

# **Milepost 205 Richardson Highway Spill Groundwater Monitoring Well Report**

## **Mile 205 Richardson Highway, Alaska**

January 2014

Prepared for:

### **Big States Logistics Inc.**

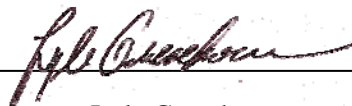
Prepared by:

### **Alaska Resources and Environmental Services, LLC.**



284 Topside Drive  
Fairbanks, AK 99712

Prepared  
by:



Lyle Gresehover  
Project Manager/Geologist

**Milepost 205 Richardson Highway Spill  
Groundwater Monitoring Well Report  
January 2014**

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## **INTRODUCTION**

This report was prepared on behalf of Big State Logistics Inc., who has contracted with Alaska Resources & Environmental Services (ARES) to perform the groundwater investigation associated with the petroleum release of diesel fuel as detailed in the ARES Release Investigation / Phase II ESA dated April 2010. The release occurred at milepost 205 of the Richardson highway. The ADEC file ID number for this site is 140.38.052. The work described in this report was conducted as described in the ADEC approved Work Plan submitted in March 2009.

The objective of our work was to obtain groundwater sample data near the site of a former petroleum release in order to assess the impacts to groundwater and to evaluate the extent of groundwater migration. Groundwater samples were collected from monitoring wells MW-1 through MW-6 that were installed in March 2009. All groundwater samples were collected from monitoring wells in general accordance with ADEC Oil and Other Hazardous Substances Pollution Control Regulations (18 AAC 75 – amended April 08, 2012).

The ADEC file # for the site is 140.38.052.

## **SITE BACKGROUND**

### **Site Description**

The petroleum release occurred on State of Alaska owned property located at Mile 205 Richardson Highway within the State of Alaska Department of Transportation (D.O.T.) right-of-way (ROW) corridor (Figure 1,2). The D.O.T. manages the ROW which is 150' from road centerline. Lands outside of the D.O.T. corridor are owned and managed by Department of Interior Bureau of Land Management (BLM).

Lands in the vicinity of the spill are undeveloped. The GPS coordinates for the spill site is N 63° 15.447', W -145 ° 41.118'. The elevation of the site is approximately 2800' above mean sea level according to topographical map of the area.

### **History**

On December 30, 2008 a tanker truck owned and operated by Big State Logistics Inc., (BSL) was involved in an accident at milepost 205 on the Richardson highway (Appendix A, Figure 1). A fuel trailer separated from the tanker truck, overturned and came to rest in a ditch on the east side of the highway. No injuries were reported. The trailer released all of the approximately 4,000-gallons of #2 Diesel fuel it contained onto the ground surface.

Initial cleanup attempts took place January 19, 2009. A total of 140 cubic yards of contaminated soil/ snow was transported to OIT, Moose Creek facility for thermal remediation.

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In March 2009 ARES conducted a groundwater investigation that included the installation of six permanent groundwater monitoring wells. Monitoring well locations can be found in Appendix A, Figure 2.

Groundwater samples have been collected from the spill site on an annual basis since 2009 to confirm site conditions and monitor the contaminant plume.

### **Topography**

The United States Geological Survey (USGS) Mt. Hayes quad (B-4) provides topographic map coverage of the site (Figure 1). The subject property is located in the foothills of the Alaska Range within the Tanana-Kuskokwim Lowland physiographic province. Summit Lake occupies the broad valley to the south, a basin scooped out by glaciers and dammed by alluvial debris deposited by Falls Creek at the basin's north end. Based upon the topographic map of the Mt Hayes Quadrangle, the site elevation is approximately 2800 feet above the mean sea level.

### **Regional Hydrology**

The Delta River is the dominant influence on ground-water flow in the subject area. Two discharge peaks characterize the Delta River: spring snowmelt runoff and summer glacial melt (mid-late July). The stage of nearby water bodies such as Phelan Creek typically rises and falls in response to stage changes of the Delta River. The depth to groundwater varies in response to these controlling factors. Based on interpretation of USGS data, regional groundwater flow direction is generally to the north-northwest. However, the direction of flow may vary depending upon the stage of the Delta River. The seasonal high groundwater table for the surrounding area is unknown at this time.

The subject property is situated approximately 200 feet east of Phelan Creek a tributary to the Delta River and approximately 4 miles north of Summit Lake.

### **Site Hydrology**

Groundwater was encountered at approximately 4 - 4.5 feet bgs in all boreholes during the subsurface investigation conducted in March 2009 at Milepost 205 Richardson Highway. The regional water table was considered normal for the time of year. Based on groundwater data from nearby monitoring wells, the groundwater direction flows to the 5.5 degrees east of north with a fairly steep hydraulic gradient (< 0.0088 vertical ft/horizontal ft).

## **GROUNDWATER SAMPLING**

### **Scope of Work**

To achieve the stated objectives, ARES performed the following tasks:

- Collected groundwater samples from monitoring wells MW-1 through MW-6. A duplicate sample from MW-1 was collected for QA/QC purposes. Samples were

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analyzed for diesel range organics (DRO) by method AK 102 and benzene, toluene, ethylbenzene and xylenes (BTEX) constituents by method EPA 8021B and;

- Data review and report preparation.

### **Sampling Method**

The monitoring well was developed, purged and sampled in accordance with the *UST Procedures Manual* (November, 2002), the *ADEC Draft Field Sampling Guidance* (May 2010), and standard procedures. A disposable polyethylene bailer and new nitrile gloves were used during the sampling event. Before sampling, the groundwater elevation was measured to 0.010 feet using a Heron Model D-T Interface Meter. Well volume was then calculated, and at least three times the well volume was purged prior to sampling. Recharge rates were observed during purging, and water levels measurements taken following sampling. Water parameters were recorded to include temperature, pH, conductivity, turbidity, dissolved oxygen, and salinity using a Horiba Water Meter Model U-10.

Once well was sufficiently recharged and groundwater parameters stabilized, samples were collected in order of decreasing volatility. The bailers were carefully lowered in to the well to avoid loss of volatiles and water collected from the bailers was placed directly into lab supplied sample bottles. Volatile samples were collected to avoid any headspace in the bottle. All bottles were labeled and placed in a pre-chilled cooler (at approximately 4°C) and submitted to ADEC approved laboratory following chain of custody (COC) procedures.

Purge water was placed in drums and stored at an off-site location pending laboratory results. Groundwater samples were collected from MW-1 through MW-6 on July 03, 2013. A blind duplicate sample was collected from monitoring well MW-1 for quality assurance/quality control purposes.

### **Field Observations**

There was a diesel odor and visible sheen observed in groundwater collected from monitoring wells MW-1 and MW-2 during sampling activities. MW1 had a heavy sheen. MW2 had a light sheen. Purge water was almost clear in appearance. Groundwater was approximately 6.5' below ground surface at the time of sampling.

### **Analytical Results**

The monitoring wells were sampled and analyzed for DRO by method AK102 and BTEX by method 8021B. A summary of groundwater analytical results are shown in Table 1. The summary table also includes historical analytical results for comparative purposes with the current sampling event. Complete laboratory results are included in Appendix B.

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**Table 1  
Historical Groundwater Analytical Results Summary  
(Results shown as mg/L)**

Sample Location	Sample ID	Date Sampled	EPA Method 8021B				Alaska Method AK 102
			Benzene in mg/L	Toluene in mg/L	Ethylbenzene in mg/L	Total xylenes in mg/L	DRO in mg/L
MW-1	MW1-0309	03/24/09	ND	0.598	0.204	1.190	<b>5.23</b>
	MW1-0909	10/04/09	<b>0.0461</b>	.0284	0.120	0.843	<b>46.7</b>
	MW1-0910	09/25/10	0.00142	0.0439	0.0551	0.266	<b>126</b>
	MW1-0711	07/20/11	0.000610	0.0125	0.0210	0.291	<b>59.8</b>
	MW1-0912	09/23/12	ND	0.0132	.0109	0.1311	<b>3.19</b>
	MW1-0712*	07/31/13	ND	0.00292	0.00175	0.0552	<b>48.4</b>
	DUP-W-0712* Blind Field Duplicate Sample to MW1-0712	07/31/13	ND	0.00387	0.00382	0.0635	<b>42.9</b>
MW-2	MW2-0309	03/24/09	0.00120	0.0166	0.00540	.0475	0.471
	DUP-W-0309 Blind Field Duplicate Sample to MW2-0309	03/24/09	.00137	.0181	.00601	.0505	ND
	MW2-0909	10/04/09	ND	.0266	.0528	.388	<b>1210</b>
	MWDUP-0909 Blind Field Duplicate Sample to MW2-0909	10/04/09	ND	.0228	.0503	.373	<b>555</b>
	MW2-0910	09/25/10	ND	ND	0.00223	0.0218	<b>27.1</b>
	MW2-0711	07/20/11	ND	ND	ND	ND	<b>9.14</b>
	MW2-0912	09/23/12	ND	ND	ND	ND	0.725
	MW2-0712*	07/31/13	ND	ND	0.000675	ND	<b>6.92</b>
MW-3	MW3-0309	03/24/09	ND	ND	ND	ND	ND
	MW3-0909	10/04/09	ND	ND	ND	ND	0.725
	MW3-0910	09/25/10	ND	ND	ND	ND	ND
	MW3-0711	07/20/11	ND	ND	ND	ND	ND
	DUP-W-0711 Blind Field Duplicate Sample to MW3-0711	07/20/11	ND	ND	ND	ND	ND
	MW3-0912	09/23/12	ND	ND	ND	ND	0.0154
	MW3-0712*	07/31/13	ND	ND	ND	ND	ND
MW-4	MW4-0309	03/24/09	0.000610	0.00616	0.00231	0.0102	ND
	MW4-0909	10/04/09	ND	0.00563	0.0283	.224	<b>108</b>
	MW4-0910	09/25/10	ND	ND	ND	0.00759	<b>14.1</b>
	MW4-0711	07/20/11	ND	ND	ND	ND	<b>6.84</b>
	MW4-0912	09/23/12	ND	ND	ND	ND	<b>2.39</b>
	MW4-0712*	07/31/13	ND	ND	ND	ND	<b>3.36</b>
MW-5	MW5-0309	03/24/09	ND	ND	ND	ND	ND
	MW5-0909	10/04/09	ND	ND	ND	ND	ND
	MW5-0910	09/25/10	ND	ND	ND	ND	ND

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	DUP Blind Field Duplicate Sample to MW5-0910	09/25/10	ND	ND	ND	ND	ND
	MW5-0711	07/20/11	ND	ND	ND	ND	ND
	MW5-0912	09/23/12	ND	ND	ND	ND	ND
	MW5-0712*	7/31/13	ND	ND	ND	ND	ND
MW-6	MW6-0309	03/24/09	ND	ND	ND	ND	ND
	MW6-0909	10/04/09	ND	ND	ND	ND	ND
	MW6-0910	09/25/10	ND	ND	ND	ND	ND
	MW6-0711	07/20/11	ND	ND	ND	ND	ND
	MW6-0912	09/23/12	ND	ND	ND	ND	0.454
	MW6-0712*	7/31/13	ND	ND	ND	ND	ND
ADEC Cleanup Level <sup>1</sup>			0.005	1.0	0.7	10.0	1.5

Results above ADEC cleanup levels are **highlighted and bold**.

