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July 22, 2013

Mr. Grant Lidren
Contaminated Sites Program
Alaska Department of Environmental Conservation
410 Willoughby Ave., Suite 303
P.O. Box 111800
Juneau, AK 99811-1800

**Re: 2013 Groundwater Monitoring Report for the Iliamna Tank Farm, Iliamna, Alaska;
ADEC File Number: 2560.38.012**

Dear Mr. Lidren:

Weston Solutions, Inc. (Weston) has prepared this report on behalf of CPD Alaska, LLC (CPD-AK) to document the results of groundwater monitoring activities conducted by Weston in May 2013 at CPD-AK's Iliamna Tank Farm Site. This site is located in Iliamna, Alaska, approximately 200 air miles southwest of Anchorage, Alaska (Attachment 1, Figure 1). Monitoring of the groundwater is required to delineate and establish trends of the dissolved-phase hydrocarbon plume that resulted from a 1,500-gallon fuel spill at the site in 2009. This monitoring is in accordance with Alaska Administrative Code Title 18, Chapter 75.30(c)(2) (18 AAC 75.30.c.2). Activities were conducted in accordance with the *2013 Groundwater Monitoring Work Plan; Iliamna Tank Farm, Iliamna, Alaska* previously submitted to CPD-AK (2013 Work Plan). This site is listed in the Alaska Department of Environment (ADEC) Contaminated Sites Database under File Number: 2560.38.012 and Site Name: Crowley Tank Farm Iliamna Airport.

This report presents the following information: the site background, work accomplished in May 2013, observations and analytical results, conclusions, and recommendations. Four attachments provide the accompanying detailed information: Attachment 1-Figures, Attachment 2-Tables, Attachment 3-Field Notes and Forms, and Attachment 4-Analytical Results, ADEC Data Review Checklist, and Quality Assurance Report (QAR) Memo.

SITE BACKGROUND

CPD-AK's tank farm is located at approximately 59°45'16.44" north latitude and 154°54'22.63" west longitude. CPD-AK leases the site (Lot 2A, Block 1200) from the Alaska Department of Transportation and Public Facilities. The site is located within Bureau of Land Management Public Land Survey Section 9, Township 5 South, Range 33 West, Seward Meridian.

In September 2005, CPD-AK acquired the tank farm from Yukon Fuels, which had acquired the tank farm from Moody Fuels in 1999. The site is currently operated by CPD-AK for the storage and distribution of aviation fuel, home heating oil, diesel fuel, and automobile gasoline. Between November

4, 2009, and December 14, 2009, approximately 1,500 gallons of fuel leaked from a broken fuel line elbow at the bottom of a tanker truck's fuel tank on the western side of the tank farm (Figure 2, Attachment 2).

In December 2009, an initial soil removal response was conducted, which included collecting excavation confirmation samples and stockpiling and characterizing excavated soil. Approximately 65 loose cubic yards (LCY) of soil were characterized as impacted with diesel-range organics (DRO) and toluene above ADEC Method Two soil cleanup levels, which are 250 milligrams per kilogram (mg/kg) and 6.5 mg/kg, respectively. The soil was landfarmed in the spring of 2010, and soil samples were subsequently collected and analyzed for the following contaminants of concern:

- Gasoline range organics (GRO)
- Benzene, toluene, ethylbenzene and total xylenes (BTEX); and
- DRO / Residual range organics (RRO)

The removal of impacted soil was incomplete horizontally and vertically due to obstructions of facility infrastructure including a fence, secondary containment wall for the tank farm, and a buried electrical utility line located directly below the spill area. Based on the analytical data, ADEC approved the disposal of this soil at the Newhalen landfill during the 2013 field season, as documented in the *Iliamna Fuel Release Response Report; Iliamna, Alaska* prepared by OASIS Environmental, 2010.

To delineate the extent of the dissolved phase hydrocarbon plume, 14 groundwater monitoring wells (MW-1 through MW-14) and eight temporary well points (TWP-1 through TWP-6 and SP-1 and SP-2) were installed and sampled between 2010 and 2012. Of the 14 groundwater monitoring wells, only five (MW-2, MW-4, MW-5, MW-6 and MW-7) have historically had detections of contaminants of concern exceeding the ADEC cleanup levels outlined in 18 AAC 75 (refer to Attachment 2, Table 1, for historic analytical data). Historic groundwater elevation trends are listed in Table 2 of Attachment 2.

