

Milepost 205 Richardson Highway Spill 2015 Groundwater Monitoring Well Report

Mile 205 Richardson Highway, Alaska

June 2016

Prepared for:

Big States Logistics Inc.

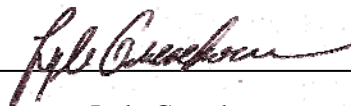
Prepared by:

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



284 Topside Drive
Fairbanks, AK 99712

Prepared
by:



Lyle Gresehover
Project Manager/Geologist

Milepost 205 Richardson Highway Spill 2015 Groundwater Monitoring Well Report

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 June 17, 2015).

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 analyzed for diesel range organics (DRO) by method AK 102 and benzene,

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- 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 peristaltic pump with new disposable polyethylene tubing 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 tubing was carefully lowered in to the well to avoid loss of volatiles and water collected from the pump tubing 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 September 01, 2015. A blind duplicate sample was collected from monitoring well MW-1 for quality assurance/quality control purposes.

Field Observations

Purge water was brown and slightly cloudy in appearance with the exception of purge water from monitoring well MW-1 which was clear. No odor or visible sheen was observed in groundwater collected from the monitoring wells during sampling activities.

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**

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	5.23
	MW1-0909	10/04/09	0.0461	.0284	0.120	0.843	46.7
	MW1-0910	09/25/10	0.00142	0.0439	0.0551	0.266	126
	MW1-0711	07/20/11	0.000610	0.0125	0.0210	0.291	59.8
	MW1-0912	09/23/12	ND	0.0132	.0109	0.1311	3.19
	MW1-0712*	07/31/13	ND	0.00292	0.00175	0.0552	48.4
	DUP-W-0712* Blind Field Duplicate Sample to MW1-0712	07/31/13	ND	0.00387	0.00382	0.0635	42.9
	MW1-0914	09/10/14	ND	0.0016	0.00032 J	0.0093	0.84
	DUP-W-0914 Blind Field Duplicate Sample to MW1-0914	09/10/14	ND	0.00025 J	0.00043 J	0.011	0.96
	MW1-0915	09/1/15	0.000350 J	ND	0.000430 J	0.00493 J	1.8
DUP-W-0915 Blind Field Duplicate Sample to MW1-0915	09/01/15	ND	ND	0.000380 J	0.00444	1.31	
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	1210
	MWDUP-0909 Blind Field Duplicate Sample to MW2-0909	10/04/09	ND	.0228	.0503	.373	555
	MW2-0910	09/25/10	ND	ND	0.00223	0.0218	27.1
	MW2-0711	07/20/11	ND	ND	ND	ND	9.14
	MW2-0912	09/23/12	ND	ND	ND	ND	0.725
	MW2-0712*	07/31/13	ND	ND	0.000675	ND	6.92
	MW2-0914	09/10/14	ND	ND	ND	ND	7.6
MW1-0915	09/01/15	0.000320 J	ND	ND	ND	9.60	
ADEC Cleanup Level ¹			0.005	1.0	0.7	10.0	1.5

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

¹ Title 18 of the Alaska Administrative Code, Chapter 75. Section 345. Table C. June 2015 revision.

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

Results above ADEC Regulatory Limit in Bold.

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

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**Table 1 Continued
Historical Groundwater Analytical Results Summary**

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-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
	MW3-0914	09/10/14	ND	ND	ND	ND	ND
	MW3-0915	09/01/15	0.000310 J	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	108
	MW4-0910	09/25/10	ND	ND	ND	0.00759	14.1
	MW4-0711	07/20/11	ND	ND	ND	ND	6.84
	MW4-0912	09/23/12	ND	ND	ND	ND	2.39
	MW4-0712*	07/31/13	ND	ND	ND	ND	3.36
	MW4-0914	09/10/14	ND	0.00049 J	0.00021 J	0.00065 J	2.3
	MW4-0915	09/01/15	ND	ND	ND	0.000920 J	18.9
ADEC Cleanup Level ¹			0.005	1.0	0.7	10.0	1.5

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

¹ Title 18 of the Alaska Administrative Code, Chapter 75. Section 345. Table C. June 2015 revision.

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

Results above ADEC Regulatory Limit in Bold.

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

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**Table 1 Continued
Historical Groundwater Analytical Results Summary**

Sample Location	Sample ID	Date Sampled	EPA Method 8021B				Alaska Method AK 102
			Benzene in mg/L	Toluene in mg/L	Ethyl-benzene in mg/L	Total xylenes in mg/L	DRO in mg/L
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
	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
	MW5-0914	09/10/14	ND	ND	ND	ND	ND
	MW5-0915	09/01/15	ND	ND	ND	ND	0.201 J
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
	MW6-0914	09/10/14	ND	ND	ND	ND	ND
	MW6-0915	09/01/15	ND	ND	ND	ND	ND
ADEC Cleanup Level ¹			0.005	1.0	0.7	10.0	1.5

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

¹ Title 18 of the Alaska Administrative Code, Chapter 75. Section 345. Table C. June 2015 revision.

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

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. Additionally the level of DRO in the above wells has increased as compared to recent sampling events. All other results, for all other analytes, are below ADEC cleanup level or non-detectable at reporting limits. A graphical summary of DRO results over time is presented in Appendix C for wells MW-1, MW-2, and MW-4.

All samples were analyzed for GRO by AK 101 in 2015. No detections of GRO were identified over the PQL. For clarity sake the historical summary table was not updated to show the results of the GRO analysis.

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-0915) was collected for quality control purposes. Sample ID DUP-W-0915 was a blind duplicate to MW1-0915. The QC sample was analyzed to assess the

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quality of sample collection and handling, as well as the accuracy and precision of the laboratory's analytical procedures.

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:

Table 2: Relative Percent Difference Calculations

Sample ID / Duplicate ID	Matrix	Compound	Sample Concentration (mg/kg)	Duplicate Concentration (mg/kg)	RPD
MW1-0915 / DUP-W-0915	Water	Ethylbenzene	0.000430 J	0.000380 J	12.3
		Total xylenes	0.00493 J	0.00444	10.5
		DRO	1.8	1.31	31.5

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 DRO. Data quality is affected. Results for DRO 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.

The ADEC Environmental Laboratory Data Quality Assurance Requirements (ADEC 2009) and United States Environmental Protection Agency (EPA) National Functional Guidelines for Superfund Organic Methods Data Review (EPA 2008) 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
- 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)

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Laboratory Report Number: 1158584

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

- The calculated RPD for the blind field duplicate had one analyte (DRO) above the RPD limit of 30% in water. The calculated RPD for DRO was 31.5%. Results for DRO should be viewed qualitatively rather than quantitatively.

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

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.

Source area monitoring well MW-1 and hydraulically down-gradient monitoring well MW-2 showed a slight increase in DRO levels since the previous sampling event. Hydraulically down-gradient monitoring well MW-4 showed a significant increase in DRO levels since the previous sampling event. The levels of DRO in groundwater overall have decreased since the monitoring wells were installed in 2009.