<sup>1</sup> Title 18 of the Alaska Administrative Code, Chapter 75. Section 345. Table C.

ND = Not detected at the MRL (Method Reporting Limit).

N/A = Not Analyzed.

Results above ADEC Regulatory Limit in Bold.

\* = samples with the suffix "-0712" were collected in 2013

Analytical results indicate that MW-1, MW-2 and MW-4 remain above ADEC target cleanup levels for DRO. All other results, for all other analytes, are below ADEC cleanup level or non-detectable at reporting limits. Graphs showing levels of DRO over time are presented in Appendix C for wells MW-1, MW-2, and MW-4.

### Quality Assurance / Quality Control

Field quality control (QC) procedures for this project included the collection and analysis of a field duplicate and trip blank, which accompanied the samples in the field. One field duplicate (DUP-W-0712) was collected for quality control purposes. Sample ID DUP-W-0712 was a blind duplicate to MW1-0712. The QC sample was analyzed to assess the quality of sample collection and handling, as well as the accuracy and precision of the laboratory's analytical procedures.

The ADEC Environmental Laboratory Data Quality Assurance Requirements (ADEC 2006) and United States Environmental Protection Agency (EPA) National Functional Guidelines for Organic Review (EPA 1999) were followed in this site investigation. The data were reviewed to determine the data quality and to evaluate potential impact on the usability of the data. The review was performed using Level II reports that were provided by Test America, Inc. laboratory of Anchorage, AK. The analytical laboratory reports and chain-of-custody records is included in Appendix B.

A complete set of quality control parameters were reviewed as listed below.

- Holding times
- Sample handling and receiving
- Surrogate percent recovery
- Field duplicate sample comparability

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- Matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD)
- Laboratory control sample (LCS)/Laboratory control sample duplicate (LCSD) percent recoveries and RPD
- Method blanks
- Trip blanks
- Method Sensitivity – reporting limits and practical quantitation limits (PQL)

Laboratory Report Number: AWH0013

All reviewed quality control parameters were met for this analytical sampling event with the following exceptions:

- A laboratory duplicate sample had a RPD above acceptable limits. Due to the low levels of analyte in the laboratory duplicate sample, the duplicate RPD calculation does not provide useful information. Data quality and usability are not affected.
- The RPD between the primary and confirmatory analysis for ethylbenzene exceeded 40% for field sample MW1-0712. Per method 8000B, the lower value was reported due to apparent chromatographic problems. Data quality is affected for ethylbenzene results for MW1-0712. Ethylbenzene results for MW1-0712 should be viewed qualitatively rather than quantitatively.
- The RPD between the primary and confirmatory analysis for toluene exceeded 40% for field samples MW1-0712, MW2-0712, and Dup-W-0712. Per method 8000B, the higher value was recorded. Data quality is affected for toluene results for Sample MW1-0712, MW2-0712, and Dup-W-0712. Toluene results from these samples could demonstrate a high bias.
- All three of the VOA trip blank vials contained headspace. Trip blank data quality is affected. Small headspace issues (<10%) express essentially no value loss (<3%) for the less volatile VOC's, specifically the BTEX compounds. The trip blanks were only analyzed for BTEX, and all results were non-detect. Trip blank data should still be considered usable. There is no evidence of cross contamination.

Precision, expressed as the relative percent difference (RPD) between field duplicate sample results, is an indication of the consistency of sampling, sample handling, preservation, and laboratory analysis. As required by the 18 AAC 78 and the UST Procedures Manual, field quality control sampling consisted of 10% field duplicates and 5% trip blanks.

The following blind field duplicates and associated RPD calculations are as follows:

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**Table 2: Relative Percent Difference Calculations**

Sample ID / Duplicate ID	Matrix	Compound	Sample Concentration (mg/kg)	Duplicate Concentration (mg/kg)	RPD
MW1-0712 /DUP-W-0712	Water	Toluene	2.92	3.87	28.0
		Ethylbenzene	1.75	3.82	<b>74.3</b>
		Total xylenes	55.2	63.5	14.0
		DRO	48.4	42.9	12.0

Given two sample concentrations (X and Y) the formula to determine RPD is the absolute value of the following:

$$[ ((X - Y) / (X + Y)) / 2 ] * 100 = \text{RPD}$$

Results above ADEC recommended range in **Bold**.

The recommended range for RPD for water analysis is < 30%. The RPD's for duplicates collected as part of this investigation fell within the acceptable range or were not calculable, with the exception of ethylbenzene. The laboratory noted that chromatographic errors occurred during analysis for ethylbenzene in sample MW1-0712, leading to the RPD failure. Data quality is affected. Results for ethylbenzene should be viewed qualitatively rather than quantitatively.

Analysis of the trip blanks showed no analytes above the practical quantitation limit (PQL). Thus, there is no indication that cross-contamination among samples occurred.

Laboratory quality assurance included the procedures outlined in the laboratory's ADEC-approved standard operating procedures documentation. As presented in the laboratory report's QC summary sheet, the laboratory QC parameters fell within the acceptable limits.

### Conclusions and Recommendations

The source area monitoring well, MW-1, shows an increase in DRO levels compared to the previous sampling event. Based on past trend analysis, the 2012 sampling event appears to be an outlier, possibly due to a change in hydraulic conditions at the time of sampling. Hydraulically down-gradient monitoring wells MW-2, and MW-4 both showed a slight increase in DRO levels since the previous sampling event though the levels of DRO in groundwater overall have steady decreased since the monitoring wells were installed in 2009.

Monitoring wells MW-1, MW-2 and MW-4 remain above ADEC cleanup levels for DRO in groundwater. DRO in groundwater ranged from non-detect to 42.9 mg/L. The ADEC cleanup for DRO in groundwater is 1.5 mg/L. Monitoring wells MW-3, MW-5, and MW-6 all show non-detect results for all sampled analytes. All monitoring wells with detectible DRO results are located on the east side of the highway.

Additional sampling events will be required to determine if the contaminant plume is expanding, decreasing, or has stabilized.

ARES recommends the following:



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- Annual Monitoring of wells MW-1 through MW-6 should continue for DRO and BTEX analysis until it can be verified that the contaminant plume has stabilized or is in a decreasing trend.

**Limitations**

This report presents the analytical results from a limited number of groundwater samples, and should not be construed as a comprehensive study of groundwater quality at the site. The samples were intended to evaluate the presence or absence of contaminants at the locations selected. Detectable levels of petroleum hydrocarbons may be present at other locations. It was also not the intent of our sampling and testing to detect the presence of groundwater affected by contaminants other than those for which laboratory analysis were performed. No conclusions can be drawn on the presence or absence of other contaminants. This is not a geotechnical study.

The data presented in this report should be considered representative of the time of our site observations and sample collection. Changes in site conditions can occur with time because of natural forces or human activity. ARES reserves the right to modify or alter conclusions and recommendations should additional data become available.

This report was prepared for the exclusive use of Big State Logistics Inc., and their representatives. If it is made available to others, it should be for information on factual data only and not as a warranty of subsurface conditions.

**Qualifications & Signature of Environmental Professional**

Lyle Gresehover is an ADEC ‘Qualified Person’ and has extensive field experience as an environmental project manager and has worked on all aspects of environmental assessments, investigations, and clean-up efforts.

Lyle Gresehover  
Project Manager

Sincerely,



Lyle Gresehover  
Alaska Resources and Environmental Services, LLC

Enclosure:

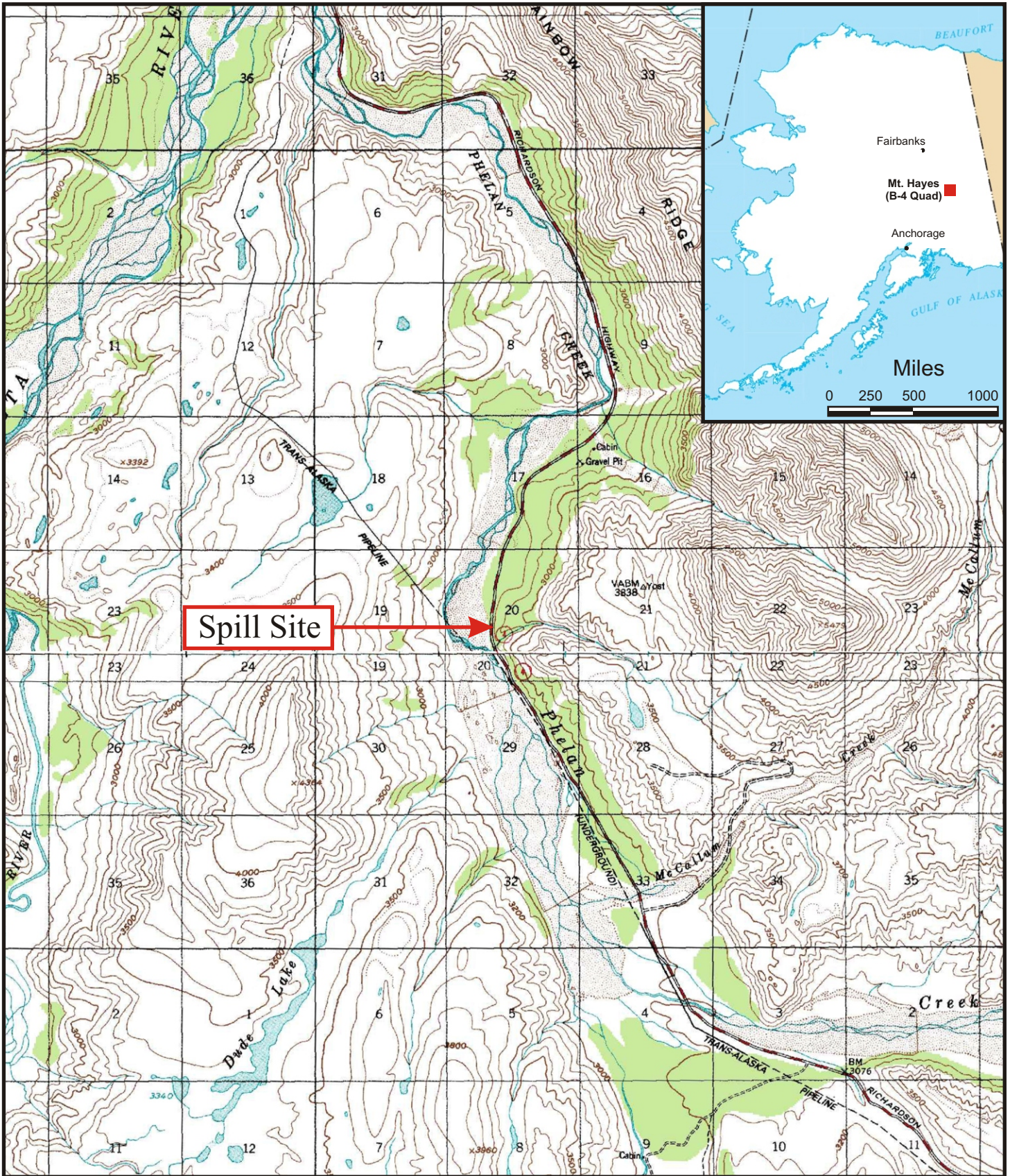
- Appendix A – Figure 1 (Area map), Figure 2 (Well location map).
- Appendix B – Alaska Analytical laboratory results and ADEC QA/QC analytical lab checklist.
- Appendix C – Graphs of DRO results over time

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**Appendix A**  
Figures





**Spill Site**



**1954 Topo Map  
Mt. Hayes, Alaska  
Quad B-4**

Scale in Miles:

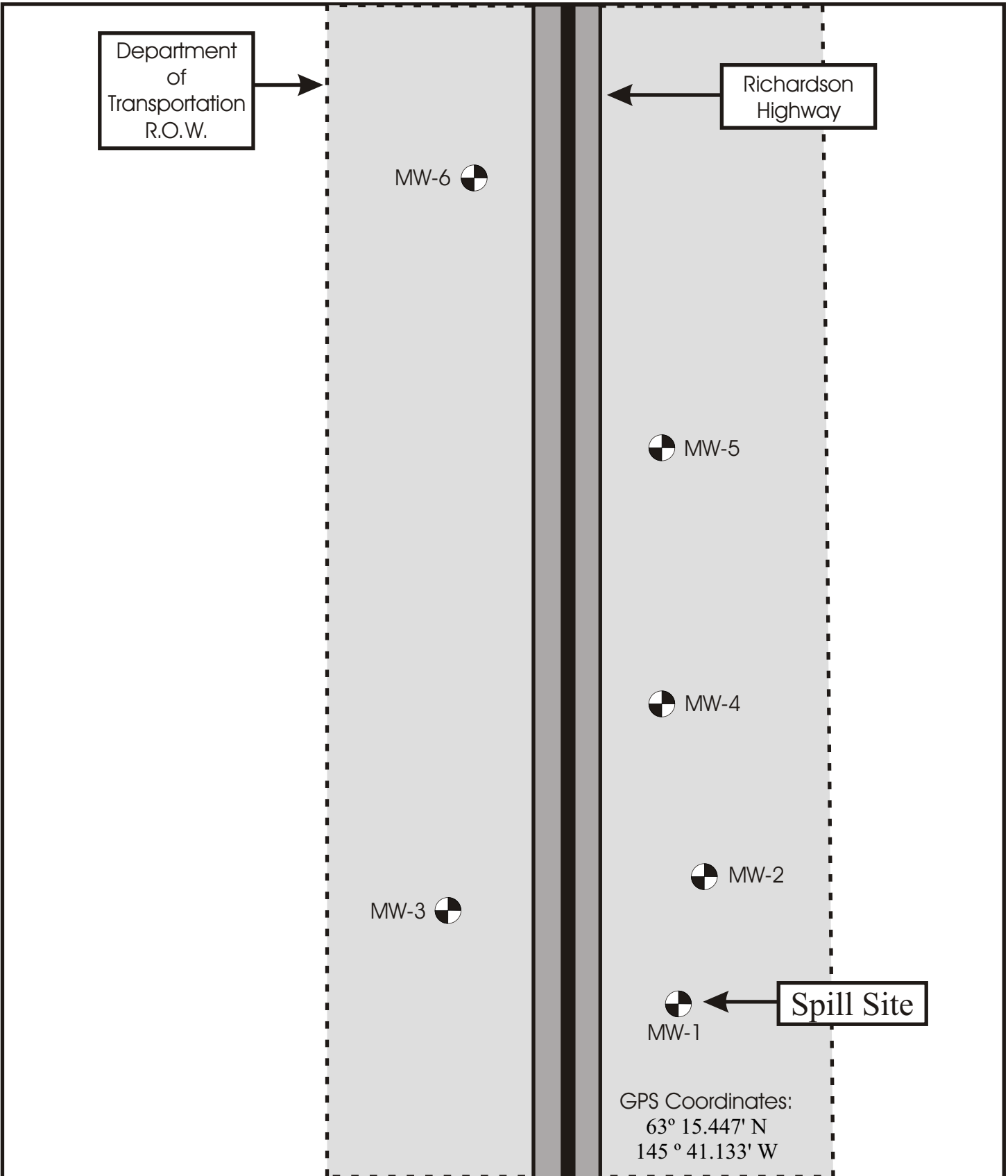


**Groundwater Monitoring  
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Summit Lake, Alaska**

**FIGURE 1**

**ARES  
Alaska Resources and  
Environmental Services, LLC  
284 Topside  
Fairbanks AK 99701**





**MW Location Map**

Scale in Feet:

0 25 50 100

**Groundwater Monitoring Report**  
**Mile 205 Richardson Hwy.**  
**Summit Lake, Alaska**

**FIGURE 2**

**ARES**  
 Alaska Resources and  
 Environmental Services, LLC  
 284 Topside  
 Fairbanks AK 99701

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**Appendix B**  
Analytical Results & ADEC Lab Quality Checklist

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Anchorage

2000 West International Airport Road Suite A10

Anchorage, AK 99502-1119

Tel: (907) 563-9200

TestAmerica Job ID: AWH0013

Client Project/Site: [none]

Client Project Description: 205 Richardson Hwy

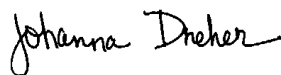
For:

Alaska Resources & Environmental Services

P.O. Box 83050

Fairbanks, AK 99708

Attn: Lyle Gresehover



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Authorized for release by:

8/9/2013 5:37:10 PM

Johanna L Dreher, Client Services Manager

[johanna.dreher@testamericainc.com](mailto:johanna.dreher@testamericainc.com)



### LINKS

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[www.testamericainc.com](http://www.testamericainc.com)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Definitions/Glossary

Client: Alaska Resources & Environmental Services  
Project/Site: [none]

TestAmerica Job ID: AWH0013

## Qualifiers

### Fuels

Qualifier	Qualifier Description
Q1	Does not match typical pattern
Q11	Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel.

### GC Volatiles

Qualifier	Qualifier Description
C8	Calibration Verification recovery was above the method control limit for this analyte.
R4	Due to the low levels of analyte in the sample, the duplicate RPD calculation does not provide useful information.
R10	The RPD between the primary and confirmatory analysis exceeded 40%. Per method 8000B, the lower value was reported due to apparent chromatographic problems.
R1	The RPD between the primary and confirmatory analysis exceeded 40%. Per method 8000B, the higher value was reported.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)



## Case Narrative

Client: Alaska Resources & Environmental Services  
Project/Site: [none]

TestAmerica Job ID: AWH0013

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**Job ID: AWH0013**

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**Laboratory: TestAmerica Anchorage**

### Narrative

#### Receipt

Samples were received on 08/02/2013 at 08:48 AM; the samples arrived in good condition, properly preserved and, where required, on ice.

The temperature of the cooler at receipt was 2.5° C.

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# Detection Summary

Client: Alaska Resources & Environmental Services  
Project/Site: [none]

TestAmerica Job ID: AWH0013

## Client Sample ID: MW1-0712

## Lab Sample ID: AWH0013-01

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Diesel Range Organics	48.4	Q1	0.385		mg/l	1.00		AK 102	Total
Toluene - RE1	2.92	R1	0.500		ug/l	1.00		EPA 8021B	Total
Ethylbenzene - RE1	1.75	R10	0.500		ug/l	1.00		EPA 8021B	Total
Xylenes (total) - RE1	55.2		1.50		ug/l	1.00		EPA 8021B	Total

## Client Sample ID: MW2-0712

## Lab Sample ID: AWH0013-02

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Diesel Range Organics	6.92	Q1	0.385		mg/l	1.00		AK 102	Total
Ethylbenzene - RE1	0.675	R1	0.500		ug/l	1.00		EPA 8021B	Total

## Client Sample ID: MW3-0712

## Lab Sample ID: AWH0013-03

No Detections.