A more detailed site background is presented in the 2013 Work Plan.

REGULATORY STANDARDS

Analytical results for the work reported herein will be compared to relevant State of Alaska cleanup criteria. The State of Alaska, through ADEC, has established cleanup criteria for petroleum-contaminated sites. Cleanup standards are defined in 18 AAC 75, Article 3, entitled *Oil and Hazardous Substance Pollution Control Regulations, Discharge Reporting, Cleanup, and Disposal of Oil and Other Hazardous Substances*. Groundwater sample analytical results will be compared to 18 AAC 75.345, Table C groundwater cleanup levels. These values are listed with the analytical results in Tables 1 and 6 of Attachment 2.

WORK ACCOMPLISHED - 2013

This section describes field activities conducted by Weston in May 2013 in support of the Iliamna Tank Farm routine groundwater monitoring activities in accordance with the 2013 Work Plan. This work included: the assessment of the seasonal fluctuation in groundwater flow direction and gradient (i.e.,

groundwater contours), groundwater monitoring/sample collection, and waste management. In addition to the monitoring activities, Weston supervised the removal and transport of soil contaminated by the 2009 spill and treated by landfarming. Field notes and forms documenting these activities are in Attachment 3.

Groundwater Flow Direction and Gradient Assessment

To evaluate the seasonal fluctuation in groundwater flow direction and gradient, a total of three Solinst® Levellogger Junior Edge® pressure transducers were deployed in monitoring wells MW-8, MW-9, and MW-11 at the end of the July 2012 monitoring event. To compensate for barometric fluctuation, a Barologger Edge® was also deployed in monitoring well MW-9 at the end of the July 2012 monitoring event. All transducers were programmed to record groundwater elevation at 12:00 am and 12:00 pm (twice daily) until collected, downloaded and reset in May 2013. The transducers were placed approximately 6 inches above the bottom of each monitoring well, to allow for approximately 5 feet of water column above the transducers to prevent freezing.

During the May 2013 routine groundwater sampling event, only two pressure transducers were retrieved from the groundwater monitoring wells, MW-8 and MW-9, and the data downloaded from them. The third, in groundwater monitoring well MW-11, was frozen and depth to water was not measured due to ice obstructing the well roughly 2 feet below top of well casing. As current data was only available from two of three data loggers, there were an insufficient number of points to analyze the seasonal variation in the groundwater gradient, as three points are the minimum number necessary for this evaluation. The data loggers were reprogrammed and redeployed for retrieval in 2014, to add to the long term data collected thus far.

Groundwater Monitoring

Between May 20 and May 21, 2013, the following 10 of the 14 groundwater monitoring wells were sampled: MW-2, MW-4, MW-5, MW-6, MW-7, MW-8, MW-10, MW-12, MW-13 and MW-14. The remaining four monitoring wells (MW-1, MW-3, MW-9 and MW-11) were not sampled as they have consistently been found to be clean, having had no detections exceeding ADEC groundwater cleanup levels. Table 3 (Attachment 2) presents the sample collection summary. All monitoring wells were gauged for depth to water. Depths were used to calculate groundwater elevation and contours. Groundwater elevations are presented in Table 4 of Attachment 2. Prior to sampling wells, water quality parameters were recorded, as presented in Table 5 of Attachment 2. Samples were collected using the appropriate sampling containers with preservatives as required for analysis of the following parameters (i.e., contaminants of concern):

- GRO
- BTEX; and
- DRO / RRO

Investigation-Derived Waste Management

Two sources of investigation-derived waste existed for this project: solid waste derived from field sampling (nitrile gloves, paper towels, used tubing, etc.), and purge water produced during groundwater

sampling. All solid waste was placed in trash bags and treated as municipal waste to be disposed of at the Newhalen landfill. Purge water from all groundwater monitoring wells was collected in 5-gallon buckets and transported to CPD-AK's charcoal filter system, located within the Iliamna Tank Farm fenced area, prior to surface discharge.

Landfarmed Soil Removal

In addition to performing routine groundwater monitoring, Weston oversaw the removal and transport of the soil excavated in 2009 and landfarmed in 2010 to the Newhalen landfill by Don Henry of Alaska Power and Communications, LLC. The landfarmed material (approximately 65 LCY) was located on the northern portion of the tank farm facility, within the fenced tank farm area (Attachment 1, Figure 2).