Monitoring wells MW-1, MW-2, and MW-4 remain above ADEC regulated levels for DRO in groundwater. DRO in groundwater ranged from non-detect to 18.9 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 results below the PQL for all sampled analytes. All monitoring wells with detectible DRO results are located on the east side of the highway.

The contaminant plume appears to have moved down gradient towards MW-4, and has increased in concentration for the previous sampling event. Additional sampling events will be required to determine if the contaminant plume is continuing to increase in size and concentration at leading edge of the contaminant plume.

ARES recommends the following:

- Levels of DRO have not stabilized or established a decreasing trend at this time. Annual Monitoring of wells MW-1 through MW-6 should continue for DRO and BTEX analysis until the contaminant plume is following a decreasing trend. If a decreasing trend is established, the monitoring frequency should be reduced or eliminated pending ADEC approval.

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

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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 Environmental Professional’ and has extensive field experience as an environmental project manager and has worked on all aspects of environmental assessments, investigations, and clean-up efforts.

Sincerely,



Lyle Gresehover
Project Manager
Alaska Resources and Environmental Services, LLC

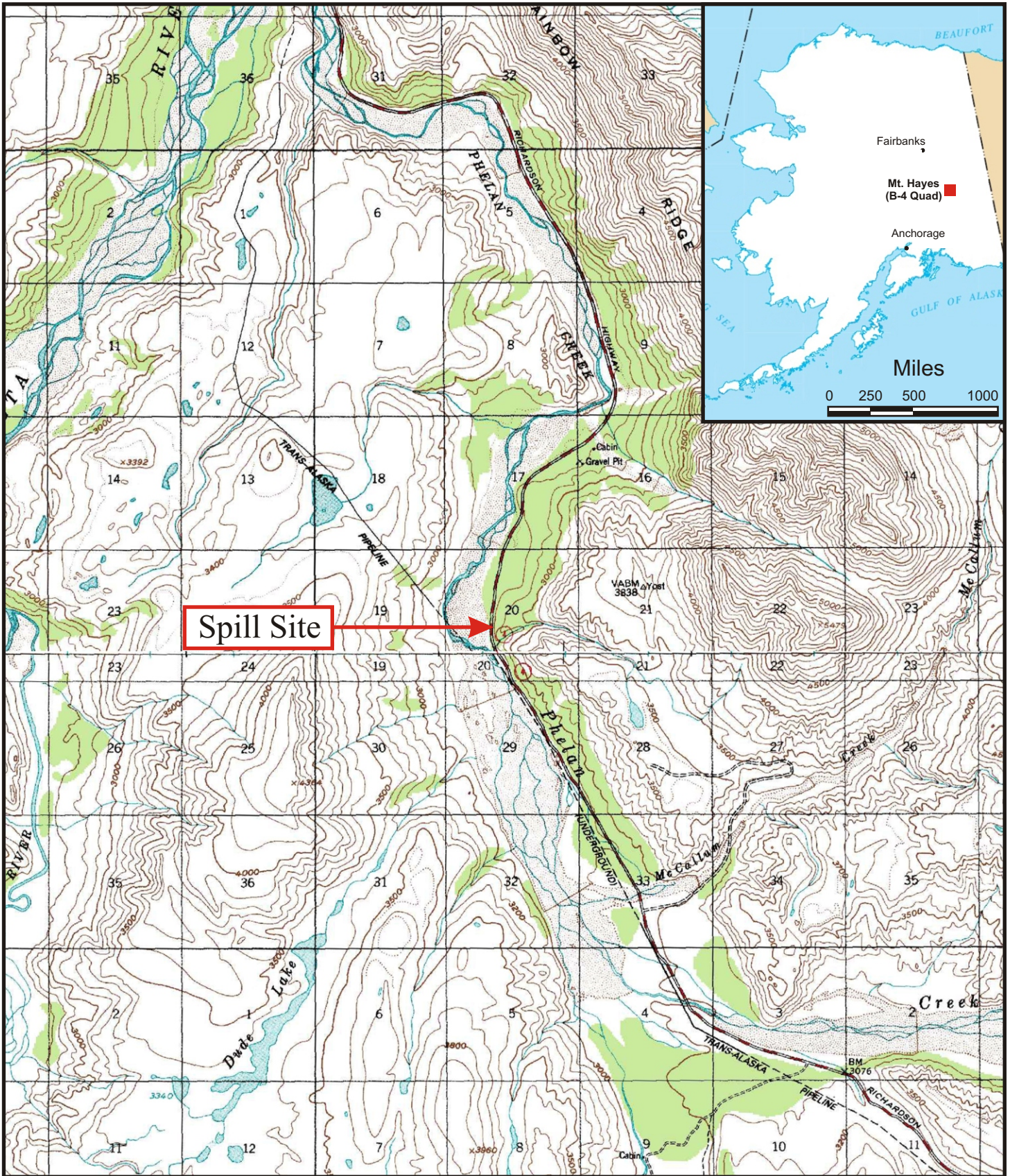
Enclosure:

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 – Graphical summary of DRO results over time