## Client Sample ID: MW4-0712

## Lab Sample ID: AWH0013-04

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Diesel Range Organics	3.36	Q11	0.385		mg/l	1.00		AK 102	Total

## Client Sample ID: MW5-0712

## Lab Sample ID: AWH0013-05

No Detections.

## Client Sample ID: MW6-0712

## Lab Sample ID: AWH0013-06

No Detections.

## Client Sample ID: Dup-W-0712

## Lab Sample ID: AWH0013-07

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Diesel Range Organics	42.9	Q1	0.385		mg/l	1.00		AK 102	Total
Toluene - RE1	3.87	R1	0.500		ug/l	1.00		EPA 8021B	Total
Ethylbenzene - RE1	3.82		0.500		ug/l	1.00		EPA 8021B	Total
Xylenes (total) - RE1	63.5		1.50		ug/l	1.00		EPA 8021B	Total

## Client Sample ID: Trip Blank

## Lab Sample ID: AWH0013-08

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Anchorage

# Client Sample Results

Client: Alaska Resources & Environmental Services  
 Project/Site: [none]

TestAmerica Job ID: AWH0013

**Client Sample ID: MW1-0712**

**Lab Sample ID: AWH0013-01**

Date Collected: 07/31/13 14:15

Matrix: Water

Date Received: 08/02/13 08:48

**Method: AK 102 - Diesel Range Organics (C10-C25) per AK102**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics	48.4	Q1	0.385		mg/l		08/05/13 08:21	08/06/13 00:42	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1-Chlorooctadecane	110		50 - 150				08/05/13 08:21	08/06/13 00:42	1.00

**Method: EPA 8021B - BTEX by EPA Method 8021B - RE1**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.500		ug/l		08/05/13 14:37	08/07/13 16:46	1.00
Toluene	2.92	R1	0.500		ug/l		08/05/13 14:37	08/07/13 16:46	1.00
Ethylbenzene	1.75	R10	0.500		ug/l		08/05/13 14:37	08/07/13 16:46	1.00
Xylenes (total)	55.2		1.50		ug/l		08/05/13 14:37	08/07/13 16:46	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-BFB (PID)	97.8		50 - 150				08/05/13 14:37	08/07/13 16:46	1.00
a,a,a-TFT (PID)	68.6		50 - 150				08/05/13 14:37	08/07/13 16:46	1.00

**Client Sample ID: MW2-0712**

**Lab Sample ID: AWH0013-02**

Date Collected: 07/31/13 15:06

Matrix: Water

Date Received: 08/02/13 08:48

**Method: AK 102 - Diesel Range Organics (C10-C25) per AK102**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics	6.92	Q1	0.385		mg/l		08/05/13 08:21	08/06/13 01:15	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1-Chlorooctadecane	111		50 - 150				08/05/13 08:21	08/06/13 01:15	1.00

**Method: EPA 8021B - BTEX by EPA Method 8021B - RE1**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.500		ug/l		08/05/13 14:37	08/07/13 18:08	1.00
Toluene	ND		0.500		ug/l		08/05/13 14:37	08/07/13 18:08	1.00
Ethylbenzene	0.675	R1	0.500		ug/l		08/05/13 14:37	08/07/13 18:08	1.00
Xylenes (total)	ND		1.50		ug/l		08/05/13 14:37	08/07/13 18:08	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-BFB (PID)	138		50 - 150				08/05/13 14:37	08/07/13 18:08	1.00
a,a,a-TFT (PID)	126		50 - 150				08/05/13 14:37	08/07/13 18:08	1.00

**Client Sample ID: MW3-0712**

**Lab Sample ID: AWH0013-03**

Date Collected: 07/31/13 15:49

Matrix: Water

Date Received: 08/02/13 08:48

**Method: AK 102 - Diesel Range Organics (C10-C25) per AK102**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics	ND		0.400		mg/l		08/05/13 08:21	08/05/13 23:06	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1-Chlorooctadecane	105		50 - 150				08/05/13 08:21	08/05/13 23:06	1.00

**Method: EPA 8021B - BTEX by EPA Method 8021B**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.500		ug/l		08/04/13 11:52	08/05/13 14:17	1.00

TestAmerica Anchorage

# Client Sample Results

Client: Alaska Resources & Environmental Services  
 Project/Site: [none]

TestAmerica Job ID: AWH0013

## Client Sample ID: MW3-0712

## Lab Sample ID: AWH0013-03

Date Collected: 07/31/13 15:49

Matrix: Water

Date Received: 08/02/13 08:48

### Method: EPA 8021B - BTEX by EPA Method 8021B (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	ND		0.500		ug/l		08/04/13 11:52	08/05/13 14:17	1.00
Ethylbenzene	ND		0.500		ug/l		08/04/13 11:52	08/05/13 14:17	1.00
Xylenes (total)	ND		1.50		ug/l		08/04/13 11:52	08/05/13 14:17	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-BFB (PID)	60.1		50 - 150				08/04/13 11:52	08/05/13 14:17	1.00
a,a,a-TFT (PID)	84.6		50 - 150				08/04/13 11:52	08/05/13 14:17	1.00

## Client Sample ID: MW4-0712

## Lab Sample ID: AWH0013-04

Date Collected: 07/31/13 16:48

Matrix: Water

Date Received: 08/02/13 08:48

### Method: AK 102 - Diesel Range Organics (C10-C25) per AK102

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics	3.36	Q11	0.385		mg/l		08/05/13 08:21	08/05/13 23:38	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1-Chlorooctadecane	107		50 - 150				08/05/13 08:21	08/05/13 23:38	1.00

### Method: EPA 8021B - BTEX by EPA Method 8021B

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.500		ug/l		08/04/13 11:52	08/05/13 14:44	1.00
Toluene	ND		0.500		ug/l		08/04/13 11:52	08/05/13 14:44	1.00
Ethylbenzene	ND		0.500		ug/l		08/04/13 11:52	08/05/13 14:44	1.00
Xylenes (total)	ND		1.50		ug/l		08/04/13 11:52	08/05/13 14:44	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-BFB (PID)	61.3		50 - 150				08/04/13 11:52	08/05/13 14:44	1.00
a,a,a-TFT (PID)	77.3		50 - 150				08/04/13 11:52	08/05/13 14:44	1.00

## Client Sample ID: MW5-0712

## Lab Sample ID: AWH0013-05

Date Collected: 07/31/13 17:25

Matrix: Water

Date Received: 08/02/13 08:48

### Method: AK 102 - Diesel Range Organics (C10-C25) per AK102

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics	ND		0.385		mg/l		08/05/13 08:21	08/06/13 00:10	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1-Chlorooctadecane	100		50 - 150				08/05/13 08:21	08/06/13 00:10	1.00

### Method: EPA 8021B - BTEX by EPA Method 8021B

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.500		ug/l		08/04/13 11:52	08/05/13 15:11	1.00
Toluene	ND		0.500		ug/l		08/04/13 11:52	08/05/13 15:11	1.00
Ethylbenzene	ND		0.500		ug/l		08/04/13 11:52	08/05/13 15:11	1.00
Xylenes (total)	ND		1.50		ug/l		08/04/13 11:52	08/05/13 15:11	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-BFB (PID)	85.2		50 - 150				08/04/13 11:52	08/05/13 15:11	1.00
a,a,a-TFT (PID)	115		50 - 150				08/04/13 11:52	08/05/13 15:11	1.00

TestAmerica Anchorage

# Client Sample Results

Client: Alaska Resources & Environmental Services  
Project/Site: [none]

TestAmerica Job ID: AWH0013

**Client Sample ID: MW6-0712**

**Lab Sample ID: AWH0013-06**

Date Collected: 07/31/13 18:00

Matrix: Water

Date Received: 08/02/13 08:48

**Method: AK 102 - Diesel Range Organics (C10-C25) per AK102**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics	ND		0.385		mg/l		08/05/13 08:21	08/05/13 22:01	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1-Chlorooctadecane	104		50 - 150				08/05/13 08:21	08/05/13 22:01	1.00

**Method: EPA 8021B - BTEX by EPA Method 8021B**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.500		ug/l		08/04/13 11:52	08/05/13 15:38	1.00
Toluene	ND		0.500		ug/l		08/04/13 11:52	08/05/13 15:38	1.00
Ethylbenzene	ND		0.500		ug/l		08/04/13 11:52	08/05/13 15:38	1.00
Xylenes (total)	ND		1.50		ug/l		08/04/13 11:52	08/05/13 15:38	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-BFB (PID)	74.8		50 - 150				08/04/13 11:52	08/05/13 15:38	1.00
a,a,a-TFT (PID)	90.4		50 - 150				08/04/13 11:52	08/05/13 15:38	1.00

**Client Sample ID: Dup-W-0712**

**Lab Sample ID: AWH0013-07**

Date Collected: 07/31/13 18:30

Matrix: Water

Date Received: 08/02/13 08:48

**Method: AK 102 - Diesel Range Organics (C10-C25) per AK102**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics	42.9	Q1	0.385		mg/l		08/05/13 08:21	08/05/13 22:34	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1-Chlorooctadecane	113		50 - 150				08/05/13 08:21	08/05/13 22:34	1.00

**Method: EPA 8021B - BTEX by EPA Method 8021B - RE1**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.500		ug/l		08/05/13 14:37	08/07/13 18:35	1.00
Toluene	3.87	R1	0.500		ug/l		08/05/13 14:37	08/07/13 18:35	1.00
Ethylbenzene	3.82		0.500		ug/l		08/05/13 14:37	08/07/13 18:35	1.00
Xylenes (total)	63.5		1.50		ug/l		08/05/13 14:37	08/07/13 18:35	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-BFB (PID)	104		50 - 150				08/05/13 14:37	08/07/13 18:35	1.00
a,a,a-TFT (PID)	82.4		50 - 150				08/05/13 14:37	08/07/13 18:35	1.00