Three discrete grab footprint soil samples were collected on June 30, 2013 for off-site analysis and will be compared to background sample data collected in 2010 prior to landfarming the soil. This data will be presented in a separate report.

OBSERVATIONS AND ANALYTICAL RESULTS

This section presents a discussion of field observations and the analytical results of the groundwater samples collected in May 2013. Laboratory analytical results, the completed ADEC Data Review Checklist, and the QAR are provided as Attachment 4.

Laboratory Analytical Methods and Results

Field collected groundwater quality parameters and laboratory analytical results for the May 2013 sampling event are summarized in Tables 5 and 6 (Attachment 2). Samples collected in May 2013 were submitted to ESC Lab Science (ESC) located in Mt. Juliet, Tennessee, an ADEC-approved laboratory for analytical services. All samples were submitted in accordance with standard chain-of-custody procedures outlined in the work plan. All necessary samples were preserved and stored at a temperature of 4 degrees Celsius ($^{\circ}\text{C}$) \pm 2 $^{\circ}\text{C}$ prior to shipment to ESC for laboratory analysis.

Groundwater samples were submitted for the following analyses/methods:

- GRO by Alaska Method (AK) 101
- BTEX by EPA Method SW8260B
- DRO/RRO by AK102/AK103, respectively.

None of the 10 monitoring wells sampled contained concentrations of a contaminant of concern above the ADEC Table C groundwater cleanup level. All analytes were detected variously in groundwater samples above the method detection limit (MDL) but below the reporting limit (RL) and the respective ADEC Table C groundwater cleanup levels. Groundwater analytical results are summarized in Table 6 (Attachment 2) and on Figure 3 (Attachment 1).

Groundwater Flow Direction and Gradient Results

Calculated groundwater elevations are presented in Table 4 (Attachment 2) for the May 2013 monitoring event. Groundwater contours along with measured elevations are presented in Figure 4 (Attachment 1). Groundwater was present between approximately 2.6 and 7.5 feet below ground surface (bgs) throughout the site with an average depth to groundwater of 4.9 feet bgs across the site. Groundwater flow direction at the site is inferred to be to the southeast, with an estimated horizontal hydraulic gradient of 0.013 feet/foot from northwest to southeast calculated for May 2013. Table 4 presents groundwater elevations from the May 2013 sampling event and Table 2 of Attachment 2 presents historical groundwater elevations since 2010.

CONCLUSIONS AND RECOMMENDATIONS

It is important to continue monitoring of groundwater at the Iliamna Tank Farm to determine whether the hydrocarbon contamination in the groundwater has picked up additional contamination from the soil remaining at the spill site, or whether the contamination that had been present has naturally attenuated. The 2012 groundwater laboratory analytical data indicated that the petroleum hydrocarbon plume in groundwater has been fully defined and characterized. Though a small dissolved-phase benzene plume was evident east and possibly south of the southwest corner of the site in 2012, this plume was not present during the May 2013 sampling event. Evaluation of past groundwater data indicates that GRO, DRO and benzene concentrations have declined.

Weston recommends continued annual groundwater monitoring at this site in 2014 to verify the decreasing trend of contamination as well as the delineation of the plume. Evaluation of transducer data in 2014 is recommended because it will provide additional data points, which will help determine the current and trending direction of groundwater flow at the site.

Weston is pleased to support CPD-AK with your monitoring project at the Iliamna Tank Farm. Please do not hesitate to contact myself or Mr. Dale Greinke via the contact information below if you have any questions or would like to discuss any part of this report.

Sincerely,

Weston Solutions, Inc.