Appendix A
Figures



Spill Site



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

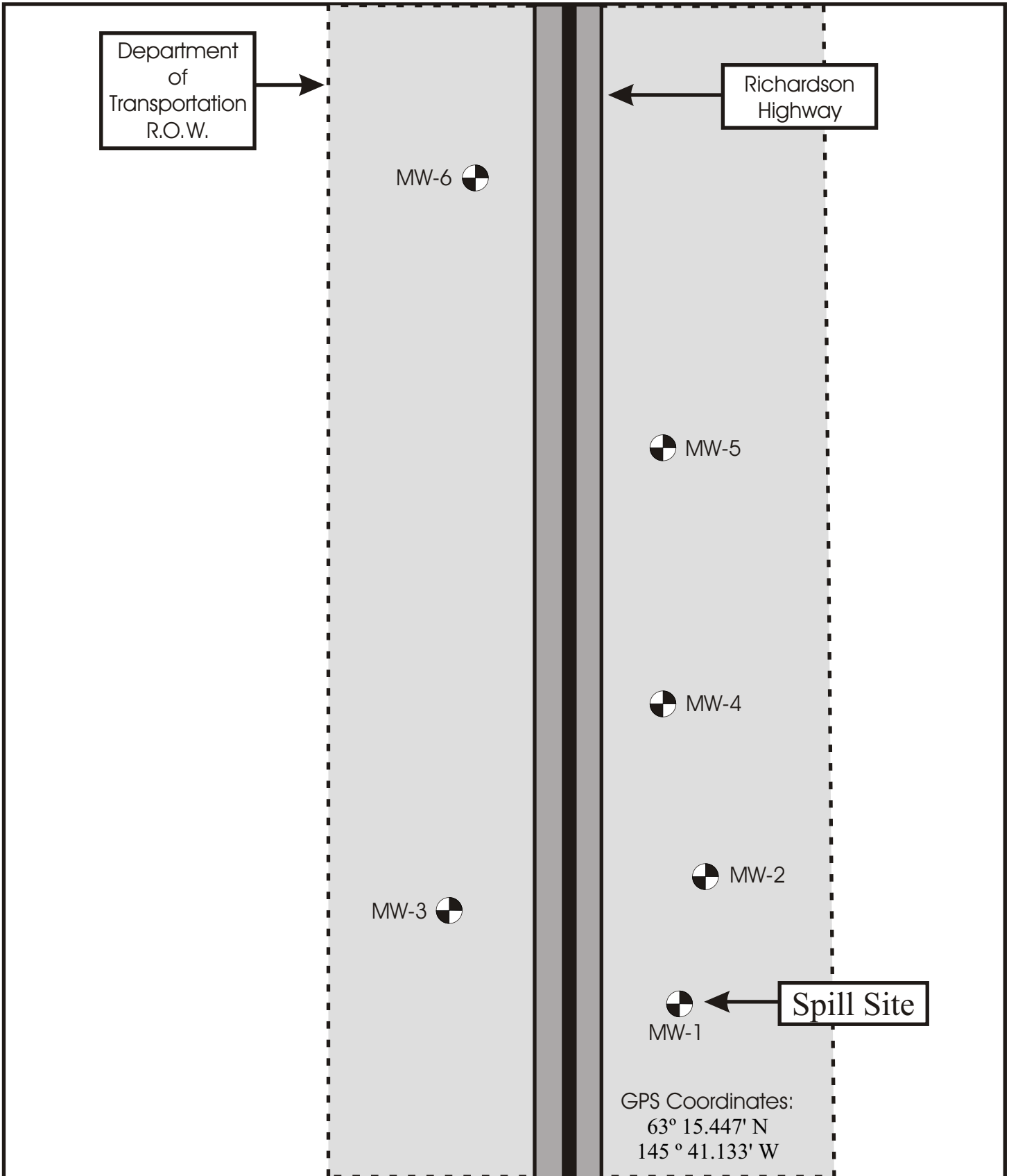
Scale in Miles:



**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:



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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



Laboratory Report of Analysis

To: Alaska Resources + Env. Svcs
P.O. Box 83050
Fairbanks, AK 99708
(907)374-3226

Report Number: **1158584**

Client Project: **205 Richardson Hwy.**

Dear Lyle Gresehover,

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 Jennifer 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.

Jennifer Dawkins
Project Manager

Date

Print Date: 09/22/2015 1:47:01PM

Case Narrative

SGS Client: **Alaska Resources + Env. Svcs**

SGS Project: **1158584**

Project Name/Site: **205 Richardson Hwy.**

Project Contact: **Lyle Gresehover**

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: 09/22/2015 1:47:02PM

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>
MW1-0915	1158584001	09/01/2015	09/03/2015	Water (Surface, Eff., Ground)
MW2-0915	1158584002	09/01/2015	09/03/2015	Water (Surface, Eff., Ground)
MW3-0915	1158584003	09/01/2015	09/03/2015	Water (Surface, Eff., Ground)
MW4-0915	1158584004	09/01/2015	09/03/2015	Water (Surface, Eff., Ground)
MW5-0915	1158584005	09/01/2015	09/03/2015	Water (Surface, Eff., Ground)
MW6-0915	1158584006	09/01/2015	09/03/2015	Water (Surface, Eff., Ground)
Dup-W-0915	1158584007	09/01/2015	09/03/2015	Water (Surface, Eff., Ground)
Trip Blank	1158584008	09/01/2015	09/03/2015	Water (Surface, Eff., Ground)

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

Detectable Results Summary

Client Sample ID: **MW1-0915**

Lab Sample ID: 1158584001

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	1.80	mg/L
Benzene	0.350J	ug/L
Ethylbenzene	0.430J	ug/L
Gasoline Range Organics	0.0990J	mg/L
o-Xylene	3.93	ug/L
P & M -Xylene	1.00J	ug/L

Client Sample ID: **MW2-0915**

Lab Sample ID: 1158584002

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	9.60	mg/L
Benzene	0.320J	ug/L
Gasoline Range Organics	0.0454J	mg/L

Client Sample ID: **MW3-0915**

Lab Sample ID: 1158584003

Volatile Fuels

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

Client Sample ID: **MW4-0915**

Lab Sample ID: 1158584004

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	18.9	mg/L
Gasoline Range Organics	0.0765J	mg/L
o-Xylene	0.920J	ug/L

Client Sample ID: **MW5-0915**

Lab Sample ID: 1158584005

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	0.201J	mg/L
Gasoline Range Organics	0.0648J	mg/L

Client Sample ID: **MW6-0915**

Lab Sample ID: 1158584006

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Gasoline Range Organics	0.0715J	mg/L

Client Sample ID: **Dup-W-0915**

Lab Sample ID: 1158584007

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	1.31	mg/L
Ethylbenzene	0.380J	ug/L
Gasoline Range Organics	0.119	mg/L
o-Xylene	3.61	ug/L
P & M -Xylene	0.830J	ug/L

Client Sample ID: **Trip Blank**

Lab Sample ID: 1158584008

Volatile Fuels

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

Results of MW1-0915

Client Sample ID: **MW1-0915**
 Client Project ID: **205 Richardson Hwy.**
 Lab Sample ID: 1158584001
 Lab Project ID: 1158584

Collection Date: 09/01/15 12:00
 Received Date: 09/03/15 09:25
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Semivolatile Organic Fuels

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.80		0.536	0.161	mg/L	1		09/16/15 05:53
Surrogates								
5a Androstane (surr)	93.8		50-150		%	1		09/16/15 05:53

Batch Information

Analytical Batch: XFC12091
 Analytical Method: AK102
 Analyst: KJO
 Analytical Date/Time: 09/16/15 05:53
 Container ID: 1158584001-A

Prep Batch: XXX34131
 Prep Method: SW3520C
 Prep Date/Time: 09/14/15 09:50
 Prep Initial Wt./Vol.: 280 mL
 Prep Extract Vol: 1 mL



Results of MW1-0915

Client Sample ID: **MW1-0915**
Client Project ID: **205 Richardson Hwy.**
Lab Sample ID: 1158584001
Lab Project ID: 1158584

Collection Date: 09/01/15 12:00
Received Date: 09/03/15 09:25
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	0.0990 J	0.100	0.0310	mg/L	1		09/13/15 06:05

Surrogates

4-Bromofluorobenzene (surr)	90.7	50-150		%	1		09/13/15 06:05
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Batch Information