**Client Sample ID: Trip Blank**

**Lab Sample ID: AWH0013-08**

Date Collected: 07/31/13 00:00

Matrix: Water

Date Received: 08/02/13 08:48

**Method: EPA 8021B - BTEX by EPA Method 8021B**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.500		ug/l		08/04/13 11:52	08/05/13 16:33	1.00
Toluene	ND		0.500		ug/l		08/04/13 11:52	08/05/13 16:33	1.00
Ethylbenzene	ND		0.500		ug/l		08/04/13 11:52	08/05/13 16:33	1.00
Xylenes (total)	ND		1.50		ug/l		08/04/13 11:52	08/05/13 16:33	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-BFB (PID)	65.3		50 - 150				08/04/13 11:52	08/05/13 16:33	1.00
a,a,a-TFT (PID)	91.3		50 - 150				08/04/13 11:52	08/05/13 16:33	1.00

TestAmerica Anchorage

# Surrogate Summary

Client: Alaska Resources & Environmental Services  
 Project/Site: [none]

TestAmerica Job ID: AWH0013

## Method: AK 102 - Diesel Range Organics (C10-C25) per AK102

Matrix: Water

Prep Type: Total

			Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	1COD (50-150)		
13H0016-BLK1	Method Blank	105		
13H0016-DUP1	Duplicate	104		
13H0016-MS1	Matrix Spike	107		
13H0016-MSD1	Matrix Spike Duplicate	104		
AWH0013-01	MW1-0712	110		
AWH0013-02	MW2-0712	111		
AWH0013-03	MW3-0712	105		
AWH0013-04	MW4-0712	107		
AWH0013-05	MW5-0712	100		
AWH0013-06	MW6-0712	104		
AWH0013-07	Dup-W-0712	113		

**Surrogate Legend**  
 1COD = 1-Chlorooctadecane

## Method: AK 102 - Diesel Range Organics (C10-C25) per AK102

Matrix: Water

Prep Type: Total

			Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	1COD (60-120)		
13H0016-BS1	Lab Control Sample	106		
13H0016-BSD1	Lab Control Sample Dup	109		

**Surrogate Legend**  
 1COD = 1-Chlorooctadecane

## Method: EPA 8021B - BTEX by EPA Method 8021B

Matrix: Water

Prep Type: Total

			Percent Surrogate Recovery (Acceptance Limits)		
Lab Sample ID	Client Sample ID	4-BFB (PID) (50-150)	a,a-TFT (PII) (50-150)		
13H0014-BLK1	Method Blank	77.1	101		
13H0014-DUP1	Duplicate	62.8	88.6		
13H0014-MS1	Matrix Spike	65.9	89.5		
13H0014-MSD1	Matrix Spike Duplicate	61.5	90.2		
13H0018-BLK1	Method Blank	101 C8	88.9 C8		
13H0018-DUP1	Duplicate	88.2	84.6		
AWH0013-01 - RE1	MW1-0712	97.8	68.6		
AWH0013-02 - RE1	MW2-0712	138	126		
AWH0013-03	MW3-0712	60.1	84.6		
AWH0013-04	MW4-0712	61.3	77.3		
AWH0013-05	MW5-0712	85.2	115		
AWH0013-06	MW6-0712	74.8	90.4		
AWH0013-07 - RE1	Dup-W-0712	104	82.4		
AWH0013-08	Trip Blank	65.3	91.3		

**Surrogate Legend**  
 4-BFB (PID) = 4-BFB (PID)

TestAmerica Anchorage

# Surrogate Summary

Client: Alaska Resources & Environmental Services  
Project/Site: [none]

TestAmerica Job ID: AWH0013

a,a,a-TFT (PID) = a,a,a-TFT (PID)

## Method: EPA 8021B - BTEX by EPA Method 8021B

Matrix: Water

Prep Type: Total

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	4-BFB (PID)	a,a-TFT (PII)
		(58.2-129)	(60-135)
13H0014-BS1	Lab Control Sample	66.0	94.0
13H0014-BSD1	Lab Control Sample Dup	82.1	101
13H0018-BS1	Lab Control Sample	96.4	95.2
13H0018-BSD1	Lab Control Sample Dup	99.5	102

### Surrogate Legend

4-BFB (PID) = 4-BFB (PID)

a,a,a-TFT (PID) = a,a,a-TFT (PID)

# QC Sample Results

Client: Alaska Resources & Environmental Services  
 Project/Site: [none]

TestAmerica Job ID: AWH0013

## Method: AK 102 - Diesel Range Organics (C10-C25) per AK102

**Lab Sample ID: 13H0016-BLK1**

**Matrix: Water**

**Analysis Batch: W000406**

**Client Sample ID: Method Blank**

**Prep Type: Total**

**Prep Batch: 13H0016\_P**

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics	ND		0.500		mg/l		08/05/13 08:21	08/05/13 14:53	1.00

Surrogate	Blank %Recovery	Blank Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Chlorooctadecane	105		50 - 150	08/05/13 08:21	08/05/13 14:53	1.00

**Lab Sample ID: 13H0016-BS1**

**Matrix: Water**

**Analysis Batch: W000406**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total**

**Prep Batch: 13H0016\_P**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Diesel Range Organics	10.1	9.44		mg/l		93.4	75 - 125

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1-Chlorooctadecane	106		60 - 120

**Lab Sample ID: 13H0016-BSD1**

**Matrix: Water**

**Analysis Batch: W000406**

**Client Sample ID: Lab Control Sample Dup**

**Prep Type: Total**

**Prep Batch: 13H0016\_P**

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Diesel Range Organics	10.1	8.88		mg/l		87.9	75 - 125	6.08	20

Surrogate	LCS Dup %Recovery	LCS Dup Qualifier	Limits
1-Chlorooctadecane	109		60 - 120

**Lab Sample ID: 13H0016-MS1**

**Matrix: Water**

**Analysis Batch: W000406**

**Client Sample ID: Matrix Spike**

**Prep Type: Total**

**Prep Batch: 13H0016\_P**

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	%Rec	Limits
Diesel Range Organics	ND		8.21	6.86		mg/l		83.6	75 - 125

Surrogate	Matrix Spike %Recovery	Matrix Spike Qualifier	Limits
1-Chlorooctadecane	107		50 - 150

**Lab Sample ID: 13H0016-MSD1**

**Matrix: Water**

**Analysis Batch: W000406**

**Client Sample ID: Matrix Spike Duplicate**

**Prep Type: Total**

**Prep Batch: 13H0016\_P**

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Dup Result	Matrix Spike Dup Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Diesel Range Organics	ND		7.83	6.34		mg/l		80.9	75 - 125	7.99	25

Surrogate	Matrix Spike Dup %Recovery	Matrix Spike Dup Qualifier	Limits
1-Chlorooctadecane	104		50 - 150

TestAmerica Anchorage



# QC Sample Results

Client: Alaska Resources & Environmental Services  
 Project/Site: [none]

TestAmerica Job ID: AWH0013

## Method: AK 102 - Diesel Range Organics (C10-C25) per AK102 (Continued)

**Lab Sample ID: 13H0016-DUP1**

**Matrix: Water**

**Analysis Batch: W000406**

**Client Sample ID: Duplicate**

**Prep Type: Total**

**Prep Batch: 13H0016\_P**

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	Limit
Diesel Range Organics	ND		ND		mg/l			20

Surrogate	Duplicate %Recovery	Duplicate Qualifier	Limits
1-Chlorooctadecane	104		50 - 150

## Method: EPA 8021B - BTEX by EPA Method 8021B

**Lab Sample ID: 13H0014-BLK1**

**Matrix: Water**

**Analysis Batch: W000404**

**Client Sample ID: Method Blank**

**Prep Type: Total**

**Prep Batch: 13H0014\_P**

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		16.6		ug/l		08/04/13 11:52	08/04/13 17:56	33.3
Toluene	ND		16.6		ug/l		08/04/13 11:52	08/04/13 17:56	33.3
Ethylbenzene	ND		16.6		ug/l		08/04/13 11:52	08/04/13 17:56	33.3
Xylenes (total)	ND		50.0		ug/l		08/04/13 11:52	08/04/13 17:56	33.3

Surrogate	Blank %Recovery	Blank Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-BFB (PID)	77.1		50 - 150	08/04/13 11:52	08/04/13 17:56	33.3
a,a,a-TFT (PID)	101		50 - 150	08/04/13 11:52	08/04/13 17:56	33.3

**Lab Sample ID: 13H0014-BS1**

**Matrix: Water**

**Analysis Batch: W000404**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total**

**Prep Batch: 13H0014\_P**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Benzene	20.0	17.3		ug/l		86.6	57.9 - 151
Toluene	20.0	16.3		ug/l		81.7	54.8 - 154
Ethylbenzene	20.0	16.9		ug/l		84.7	67.2 - 132
Xylenes (total)	60.0	49.5		ug/l		82.5	66.4 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-BFB (PID)	66.0		58.2 - 129
a,a,a-TFT (PID)	94.0		60 - 135

**Lab Sample ID: 13H0014-BSD1**

**Matrix: Water**

**Analysis Batch: W000404**

**Client Sample ID: Lab Control Sample Dup**

**Prep Type: Total**

**Prep Batch: 13H0014\_P**

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene	20.0	19.6		ug/l		98.2	57.9 - 151	12.6	20
Toluene	20.0	18.6		ug/l		93.2	54.8 - 154	13.2	20
Ethylbenzene	20.0	19.2		ug/l		96.0	67.2 - 132	12.6	20
Xylenes (total)	60.0	60.0		ug/l		100	66.4 - 130	19.2	20

TestAmerica Anchorage

# QC Sample Results

Client: Alaska Resources & Environmental Services  
 Project/Site: [none]

TestAmerica Job ID: AWH0013

## Method: EPA 8021B - BTEX by EPA Method 8021B (Continued)

**Lab Sample ID: 13H0014-BSD1**

**Matrix: Water**

**Analysis Batch: W000404**

**Client Sample ID: Lab Control Sample Dup**

**Prep Type: Total**

**Prep Batch: 13H0014\_P**

Surrogate	LCS Dup	LCS Dup	Limits
	%Recovery	Qualifier	
4-BFB (PID)	82.1		58.2 - 129
a,a,a-TFT (PID)	101		60 - 135

