Analytical results from samples collected from wells MW-2, MW-4, MW-5, MW-6, MW-7, and WC-3 exceeded the Alaska Department of Environmental Conservation (ADEC) Table C groundwater cleanup level for DRO. In addition, wells MW-2, MW-7, and WC-3 exceeded the ADEC cleanup level for RRO, and wells MW-2 and MW-6 exceeded the ADEC groundwater cleanup level for benzene. Historically, cleanup level exceedances have consistently occurred in groundwater samples collected from source area wells or from wells located immediately downgradient of the source area; contaminant concentrations detected in 2015 were consistent with historical results. Contaminant concentrations in samples collected from wells MW-8 and MW-9 have remained below applicable ADEC cleanup levels indicating that groundwater contamination is not migrating in the southern direction.

Additional groundwater monitoring is recommended to further evaluate ongoing site conditions. However, due to the relative lack of changes noted in groundwater contaminant concentrations over the last decade, the sampling frequency should be reduced.

## 1.0 INTRODUCTION

### 1.1 Site Description and History

The ARRC Fairbanks Rail Yard is located off of Phillips 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 subsequent 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 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 (screened between 15 and 30 feet bgs). Product was observed in WC-2 and WC-3.
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	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). Samples from the newly installed wells exceeded cleanup levels for DRO and/or benzene. Free-phase product was consistently noted in well WC-3, and periodically in wells MW-1 and MW-2 (Hart Crowser, 2006).
2010	Groundwater Monitoring	Results from this event indicate that product was measured in wells MW-1 and WC-3 and that petroleum hydrocarbon concentrations including benzene, GRO, DRO, and RRO remain above applicable 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 concentrations exceeded ADEC groundwater cleanup levels in the sample from well MW-1 (Restoration Science & Engineering, LLC., 2011).

### Summary of Previous Investigations (Continued)

Year	Action	Description
2012-2013	Well Installation and Groundwater Monitoring	Free-phase product was measured in WC-3. Monitoring wells MW-8 and MW-9 were installed in 2012 to delineate the southern extent of the plume. 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 samples collected from wells MW-1, MW-2, and MW-7, and benzene exceeded the cleanup level in samples from MW-2 and MW-6 (FES, 2012 and 2013). In 2013, monitoring well MW-1 was found to be damaged and was not sampled.
2014	Groundwater Monitoring	Product was measured in MW-2 and WC-3. Sample results indicate that DRO concentrations exceeded cleanup levels in MW-4, MW-6, and MW-7; the RRO concentration exceeded in MW-6.

## 2.0 GROUNDWATER SAMPLE COLLECTION

Field work was performed in accordance with the ADEC approved Work Plan (FES, 2015b). Vanessa Ritchie and Josh Klynstra, ADEC qualified persons, performed groundwater sampling services.

Eight monitoring wells (MW-2, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, and WC-3) were sampled on September 1, 2015. A field duplicate sample (MW-X) was collected from MW-7. Well MW-1 was found to be damaged during 2013 and well MW-3 hasn't been located since 2010. Well locations are shown on Figure 2.

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 2 feet below the top of the water column. Groundwater parameters were collected with YSI Model 556 multi-parameter instruments equipped with a flow through cell. Turbidity readings were measured with HF Scientific MicroTPW turbidimeters. 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 on September 1, 2015 varied between approximately 10.7 feet and 13.2 feet bgs, which is similar but slightly lower (approximately 0.3 feet lower) than water levels measured in August 2014, but approximately 2.5 feet higher than water levels measured during the two previous sampling events in September 2012 and June 2013. A trace of floating product ( $\leq 0.01$  foot) was identified in WC-3, but the well was sampled anyway.

Relative groundwater elevations were used to determine flow direction. Groundwater contours for September 1, 2015, are displayed in Figure 2; inferred groundwater flow is fairly flat but, overall, trends to the west and northwest with a gradient of approximately 0.0007. The gradient and flow directions are similar to those measured during 2014. Historical water level data generally indicate a similarly flat gradient but a flow to the southwest (Clarus, 2010; Restoration Science and Engineering, 2011; FES, 2012 and 2013). Groundwater flow direction appears to be a function of water level.

Laboratory results from samples collected from wells MW-2, MW-4, MW-5, MW-6, MW-7, and WC-3 exceeded the ADEC Table C cleanup level for DRO. In addition, samples from MW-2, MW-7, and WC-3 exceeded the ADEC cleanup level for RRO and the samples from MW-2 and MW-6 exceeded the ADEC cleanup level for benzene. These results are consistent with historical data. Groundwater field parameters and laboratory results for 2015 groundwater samples 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. Approximately 21 gallons of 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, 2015b). 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 1154883. 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 issues were identified:

- GRO was detected in method blanks associated with two analytical batches at concentrations that were below the limit of quantitation (LOQ). Consequently, the GRO results in all project samples were qualified (B) because they were within 10 times the method blank concentration. Impact to data is minor as the GRO concentrations were below the ADEC groundwater cleanup level.
- Benzene was detected in the method blank associated with batch VXX27884 and in the Trip Blank. Benzene results in the following samples were within 10 times the blank concentrations and were qualified (B): MW-4, MW-5, MW-7, MW-X, MW-8, MW-9, and Trip Blank. Impact to data is minor as the affected benzene results were below the ADEC groundwater cleanup level.
- RRO concentrations in field duplicate samples MW-7/MW-X did not meet the ADEC comparison criterion of 30% and were qualified (Q). The variance in 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 RRO results for both the primary and field duplicate sample were above the ADEC cleanup level.

## 6.0 CONCLUSION AND RECOMMENDATIONS

The predominant groundwater flow direction during the two most recent sampling events (August 2014 and September 2015) was to the west and northwest with a flat gradient; inferred flow direction during previous events (2012 and 2013) was to the southwest. The variation in flow direction may be the result of a high water table. Water levels measured in September 2015 were similar but slightly lower than water levels measured in August 2014, but were significantly higher (approximately 2.5 feet higher) than water levels in September 2012 and June 2013.

A trace of free-phase product was observed in source area well WC-3. Petroleum hydrocarbons, particularly DRO and RRO, still exceed applicable ADEC groundwater cleanup levels in several wells at the site, especially in those closest to the former ASTs. Although the northern and western extent of the DRO/RRO plume is unknown, the plume is bounded to the south by wells MW-8 and MW-9; results for samples collected from these wells (located between the source area and the Chena River) have remained below groundwater cleanup levels since installation in 2012.

FES recommends continued periodic groundwater monitoring to include water level measurements at the ARRC Fairbanks Rail Yard. The sampling frequency should be reduced due to the relative lack changes in groundwater concentrations with time. The high water table and change in groundwater flow direction should be noted.

## 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.
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- FES, 2012. *Groundwater Monitoring Report, Fairbanks Rail Yard, Fairbanks, AK*. November 26.
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Woodward-Clyde Consultants, 1988. *Fairbanks Fuel Facility, Fairbanks, Alaska.* July 29.

## **Attachments**

Table 1 – 2015 Field Parameters

Table 2 – 2015 Groundwater Results

Table 3 – Historical Groundwater Data

Figure 1 – Vicinity Map

Figure 2 – Site Map

Figure 3 – Groundwater Results Exceeding Cleanup Levels

Appendix A – Laboratory Report 1154883

Appendix B – ADEC Laboratory Review Checklist

**Table 1 - 2015 Field Parameters**  
**Fairbanks Rail Yard**

Well	Date	Sheen or Odor?	Depth to Groundwater (feet BTOC)	Well Drawdown (feet)	Temperature (Degrees Celsius)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	pH	Potential (mV)	Turbidity (NTU)
MW-2	9/1/15	Sheen and Strong Odor	12.51	0.00	5.83	1.057	0.30	6.18	-102.3	2.54
MW-4	9/1/15	None	13.17	0.01	6.11	0.958	0.34	6.70	-122.4	4.35
MW-5	9/1/15	Slight Sheen and Odor	12.50	0.02	5.95	1.002	0.37	6.58	-86.1	4.96
MW-6	9/1/15	Sheen and Strong Odor	12.32	0.00	5.85	1.183	0.17	6.09	-111.5	5.01
MW-7	9/1/15	Slight Odor	12.14	0.01	6.92	1.038	0.26	6.24	-107.8	2.96
MW-8	9/1/15	None	10.67	0.00	4.78	1.059	0.24	5.38	234.3	0.83
MW-9	9/1/15	Slight Odor	11.09	0.03	3.4	1.209	0.47	6.00	7.0	2.08
WC-3	9/1/15	Free-Phase Product	12.98 <sup>1</sup>	0.00	6.54	0.974	0.29	6.48	-98.4	20.33

<sup>1</sup> - A trace of product ( $\leq 0.01$  feet) was noted in WC-3, but it was sampled anyway.

BTOC - below top of casing

mS/cm - milliSiemens per centimeter

mV - millivolts

NTU - nephelometric turbidity units

**Table 2 - 2015 Groundwater Results  
Fairbanks Rail Yard**

Location			Cleanup Level <sup>1</sup>	MW-2	MW-4	MW-5	MW-6	MW-7		MW-8	MW-9	WC-3	Trip Blank	
Sample ID				MW-2	MW-4	MW-5	MW-6	MW-7	MW-X	MW-8	MW-9	WC-3	Trip Blank	
Laboratory				SGSA	SGSA	SGSA	SGSA	SGSA	SGSA	SGSA	SGSA	SGSA	SGSA	
Lab Sample ID				1154883002	1154883003	1154883004	1154883005	1154883006	1154883007	1154883008	1154883009	1154883001	1154883010	
Collect Date				9/1/2015	9/1/2015	9/1/2015	9/1/2015	9/1/2015	9/1/2015	9/1/2015	9/1/2015	9/1/2015	9/1/2015	
Matrix				Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	
Sample Type				Primary	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	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	Result [LOD] Qualifier	Result [LOD] Qualifier
Gasoline Range Organics	AK101	mg/L	2.2	0.373 B	0.263 B	0.103 B	0.305 B	0.0696 J,B	0.0647 J,B	0.0443 J,B	0.0551 J,B	0.165 B	ND (0.05)	
Diesel Range Organics	AK102	mg/L	1.5	11.3	6.27	2.60	8.59	10.7	14.0	0.312 J	0.314 J	16.4	-	
Residual Range Organics	AK103	mg/L	1.1	1.16	0.488 J	0.351 J	1.06	1.61 Q	2.19 Q	ND (0.265)	ND (0.259)	1.56	-	
Benzene	SW8021B	µg/L	5	26.3	0.500 B	0.570 B	8.23	2.38 B	2.43 B	0.320 J,B	0.310 J,B	4.82	0.310 J,B	
Toluene	SW8021B	µg/L	700	0.370 J	ND (0.5)	0.480 J	0.400 J	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	0.740 J	ND (0.5)	
Ethylbenzene	SW8021B	µg/L	1,000	16.3	14.7	0.960 J	15.5	0.520 J	0.490 J	ND (0.5)	ND (0.5)	3.08	ND (0.5)	
Xylene, Isomers m,p	SW8021B	µg/L	10,000	44.2	30.2	1.68 J	45.0	1.47 J	1.34 J	ND (1.0)	1.17 J	10.6	ND (1.0)	
o-Xylene	SW8021B	µg/L	(total)	19.1	14.3	0.550 J	24.5	0.610 J	0.530 J	ND (0.5)	1.12	19.9	ND (0.5)	

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

<sup>1</sup> - Groundwater cleanup levels are from Table C, 18 AAC 75.345

B - Analyte was also detected in a blank at a similar concentration; result may be from cross contamination.