Analytical Batch: VFC12652
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 09/13/15 06:05
Container ID: 1158584001-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	0.350 J	0.500	0.150	ug/L	1		09/13/15 06:05
Ethylbenzene	0.430 J	1.00	0.310	ug/L	1		09/13/15 06:05
o-Xylene	3.93	1.00	0.310	ug/L	1		09/13/15 06:05
P & M -Xylene	1.00 J	2.00	0.620	ug/L	1		09/13/15 06:05
Toluene	0.500 U	1.00	0.310	ug/L	1		09/13/15 06:05

Surrogates

1,4-Difluorobenzene (surr)	85	77-115		%	1		09/13/15 06:05
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Batch Information

Analytical Batch: VFC12652
Analytical Method: SW8021B
Analyst: CRD
Analytical Date/Time: 09/13/15 06:05
Container ID: 1158584001-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 MW2-0915

Client Sample ID: **MW2-0915**
 Client Project ID: **205 Richardson Hwy.**
 Lab Sample ID: 1158584002
 Lab Project ID: 1158584

Collection Date: 09/01/15 12:35
 Received Date: 09/03/15 09:25
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Semivolatile Organic Fuels

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	9.60		0.536	0.161	mg/L	1		09/16/15 17:28
Surrogates								
5a Androstane (surr)	96.5		50-150		%	1		09/16/15 17:28

Batch Information

Analytical Batch: XFC12090
 Analytical Method: AK102
 Analyst: KJO
 Analytical Date/Time: 09/16/15 17:28
 Container ID: 1158584002-A

Prep Batch: XXX34131
 Prep Method: SW3520C
 Prep Date/Time: 09/14/15 09:50
 Prep Initial Wt./Vol.: 280 mL
 Prep Extract Vol: 1 mL



Results of MW2-0915

Client Sample ID: MW2-0915
Client Project ID: 205 Richardson Hwy.
Lab Sample ID: 1158584002
Lab Project ID: 1158584

Collection Date: 09/01/15 12:35
Received Date: 09/03/15 09:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Gasoline Range Organics, 0.0454 J, 0.100, 0.0310, mg/L, 1, 09/13/15 06:24

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 4-Bromofluorobenzene (surr), 88.9, 50-150, %, 1, 09/13/15 06:24

Batch Information

Analytical Batch: VFC12652
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 09/13/15 06:24
Container ID: 1158584002-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

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows: Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 1,4-Difluorobenzene (surr), 80.9, 77-115, %, 1, 09/13/15 06:24

Batch Information

Analytical Batch: VFC12652
Analytical Method: SW8021B
Analyst: CRD
Analytical Date/Time: 09/13/15 06:24
Container ID: 1158584002-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 MW3-0915

Client Sample ID: **MW3-0915**
 Client Project ID: **205 Richardson Hwy.**
 Lab Sample ID: 1158584003
 Lab Project ID: 1158584

Collection Date: 09/01/15 13:00
 Received Date: 09/03/15 09:25
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Semivolatile Organic Fuels

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.268 U	0.536	0.161	mg/L	1		09/16/15 17:49
Surrogates							
5a Androstane (surr)	92	50-150		%	1		09/16/15 17:49

Batch Information

Analytical Batch: XFC12090
 Analytical Method: AK102
 Analyst: KJO
 Analytical Date/Time: 09/16/15 17:49
 Container ID: 1158584003-A

Prep Batch: XXX34131
 Prep Method: SW3520C
 Prep Date/Time: 09/14/15 09:50
 Prep Initial Wt./Vol.: 280 mL
 Prep Extract Vol: 1 mL



Results of MW3-0915

Client Sample ID: MW3-0915
Client Project ID: 205 Richardson Hwy.
Lab Sample ID: 1158584003
Lab Project ID: 1158584

Collection Date: 09/01/15 13:00
Received Date: 09/03/15 09:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Gasoline Range Organics, 0.0500 U, 0.100, 0.0310, mg/L, 1, 09/13/15 06:43

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 4-Bromofluorobenzene (surr), 82.4, 50-150, %, 1, 09/13/15 06:43

Batch Information

Analytical Batch: VFC12652
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 09/13/15 06:43
Container ID: 1158584003-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

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows: Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 1,4-Difluorobenzene (surr), 83.1, 77-115, %, 1, 09/13/15 06:43

Batch Information

Analytical Batch: VFC12652
Analytical Method: SW8021B
Analyst: CRD
Analytical Date/Time: 09/13/15 06:43
Container ID: 1158584003-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 MW4-0915

Client Sample ID: **MW4-0915**
 Client Project ID: **205 Richardson Hwy.**
 Lab Sample ID: 1158584004
 Lab Project ID: 1158584

Collection Date: 09/01/15 13:40
 Received Date: 09/03/15 09:25
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Semivolatile Organic Fuels

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	18.9		0.536	0.161	mg/L	1		09/16/15 18:09
Surrogates								
5a Androstane (surr)	88.1		50-150		%	1		09/16/15 18:09

Batch Information

Analytical Batch: XFC12090
 Analytical Method: AK102
 Analyst: KJO
 Analytical Date/Time: 09/16/15 18:09
 Container ID: 1158584004-A

Prep Batch: XXX34131
 Prep Method: SW3520C
 Prep Date/Time: 09/14/15 09:50
 Prep Initial Wt./Vol.: 280 mL
 Prep Extract Vol: 1 mL



Results of MW4-0915

Client Sample ID: MW4-0915
Client Project ID: 205 Richardson Hwy.
Lab Sample ID: 1158584004
Lab Project ID: 1158584

Collection Date: 09/01/15 13:40
Received Date: 09/03/15 09:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row 1: Gasoline Range Organics, 0.0765 J, 0.100, 0.0310, mg/L, 1, 09/13/15 13:02

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row 1: 4-Bromofluorobenzene (surr), 85.4, 50-150, %, 1, 09/13/15 13:02

Batch Information

Analytical Batch: VFC12657
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 09/13/15 13:02
Container ID: 1158584004-C

Prep Batch: VXX27889
Prep Method: SW5030B
Prep Date/Time: 09/13/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows: Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row 1: 1,4-Difluorobenzene (surr), 89.8, 77-115, %, 1, 09/13/15 13:02

Batch Information

Analytical Batch: VFC12657
Analytical Method: SW8021B
Analyst: CRD
Analytical Date/Time: 09/13/15 13:02
Container ID: 1158584004-C

Prep Batch: VXX27889
Prep Method: SW5030B
Prep Date/Time: 09/13/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of MW5-0915

Client Sample ID: **MW5-0915**
Client Project ID: **205 Richardson Hwy.**
Lab Sample ID: 1158584005
Lab Project ID: 1158584

Collection Date: 09/01/15 14:10
Received Date: 09/03/15 09:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.201 J	0.536	0.161	mg/L	1		09/16/15 18:30
Surrogates							
5a Androstane (surr)	86.5	50-150		%	1		09/16/15 18:30