**Lab Sample ID: 13H0014-MS1**

**Matrix: Water**

**Analysis Batch: W000404**

**Client Sample ID: Matrix Spike**

**Prep Type: Total**

**Prep Batch: 13H0014\_P**

Analyte	Sample	Sample	Spike	Matrix Spike	Matrix Spike	Unit	D	%Rec	Limits
	Result	Qualifier	Added	Result	Qualifier				
Benzene	ND		20.0	18.7		ug/l		93.7	60 - 140
Toluene	ND		20.0	17.6		ug/l		87.8	60 - 140
Ethylbenzene	ND		20.0	17.9		ug/l		89.3	60 - 140
Xylenes (total)	ND		60.0	52.1		ug/l		86.8	60 - 140

Surrogate	Matrix Spike	Matrix Spike	Limits
	%Recovery	Qualifier	
4-BFB (PID)	65.9		50 - 150
a,a,a-TFT (PID)	89.5		50 - 150

**Lab Sample ID: 13H0014-MSD1**

**Matrix: Water**

**Analysis Batch: W000404**

**Client Sample ID: Matrix Spike Duplicate**

**Prep Type: Total**

**Prep Batch: 13H0014\_P**

Analyte	Sample	Sample	Spike	Matrix Spike Dup	Matrix Spike Dup	Unit	D	%Rec	Limits	RPD	RPD	Limit
	Result	Qualifier	Added	Result	Qualifier							
Benzene	ND		20.0	19.9		ug/l		99.5	60 - 140	5.99		25
Toluene	ND		20.0	18.6		ug/l		93.2	60 - 140	6.00		25
Ethylbenzene	ND		20.0	19.0		ug/l		94.9	60 - 140	6.10		25
Xylenes (total)	ND		60.0	55.0		ug/l		91.7	60 - 140	5.55		25

Surrogate	Matrix Spike Dup	Matrix Spike Dup	Limits
	%Recovery	Qualifier	
4-BFB (PID)	61.5		50 - 150
a,a,a-TFT (PID)	90.2		50 - 150

**Lab Sample ID: 13H0014-DUP1**

**Matrix: Water**

**Analysis Batch: W000404**

**Client Sample ID: Duplicate**

**Prep Type: Total**

**Prep Batch: 13H0014\_P**

Analyte	Sample	Sample	Duplicate	Duplicate	Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
Benzene	ND		ND		ug/l			20
Toluene	ND		ND		ug/l			20
Ethylbenzene	ND		ND		ug/l			20
Xylenes (total)	ND		ND		ug/l			20

Surrogate	Duplicate	Duplicate	Limits
	%Recovery	Qualifier	
4-BFB (PID)	62.8		50 - 150
a,a,a-TFT (PID)	88.6		50 - 150

TestAmerica Anchorage

# QC Sample Results

Client: Alaska Resources & Environmental Services  
 Project/Site: [none]

TestAmerica Job ID: AWH0013

## Method: EPA 8021B - BTEX by EPA Method 8021B (Continued)

**Lab Sample ID: 13H0018-BLK1**  
**Matrix: Water**  
**Analysis Batch: W000407**

**Client Sample ID: Method Blank**  
**Prep Type: Total**  
**Prep Batch: 13H0018\_P**

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.500		ug/l		08/05/13 14:37	08/06/13 22:29	1.00
Toluene	ND		0.500		ug/l		08/05/13 14:37	08/06/13 22:29	1.00
Ethylbenzene	ND		0.500		ug/l		08/05/13 14:37	08/06/13 22:29	1.00
Xylenes (total)	ND		1.50		ug/l		08/05/13 14:37	08/06/13 22:29	1.00

Surrogate	Blank %Recovery	Blank Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-BFB (PID)	101	C8	50 - 150	08/05/13 14:37	08/06/13 22:29	1.00
a,a,a-TFT (PID)	88.9	C8	50 - 150	08/05/13 14:37	08/06/13 22:29	1.00

**Lab Sample ID: 13H0018-BS1**  
**Matrix: Water**  
**Analysis Batch: W000407**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total**  
**Prep Batch: 13H0018\_P**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	20.0	19.5		ug/l		97.3	57.9 - 151
Toluene	20.0	19.7		ug/l		98.3	54.8 - 154
Ethylbenzene	20.0	19.8		ug/l		98.8	67.2 - 132
Xylenes (total)	60.0	58.7		ug/l		97.8	66.4 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-BFB (PID)	96.4		58.2 - 129
a,a,a-TFT (PID)	95.2		60 - 135

**Lab Sample ID: 13H0018-BSD1**  
**Matrix: Water**  
**Analysis Batch: W000407**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total**  
**Prep Batch: 13H0018\_P**

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	20.0	20.5		ug/l		103	57.9 - 151	5.32	20
Toluene	20.0	20.5		ug/l		103	54.8 - 154	4.40	20
Ethylbenzene	20.0	20.5		ug/l		102	67.2 - 132	3.54	20
Xylenes (total)	60.0	60.3		ug/l		101	66.4 - 130	2.77	20

Surrogate	LCS Dup %Recovery	LCS Dup Qualifier	Limits
4-BFB (PID)	99.5		58.2 - 129
a,a,a-TFT (PID)	102		60 - 135

**Lab Sample ID: 13H0018-DUP1**  
**Matrix: Water**  
**Analysis Batch: W000407**

**Client Sample ID: Duplicate**  
**Prep Type: Total**  
**Prep Batch: 13H0018\_P**

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	RPD Limit
Benzene	ND		ND		ug/l			20
Toluene	0.320		0.287		ug/l		10.9	20
Ethylbenzene	ND		ND		ug/l			20
Xylenes (total)	0.530		0.330	R4	ug/l		46.5	20

TestAmerica Anchorage

# QC Sample Results

Client: Alaska Resources & Environmental Services  
Project/Site: [none]

TestAmerica Job ID: AWH0013

## Method: EPA 8021B - BTEX by EPA Method 8021B (Continued)

Lab Sample ID: 13H0018-DUP1

Matrix: Water

Analysis Batch: W000407

Client Sample ID: Duplicate

Prep Type: Total

Prep Batch: 13H0018\_P

<i>Surrogate</i>	<i>Duplicate %Recovery</i>	<i>Duplicate Qualifier</i>	<i>Limits</i>
4-BFB (PID)	88.2		50 - 150
a,a,a-TFT (PID)	84.6		50 - 150

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# QC Association Summary

Client: Alaska Resources & Environmental Services  
 Project/Site: [none]

TestAmerica Job ID: AWH0013

## Fuels

### Analysis Batch: W000405

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
AWH0013-02	MW2-0712	Total	Water	AK 102	13H0016_P

### Analysis Batch: W000406

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
13H0016-BLK1	Method Blank	Total	Water	AK 102	13H0016_P
13H0016-BS1	Lab Control Sample	Total	Water	AK 102	13H0016_P
13H0016-BSD1	Lab Control Sample Dup	Total	Water	AK 102	13H0016_P
13H0016-DUP1	Duplicate	Total	Water	AK 102	13H0016_P
13H0016-MS1	Matrix Spike	Total	Water	AK 102	13H0016_P
13H0016-MSD1	Matrix Spike Duplicate	Total	Water	AK 102	13H0016_P
AWH0013-01	MW1-0712	Total	Water	AK 102	13H0016_P
AWH0013-03	MW3-0712	Total	Water	AK 102	13H0016_P
AWH0013-04	MW4-0712	Total	Water	AK 102	13H0016_P
AWH0013-05	MW5-0712	Total	Water	AK 102	13H0016_P
AWH0013-06	MW6-0712	Total	Water	AK 102	13H0016_P
AWH0013-07	Dup-W-0712	Total	Water	AK 102	13H0016_P

### Prep Batch: 13H0016\_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
13H0016-BLK1	Method Blank	Total	Water	EPA 3510	
13H0016-BS1	Lab Control Sample	Total	Water	EPA 3510	
13H0016-BSD1	Lab Control Sample Dup	Total	Water	EPA 3510	
13H0016-DUP1	Duplicate	Total	Water	EPA 3510	
13H0016-MS1	Matrix Spike	Total	Water	EPA 3510	
13H0016-MSD1	Matrix Spike Duplicate	Total	Water	EPA 3510	
AWH0013-01	MW1-0712	Total	Water	EPA 3510	
AWH0013-02	MW2-0712	Total	Water	EPA 3510	
AWH0013-03	MW3-0712	Total	Water	EPA 3510	
AWH0013-04	MW4-0712	Total	Water	EPA 3510	
AWH0013-05	MW5-0712	Total	Water	EPA 3510	
AWH0013-06	MW6-0712	Total	Water	EPA 3510	
AWH0013-07	Dup-W-0712	Total	Water	EPA 3510	

## GC Volatiles

### Analysis Batch: W000404

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
13H0014-BLK1	Method Blank	Total	Water	EPA 8021B	13H0014_P
13H0014-BS1	Lab Control Sample	Total	Water	EPA 8021B	13H0014_P
13H0014-BSD1	Lab Control Sample Dup	Total	Water	EPA 8021B	13H0014_P
13H0014-DUP1	Duplicate	Total	Water	EPA 8021B	13H0014_P
13H0014-MS1	Matrix Spike	Total	Water	EPA 8021B	13H0014_P
13H0014-MSD1	Matrix Spike Duplicate	Total	Water	EPA 8021B	13H0014_P
AWH0013-03	MW3-0712	Total	Water	EPA 8021B	13H0014_P
AWH0013-04	MW4-0712	Total	Water	EPA 8021B	13H0014_P
AWH0013-05	MW5-0712	Total	Water	EPA 8021B	13H0014_P
AWH0013-06	MW6-0712	Total	Water	EPA 8021B	13H0014_P
AWH0013-08	Trip Blank	Total	Water	EPA 8021B	13H0014_P

TestAmerica Anchorage

# QC Association Summary

Client: Alaska Resources & Environmental Services  
 Project/Site: [none]

TestAmerica Job ID: AWH0013

## GC Volatiles (Continued)

### Analysis Batch: W000407

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
13H0018-BLK1	Method Blank	Total	Water	EPA 8021B	13H0018_P
13H0018-BS1	Lab Control Sample	Total	Water	EPA 8021B	13H0018_P
13H0018-BSD1	Lab Control Sample Dup	Total	Water	EPA 8021B	13H0018_P
13H0018-DUP1	Duplicate	Total	Water	EPA 8021B	13H0018_P
AWH0013-01 - RE1	MW1-0712	Total	Water	EPA 8021B	13H0018_P
AWH0013-02 - RE1	MW2-0712	Total	Water	EPA 8021B	13H0018_P
AWH0013-07 - RE1	Dup-W-0712	Total	Water	EPA 8021B	13H0018_P