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Project Manager
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Attachments:

1. Site Figures
2. Tables
3. Field Notes and Forms
4. Analytical results, ADEC Data Review Checklist, QAR Memo

ATTACHMENT 1

Site Figures



ArcGIS map service shown is NGS_Topo_UD_2D, National Geographic TOPO! (1:63,000 source scale)

 <p>425 G Street, Suite 300 Anchorage, AK 99501 (907) 276-6610</p>	<p>Project No: 15036.001.003.0003 Drawn by: SWD Checked by: LME Date: 6/18/13</p>	<p>SITE LOCATION MAP</p> <p>2013 SPRING ILIAMNA TANK FARM ROUTINE GROUNDWATER MONITORING REPORT CPD ALASKA, LLC ILIAMNA, ALASKA</p>	<p>FIGURE</p> <p>1</p>
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Path: W:\GIS\Alaska_IndComm\Iliamna\MXD\SI\Iliamna_Location.mxd



FIGURE

2

SITE PLAN

2013 SPRING ILIAMNA TANK FARM ROUTINE GROUNDWATER
MONITORING REPORT
CPD ALASKA, LLC
ILIAMNA, ALASKA

Project No. 15036.001.003.0003

Drawn by: SWD

Checked by: LME

Date: 6/18/13

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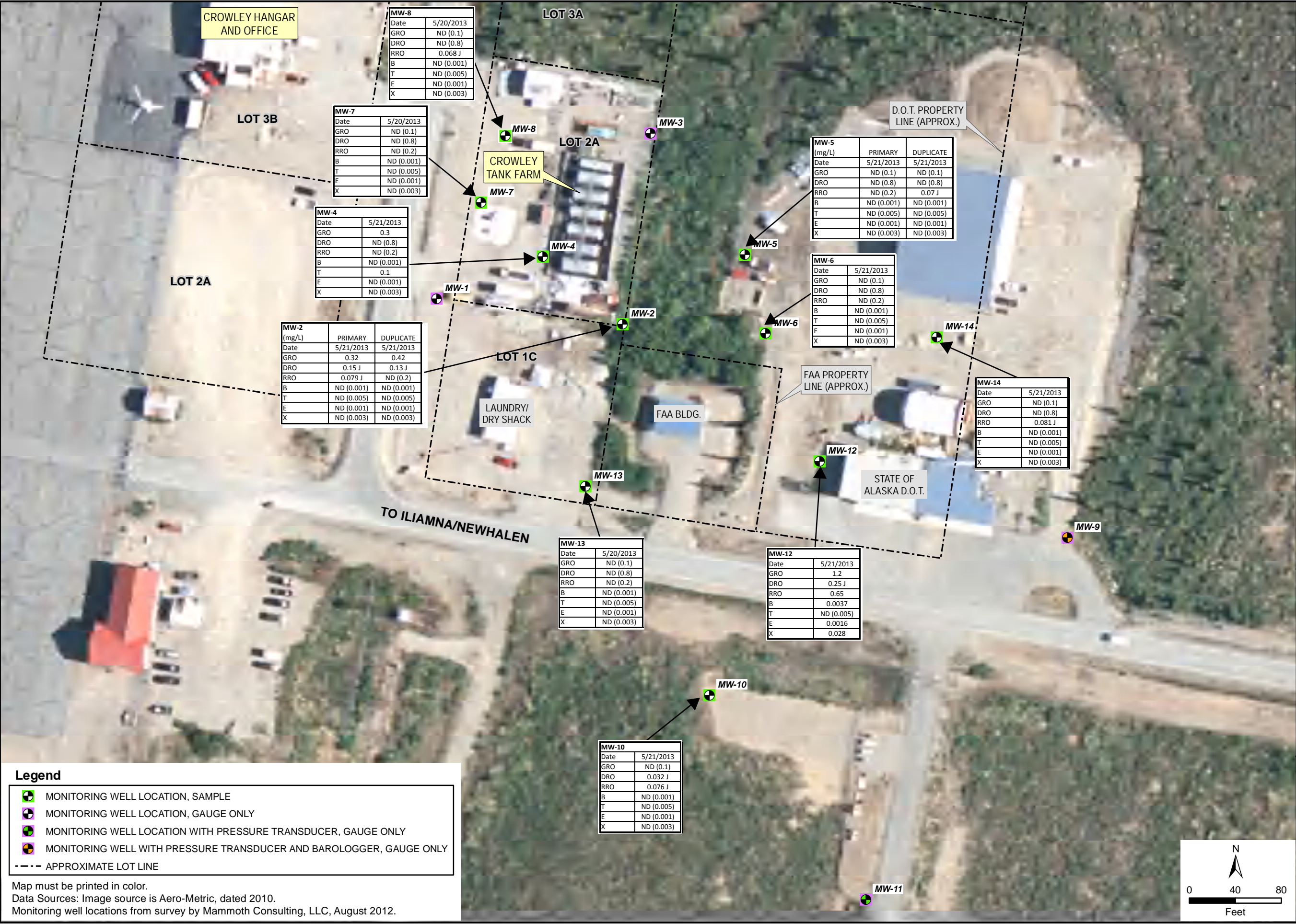