J - Result is considered an estimate because it was reported below the LOQ.

Q - Result is considered an estimate due to a quality control failure.

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



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

Well Number	Sample Date	AK101	AK102	AK103	EPA Method SW8021B			
		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	0.88	123	4.23	0.0049	0.0015	0.0087	0.292
	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 after 2012 due to broken well casing						
MW-2	Nov-03	not sampled due to 0.14 feet of floating product						
	Sept 04 & 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
	Aug-14	not sampled due to 0.33 feet of floating product						
MW-3	Sep-15	0.373 B	11.3	1.16	0.0263	0.00037 J	0.0163	0.06333
	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)
MW-4	Sep-11	well could not be located in 2011, 2012, 2013, 2014, and 2015						
	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	0.0226
	Aug-14	0.251	1.8 B	ND (0.250)	ND (0.00025)	ND (0.0005)	0.00635	0.0182
	Sep-15	0.263 B	6.27	0.488 J	0.0005 B	ND (0.0005)	0.0147	0.0445
MW-5	Sep-04	0.228	4.21	ND (0.48)	ND (0.0005)	ND (0.0005)	0.0032	0.0039
	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 in September 2010 or 2011						
	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)
	Aug-14	ND (0.05)	0.225 J,B	ND (0.254)	ND (0.00025)	ND (0.0005)	ND (0.0005)	ND (0.0015)
	Sep-15	0.103 B	2.60	0.351 J	0.00057 B	0.00048 J	0.00096 J	0.00223
MW-6	Sep-06	0.30	11.2	0.90	0.0076	ND (0.0020)	0.0155	0.0590
	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	0.0185
	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	0.0186
	Aug-14	ND (0.05)	6.94	1.41	0.00434	ND (0.0005)	0.00403	0.0183
	Sep-15	0.305 B	8.59	1.06	0.00823	0.0004 J	0.0155	0.0695
MW-7	Sep-11	0.0854 J	19.6	-	0.00107	ND (0.001)	0.00048 J	0.00352
	Sep-12	0.0937	12.4	1.85	0.0012	ND (0.00062)	0.0005 J	0.00139 J
	Jun-13	0.114	10.5	1.46	0.00126	0.00071 J	0.000390 J	0.0017 J
	Aug-14	0.0508 J	6.73	1.05 Q	0.00033 J	ND (0.0005)	ND (0.0005)	ND (0.0015)
	Sep-15	0.0696 J,B	14.0	2.19 Q	0.00243 B	ND (0.0005)	0.00052 J	0.000208 J
MW-8	Sep-12	ND (0.062)	0.288 J	0.339 J	ND (0.0003)	0.00031 J	0.00035 J	ND (0.00186)
	Jun-13	ND (0.062)	ND (0.368)	0.267 J	ND (0.0003)	ND (0.00062)	ND (0.00062)	ND (0.00186)
	Aug-14	ND (0.05)	ND (0.300)	ND (0.250)	ND (0.00025)	ND (0.0005)	ND (0.0005)	ND (0.0015)
	Sep-15	0.0443 J,B	0.312 J	ND (0.265)	0.00032 J,B	ND (0.0005)	ND (0.0005)	ND (0.0015)
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)
	Aug-14	ND (0.05)	ND (0.302)	ND (0.252)	ND (0.00025)	ND (0.0005)	ND (0.0005)	ND (0.0015)
	Sep-15	0.0551 J,B	0.314 J	ND (0.259)	0.00031 J,B	ND (0.0005)	ND (0.0005)	0.002296 J
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						
	Sept 11, Sept 12, June 13, Aug 14	not sampled due to 0.01 feet of floating product						
	Sep-15	0.165 B	16.4	1.56	0.00482	0.00074 J	0.00308	0.0305

Sources of historical data: Hart Crowser 2004, 2005, 2006; Clarus Technologies 2010; Restoration Science & Engineering 2011; and FES 2012, 2013, 2014, 2015a.

Results in bold and yellow highlight exceed the cleanup level

The higher field duplicate result is displayed, when applicable.

B - analyte was also detected in a blank; result may possibly be due to cross-contamination

ADEC - Alaska Department of Environmental Conservation

DRO - diesel range organics

EPA - Environmental Protection Agency

GRO - gasoline range organics

J or Q - result is an estimated value (see report)

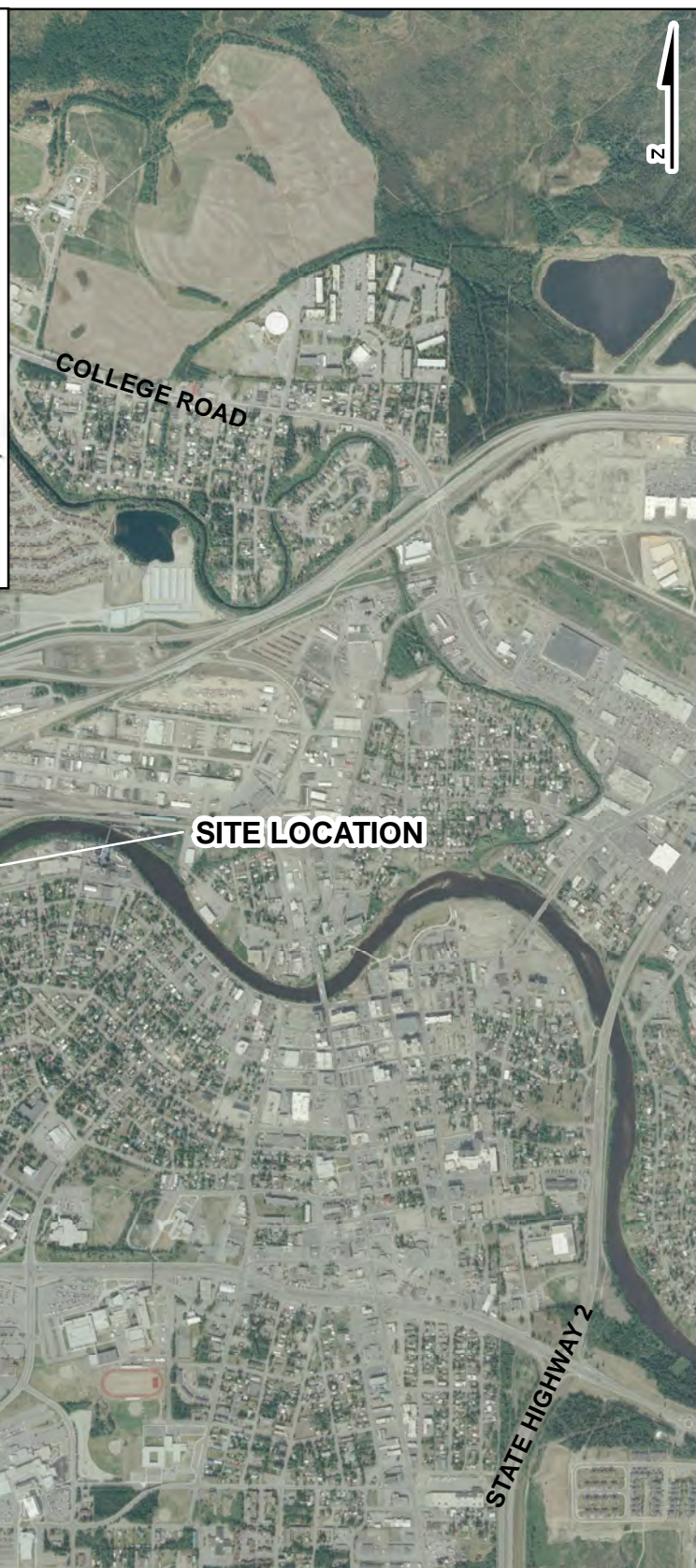
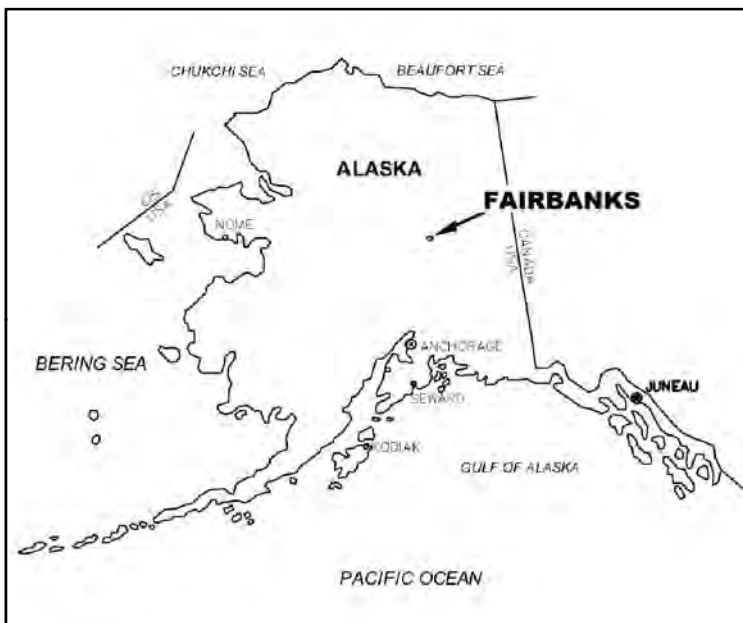
mg/L - milligrams per liter