Batch Information

Analytical Batch: XFC12090
Analytical Method: AK102
Analyst: KJO
Analytical Date/Time: 09/16/15 18:30
Container ID: 1158584005-A

Prep Batch: XXX34131
Prep Method: SW3520C
Prep Date/Time: 09/14/15 09:50
Prep Initial Wt./Vol.: 280 mL
Prep Extract Vol: 1 mL



Results of MW5-0915

Client Sample ID: MW5-0915
Client Project ID: 205 Richardson Hwy.
Lab Sample ID: 1158584005
Lab Project ID: 1158584

Collection Date: 09/01/15 14:10
Received Date: 09/03/15 09:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Gasoline Range Organics, 0.0648 J, 0.100, 0.0310, mg/L, 1, 09/13/15 12:24

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 4-Bromofluorobenzene (surr), 81.4, 50-150, %, 1, 09/13/15 12:24

Batch Information

Analytical Batch: VFC12657
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 09/13/15 12:24
Container ID: 1158584005-C

Prep Batch: VXX27889
Prep Method: SW5030B
Prep Date/Time: 09/13/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows: Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 1,4-Difluorobenzene (surr), 90.3, 77-115, %, 1, 09/13/15 12:24

Batch Information

Analytical Batch: VFC12657
Analytical Method: SW8021B
Analyst: CRD
Analytical Date/Time: 09/13/15 12:24
Container ID: 1158584005-C

Prep Batch: VXX27889
Prep Method: SW5030B
Prep Date/Time: 09/13/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of **MW6-0915**

Client Sample ID: **MW6-0915**
Client Project ID: **205 Richardson Hwy.**
Lab Sample ID: 1158584006
Lab Project ID: 1158584

Collection Date: 09/01/15 14:40
Received Date: 09/03/15 09:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.268 U	0.536	0.161	mg/L	1		09/16/15 18:51
Surrogates							
5a Androstane (surr)	88.9	50-150		%	1		09/16/15 18:51

Batch Information

Analytical Batch: XFC12090
Analytical Method: AK102
Analyst: KJO
Analytical Date/Time: 09/16/15 18:51
Container ID: 1158584006-A

Prep Batch: XXX34131
Prep Method: SW3520C
Prep Date/Time: 09/14/15 09:50
Prep Initial Wt./Vol.: 280 mL
Prep Extract Vol: 1 mL



Results of MW6-0915

Client Sample ID: **MW6-0915**
Client Project ID: **205 Richardson Hwy.**
Lab Sample ID: 1158584006
Lab Project ID: 1158584

Collection Date: 09/01/15 14:40
Received Date: 09/03/15 09:25
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	0.0715 J	0.100	0.0310	mg/L	1		09/13/15 12:43

Surrogates

4-Bromofluorobenzene (surr)	80.1	50-150		%	1		09/13/15 12:43
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Batch Information

Analytical Batch: VFC12657
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 09/13/15 12:43
Container ID: 1158584006-C

Prep Batch: VXX27889
Prep Method: SW5030B
Prep Date/Time: 09/13/15 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	0.250 U	0.500	0.150	ug/L	1		09/13/15 12:43
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/13/15 12:43
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/13/15 12:43
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/13/15 12:43
Toluene	0.500 U	1.00	0.310	ug/L	1		09/13/15 12:43

Surrogates

1,4-Difluorobenzene (surr)	90	77-115		%	1		09/13/15 12:43
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Batch Information

Analytical Batch: VFC12657
Analytical Method: SW8021B
Analyst: CRD
Analytical Date/Time: 09/13/15 12:43
Container ID: 1158584006-C

Prep Batch: VXX27889
Prep Method: SW5030B
Prep Date/Time: 09/13/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of Dup-W-0915

Client Sample ID: **Dup-W-0915**
 Client Project ID: **205 Richardson Hwy.**
 Lab Sample ID: 1158584007
 Lab Project ID: 1158584

Collection Date: 09/01/15 15:20
 Received Date: 09/03/15 09:25
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Semivolatile Organic Fuels

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.31		0.536	0.161	mg/L	1		09/16/15 19:12
Surrogates								
5a Androstane (surr)	93.8		50-150		%	1		09/16/15 19:12

Batch Information

Analytical Batch: XFC12090
 Analytical Method: AK102
 Analyst: KJO
 Analytical Date/Time: 09/16/15 19:12
 Container ID: 1158584007-A

Prep Batch: XXX34131
 Prep Method: SW3520C
 Prep Date/Time: 09/14/15 09:50
 Prep Initial Wt./Vol.: 280 mL
 Prep Extract Vol: 1 mL



Results of Dup-W-0915

Client Sample ID: Dup-W-0915
Client Project ID: 205 Richardson Hwy.
Lab Sample ID: 1158584007
Lab Project ID: 1158584

Collection Date: 09/01/15 15:20
Received Date: 09/03/15 09:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Gasoline Range Organics, 0.119, 0.100, 0.0310, mg/L, 1, 09/13/15 13:21

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 4-Bromofluorobenzene (surr), 88.4, 50-150, %, 1, 09/13/15 13:21

Batch Information

Analytical Batch: VFC12657
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 09/13/15 13:21
Container ID: 1158584007-C

Prep Batch: VXX27889
Prep Method: SW5030B
Prep Date/Time: 09/13/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows: Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 1,4-Difluorobenzene (surr), 93, 77-115, %, 1, 09/13/15 13:21

Batch Information

Analytical Batch: VFC12657
Analytical Method: SW8021B
Analyst: CRD
Analytical Date/Time: 09/13/15 13:21
Container ID: 1158584007-C

Prep Batch: VXX27889
Prep Method: SW5030B
Prep Date/Time: 09/13/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of Trip Blank

Client Sample ID: **Trip Blank**
 Client Project ID: **205 Richardson Hwy.**
 Lab Sample ID: 1158584008
 Lab Project ID: 1158584

Collection Date: 09/01/15 07:00
 Received Date: 09/03/15 09:25
 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	0.0500 U	0.100	0.0310	mg/L	1		09/12/15 23:27

Surrogates

4-Bromofluorobenzene (surr)	85.5	50-150		%	1		09/12/15 23:27
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Batch Information

Analytical Batch: VFC12652
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 09/12/15 23:27
 Container ID: 1158584008-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

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.310 J	0.500	0.150	ug/L	1		09/12/15 23:27
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/12/15 23:27
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/12/15 23:27
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/12/15 23:27
Toluene	0.500 U	1.00	0.310	ug/L	1		09/12/15 23:27

Surrogates

1,4-Difluorobenzene (surr)	85.6	77-115		%	1		09/12/15 23:27
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Batch Information

Analytical Batch: VFC12652
 Analytical Method: SW8021B
 Analyst: CRD
 Analytical Date/Time: 09/12/15 23:27
 Container ID: 1158584008-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:
1158584001, 1158584002, 1158584003, 1158584008

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
Surrogates				
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