### Prep Batch: 13H0014\_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
13H0014-BLK1	Method Blank	Total	Water	EPA 5030B	
13H0014-BS1	Lab Control Sample	Total	Water	EPA 5030B	
13H0014-BSD1	Lab Control Sample Dup	Total	Water	EPA 5030B	
13H0014-DUP1	Duplicate	Total	Water	EPA 5030B	
13H0014-MS1	Matrix Spike	Total	Water	EPA 5030B	
13H0014-MSD1	Matrix Spike Duplicate	Total	Water	EPA 5030B	
AWH0013-03	MW3-0712	Total	Water	EPA 5030B	
AWH0013-04	MW4-0712	Total	Water	EPA 5030B	
AWH0013-05	MW5-0712	Total	Water	EPA 5030B	
AWH0013-06	MW6-0712	Total	Water	EPA 5030B	
AWH0013-08	Trip Blank	Total	Water	EPA 5030B	

### Prep Batch: 13H0018\_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
13H0018-BLK1	Method Blank	Total	Water	EPA 5030B	
13H0018-BS1	Lab Control Sample	Total	Water	EPA 5030B	
13H0018-BSD1	Lab Control Sample Dup	Total	Water	EPA 5030B	
13H0018-DUP1	Duplicate	Total	Water	EPA 5030B	
AWH0013-01 - RE1	MW1-0712	Total	Water	EPA 5030B	
AWH0013-02 - RE1	MW2-0712	Total	Water	EPA 5030B	
AWH0013-07 - RE1	Dup-W-0712	Total	Water	EPA 5030B	

# Lab Chronicle

Client: Alaska Resources & Environmental Services  
 Project/Site: [none]

TestAmerica Job ID: AWH0013

## Client Sample ID: MW1-0712

Lab Sample ID: AWH0013-01

Date Collected: 07/31/13 14:15

Matrix: Water

Date Received: 08/02/13 08:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	EPA 3510		0.769	13H0016_P	08/05/13 08:21	LS	TAL ANC
Total	Analysis	AK 102		1.00	W000406	08/06/13 00:42	KDC	TAL ANC
Total	Prep	EPA 5030B	RE1	1.00	13H0018_P	08/05/13 14:37	AD	TAL ANC
Total	Analysis	EPA 8021B	RE1	1.00	W000407	08/07/13 16:46	ASD	TAL ANC

## Client Sample ID: MW2-0712

Lab Sample ID: AWH0013-02

Date Collected: 07/31/13 15:06

Matrix: Water

Date Received: 08/02/13 08:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	EPA 3510		0.769	13H0016_P	08/05/13 08:21	LS	TAL ANC
Total	Analysis	AK 102		1.00	W000405	08/06/13 01:15	KDC	TAL ANC
Total	Prep	EPA 5030B	RE1	1.00	13H0018_P	08/05/13 14:37	AD	TAL ANC
Total	Analysis	EPA 8021B	RE1	1.00	W000407	08/07/13 18:08	ASD	TAL ANC

## Client Sample ID: MW3-0712

Lab Sample ID: AWH0013-03

Date Collected: 07/31/13 15:49

Matrix: Water

Date Received: 08/02/13 08:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	EPA 3510		0.800	13H0016_P	08/05/13 08:21	LS	TAL ANC
Total	Analysis	AK 102		1.00	W000406	08/05/13 23:06	KDC	TAL ANC
Total	Prep	EPA 5030B		1.00	13H0014_P	08/04/13 11:52	AD	TAL ANC
Total	Analysis	EPA 8021B		1.00	W000404	08/05/13 14:17	ASD	TAL ANC

## Client Sample ID: MW4-0712

Lab Sample ID: AWH0013-04

Date Collected: 07/31/13 16:48

Matrix: Water

Date Received: 08/02/13 08:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	EPA 3510		0.769	13H0016_P	08/05/13 08:21	LS	TAL ANC
Total	Analysis	AK 102		1.00	W000406	08/05/13 23:38	KDC	TAL ANC
Total	Prep	EPA 5030B		1.00	13H0014_P	08/04/13 11:52	AD	TAL ANC
Total	Analysis	EPA 8021B		1.00	W000404	08/05/13 14:44	ASD	TAL ANC

## Client Sample ID: MW5-0712

Lab Sample ID: AWH0013-05

Date Collected: 07/31/13 17:25

Matrix: Water

Date Received: 08/02/13 08:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	EPA 3510		0.769	13H0016_P	08/05/13 08:21	LS	TAL ANC
Total	Analysis	AK 102		1.00	W000406	08/06/13 00:10	KDC	TAL ANC
Total	Prep	EPA 5030B		1.00	13H0014_P	08/04/13 11:52	AD	TAL ANC

TestAmerica Anchorage

# Lab Chronicle

Client: Alaska Resources & Environmental Services  
Project/Site: [none]

TestAmerica Job ID: AWH0013

## Client Sample ID: MW5-0712

Lab Sample ID: AWH0013-05

Date Collected: 07/31/13 17:25

Matrix: Water

Date Received: 08/02/13 08:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Analysis	EPA 8021B		1.00	W000404	08/05/13 15:11	ASD	TAL ANC

## Client Sample ID: MW6-0712

Lab Sample ID: AWH0013-06

Date Collected: 07/31/13 18:00

Matrix: Water

Date Received: 08/02/13 08:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	EPA 3510		0.769	13H0016_P	08/05/13 08:21	LS	TAL ANC
Total	Analysis	AK 102		1.00	W000406	08/05/13 22:01	KDC	TAL ANC
Total	Prep	EPA 5030B		1.00	13H0014_P	08/04/13 11:52	AD	TAL ANC
Total	Analysis	EPA 8021B		1.00	W000404	08/05/13 15:38	ASD	TAL ANC

## Client Sample ID: Dup-W-0712

Lab Sample ID: AWH0013-07

Date Collected: 07/31/13 18:30

Matrix: Water

Date Received: 08/02/13 08:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	EPA 3510		0.769	13H0016_P	08/05/13 08:21	LS	TAL ANC
Total	Analysis	AK 102		1.00	W000406	08/05/13 22:34	KDC	TAL ANC
Total	Prep	EPA 5030B	RE1	1.00	13H0018_P	08/05/13 14:37	AD	TAL ANC
Total	Analysis	EPA 8021B	RE1	1.00	W000407	08/07/13 18:35	ASD	TAL ANC

## Client Sample ID: Trip Blank

Lab Sample ID: AWH0013-08

Date Collected: 07/31/13 00:00

Matrix: Water

Date Received: 08/02/13 08:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	EPA 5030B		1.00	13H0014_P	08/04/13 11:52	AD	TAL ANC
Total	Analysis	EPA 8021B		1.00	W000404	08/05/13 16:33	ASD	TAL ANC

**Laboratory References:**

TAL ANC = TestAmerica Anchorage, 2000 West International Airport Road Suite A10, Anchorage, AK 99502-1119, TEL (907) 563-9200



# Certification Summary

Client: Alaska Resources & Environmental Services  
Project/Site: [none]

TestAmerica Job ID: AWH0013

## Laboratory: TestAmerica Anchorage

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska	State Program	10	AK00975	06-30-14
Alaska (UST)	State Program	10	UST-067	06-16-14

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# Method Summary

Client: Alaska Resources & Environmental Services  
Project/Site: [none]

TestAmerica Job ID: AWH0013

Method	Method Description	Protocol	Laboratory
AK 102	Diesel Range Organics (C10-C25) per AK102		TAL ANC
EPA 8021B	BTEX by EPA Method 8021B		TAL ANC

**Protocol References:**

**Laboratory References:**

TAL ANC = TestAmerica Anchorage, 2000 West International Airport Road Suite A10, Anchorage, AK 99502-1119, TEL (907) 563-9200

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# Sample Summary

Client: Alaska Resources & Environmental Services  
Project/Site: [none]

TestAmerica Job ID: AWH0013

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
AWH0013-01	MW1-0712	Water	07/31/13 14:15	08/02/13 08:48
AWH0013-02	MW2-0712	Water	07/31/13 15:06	08/02/13 08:48
AWH0013-03	MW3-0712	Water	07/31/13 15:49	08/02/13 08:48
AWH0013-04	MW4-0712	Water	07/31/13 16:48	08/02/13 08:48
AWH0013-05	MW5-0712	Water	07/31/13 17:25	08/02/13 08:48
AWH0013-06	MW6-0712	Water	07/31/13 18:00	08/02/13 08:48
AWH0013-07	Dup-W-0712	Water	07/31/13 18:30	08/02/13 08:48
AWH0013-08	Trip Blank	Water	07/31/13 00:00	08/02/13 08:48



# Test America Cooler Receipt Form

(Army Corps. Compliant)

WORK ORDER # AW140913 CLIENT: ARES PROJECT: 205 Richards on Hwy.