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



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**Vicinity Map**

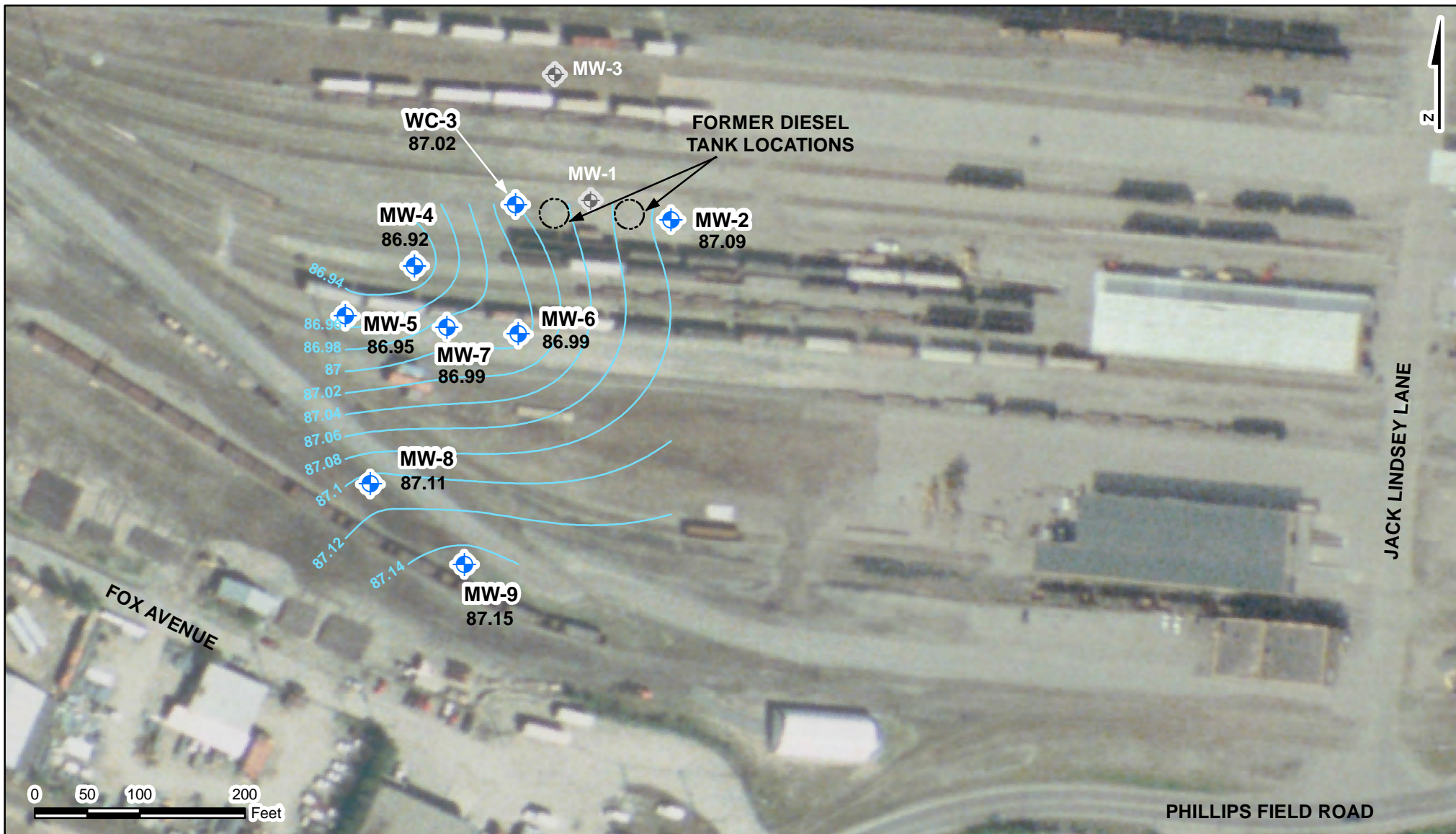
2015 Report  
Fairbanks Rail Yard  
Fairbanks, Alaska

CONTRACT:  
85304

FIGURE:  
1

DATE:  
10/15








#### NOTES:

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

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

#### LEGEND:

-  Existing Monitoring Well
-  Well Location Unknown or Broken
-  Groundwater Contour (0.02-foot)

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Fairbanks, Alaska 99701



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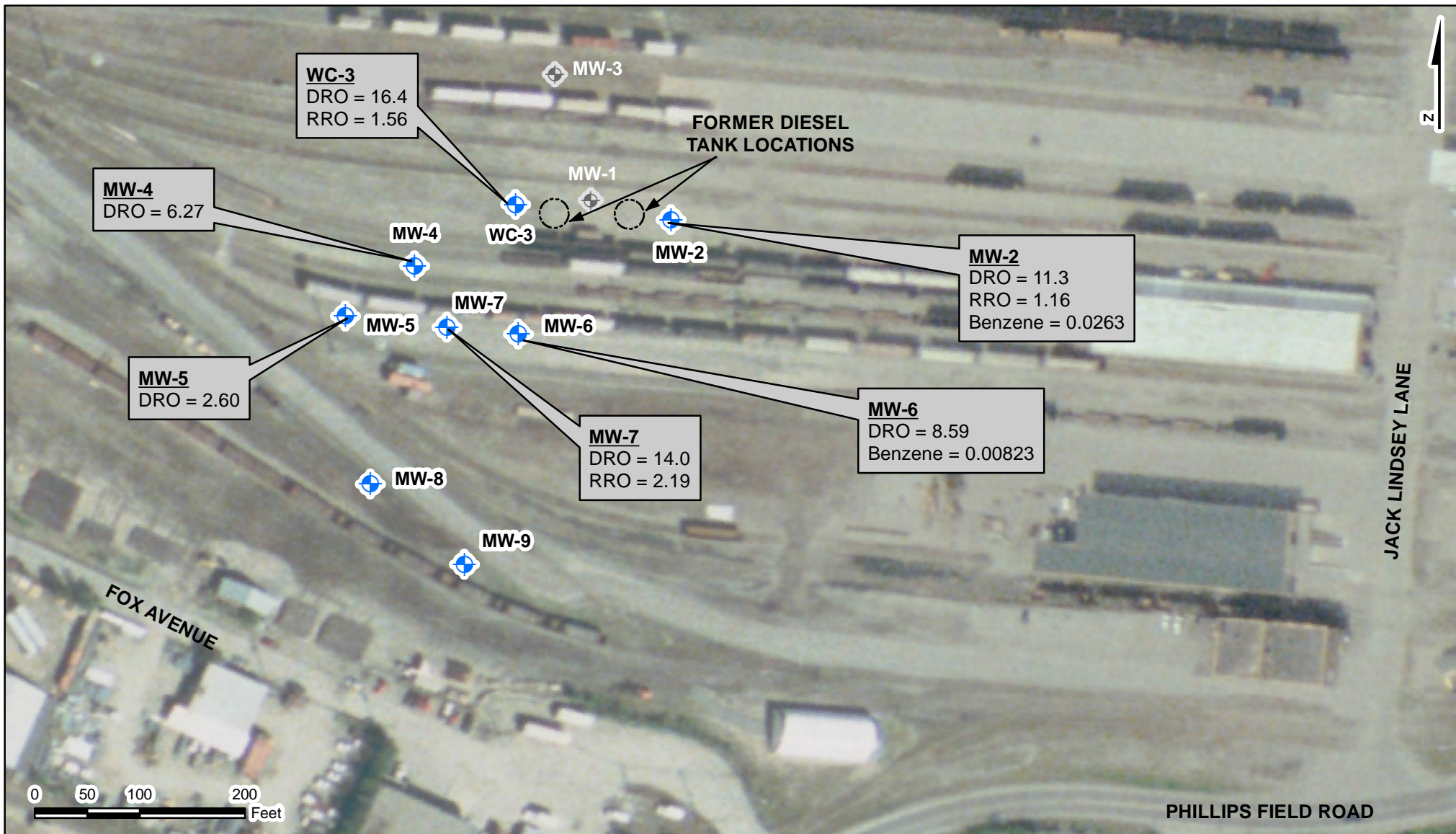
**Site Map**  
2015 Report  
Fairbanks Rail Yard  
Fairbanks, Alaska

CONTRACT:  
85304

FIGURE:  
2

DATE:  
10/15





#### NOTES:

1. Locations of former diesel tanks are approximate; monitoring wells were surveyed during 2012 field work; well MW-3 could not be located. Well MW-1 is broken and was not measured.
2. Sources: Aerial Imagery was provided by Alaska Mapped (UAF-GINA/SDMI <http://alaskamapped.org/bdl>).
3. All results in milligrams per liter (mg/L).

#### LEGEND:

- Existing Monitoring Well
- Well Location Unknown or Broken

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3538 International Street  
Fairbanks, Alaska 99701



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#### Groundwater Results Exceeding Cleanup Levels

2015 Report  
Fairbanks Rail Yard  
Fairbanks, Alaska

CONTRACT:  
85304

FIGURE:  
3

DATE:  
10/15

**APPENDIX A**  
**LABORATORY REPORT 1154883**

## Laboratory Report of Analysis

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

Report Number: **1154883**

Client Project: **ARRC 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 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 Justin 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 Inc.  
Environmental Services - Alaska Division  
Project Manager

**Justin Nelson**

**2015.09.18**

**12:33:51 -08'00'**

Justin Nelson  
Project Manager  
Justin.Nelson@sgs.com

Date

Print Date: 09/18/2015 12:18:53PM

## Case Narrative

SGS Client: **AK Railroad Corp**  
SGS Project: **1154883**  
Project Name/Site: **ARRC Fairbanks Rail Yard**  
Project Contact: **Mike Boese**

Refer to sample receipt form for information on sample condition.

\*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: 09/18/2015 12:18:53PM

## 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, indemnification 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) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8021B, 8082A, 8260B, 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
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., 1/2 of the LOQ)
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>
WC-3	1154883001	09/01/2015	09/02/2015	Water (Surface, Eff., Ground)
MW-2	1154883002	09/01/2015	09/02/2015	Water (Surface, Eff., Ground)
MW-4	1154883003	09/01/2015	09/02/2015	Water (Surface, Eff., Ground)
MW-5	1154883004	09/01/2015	09/02/2015	Water (Surface, Eff., Ground)
MW-6	1154883005	09/01/2015	09/02/2015	Water (Surface, Eff., Ground)
MW-7	1154883006	09/01/2015	09/02/2015	Water (Surface, Eff., Ground)
MW-X	1154883007	09/01/2015	09/02/2015	Water (Surface, Eff., Ground)
MW-8	1154883008	09/01/2015	09/02/2015	Water (Surface, Eff., Ground)
MW-9	1154883009	09/01/2015	09/02/2015	Water (Surface, Eff., Ground)
Trip Blank	1154883010	09/01/2015	09/02/2015	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: 09/18/2015 12:18:55PM

## Detectable Results Summary

Client Sample ID: **WC-3**

Lab Sample ID: 1154883001

**Semivolatile Organic Fuels**

**Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	16.4	mg/L
Residual Range Organics	1.56	mg/L
Benzene	4.82	ug/L
Ethylbenzene	3.08	ug/L
Gasoline Range Organics	0.165	mg/L
o-Xylene	19.9	ug/L
P & M -Xylene	10.6	ug/L
Toluene	0.740J	ug/L

Client Sample ID: **MW-2**

Lab Sample ID: 1154883002

**Semivolatile Organic Fuels**

**Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	11.3	mg/L
Residual Range Organics	1.16	mg/L
Benzene	26.3	ug/L
Ethylbenzene	16.3	ug/L
Gasoline Range Organics	0.373	mg/L
o-Xylene	19.1	ug/L
P & M -Xylene	44.2	ug/L
Toluene	0.370J	ug/L

Client Sample ID: **MW-4**

Lab Sample ID: 1154883003

**Semivolatile Organic Fuels**

**Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	6.27	mg/L
Residual Range Organics	0.488J	mg/L
Benzene	0.500	ug/L
Ethylbenzene	14.7	ug/L
Gasoline Range Organics	0.263	mg/L
o-Xylene	14.3	ug/L
P & M -Xylene	30.2	ug/L

Client Sample ID: **MW-5**

Lab Sample ID: 1154883004

**Semivolatile Organic Fuels**

**Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	2.60	mg/L
Residual Range Organics	0.351J	mg/L
Benzene	0.570	ug/L
Ethylbenzene	0.960J	ug/L
Gasoline Range Organics	0.103	mg/L
o-Xylene	0.550J	ug/L
P & M -Xylene	1.68J	ug/L
Toluene	0.480J	ug/L

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SGS North America Inc.