Blank Spike Summary

Blank Spike ID: LCS for HBN 1158584 [VXX27884]
 Blank Spike Lab ID: 1290432
 Date Analyzed: 09/12/2015 22:29

Spike Duplicate ID: LCSD for HBN 1158584 [VXX27884]
 Spike Duplicate Lab ID: 1290433
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1158584001, 1158584002, 1158584003, 1158584008

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)
Surrogates									
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

Method Blank

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

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1158584001, 1158584002, 1158584003, 1158584008

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
Surrogates				
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

Blank Spike Summary

Blank Spike ID: LCS for HBN 1158584 [VXX27884]
 Blank Spike Lab ID: 1290430
 Date Analyzed: 09/12/2015 22:10

Spike Duplicate ID: LCSD for HBN 1158584 [VXX27884]
 Spike Duplicate Lab ID: 1290431
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1158584001, 1158584002, 1158584003, 1158584008

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)
Surrogates									
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

Method Blank

Blank ID: MB for HBN 1720261 [VXX/27889]
 Blank Lab ID: 1290456

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1158584004, 1158584005, 1158584006, 1158584007

Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	0.0779J	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	87.1	50-150		%

Batch Information

Analytical Batch: VFC12657
 Analytical Method: AK101
 Instrument: Agilent 7890A PID/FID
 Analyst: CRD
 Analytical Date/Time: 9/13/2015 10:29:00AM

Prep Batch: VXX27889
 Prep Method: SW5030B
 Prep Date/Time: 9/13/2015 8:00:00AM
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1158584 [VXX27889]
 Blank Spike Lab ID: 1290459
 Date Analyzed: 09/13/2015 11:26

Spike Duplicate ID: LCSD for HBN 1158584 [VXX27889]
 Spike Duplicate Lab ID: 1290460
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1158584004, 1158584005, 1158584006, 1158584007

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	1.04	104	1.00	1.00	100	(60-120)	3.10	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	87.3	87	0.0500	82	82	(50-150)	6.20	

Batch Information

Analytical Batch: **VFC12657**
 Analytical Method: **AK101**
 Instrument: **Agilent 7890A PID/FID**
 Analyst: **CRD**

Prep Batch: **VXX27889**
 Prep Method: **SW5030B**
 Prep Date/Time: **09/13/2015 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

Method Blank

Blank ID: MB for HBN 1720261 [VXX/27889]
 Blank Lab ID: 1290456

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1158584004, 1158584005, 1158584006, 1158584007

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
Surrogates				
1,4-Difluorobenzene (surr)	89.9	77-115		%

Batch Information

Analytical Batch: VFC12657
 Analytical Method: SW8021B
 Instrument: Agilent 7890A PID/FID
 Analyst: CRD
 Analytical Date/Time: 9/13/2015 10:29:00AM

Prep Batch: VXX27889
 Prep Method: SW5030B
 Prep Date/Time: 9/13/2015 8:00:00AM
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1158584 [VXX27889]
 Blank Spike Lab ID: 1290457
 Date Analyzed: 09/13/2015 11:07

Spike Duplicate ID: LCSD for HBN 1158584 [VXX27889]
 Spike Duplicate Lab ID: 1290458
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1158584004, 1158584005, 1158584006, 1158584007

Results by SW8021B

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	100	105	105	100	106	106	(80-120)	1.20	(< 20)
Ethylbenzene	100	102	102	100	102	102	(75-125)	0.12	(< 20)
o-Xylene	100	96.6	97	100	95.6	96	(80-120)	1.00	(< 20)
P & M -Xylene	200	197	98	200	197	98	(75-130)	0.00	(< 20)
Toluene	100	98.4	98	100	99.4	99	(75-120)	1.10	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50	94.5	95	50	93.9	94	(77-115)	0.68	

Batch Information

Analytical Batch: **VFC12657**
 Analytical Method: **SW8021B**
 Instrument: **Agilent 7890A PID/FID**
 Analyst: **CRD**

Prep Batch: **VXX27889**
 Prep Method: **SW5030B**
 Prep Date/Time: **09/13/2015 08:00**
 Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

Method Blank

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

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1158584001, 1158584002, 1158584003, 1158584004, 1158584005, 1158584006, 1158584007

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
Surrogates				
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: 09/22/2015 1:47:26PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1158584 [XXX34131]
 Blank Spike Lab ID: 1290567
 Date Analyzed: 09/16/2015 00:43

Spike Duplicate ID: LCSD for HBN 1158584 [XXX34131]
 Spike Duplicate Lab ID: 1290568
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1158584001, 1158584002, 1158584003, 1158584004, 1158584005, 1158584006, 1158584007

Results by AK102

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	20	19.7	99	20	18.3	92	(75-125)	7.30	(< 20)
Surrogates									
5a Androstane (surr)	0.4	91.6	92	0.4	85.6	86	(60-120)	6.80	

Batch Information

Analytical Batch: **XFC12091**
 Analytical Method: **AK102**
 Instrument: **HP 7890A FID SV E R**
 Analyst: **KJO**

Prep Batch: **XXX34131**
 Prep Method: **SW3520C**
 Prep Date/Time: **09/14/2015 09:50**
 Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

1158584



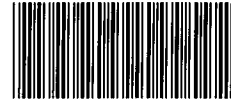
ARES
P.O. Box 83050
Fairbanks, Alaska 99708
Phone: 907.374.3226
Fax: 907.374.2319

Chain of Custody Report

Client: Alaska Resources and Environmental Services Report To: Lyle Greshover Address: ARES P.O. Box 83050 lyle@ak-res.com Phone: (907) 374-3226 Fax: (907) 374-3219		Invoice To: ARES P.O. Box 83050 Fairbanks, Alaska 99708 P.O. Number:		Laboratory Name: SGS Address: 3180 Peger Rd #190, Fairbanks, AK 99709 (907) 474-8656		Turnaround Request In Business Days Organic & Inorganic Analyses Petroleum Hydrocarbon Analyses	
Project Name: 205 Richardson Hwy. Project Number: Sampled By: Dustin Stahl		HCL HCL EPA 802/B AK101 BTEX/GRO DR AK 10		Preservative Requested Analyses		Specify Other: Report Tier Levels: Tier II reporting requested (results + QC)	
Sample Identification	Sampling Date/Time			Matrix (W.S.O)	# of Cont.	Location / Comments	Lab ID
MW1-0915	9/01/2015 1200	X	X	W	5		1A-E
MW2-0915	9/01/2015 1235	X	X	W	5		2A-E
MW3-0915	9/01/2015 1300	X	X	W	5		3A-E
MW4-0915	9/01/2015 1340	X	X	W	5		4A-E
MW5-0915	9/01/2015 1410	X	X	W	5		5A-E
MW6-0915	9/01/2015 1440	X	X	W	5		6A-E
Dup-W-0915	9/01/2015 1520	X	X	W	5		7A-E
Trip Blank	9/01/2015 0700	X		0	3		8A-C
Released By: <i>[Signature]</i> Print Name: Dustin Stahl Firm: ARES Date: 9/02/2015 Time: 1000		Received By: <i>[Signature]</i> Print Name: Nicole Womw Firm: SGS Date: 9/2/15 Time: 1230		Released By: <i>[Signature]</i> Print Name: Tom Loughera Firm: SGS Date: 9/2/15 Time: 9/2/15		Temp:	
Additional Remarks: Please report method detection limits along with the reporting limits for all samples. Please include MS/MSD, LCS/LCSD samples with QC.							