Date/Time Cooler Arrived 8/2/13 8:48 Cooler signed for by: Andrew Pich  
(Print name)

## Preliminary Examination Phase:

Date cooler opened:  same as date received or 1-1

Cooler opened by (print) Andrew Pich (sign) Andrew Pich

1. Delivered by  ALASKA AIRLINES  Fed-Ex  UPS  NAC  LYNDEN  CLIENT  Other

Shipment Tracking # if applicable: 027-8646 4722 (include copy of shipping papers in file)

2. Number of Custody Seals 2 Signed by see back Date 1-1

Were custody seals unbroken and intact on arrival?  Yes  No

3. Were custody papers sealed in a plastic bag?  Yes  No

4. Were custody papers filled out properly (ink, signed, etc.)?  Yes  No

5. Did you sign the custody papers in the appropriate place?  Yes  No

6. Was ice used?  Yes  No Type of ice:  blue ice  gel ice  real ice  dry ice Condition of ice: mostly hard

Temperature 2.5 °C (corrected) Thermometer # IR Gun

7. Packing in Cooler:  bubble wrap  styrofoam  cardboard  Other

8. Did samples arrive in plastic bags?  Yes  No

9. Did all bottles arrive unbroken, and with labels in good condition?  Yes  No

10. Are all bottle labels complete (ID, date, time, etc.)?  Yes  No

11. Do bottle labels and Chain of Custody agree?  Yes  No

12. Are the containers and preservatives correct for the tests indicated?  Yes  No

13. Conoco Phillips, Alyeska, BP H2O samples only, pH <2?  Yes  No  N/A

14. Is there adequate volume for the tests requested?  Yes  No

14. Is there dry weight volume provided?  Yes  No

15. Were VOA vials free of bubbles?  N/A  Yes  No

If "NO" which containers contained "head space" or bubbles? all of TBs

16. Are methanol soils immersed in methanol?  Yes  No  N/A

## Log-in Phase:

Date of sample log-in 8/2/13

Samples logged in by (print) Andrew Pich (sign) Andrew Pich

1. Was project identifiable from custody papers?  Yes  No

2. Do Turn Around Times and Due Dates agree?  Yes  No

3. Was the Project Manager notified of status?  Yes  No

4. Was the Lab notified of status?  Yes  No

5. Was the COC scanned and copied?  Yes  No

AK-FORM-SPL-005 5 October 2011

**CUSTODY SEAL**



ENVIRONMENTAL SAMPLING SUPPLY  
9601 San Leandro St. Oakland, CA 94625-8425

Date: 8/11/13  
Signature: *[Handwritten Signature]*

AWH0013

Signature

D

Date: 8/11/13  
Signature: *[Handwritten Signature]*

ENVIRONMENTAL SAMPLING SUPPLY  
1601 San Leandro St. Oakland, CA 94625-8425



**CUSTODY SEAL**

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## Laboratory Data Review Checklist

Completed by:

Title:  Date:

CS Report Name:  Report Date:

Consultant Firm:

Laboratory Name:  Laboratory Report Number:

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 ( $4^{\circ} \pm 2^{\circ}$  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 three of the VOA trip blank vials contained headspace.

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:

There were no other discrepancies noted.

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

Comments:

Trip blank data quality is affected. Small headspace issues (<10%) express essentially no value loss (<3%) for the less volatile VOC's, specifically the BTEX compounds. The trip blanks were only analyzed for BTEX, and all results were non-detect. Trip blank data should still be considered usable. There is no evidence of cross contamination.

#### 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:

There were no discrepancies, errors or QC failures mentioned in the case narrative.

c. Were all corrective actions documented?

Yes    No     NA (Please explain.)                      Comments:

N/A; see above.

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

Comments:

N/A

#### 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:

Water was the matrix for all samples collected during this sampling event.

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:

N/A

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:

iii. If above PQL, what samples are affected?

Comments:

N/A

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

Yes     No     NA (Please explain.)

Comments:

All results were less than PQL.

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

Comments:

N/A; see above.

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 inorganic samples were collected or analyzed for this sampling event.

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:

A laboratory duplicate sample had a RPD above acceptable limits. The RPD between the primary and confirmatory analysis for ethylbenzene exceeded 40% for field sample MW1-0712. Per method 8000B, the lower value was reported due to apparent chromatographic problems. The RPD between the primary and confirmatory analysis for toluene exceeded 40% for field samples MW1-0712, MW2-0712, and Dup-W-0712. Per method 8000B, the higher value was recorded.

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

Comments:

Samples MW1-0712, MW2-0712, and Dup-W-0712 are affected.

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

Yes     No     NA (Please explain.)                      Comments:

The samples were flagged with the “R1”, “R4”, and “R10” data flags.

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

Comments:

Due to the low levels of analyte in the laboratory duplicate sample, the duplicate RPD calculation does not provide useful information. Data quality and usability are not affected. Data quality is affected for ethylbenzene results for MW1-0712. Ethylbenzene results for MW1-0712 should be viewed qualitatively rather than quantitatively. Data quality is affected for toluene results for Sample MW1-0712, MW2-0712, and Dup-W-0712. Toluene results from these samples could demonstrate a high bias.

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:

The %R for all surrogates was within acceptable limits.

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

Comments:

N/A; see above.

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:

All samples were shipped in a single cooler. No unique identifying marks were available on the cooler. Custody seal was intact upon receipt.

iii. All results less than PQL?

Yes     No     NA (Please explain.)

Comments:

iv. If above PQL, what samples are affected?

Comments:

N/A

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

Comments:

N/A

e. Field Duplicate

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

Yes     No     NA (Please explain.)

Comments:

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:

The RPD for ethylbenzene was 74.3.

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

Comments:

The lab reported apparent chromatographic problems in the field sample for ethylbenzene resulting in the RPD error. Data quality for ethylbenzene is affected. Results for ethylbenzene should be viewed qualitatively rather than quantitatively.

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

Yes  No  NA (Please explain.)  Comments:

No equipment blank was required for this sampling event.

i. All results less than PQL?

Yes  No  NA (Please explain.)  Comments:

ii. If above PQL, what samples are affected?

Comments:

N/A

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

Comments:

N/A

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

a. Defined and appropriate?

Yes  No  NA (Please explain.)  Comments:

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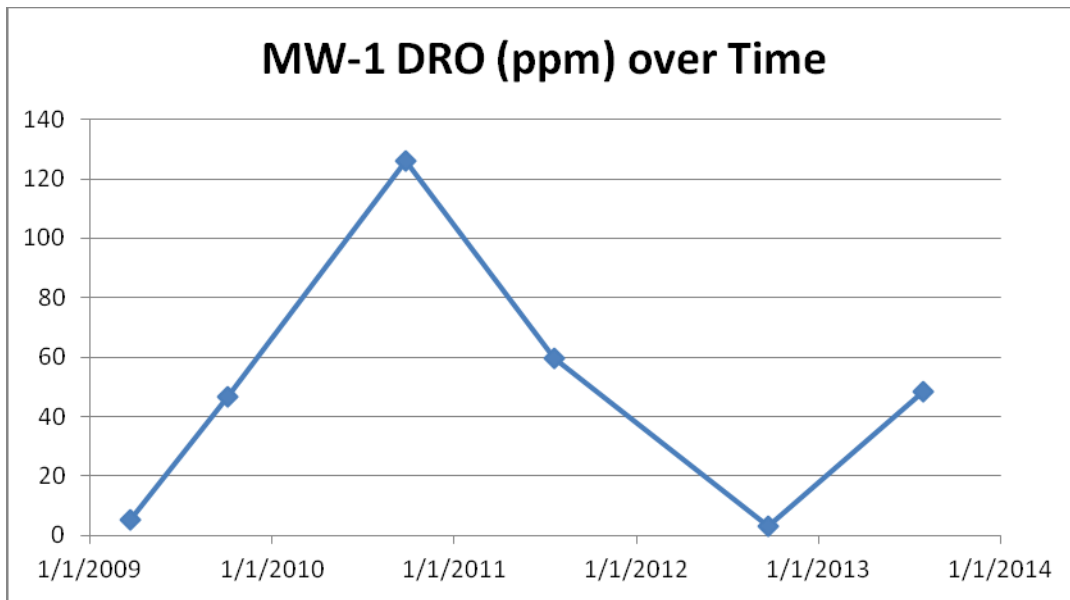
**Appendix C**  
Graphs of DRO results over time

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## Monitoring Well MW-1

Date	MW-1 DRO (ppm)
3/24/2009	5.23
10/4/2009	46.7
9/25/2010	126
7/20/2011	59.8
9/23/2012	3.19
7/31/2013	48.4

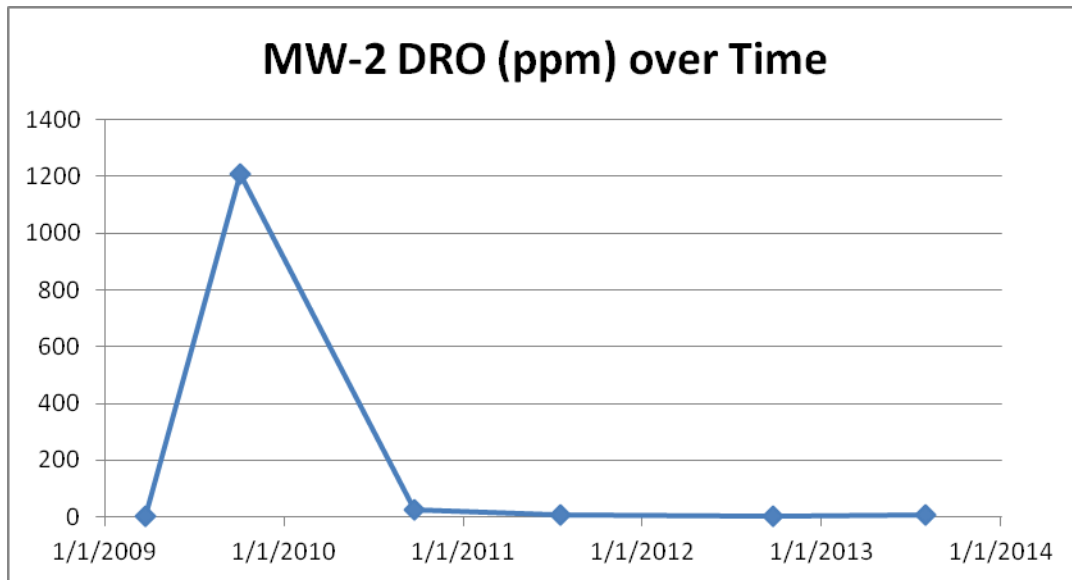


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## Monitoring Well MW-2

Date	MW-2 DRO (ppm)
3/24/2009	0.471
10/4/2009	1210
9/25/2010	27.1
7/20/2011	9.14
9/23/2012	0.725
7/31/2013	6.92





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## Monitoring Well MW-4

Date	MW-4 DRO (ppm)
3/24/2009	ND
10/4/2009	108
9/25/2010	14.1
7/20/2011	6.84
9/23/2012	2.39
7/31/2013	3.36