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

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## Detectable Results Summary

Client Sample ID: **MW-6**  
 Lab Sample ID: 1154883005  
**Semivolatile Organic Fuels**

**Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	8.59	mg/L
Residual Range Organics	1.06	mg/L
Benzene	8.23	ug/L
Ethylbenzene	15.5	ug/L
Gasoline Range Organics	0.305	mg/L
o-Xylene	24.5	ug/L
P & M -Xylene	45.0	ug/L
Toluene	0.400J	ug/L

Client Sample ID: **MW-7**  
 Lab Sample ID: 1154883006  
**Semivolatile Organic Fuels**

**Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	10.7	mg/L
Residual Range Organics	1.61	mg/L
Benzene	2.38	ug/L
Ethylbenzene	0.520J	ug/L
Gasoline Range Organics	0.0696J	mg/L
o-Xylene	0.610J	ug/L
P & M -Xylene	1.47J	ug/L

Client Sample ID: **MW-X**  
 Lab Sample ID: 1154883007  
**Semivolatile Organic Fuels**

**Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	14.0	mg/L
Residual Range Organics	2.19	mg/L
Benzene	2.43	ug/L
Ethylbenzene	0.490J	ug/L
Gasoline Range Organics	0.0647J	mg/L
o-Xylene	0.530J	ug/L
P & M -Xylene	1.34J	ug/L

Client Sample ID: **MW-8**  
 Lab Sample ID: 1154883008  
**Semivolatile Organic Fuels**  
**Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	0.312J	mg/L
Benzene	0.320J	ug/L
Gasoline Range Organics	0.0443J	mg/L

Client Sample ID: **MW-9**  
 Lab Sample ID: 1154883009  
**Semivolatile Organic Fuels**  
**Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	0.314J	mg/L
Benzene	0.310J	ug/L
Gasoline Range Organics	0.0551J	mg/L
o-Xylene	1.12	ug/L
P & M -Xylene	1.17J	ug/L

Client Sample ID: **Trip Blank**  
 Lab Sample ID: 1154883010  
**Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Benzene	0.310J	ug/L

## Results of WC-3

Client Sample ID: **WC-3**  
 Client Project ID: **ARRC Fairbanks Rail Yard**  
 Lab Sample ID: 1154883001  
 Lab Project ID: 1154883

Collection Date: 09/01/15 13:30  
 Received Date: 09/02/15 09:50  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

## Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	16.4	0.625	0.188	mg/L	1		09/16/15 01:25
<b>Surrogates</b>							
5a Androstane (surr)	84.6	50-150		%	1		09/16/15 01:25

## Batch Information

Analytical Batch: XFC12091  
 Analytical Method: AK102  
 Analyst: KJO  
 Analytical Date/Time: 09/16/15 01:25  
 Container ID: 1154883001-A

Prep Batch: XXX34131  
 Prep Method: SW3520C  
 Prep Date/Time: 09/14/15 09:50  
 Prep Initial Wt./Vol.: 240 mL  
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	1.56	0.521	0.156	mg/L	1		09/16/15 01:25
<b>Surrogates</b>							
n-Triacontane-d62 (surr)	81.3	50-150		%	1		09/16/15 01:25

## Batch Information

Analytical Batch: XFC12091  
 Analytical Method: AK103  
 Analyst: KJO  
 Analytical Date/Time: 09/16/15 01:25  
 Container ID: 1154883001-A

Prep Batch: XXX34131  
 Prep Method: SW3520C  
 Prep Date/Time: 09/14/15 09:50  
 Prep Initial Wt./Vol.: 240 mL  
 Prep Extract Vol: 1 mL

## Results of WC-3

Client Sample ID: **WC-3**  
 Client Project ID: **ARRC Fairbanks Rail Yard**  
 Lab Sample ID: 1154883001  
 Lab Project ID: 1154883

Collection Date: 09/01/15 13:30  
 Received Date: 09/02/15 09:50  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

## Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.165	0.100	0.0310	mg/L	1		09/12/15 16:05

### Surrogates

4-Bromofluorobenzene (surr)	83.1	50-150		%	1		09/12/15 16:05
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## Batch Information

Analytical Batch: VFC12654  
 Analytical Method: AK101  
 Analyst: CRD  
 Analytical Date/Time: 09/12/15 16:05  
 Container ID: 1154883001-C

Prep Batch: VXX27887  
 Prep Method: SW5030B  
 Prep Date/Time: 09/12/15 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	4.82	0.500	0.150	ug/L	1		09/12/15 16:05
Ethylbenzene	3.08	1.00	0.310	ug/L	1		09/12/15 16:05
o-Xylene	19.9	1.00	0.310	ug/L	1		09/12/15 16:05
P & M -Xylene	10.6	2.00	0.620	ug/L	1		09/12/15 16:05
Toluene	0.740 J	1.00	0.310	ug/L	1		09/12/15 16:05

### Surrogates

1,4-Difluorobenzene (surr)	92.6	77-115		%	1		09/12/15 16:05
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## Batch Information

Analytical Batch: VFC12654  
 Analytical Method: SW8021B  
 Analyst: CRD  
 Analytical Date/Time: 09/12/15 16:05  
 Container ID: 1154883001-C

Prep Batch: VXX27887  
 Prep Method: SW5030B  
 Prep Date/Time: 09/12/15 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

## Results of MW-2

Client Sample ID: **MW-2**  
 Client Project ID: **ARRC Fairbanks Rail Yard**  
 Lab Sample ID: 1154883002  
 Lab Project ID: 1154883

Collection Date: 09/01/15 13:00  
 Received Date: 09/02/15 09:50  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

## Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	11.3	0.630	0.189	mg/L	1		09/16/15 01:45
<b>Surrogates</b>							
5a Androstane (surr)	92.4	50-150		%	1		09/16/15 01:45

## Batch Information

Analytical Batch: XFC12091  
 Analytical Method: AK102  
 Analyst: KJO  
 Analytical Date/Time: 09/16/15 01:45  
 Container ID: 1154883002-A

Prep Batch: XXX34131  
 Prep Method: SW3520C  
 Prep Date/Time: 09/14/15 09:50  
 Prep Initial Wt./Vol.: 238 mL  
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	1.16	0.525	0.158	mg/L	1		09/16/15 01:45
<b>Surrogates</b>							
n-Triacontane-d62 (surr)	90.6	50-150		%	1		09/16/15 01:45

## Batch Information

Analytical Batch: XFC12091  
 Analytical Method: AK103  
 Analyst: KJO  
 Analytical Date/Time: 09/16/15 01:45  
 Container ID: 1154883002-A

Prep Batch: XXX34131  
 Prep Method: SW3520C  
 Prep Date/Time: 09/14/15 09:50  
 Prep Initial Wt./Vol.: 238 mL  
 Prep Extract Vol: 1 mL

## Results of MW-2

Client Sample ID: **MW-2**  
 Client Project ID: **ARRC Fairbanks Rail Yard**  
 Lab Sample ID: 1154883002  
 Lab Project ID: 1154883

Collection Date: 09/01/15 13:00  
 Received Date: 09/02/15 09:50  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

## Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.373	0.100	0.0310	mg/L	1		09/12/15 16:24

### Surrogates

4-Bromofluorobenzene (surr)	95.6	50-150		%	1		09/12/15 16:24
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## Batch Information

Analytical Batch: VFC12654  
 Analytical Method: AK101  
 Analyst: CRD  
 Analytical Date/Time: 09/12/15 16:24  
 Container ID: 1154883002-C

Prep Batch: VXX27887  
 Prep Method: SW5030B  
 Prep Date/Time: 09/12/15 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	26.3	0.500	0.150	ug/L	1		09/12/15 16:24
Ethylbenzene	16.3	1.00	0.310	ug/L	1		09/12/15 16:24
o-Xylene	19.1	1.00	0.310	ug/L	1		09/12/15 16:24
P & M -Xylene	44.2	2.00	0.620	ug/L	1		09/12/15 16:24
Toluene	0.370 J	1.00	0.310	ug/L	1		09/12/15 16:24

### Surrogates

1,4-Difluorobenzene (surr)	95.3	77-115		%	1		09/12/15 16:24
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## Batch Information

Analytical Batch: VFC12654  
 Analytical Method: SW8021B  
 Analyst: CRD  
 Analytical Date/Time: 09/12/15 16:24  
 Container ID: 1154883002-C

Prep Batch: VXX27887  
 Prep Method: SW5030B  
 Prep Date/Time: 09/12/15 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: **ARRC Fairbanks Rail Yard**  
 Lab Sample ID: 1154883003  
 Lab Project ID: 1154883

Collection Date: 09/01/15 12:30  
 Received Date: 09/02/15 09:50  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

## Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	6.27	0.625	0.188	mg/L	1		09/16/15 02:06
<b>Surrogates</b>							
5a Androstane (surr)	90.8	50-150		%	1		09/16/15 02:06

## Batch Information

Analytical Batch: XFC12091  
 Analytical Method: AK102  
 Analyst: KJO  
 Analytical Date/Time: 09/16/15 02:06  
 Container ID: 1154883003-A

Prep Batch: XXX34131  
 Prep Method: SW3520C  
 Prep Date/Time: 09/14/15 09:50  
 Prep Initial Wt./Vol.: 240 mL  
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	0.488 J	0.521	0.156	mg/L	1		09/16/15 02:06
<b>Surrogates</b>							
n-Triacontane-d62 (surr)	90.2	50-150		%	1		09/16/15 02:06

## Batch Information

Analytical Batch: XFC12091  
 Analytical Method: AK103  
 Analyst: KJO  
 Analytical Date/Time: 09/16/15 02:06  
 Container ID: 1154883003-A

Prep Batch: XXX34131  
 Prep Method: SW3520C  
 Prep Date/Time: 09/14/15 09:50  
 Prep Initial Wt./Vol.: 240 mL  
 Prep Extract Vol: 1 mL



## Results of MW-4

Client Sample ID: **MW-4**  
 Client Project ID: **ARRC Fairbanks Rail Yard**  
 Lab Sample ID: 1154883003  
 Lab Project ID: 1154883

Collection Date: 09/01/15 12:30  
 Received Date: 09/02/15 09:50  
 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	0.263	0.100	0.0310	mg/L	1		09/12/15 16:43

### Surrogates

4-Bromofluorobenzene (surr)	110	50-150		%	1		09/12/15 16:43
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## Batch Information

Analytical Batch: VFC12654  
 Analytical Method: AK101  
 Analyst: CRD  
 Analytical Date/Time: 09/12/15 16:43  
 Container ID: 1154883003-C

Prep Batch: VXX27887  
 Prep Method: SW5030B  
 Prep Date/Time: 09/12/15 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	0.500	0.150	ug/L	1		09/12/15 16:43
Ethylbenzene	14.7	1.00	0.310	ug/L	1		09/12/15 16:43
o-Xylene	14.3	1.00	0.310	ug/L	1		09/12/15 16:43
P & M -Xylene	30.2	2.00	0.620	ug/L	1		09/12/15 16:43
Toluene	0.500 U	1.00	0.310	ug/L	1		09/12/15 16:43

### Surrogates

1,4-Difluorobenzene (surr)	88.5	77-115		%	1		09/12/15 16:43
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## Batch Information