TB 1.4

ANC 1F15 2.1/DA



FAIRBANKS SAMPLE RECEIPT FORM

Note: This form is to be completed by Fairbanks Receiving Staff for all samples

Review Criteria:	Condition:	Comments/Actions Taken
Were custody seals intact? Note # & location, if applicable. COC accompanied samples?	Yes No N/A <u>Yes</u> No N/A	<input checked="" type="checkbox"/> Exemption permitted if sampler hand carries/delivers.
Temperature blank compliant* (i.e., 0-6°C) If >6°C, were samples collected <8 hours ago? If <0°C, were all sample containers ice free? Cooler ID: <u>1</u> @ <u>1.4</u> w/Therm. ID: <u>26</u> Cooler ID: _____ @ _____ w/Therm. ID: _____ Cooler ID: _____ @ _____ w/Therm. ID: _____ Cooler ID: _____ @ _____ w/Therm. ID: _____ Cooler ID: _____ @ _____ w/Therm. ID: _____ If samples are received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank and "COOLER TEMP" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled"	<u>Yes</u> No N/A Yes No N/A Yes No N/A	<input type="checkbox"/> Exemption permitted if chilled & collected <8hrs ago <i>Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is needed.</i>
Delivery Method: <u>Client (hand carried)</u> Other: _____	Tracking/AB# : Or see attached <u>Or N/A</u>	
→For samples received with payment, note amount (\$) and whether cash / check / CC (circle one) was received.		
Were samples in good condition (no leaks/cracks/breakage)? Packing material used (specify all that apply): <u>Bubble Wrap</u> Separate plastic bags Vermiculite Other: _____	<u>Yes</u> No N/A	<i>Note: some samples are sent to Anchorage without inspection by SGS Fairbanks personnel.</i>
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	<u>Yes</u> No N/A	
For RUSH/SHORT Hold Time , were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	Yes No N/A Yes No N/A	
Additional notes (if applicable):		
<p><i>Note to Client: any "no" circled above indicates non-compliance with standard procedures and may impact data quality.</i></p>		



1158584



1 1 5 8 5 8 4

SAMPLE RECEIPT FORM

Review Criteria:	Yes	N/A	No	Comments/Action Taken:
Were custody seals 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> 1F, 1B
Temperature blank compliant* (i.e., 0-6°C after CF)? <i>If >6°C, were samples collected <8 hours ago?</i> <i>If <0°C, were all sample containers ice free?</i> Cooler ID: <u>1</u> @ <u>2.1</u> w/ Therm.ID: <u>D2</u> 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 & “ COOLER TEMP ” 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"/>	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<i>Exemption permitted if chilled & collected <8 hrs ago.</i> <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"/> Carfile <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 match 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 <1hr, record details and login per COC.</i>
Were samples in good condition (no leaks/cracks/breakage)? Packing material used (specify all that apply): <input checked="" type="checkbox"/> Bubble Wrap <input type="checkbox"/> Separate plastic bags <input type="checkbox"/> Vermiculite <input type="checkbox"/> Other:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were proper containers (type/mass/volume/preservative*) used? Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples? Were all VOA vials free of headspace (i.e., bubbles ≤6 mm)? Were all soil VOAs field extracted 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 pH verified and compliant ? 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 special handling (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 RUSH/SHORT Hold Time , were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
For SITE-SPECIFIC QC, e.g. BMS/BMSD/BDUP , were containers / paperwork flagged accordingly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
For any question answered “No,” 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: D.C 09/03/2015 PM notified:
Was PEER REVIEW of <i>sample numbering/labeling completed</i> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Peer Reviewed by: EDJ
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>
1158584001-A	HCL to pH < 2	OK			
1158584001-B	HCL to pH < 2	OK			
1158584001-C	HCL to pH < 2	OK			
1158584001-D	HCL to pH < 2	OK			
1158584001-E	HCL to pH < 2	OK			
1158584002-A	HCL to pH < 2	OK			
1158584002-B	HCL to pH < 2	OK			
1158584002-C	HCL to pH < 2	OK			
1158584002-D	HCL to pH < 2	OK			
1158584002-E	HCL to pH < 2	OK			
1158584003-A	HCL to pH < 2	OK			
1158584003-B	HCL to pH < 2	OK			
1158584003-C	HCL to pH < 2	OK			
1158584003-D	HCL to pH < 2	OK			
1158584003-E	HCL to pH < 2	OK			
1158584004-A	HCL to pH < 2	OK			
1158584004-B	HCL to pH < 2	OK			
1158584004-C	HCL to pH < 2	OK			
1158584004-D	HCL to pH < 2	OK			
1158584004-E	HCL to pH < 2	OK			
1158584005-A	HCL to pH < 2	OK			
1158584005-B	HCL to pH < 2	OK			
1158584005-C	HCL to pH < 2	OK			
1158584005-D	HCL to pH < 2	OK			
1158584005-E	HCL to pH < 2	OK			
1158584006-A	HCL to pH < 2	OK			
1158584006-B	HCL to pH < 2	OK			
1158584006-C	HCL to pH < 2	OK			
1158584006-D	HCL to pH < 2	OK			
1158584006-E	HCL to pH < 2	OK			
1158584007-A	HCL to pH < 2	OK			
1158584007-B	HCL to pH < 2	OK			
1158584007-C	HCL to pH < 2	OK			
1158584007-D	HCL to pH < 2	OK			
1158584007-E	HCL to pH < 2	OK			
1158584008-A	HCL to pH < 2	OK			
1158584008-B	HCL to pH < 2	OK			
1158584008-C	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 that 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.

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 ($4^{\circ} \pm 2^{\circ} \text{C}$)?
 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:

No adverse conditions were noted.

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 were identified.

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

Comments:

N/A; see above.

4. Case Narrative

a. Present and understandable?

Yes No NA (Please explain.) Comments:

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

Yes No NA (Please explain.) Comments:

c. Were all corrective actions documented?

Yes No NA (Please explain.) Comments:

No corrective actions were required.

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

Comments:

The case narrative does not discuss any effects on data quality or usability.

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:

Only water samples were submitted for this project.

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:

No data quality or usability affected.

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; see above.

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 the 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:

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

Comments:

N/A

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

Yes No **NA** (Please explain.) Comments:

All RPD's and %R were within acceptable limits.