Analytical Batch: VFC12654  
 Analytical Method: SW8021B  
 Analyst: CRD  
 Analytical Date/Time: 09/12/15 16:43  
 Container ID: 1154883003-C

Prep Batch: VXX27887  
 Prep Method: SW5030B  
 Prep Date/Time: 09/12/15 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: **ARRC Fairbanks Rail Yard**  
 Lab Sample ID: 1154883004  
 Lab Project ID: 1154883

Collection Date: 09/01/15 11:30  
 Received Date: 09/02/15 09:50  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

## Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	2.60	0.615	0.184	mg/L	1		09/16/15 02:26
<b>Surrogates</b>							
5a Androstane (surr)	87.7	50-150		%	1		09/16/15 02:26

## Batch Information

Analytical Batch: XFC12091  
 Analytical Method: AK102  
 Analyst: KJO  
 Analytical Date/Time: 09/16/15 02:26  
 Container ID: 1154883004-A

Prep Batch: XXX34131  
 Prep Method: SW3520C  
 Prep Date/Time: 09/14/15 09:50  
 Prep Initial Wt./Vol.: 244 mL  
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	0.351 J	0.512	0.154	mg/L	1		09/16/15 02:26
<b>Surrogates</b>							
n-Triacontane-d62 (surr)	96.4	50-150		%	1		09/16/15 02:26

## Batch Information

Analytical Batch: XFC12091  
 Analytical Method: AK103  
 Analyst: KJO  
 Analytical Date/Time: 09/16/15 02:26  
 Container ID: 1154883004-A

Prep Batch: XXX34131  
 Prep Method: SW3520C  
 Prep Date/Time: 09/14/15 09:50  
 Prep Initial Wt./Vol.: 244 mL  
 Prep Extract Vol: 1 mL

## Results of MW-5

Client Sample ID: **MW-5**  
 Client Project ID: **ARRC Fairbanks Rail Yard**  
 Lab Sample ID: 1154883004  
 Lab Project ID: 1154883

Collection Date: 09/01/15 11:30  
 Received Date: 09/02/15 09:50  
 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	0.103	0.100	0.0310	mg/L	1		09/12/15 18:00

### Surrogates

4-Bromofluorobenzene (surr)	80.7	50-150		%	1		09/12/15 18:00
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## Batch Information

Analytical Batch: VFC12654  
 Analytical Method: AK101  
 Analyst: CRD  
 Analytical Date/Time: 09/12/15 18:00  
 Container ID: 1154883004-C

Prep Batch: VXX27887  
 Prep Method: SW5030B  
 Prep Date/Time: 09/12/15 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	0.570	0.500	0.150	ug/L	1		09/12/15 18:00
Ethylbenzene	0.960 J	1.00	0.310	ug/L	1		09/12/15 18:00
o-Xylene	0.550 J	1.00	0.310	ug/L	1		09/12/15 18:00
P & M -Xylene	1.68 J	2.00	0.620	ug/L	1		09/12/15 18:00
Toluene	0.480 J	1.00	0.310	ug/L	1		09/12/15 18:00

### Surrogates

1,4-Difluorobenzene (surr)	89	77-115		%	1		09/12/15 18:00
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## Batch Information

Analytical Batch: VFC12654  
 Analytical Method: SW8021B  
 Analyst: CRD  
 Analytical Date/Time: 09/12/15 18:00  
 Container ID: 1154883004-C

Prep Batch: VXX27887  
 Prep Method: SW5030B  
 Prep Date/Time: 09/12/15 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: **ARRC Fairbanks Rail Yard**  
 Lab Sample ID: 1154883005  
 Lab Project ID: 1154883

Collection Date: 09/01/15 10:55  
 Received Date: 09/02/15 09:50  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

## Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	8.59	0.630	0.189	mg/L	1		09/16/15 02:47
<b>Surrogates</b>							
5a Androstane (surr)	88.3	50-150		%	1		09/16/15 02:47

## Batch Information

Analytical Batch: XFC12091  
 Analytical Method: AK102  
 Analyst: KJO  
 Analytical Date/Time: 09/16/15 02:47  
 Container ID: 1154883005-A

Prep Batch: XXX34131  
 Prep Method: SW3520C  
 Prep Date/Time: 09/14/15 09:50  
 Prep Initial Wt./Vol.: 238 mL  
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	1.06	0.525	0.158	mg/L	1		09/16/15 02:47
<b>Surrogates</b>							
n-Triacontane-d62 (surr)	93.4	50-150		%	1		09/16/15 02:47

## Batch Information

Analytical Batch: XFC12091  
 Analytical Method: AK103  
 Analyst: KJO  
 Analytical Date/Time: 09/16/15 02:47  
 Container ID: 1154883005-A

Prep Batch: XXX34131  
 Prep Method: SW3520C  
 Prep Date/Time: 09/14/15 09:50  
 Prep Initial Wt./Vol.: 238 mL  
 Prep Extract Vol: 1 mL



#### Results of MW-6

Client Sample ID: **MW-6**  
Client Project ID: **ARRC Fairbanks Rail Yard**  
Lab Sample ID: 1154883005  
Lab Project ID: 1154883

Collection Date: 09/01/15 10:55  
Received Date: 09/02/15 09:50  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

#### Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.305	0.100	0.0310	mg/L	1		09/13/15 01:39

#### Surrogates

4-Bromofluorobenzene (surr)	99.3	50-150		%	1		09/13/15 01:39
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#### Batch Information

Analytical Batch: VFC12652  
Analytical Method: AK101  
Analyst: CRD  
Analytical Date/Time: 09/13/15 01:39  
Container ID: 1154883005-C

Prep Batch: VXX27884  
Prep Method: SW5030B  
Prep Date/Time: 09/12/15 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	8.23	0.500	0.150	ug/L	1		09/13/15 01:39
Ethylbenzene	15.5	1.00	0.310	ug/L	1		09/13/15 01:39
o-Xylene	24.5	1.00	0.310	ug/L	1		09/13/15 01:39
P & M -Xylene	45.0	2.00	0.620	ug/L	1		09/13/15 01:39
Toluene	0.400 J	1.00	0.310	ug/L	1		09/13/15 01:39

#### Surrogates

1,4-Difluorobenzene (surr)	82.4	77-115		%	1		09/13/15 01:39
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#### Batch Information

Analytical Batch: VFC12652  
Analytical Method: SW8021B  
Analyst: CRD  
Analytical Date/Time: 09/13/15 01:39  
Container ID: 1154883005-C

Prep Batch: VXX27884  
Prep Method: SW5030B  
Prep Date/Time: 09/12/15 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 09/18/2015 12:18:56PM

J flagging is activated

## Results of MW-7

Client Sample ID: **MW-7**  
 Client Project ID: **ARRC Fairbanks Rail Yard**  
 Lab Sample ID: 1154883006  
 Lab Project ID: 1154883

Collection Date: 09/01/15 11:40  
 Received Date: 09/02/15 09:50  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

## Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	10.7	0.636	0.191	mg/L	1		09/16/15 03:08
<b>Surrogates</b>							
5a Androstane (surr)	84.2	50-150		%	1		09/16/15 03:08

## Batch Information

Analytical Batch: XFC12091  
 Analytical Method: AK102  
 Analyst: KJO  
 Analytical Date/Time: 09/16/15 03:08  
 Container ID: 1154883006-A

Prep Batch: XXX34131  
 Prep Method: SW3520C  
 Prep Date/Time: 09/14/15 09:50  
 Prep Initial Wt./Vol.: 236 mL  
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	1.61	0.530	0.159	mg/L	1		09/16/15 03:08
<b>Surrogates</b>							
n-Triacontane-d62 (surr)	88.2	50-150		%	1		09/16/15 03:08

## Batch Information

Analytical Batch: XFC12091  
 Analytical Method: AK103  
 Analyst: KJO  
 Analytical Date/Time: 09/16/15 03:08  
 Container ID: 1154883006-A

Prep Batch: XXX34131  
 Prep Method: SW3520C  
 Prep Date/Time: 09/14/15 09:50  
 Prep Initial Wt./Vol.: 236 mL  
 Prep Extract Vol: 1 mL

## Results of MW-7

Client Sample ID: **MW-7**  
 Client Project ID: **ARRC Fairbanks Rail Yard**  
 Lab Sample ID: 1154883006  
 Lab Project ID: 1154883

Collection Date: 09/01/15 11:40  
 Received Date: 09/02/15 09:50  
 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	0.0696 J	0.100	0.0310	mg/L	1		09/13/15 01:58

### Surrogates

4-Bromofluorobenzene (surr)	79.1	50-150		%	1		09/13/15 01:58
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## Batch Information

Analytical Batch: VFC12652  
 Analytical Method: AK101  
 Analyst: CRD  
 Analytical Date/Time: 09/13/15 01:58  
 Container ID: 1154883006-C

Prep Batch: VXX27884  
 Prep Method: SW5030B  
 Prep Date/Time: 09/12/15 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	2.38	0.500	0.150	ug/L	1		09/13/15 01:58
Ethylbenzene	0.520 J	1.00	0.310	ug/L	1		09/13/15 01:58
o-Xylene	0.610 J	1.00	0.310	ug/L	1		09/13/15 01:58
P & M -Xylene	1.47 J	2.00	0.620	ug/L	1		09/13/15 01:58
Toluene	0.500 U	1.00	0.310	ug/L	1		09/13/15 01:58

### Surrogates

1,4-Difluorobenzene (surr)	84.6	77-115		%	1		09/13/15 01:58
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## Batch Information

Analytical Batch: VFC12652  
 Analytical Method: SW8021B  
 Analyst: CRD  
 Analytical Date/Time: 09/13/15 01:58  
 Container ID: 1154883006-C

Prep Batch: VXX27884  
 Prep Method: SW5030B  
 Prep Date/Time: 09/12/15 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: **ARRC Fairbanks Rail Yard**  
 Lab Sample ID: 1154883007  
 Lab Project ID: 1154883

Collection Date: 09/01/15 11:50  
 Received Date: 09/02/15 09:50  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

## Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	14.0	0.647	0.194	mg/L	1		09/16/15 03:28
<b>Surrogates</b>							
5a Androstane (surr)	90	50-150		%	1		09/16/15 03:28

## Batch Information

Analytical Batch: XFC12091  
 Analytical Method: AK102  
 Analyst: KJO  
 Analytical Date/Time: 09/16/15 03:28  
 Container ID: 1154883007-A

Prep Batch: XXX34131  
 Prep Method: SW3520C  
 Prep Date/Time: 09/14/15 09:50  
 Prep Initial Wt./Vol.: 232 mL  
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	2.19	0.539	0.162	mg/L	1		09/16/15 03:28
<b>Surrogates</b>							
n-Triacontane-d62 (surr)	92.8	50-150		%	1		09/16/15 03:28

## Batch Information

Analytical Batch: XFC12091  
 Analytical Method: AK103  
 Analyst: KJO  
 Analytical Date/Time: 09/16/15 03:28  
 Container ID: 1154883007-A

Prep Batch: XXX34131  
 Prep Method: SW3520C  
 Prep Date/Time: 09/14/15 09:50  
 Prep Initial Wt./Vol.: 232 mL  
 Prep Extract Vol: 1 mL





#### Results of MW-X

Client Sample ID: **MW-X**  
Client Project ID: **ARRC Fairbanks Rail Yard**  
Lab Sample ID: 1154883007  
Lab Project ID: 1154883

Collection Date: 09/01/15 11:50  
Received Date: 09/02/15 09:50  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

#### Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0647 J	0.100	0.0310	mg/L	1		09/13/15 02:17

#### Surrogates

4-Bromofluorobenzene (surr)	79	50-150		%	1		09/13/15 02:17
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#### Batch Information

Analytical Batch: VFC12652  
Analytical Method: AK101  
Analyst: CRD  
Analytical Date/Time: 09/13/15 02:17  
Container ID: 1154883007-C

Prep Batch: VXX27884  
Prep Method: SW5030B  
Prep Date/Time: 09/12/15 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	2.43	0.500	0.150	ug/L	1		09/13/15 02:17
Ethylbenzene	0.490 J	1.00	0.310	ug/L	1		09/13/15 02:17
o-Xylene	0.530 J	1.00	0.310	ug/L	1		09/13/15 02:17
P & M -Xylene	1.34 J	2.00	0.620	ug/L	1		09/13/15 02:17
Toluene	0.500 U	1.00	0.310	ug/L	1		09/13/15 02:17

#### Surrogates

1,4-Difluorobenzene (surr)	84.6	77-115		%	1		09/13/15 02:17
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#### Batch Information

Analytical Batch: VFC12652  
Analytical Method: SW8021B  
Analyst: CRD  
Analytical Date/Time: 09/13/15 02:17  
Container ID: 1154883007-C

Prep Batch: VXX27884  
Prep Method: SW5030B  
Prep Date/Time: 09/12/15 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 09/18/2015 12:18:56PM

J flagging is activated

## Results of MW-8

Client Sample ID: **MW-8**  
 Client Project ID: **ARRC Fairbanks Rail Yard**  
 Lab Sample ID: 1154883008  
 Lab Project ID: 1154883

Collection Date: 09/01/15 09:35  
 Received Date: 09/02/15 09:50  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

## Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.312 J	0.636	0.191	mg/L	1		09/16/15 03:49
<b>Surrogates</b>							
5a Androstane (surr)	83.5	50-150		%	1		09/16/15 03:49

## Batch Information

Analytical Batch: XFC12091  
 Analytical Method: AK102  
 Analyst: KJO  
 Analytical Date/Time: 09/16/15 03:49  
 Container ID: 1154883008-A

Prep Batch: XXX34131  
 Prep Method: SW3520C  
 Prep Date/Time: 09/14/15 09:50  
 Prep Initial Wt./Vol.: 236 mL  
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	0.265 U	0.530	0.159	mg/L	1		09/16/15 03:49
<b>Surrogates</b>							
n-Triacontane-d62 (surr)	95.4	50-150		%	1		09/16/15 03:49

## Batch Information

Analytical Batch: XFC12091  
 Analytical Method: AK103  
 Analyst: KJO  
 Analytical Date/Time: 09/16/15 03:49  
 Container ID: 1154883008-A

Prep Batch: XXX34131  
 Prep Method: SW3520C  
 Prep Date/Time: 09/14/15 09:50  
 Prep Initial Wt./Vol.: 236 mL  
 Prep Extract Vol: 1 mL



#### Results of MW-8

Client Sample ID: **MW-8**  
Client Project ID: **ARRC Fairbanks Rail Yard**  
Lab Sample ID: 1154883008  
Lab Project ID: 1154883

Collection Date: 09/01/15 09:35  
Received Date: 09/02/15 09:50  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

#### Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0443 J	0.100	0.0310	mg/L	1		09/13/15 02:37

#### Surrogates

4-Bromofluorobenzene (surr)	86.6	50-150		%	1		09/13/15 02:37
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#### Batch Information

Analytical Batch: VFC12652  
Analytical Method: AK101  
Analyst: CRD  
Analytical Date/Time: 09/13/15 02:37  
Container ID: 1154883008-C

Prep Batch: VXX27884  
Prep Method: SW5030B  
Prep Date/Time: 09/12/15 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.320 J	0.500	0.150	ug/L	1		09/13/15 02:37
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/13/15 02:37
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/13/15 02:37
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/13/15 02:37
Toluene	0.500 U	1.00	0.310	ug/L	1		09/13/15 02:37

#### Surrogates

1,4-Difluorobenzene (surr)	86	77-115		%	1		09/13/15 02:37
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#### Batch Information

Analytical Batch: VFC12652  
Analytical Method: SW8021B  
Analyst: CRD  
Analytical Date/Time: 09/13/15 02:37  
Container ID: 1154883008-C

Prep Batch: VXX27884  
Prep Method: SW5030B  
Prep Date/Time: 09/12/15 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 09/18/2015 12:18:56PM

J flagging is activated

## Results of MW-9

Client Sample ID: **MW-9**  
 Client Project ID: **ARRC Fairbanks Rail Yard**  
 Lab Sample ID: 1154883009  
 Lab Project ID: 1154883

Collection Date: 09/01/15 10:00  
 Received Date: 09/02/15 09:50  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

## Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.314 J	0.620	0.186	mg/L	1		09/16/15 04:10
<b>Surrogates</b>							
5a Androstane (surr)	87.2	50-150		%	1		09/16/15 04:10

## Batch Information

Analytical Batch: XFC12091  
 Analytical Method: AK102  
 Analyst: KJO  
 Analytical Date/Time: 09/16/15 04:10  
 Container ID: 1154883009-A

Prep Batch: XXX34131  
 Prep Method: SW3520C  
 Prep Date/Time: 09/14/15 09:50  
 Prep Initial Wt./Vol.: 242 mL  
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	0.259 U	0.517	0.155	mg/L	1		09/16/15 04:10
<b>Surrogates</b>							
n-Triacontane-d62 (surr)	91.5	50-150		%	1		09/16/15 04:10

## Batch Information

Analytical Batch: XFC12091  
 Analytical Method: AK103  
 Analyst: KJO  
 Analytical Date/Time: 09/16/15 04:10  
 Container ID: 1154883009-A

Prep Batch: XXX34131  
 Prep Method: SW3520C  
 Prep Date/Time: 09/14/15 09:50  
 Prep Initial Wt./Vol.: 242 mL  
 Prep Extract Vol: 1 mL



#### Results of MW-9

Client Sample ID: **MW-9**  
Client Project ID: **ARRC Fairbanks Rail Yard**  
Lab Sample ID: 1154883009  
Lab Project ID: 1154883

Collection Date: 09/01/15 10:00  
Received Date: 09/02/15 09:50  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

#### Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0551 J	0.100	0.0310	mg/L	1		09/13/15 02:56

#### Surrogates

4-Bromofluorobenzene (surr)	88.3	50-150		%	1		09/13/15 02:56
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#### Batch Information

Analytical Batch: VFC12652  
Analytical Method: AK101  
Analyst: CRD  
Analytical Date/Time: 09/13/15 02:56  
Container ID: 1154883009-C

Prep Batch: VXX27884  
Prep Method: SW5030B  
Prep Date/Time: 09/12/15 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.310 J	0.500	0.150	ug/L	1		09/13/15 02:56
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/13/15 02:56
o-Xylene	1.12	1.00	0.310	ug/L	1		09/13/15 02:56
P & M -Xylene	1.17 J	2.00	0.620	ug/L	1		09/13/15 02:56
Toluene	0.500 U	1.00	0.310	ug/L	1		09/13/15 02:56

#### Surrogates

1,4-Difluorobenzene (surr)	85.4	77-115		%	1		09/13/15 02:56
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#### Batch Information

Analytical Batch: VFC12652  
Analytical Method: SW8021B  
Analyst: CRD  
Analytical Date/Time: 09/13/15 02:56  
Container ID: 1154883009-C

Prep Batch: VXX27884  
Prep Method: SW5030B  
Prep Date/Time: 09/12/15 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 09/18/2015 12:18:56PM

J flagging is activated

## Results of Trip Blank

Client Sample ID: **Trip Blank**  
 Client Project ID: **ARRC Fairbanks Rail Yard**  
 Lab Sample ID: 1154883010  
 Lab Project ID: 1154883

Collection Date: 09/01/15 08:00  
 Received Date: 09/02/15 09:50  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

## Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0500 U	0.100	0.0310	mg/L	1		09/13/15 03:15

### Surrogates

4-Bromofluorobenzene (surr)	85.5	50-150		%	1		09/13/15 03:15
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## Batch Information

Analytical Batch: VFC12652  
 Analytical Method: AK101  
 Analyst: CRD  
 Analytical Date/Time: 09/13/15 03:15  
 Container ID: 1154883010-A

Prep Batch: VXX27884  
 Prep Method: SW5030B  
 Prep Date/Time: 09/12/15 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.310 J	0.500	0.150	ug/L	1		09/13/15 03:15
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/13/15 03:15
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/13/15 03:15
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/13/15 03:15
Toluene	0.500 U	1.00	0.310	ug/L	1		09/13/15 03:15

### Surrogates

1,4-Difluorobenzene (surr)	84.9	77-115		%	1		09/13/15 03:15
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## Batch Information

Analytical Batch: VFC12652  
 Analytical Method: SW8021B  
 Analyst: CRD  
 Analytical Date/Time: 09/13/15 03:15  
 Container ID: 1154883010-A

Prep Batch: VXX27884  
 Prep Method: SW5030B  
 Prep Date/Time: 09/12/15 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

## Method Blank

Blank ID: MB for HBN 1720256 [VXX/27884]  
Blank Lab ID: 1290429

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1154883005, 1154883006, 1154883007, 1154883008, 1154883009, 1154883010

## Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	0.0344J	0.100	0.0310	mg/L
<b>Surrogates</b>				
4-Bromofluorobenzene (surr)	86.9	50-150		%

## Batch Information

Analytical Batch: VFC12652  
Analytical Method: AK101  
Instrument: Agilent 7890 PID/FID  
Analyst: CRD  
Analytical Date/Time: 9/12/2015 11:07:00PM

Prep Batch: VXX27884  
Prep Method: SW5030B  
Prep Date/Time: 9/12/2015 8:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 09/18/2015 12:18:58PM

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1154883 [VXX27884]  
 Blank Spike Lab ID: 1290432  
 Date Analyzed: 09/12/2015 22:29

Spike Duplicate ID: LCSD for HBN 1154883 [VXX27884]  
 Spike Duplicate Lab ID: 1290433  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1154883005, 1154883006, 1154883007, 1154883008, 1154883009, 1154883010

## 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	0.970	97	1.00	0.928	93	( 60-120 )	4.50	(< 20 )
<b>Surrogates</b>									
4-Bromofluorobenzene (surr)	0.0500	83.9	84	0.0500	86.7	87	( 50-150 )	3.30	

## Batch Information

Analytical Batch: **VFC12652**  
 Analytical Method: **AK101**  
 Instrument: **Agilent 7890 PID/FID**  
 Analyst: **CRD**

Prep Batch: **VXX27884**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **09/12/2015 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: 09/18/2015 12:18:59PM