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

Comments:

N/A; see above.

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 surrogate recovery failures were reported.

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.

iii. All results less than PQL?

Yes No NA (Please explain.) Comments:

GRO was detected below the PQL.

iv. If above PQL, what samples are affected?

Comments:

N/A; no analytes were above the PQL in the trip blank.

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:

Calculations for RPD for DRO were at 31.5% slightly above the 30% limit.

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

Comments:

Data quality is affected. Results for DRO 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:

Appendix C
Graphical Summary of DRO results over time

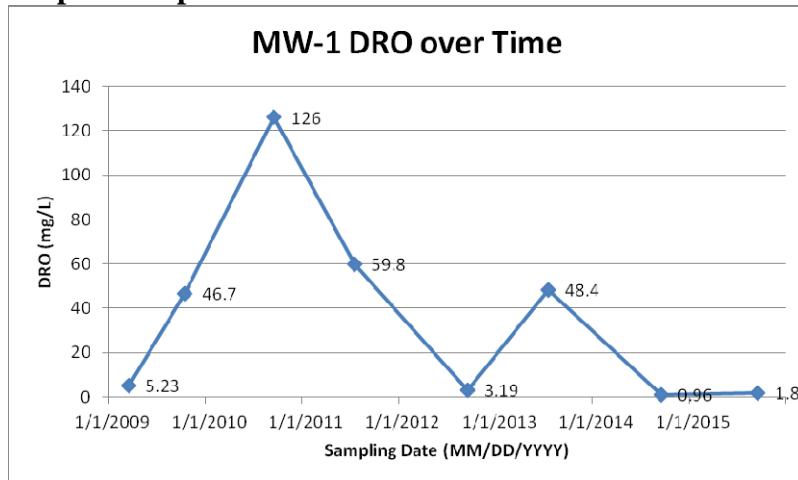
Milepost 205 Richardson Highway Spill
2015 Groundwater Monitoring Well Report

Monitoring Well MW-1

DRO levels in MW-1 over time

Date	MW-1 DRO (mg/L)
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
9/10/2014	0.96
9/1/2015	1.8

Graphical representation of DRO levels in MW-1 over time



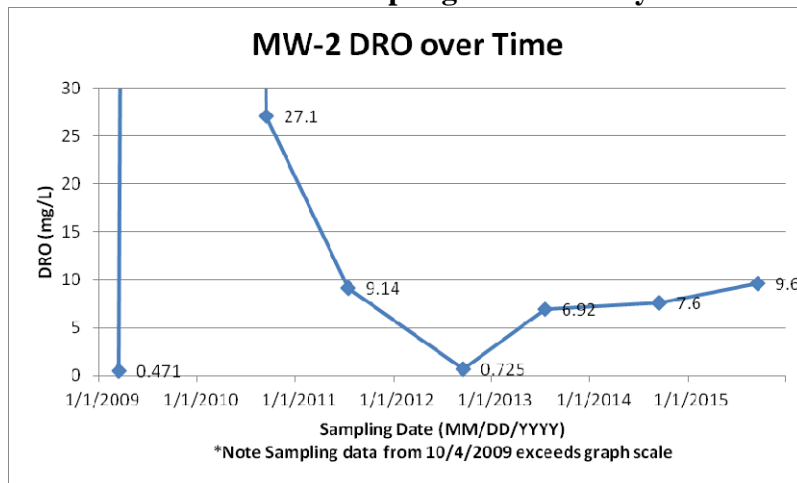
Milepost 205 Richardson Highway Spill
2015 Groundwater Monitoring Well Report

Monitoring Well MW-2

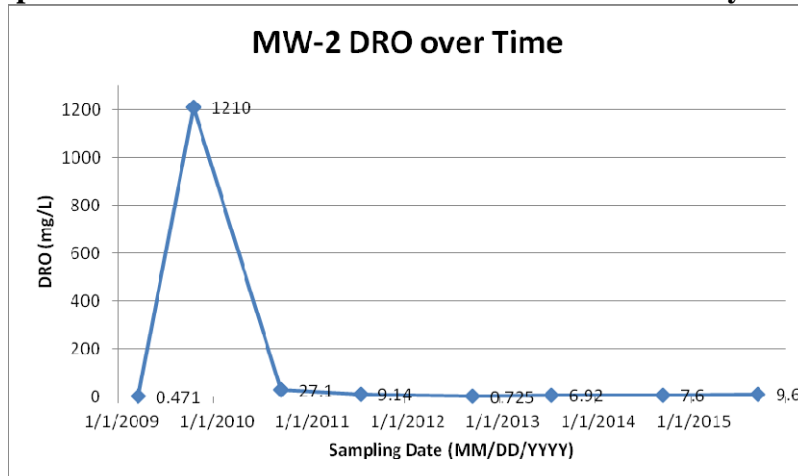
DRO levels in MW-2 over time

Date	MW-2 DRO (mg/L)
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
9/10/2014	7.6
9/1/2015	9.6

Graphical representation of DRO levels in MW-2 over time with y-axis zoomed to show recent sampling events clearly



Graphical representation of DRO levels in MW-2 over time with y-axis zoomed out



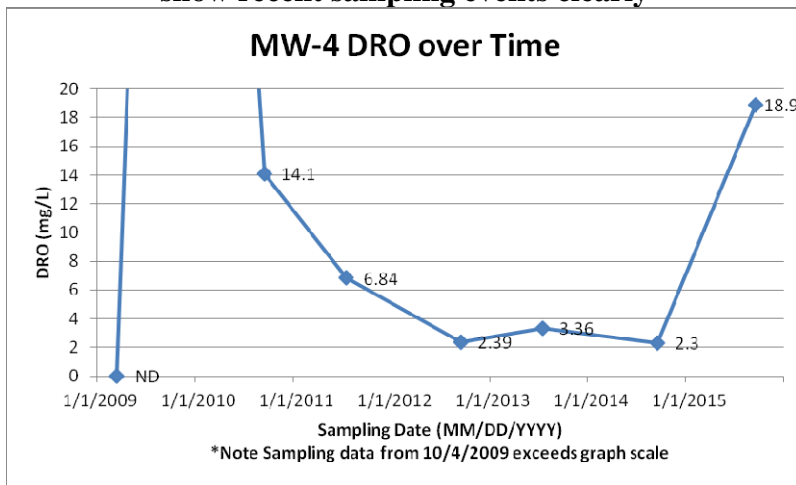
Milepost 205 Richardson Highway Spill
2015 Groundwater Monitoring Well Report

Monitoring Well MW-4

DRO levels in MW-4 over time

Date	MW-4 DRO (mg/L)
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
9/10/2014	2.3
9/1/2015	18.9

Graphical representation of DRO levels in MW-4 over time with y-axis zoomed to show recent sampling events clearly



Graphical representation of DRO levels in MW-4 over time with y-axis zoomed out