## Method Blank

Blank ID: MB for HBN 1720256 [VXX/27884]  
Blank Lab ID: 1290429

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1154883005, 1154883006, 1154883007, 1154883008, 1154883009, 1154883010

## Results by SW8021B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.320J	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
<b>Surrogates</b>				
1,4-Difluorobenzene (surr)	85.6	77-115		%

## Batch Information

Analytical Batch: VFC12652  
Analytical Method: SW8021B  
Instrument: Agilent 7890 PID/FID  
Analyst: CRD  
Analytical Date/Time: 9/12/2015 11:07:00PM

Prep Batch: VXX27884  
Prep Method: SW5030B  
Prep Date/Time: 9/12/2015 8:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 09/18/2015 12:19:00PM

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1154883 [VXX27884]  
 Blank Spike Lab ID: 1290430  
 Date Analyzed: 09/12/2015 22:10

Spike Duplicate ID: LCSD for HBN 1154883  
 [VXX27884]  
 Spike Duplicate Lab ID: 1290431  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1154883005, 1154883006, 1154883007, 1154883008, 1154883009, 1154883010

## Results by SW8021B

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	100	110	110	100	110	110	( 80-120 )	0.23	(< 20 )
Ethylbenzene	100	105	105	100	106	106	( 75-125 )	1.40	(< 20 )
o-Xylene	100	101	101	100	103	103	( 80-120 )	2.00	(< 20 )
P & M -Xylene	200	206	103	200	211	105	( 75-130 )	2.30	(< 20 )
Toluene	100	106	106	100	109	109	( 75-120 )	2.20	(< 20 )
<b>Surrogates</b>									
1,4-Difluorobenzene (surr)	50	92	92	50	92.7	93	( 77-115 )	0.76	

## Batch Information

Analytical Batch: **VFC12652**  
 Analytical Method: **SW8021B**  
 Instrument: **Agilent 7890 PID/FID**  
 Analyst: **CRD**

Prep Batch: **VXX27884**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **09/12/2015 08:00**  
 Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

Print Date: 09/18/2015 12:19:00PM

## Method Blank

Blank ID: MB for HBN 1720256 [VXX/278874  
Blank ] aL ID: 1260bb8

Ma,rti : x a,pr V( rfaup3c ffB. ro( nGd

9 Q for CaS ntp: 115b88s0013115b88s0023115b88s00s3115b88s00b

## ) pe( l,e LRAK101

<u>QaraS p,pr</u>	<u>) pe( l,e</u>	<u>l U9/Ql</u>	<u>Dl</u>	<u>y nte</u>
. aeoltnp ) anPp UrPantue	0076gJ	0000	00s10	SP/]
<b>Surrogates</b>				
b-BroS of( oroLpnzpnz W( rrd	8bB	50-150		%

## Batch Information

AnalRtual Ba,uh: VFQ12g5b  
AnalRtual Mp,hoG AK101  
Ine,r( S pn,: APtln, 7860A QID/FID  
AnalRe,: Q) D  
AnalRtual Da,p/TtS p: 6/12/2015 6:bb:00AM

OrpmBa,uh: VXX27887  
OrpmMp,hoG Cx 50s0B  
OrpmDa,p/TtS p: 6/12/2015 8:00:00AM  
OrpmInt,tal x ,EVolE 5 S]  
Orpmci ,rau, Vol: 5 S]

Ortn, Da,p: 06/18/2015 12:16:02OM

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1154883 [VXX27887]  
 Blank Spike Lab ID: 1290451  
 Date Analyzed: 09/12/2015 10:41

Spike Duplicate ID: LCSD for HBN 1154883 [VXX27887]  
 Spike Duplicate Lab ID: 1290452  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1154883001, 1154883002, 1154883003, 1154883004

## Results by AK101

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range 6 rganics	1.00	0.991	99	1.00	1.01	101	( 00-120 )	2.00	(< 20 )
<b>Surrogates</b>									
4-Bromofluorobenzene (surr)	0.0500	89.4	89	0.0500	83.4	83	( 50-150 )	Q90	

## Batch Information

Analytical Batch: **VFC12657**  
 Analytical Method: **AK101**  
 Instrument: **Agilent 89P0A DI/ EI/**  
 Analyst: **CX/**

Prep Batch: **V4428998**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **09/12/2015 09:00**  
 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: 09/18/2015 12:19:03PM

## Method Blank

Blank ID: MB for HBN 1720259 [VXX/27887]  
Blank Lab ID: 1290448

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
1154883001, 1154883002, 1154883003, 1154883004

## Results by SW8021B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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
<b>Surrogates</b>				
1,4-Difluorobenzene (surr)	89.9	77-115		%

## Batch Information

Analytical Batch: VFC12654  
Analytical Method: SW8021B  
Instrument: Agilent 7890A PID/FID  
Analyst: CRD  
Analytical Date/Time: 9/12/2015 9:44:00AM

Prep Batch: VXX27887  
Prep Method: SW5030B  
Prep Date/Time: 9/12/2015 8:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1154883 [VXX27887]  
 Blank Spike Lab ID: 1290449  
 Date Analyzed: 09/12/2015 10:22

Spike Duplicate ID: LCSD for HBN 1154883 [VXX27887]  
 Spike Duplicate Lab ID: 1290450  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1154883001, 1154883002, 1154883003, 1154883004

## Results by SW8021B

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	100	106	106	100	106	106	( 80-120 )	0.09	(< 20 )
Ethylbenzene	100	102	102	100	101	101	( 75-125 )	0.91	(< 20 )
o-Xylene	100	96.8	97	100	95.9	96	( 80-120 )	0.90	(< 20 )
P & M -Xylene	200	197	99	200	196	98	( 75-130 )	0.39	(< 20 )
Toluene	100	98.5	99	100	98.5	99	( 75-120 )	0.04	(< 20 )
<b>Surrogates</b>									
1,4-Difluorobenzene (surr)	50	93.8	94	50	94.9	95	( 77-115 )	1.10	

## Batch Information

Analytical Batch: VFC1265A  
 Analytical Method: SW8021B  
 Instrument: 7 gilent 98P07 DI/ FEI/  
 Analyst: CX/

Prep Batch: V4429889  
 Prep Method: SW5030B  
 Prep Date/Time: 09/12/2015 08:00  
 Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

Print Date: 09/18/2015 12:19:04PM



#### Method Blank

Blank ID: MB for HBN 1720283 [XXX/34131]  
Blank Lab ID: 1290566

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1154883001, 1154883002, 1154883003, 1154883004, 1154883005, 1154883006, 1154883007, 1154883008, 1154883009

#### Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	0.300U	0.600	0.180	mg/L
<b>Surrogates</b>				
5a Androstane (surr)	91.8	60-120		%

#### Batch Information

Analytical Batch: XFC12091  
Analytical Method: AK102  
Instrument: HP 7890A FID SV E R  
Analyst: KJO  
Analytical Date/Time: 9/16/2015 12:23:00AM

Prep Batch: XXX34131  
Prep Method: SW3520C  
Prep Date/Time: 9/14/2015 9:50:04AM  
Prep Initial Wt./Vol.: 250 mL  
Prep Extract Vol: 1 mL

Print Date: 09/18/2015 12:19:05PM

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1154883 [VVV34131X  
Blank Spike La2 ID: 17] b590  
Date Analyzed: b] /19/7b15 bb:43

Spike Duplicate ID: LCSD for HBN 1154883  
[VVV34131X  
Spike Duplicate La2 ID: 17] b598  
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1154883bb1, 1154883bb7, 1154883bb3, 1154883bb4, 1154883bb5, 1154883bb9, 1154883bb0,  
1154883bb8, 1154883bb]

## Results 2y AK102

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range 6 rganics	7b	1] .0	] ]	7b	18.3	] 7	( 05C175 )	0.3b	( - 7b )
<b>Surrogates</b>									
5a Androstane (surr)	b.4	] 1.9	] 7	b.4	85.9	89	( 9bC17b )	9.8b	

## Batch Information

Analytical Batc<: **XFC12091**  
Analytical Met<od: **AK102**  
Instrument: **HP 7890A** **FID SV E R**  
Analyst: **KJO**

Prep Batc<: **XXX34131**  
Prep Met<od: **SW3520C**  
Prep Date/hime: **09/14/2015 09:50**  
Spike Init Wt./Tol.: 7b mg/L Extract Tol: 1 mL  
Dupe Init Wt./Tol.: 7b mg/L Extract Tol: 1 mL

Print Date: b] /18/7b15 17:1] :b9PM



## Method Blank

Blank ID: MB for HBN 1720283 [XXX/34131]  
Blank Lab ID: 1290566

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1154883001, 1154883002, 1154883003, 1154883004, 1154883005, 1154883006, 1154883007, 1154883008, 1154883009

## Results by AK103

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	0.250U	0.500	0.150	mg/L
<b>Surrogates</b>				
nA riacontaneAt62 (surr)	90.4	60A20		%

## Batch Information

h nalytical BatcF: XKC12091  
h nalytical MetFod: hV103  
Instrument: HP 7890h KID SJ E R  
h nalytst: VTO  
h nalytical Date/- ime: 9/16/2015 12:23:00hM

Prep BatcF: XXX34131  
Prep MetFod: SW3520C  
Prep Date/- ime: 9/14/2015 9:50:04hM  
Prep Initial Wt./J ol.: 250 mL  
Prep Extract J ol: 1 mL

Print Date: 09/18/2015 12:19:06PM

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1154883 [VVV34131X  
Blank Spike La2 ID: 17] b590  
Date Analyzed: b] /19/7b15 bb:43

Spike Duplicate ID: LCSD for HBN 1154883  
[VVV34131X  
Spike Duplicate La2 ID: 17] b598  
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1154883bb1, 1154883bb7, 1154883bb3, 1154883bb4, 1154883bb5, 1154883bb9, 1154883bb0,  
1154883bb8, 1154883bb]

## Results 2y AK102

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Residual Range 6 rganics	7b	18.3	] 7	7b	10.1	85	( 9bC17b )	0.7b	( - 7b )
<b>Surrogates</b>									
nGriacontaneQ97 (surr)	b.4	8] .8	] b	b.4	81.5	87	( 9bC17b )	] .0b	

## Batch Information

Analytical Batch: XFC190H  
Analytical Method: AK102  
Instrument: P7 8DH0A FIV SE R J  
Analyst: KQ8

Prep Batch: XXX24121  
Prep Method: SW2590C  
Prep Date/Time: 0H/14/9015 0H50  
Spike Init Wt./Tol.: 7b mg/L Extract Tol: 1 mL  
Dupe Init Wt./Tol.: 7b mg/L Extract Tol: 1 mL

Print Date: b] /18/7b15 17:1] :b0PM



1154883

rth America Inc.  
CUSTODY RECORD

Locations Nationwide

Alaska Maryland  
New Jersey New York  
North Carolina Ohio  
West Virginia

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CLIENT: Fairbanks Environmental Services				SGS Reference #:				page 1 of 1			
CONTACT: Mike Boese PHONE NO: 907-452-1006											
PROJECT/SITE: ARRC Fairbanks Rail Yard											
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 SAMPLE TYPE C = U = COMP G = GRAB MI = Multi Incremental Samples	HC1	HC2	HC3	HC4	REMARKS	
QRE	WC-3	9/1/2015	1330	WG	G	3	2			WC-3	
QRE	MW-2	9/1/2015	1300	WG	G	3	2			MW-2	
QRE	MW-4	9/1/2015	1230	WG	G	3	2			MW-4	
QRE	MW-5	9/1/2015	1130	WG	G	3	2			MW-5	
QRE	MW-6	9/1/2015	1055	WG	G	3	2			MW-6	
QRE	MW-7	9/1/2015	1140	WG	G	3	2			MW-7	
QRE	MW-X	9/1/2015	1150	WG	G	3	2			MW-X	
QRE	MW-8	9/1/2015	935	WG	G	3	2			MW-8	
QRE	MW-9	9/1/2015	1000	WG	G	3	2			MW-9	
QRE	Trip Blank	9/1/2015	800	QC	QC	3				Trip Blank	
Collected/Relinquished By: (1)				Date	9/01/15	Time	1515	Received By:			
Relinquished By: (2)				Date		Time		Received By:			
Relinquished By: (3)				Date		Time		Received By:			
Relinquished By: (4)				Date	9/2/15	Time	0950	Received For Laboratory By:			

DOD Project?	NO	Special Deliverable Requirements:
Cooler ID	090101	Level 2 Data Package, EquiS, and PDF. No hard copy required.
Cooler Temp °C		
Requested Turnaround Time and/or Special Instructions:		
Normal TAT, Invoice ARRC directly (265-2429)		
Temperature Blank °C:	20.4 DF	Chain of Custody Seal: (Circle) WTAGT BROKEN ABSENT 2F

□ 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) 350-1

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



Review Criteria:	Yes	N/A	No	Comments/Action Taken:
Were <b>custody seals</b> intact? Note # & location, if applicable. COC accompanied samples?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Exemption permitted if sampler hand carries/delivers.</i>
<b>Temperature blank</b> compliant* (i.e., 0-6°C after CF)? <i>If &gt;6 °C, were samples collected &lt;8 hours ago?</i> <i>If &lt;0 °C, were all sample containers ice free?</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2F <i>Exemption permitted if chilled &amp; collected &lt;8 hrs ago.</i>
Cooler ID: 090101 @ 2.0 w/ Therm.ID: D8 Cooler ID: @ w/ Therm.ID: Cooler ID: @ w/ Therm.ID: Cooler ID: @ w/ Therm.ID: Cooler ID: @ w/ Therm.ID: If samples are received <u>without</u> a temperature blank, the “cooler temperature” will be documented in lieu of the temperature blank & “ <b>COOLER TEMP</b> ” will be noted to the right. In cases where neither a temp blank <u>nor</u> cooler temp can be obtained, note “ambient” or “chilled.”	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is needed.</i>
Delivery method (specify all that apply): <input type="checkbox"/> Client (hand carried) <input type="checkbox"/> USPS <input checked="" type="checkbox"/> Lynden <input type="checkbox"/> AK Air <input type="checkbox"/> Alert Courier <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> RAVN <input type="checkbox"/> C&D Delivery <input type="checkbox"/> Carlile <input type="checkbox"/> Pen Air <input type="checkbox"/> Warp Speed <input type="checkbox"/> Other: → For WO# with airbills, was the WO# & airbill info recorded in the Front Counter eLog?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Yes	N/A	No	
Were samples received within hold time? Do samples <b>match</b> COC* (i.e., sample IDs, dates/times collected)? Were analyses requested unambiguous?	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<i>Note: Refer to form F-083 “Sample Guide” for hold times.</i> <i>Note: If times differ &lt;1hr, record details and login per COC.</i>
Were samples in <b>good condition</b> (no leaks/cracks/breakage)? Packing material used (specify all that apply): <input checked="" type="checkbox"/> Bubble Wrap <input checked="" type="checkbox"/> Separate plastic bags <input type="checkbox"/> Vermiculite <input type="checkbox"/> Other:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were <b>proper containers</b> (type/mass/volume/preservative*) used? Were <b>Trip Blanks</b> (i.e., VOAs, LL-Hg) in cooler with samples? Were all VOA vials <b>free of headspace</b> (i.e., bubbles ≤6 mm)? Were all soil VOAs <b>field extracted</b> with MeOH+BFB?	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <i>Exemption permitted for metals (e.g., 200.8/6020A).</i>
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was <b>pH verified and compliant</b> ? If pH was adjusted, were bottles flagged (i.e., stickers)?	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
For <b>special handling</b> (e.g., “MI” soils, foreign soils, lab filter for dissolved..., lab extract for volatiles, Ref Lab, limited volume), were bottles/paperwork flagged (e.g., sticker)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
For <b>RUSH/SHORT Hold Time</b> , were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
For <b>SITE-SPECIFIC QC</b> , e.g. BMS/BMSD/BDUP, were containers / paperwork flagged accordingly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>For any question answered “No,”</b> has the PM been notified and the problem resolved (or paperwork put in their bin)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SRF Completed by: EDJ PM notified:
Was <b>PEER REVIEW</b> of <i>sample numbering/labeling completed</i> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Peer Reviewed by: VDL
Additional notes (if applicable):				

*Note to Client: Any “no” answer above indicates non-compliance with standard procedures and may impact data quality*

## Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1154883001-A	HCL to pH < 2	OK	1154883009-C	HCL to pH < 2	OK
1154883001-B	HCL to pH < 2	OK	1154883009-D	HCL to pH < 2	OK
1154883001-C	HCL to pH < 2	OK	1154883009-E	HCL to pH < 2	OK
1154883001-D	HCL to pH < 2	OK	1154883010-A	HCL to pH < 2	OK
1154883001-E	HCL to pH < 2	OK	1154883010-B	HCL to pH < 2	OK
1154883002-A	HCL to pH < 2	OK	1154883010-C	HCL to pH < 2	OK
1154883002-B	HCL to pH < 2	OK			
1154883002-C	HCL to pH < 2	OK			
1154883002-D	HCL to pH < 2	OK			
1154883002-E	HCL to pH < 2	OK			
1154883003-A	HCL to pH < 2	OK			
1154883003-B	HCL to pH < 2	OK			
1154883003-C	HCL to pH < 2	OK			
1154883003-D	HCL to pH < 2	OK			
1154883003-E	HCL to pH < 2	OK			
1154883004-A	HCL to pH < 2	OK			
1154883004-B	HCL to pH < 2	OK			
1154883004-C	HCL to pH < 2	OK			
1154883004-D	HCL to pH < 2	OK			
1154883004-E	HCL to pH < 2	OK			
1154883005-A	HCL to pH < 2	OK			
1154883005-B	HCL to pH < 2	OK			
1154883005-C	HCL to pH < 2	OK			
1154883005-D	HCL to pH < 2	OK			
1154883005-E	HCL to pH < 2	OK			
1154883006-A	HCL to pH < 2	OK			
1154883006-B	HCL to pH < 2	OK			
1154883006-C	HCL to pH < 2	OK			
1154883006-D	HCL to pH < 2	OK			
1154883006-E	HCL to pH < 2	OK			
1154883007-A	HCL to pH < 2	OK			
1154883007-B	HCL to pH < 2	OK			
1154883007-C	HCL to pH < 2	OK			
1154883007-D	HCL to pH < 2	OK			
1154883007-E	HCL to pH < 2	OK			
1154883008-A	HCL to pH < 2	OK			
1154883008-B	HCL to pH < 2	OK			
1154883008-C	HCL to pH < 2	OK			
1154883008-D	HCL to pH < 2	OK			
1154883008-E	HCL to pH < 2	OK			
1154883009-A	HCL to pH < 2	OK			
1154883009-B	HCL to pH < 2	OK			



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.

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.

BU - The container was received with headspace greater than 6mm.

**APPENDIX B**  
**ADEC LABORATORY DATA REVIEW CHECKLIST**

## Laboratory Data Review Checklist

Completed by:

Title:  Date:

CS Report Name:  Report Date:

Consultant Firm:

Laboratory Number:  Name: Laboratory Report

ADEC File Number:  ADEC RecKey Number:

### 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:

### 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:

- 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:

All samples were documented to be 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:

No discrepancies noted - all samples were documented to be in acceptable condition.

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

Comments:

No adverse impact to data quality. 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:

The laboratory did not identify any errors in the Case Narrative. However, there was blank contamination noted in three analytical batches.

c. Were all corrective actions documented?

Yes No ■NA (Please explain.) Comments:

The laboratory did not identify any errors in the Case Narrative.

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. The laboratory did not identify any errors in the Case Narrative, and no data were qualified except for J flags (indicating that result is considered to be estimated because it was reported below the limit of quantitation).

#### 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:

GRO was detected in the method blanks associated with batches VXX27884 and VXX27887, and benzene was detected in the method blank associated with batch VXX27884, at concentrations below the PQL. Consequently all associated GRO and benzene results in project samples reported with concentrations within 10X the method blank concentration were qualified with a B. They include:

GRO samples MW-2, MW-4, MW-5, MW-6, MW-7, MW-X, MW-8, MW-9, and WC-3.

Benzene samples MW-7, MW-X, MW-8, MW-9 and the Trip Blank.

Impact to project data is minimal since all affected GRO and benzene results were below ADEC cleanup levels.

iii. If above PQL, what samples are affected?

Comments:

See 6aii.

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

■Yes No NA (Please explain.)

Comments:

See 6ii.

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

Comments:

Minimal impact to data quality - See 6a.ii.

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:

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:

Not applicable

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?

Benzene, at 0.31 ug/L, was detected at a concentration less than the PQL, however. Several samples including the Trip Blank were qualified (B) due to method blank contamination ( see Section 6ii – note that the benzene concentration in the method blank was greater than the benzene concentration in the Trip Blank). At an abundance of caution, the benzene results in samples MW-4 and MW-5 were also qualified because the results were within 10X the benzene concentration detected in the Trip Blank (note that benzene in the Trip Blank may be due to MB contamination). Impact to data was minor since the benzene results in MW-4 and MW-5 were below the ADEC groundwater cleanup level.

■Yes No NA (Please explain.)

Comments:

iv. If above PQL, what samples are affected?

Comments:

See 6ii and 6diii for discussion of benzene data impacted by blank contamination.

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

Comments:

Impact to data quality was minor – see 6ii and 6diii.

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 RRO (31%) (identified in gray highlight in the table below). The sample's high level of DRO contamination is the suspected reason for the RRO imprecision. Impact to data quality is minor as the RRO results for both primary and field duplicate were above the ADEC cleanup level. Note that the LOD was used for comparing a non detect result, and that the higher of the two results will be used for evaluating the site.

Analyte	Method	Units	MW-7	Qualifier	MW-X	Qualifier	RPD
DRO	AK101	mg/L	10.7		14.0		27%
RRO	AK103	mg/L	1.61	Q	2.19	Q	31%
GRO	AK101	mg/L	0.0696	J	0.0647	J	7%
Benzene	8021B	µg/L	2.38		2.43		2%

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

Comments:

Although the RRO result in sample pair MW-7 and MW-X did not meet the field duplicate precision goal and both results were qualified (Q), the 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:

Results reported below the limit of quantitation (LOQ) were qualified with a J flag to indicate they are estimated values.