FIGURE 3

PETROLEUM HYDROCARBON CONCENTRATIONS IN GROUNDWATER (MAY 2013)

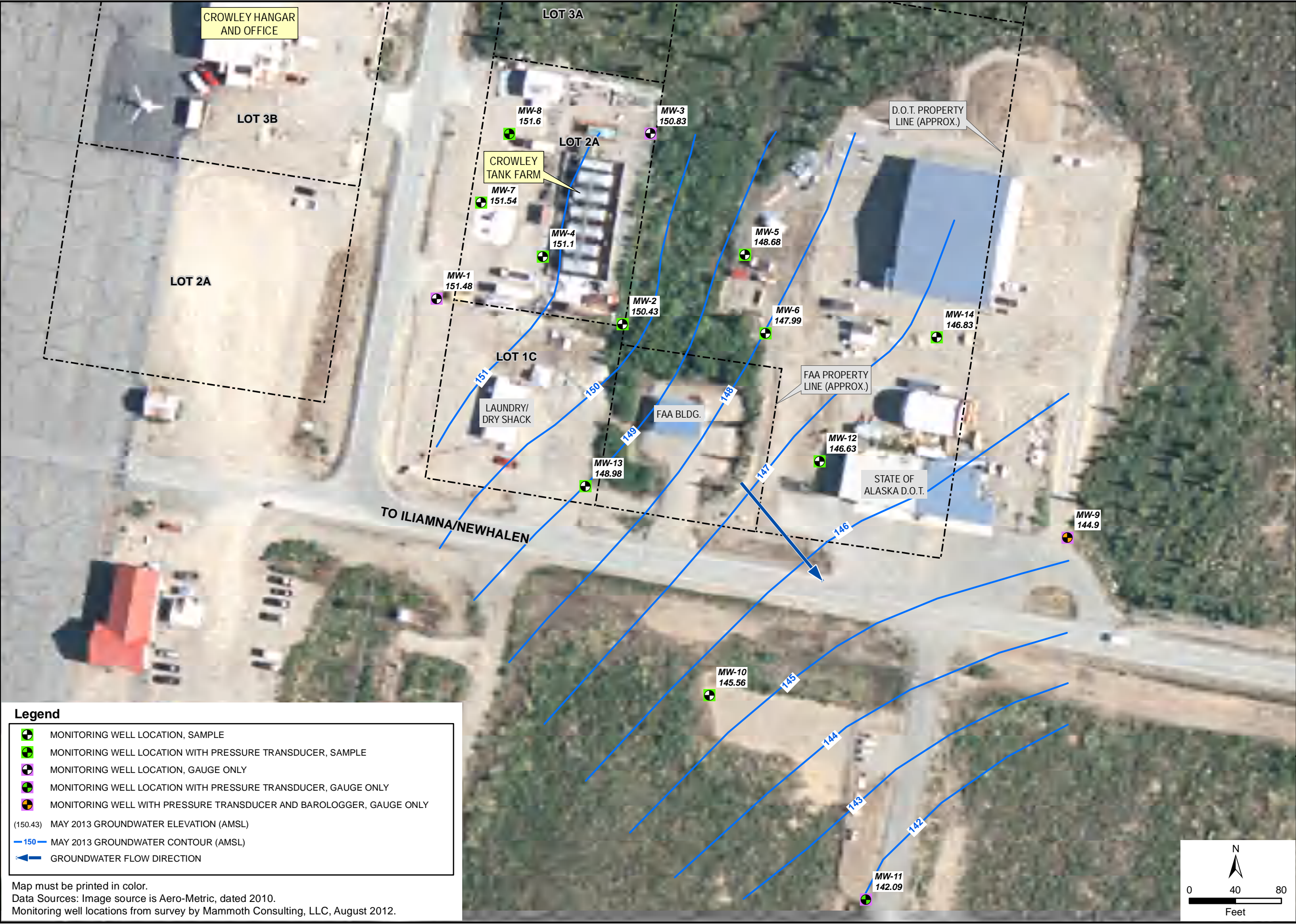
2013 ILIAMNA TANK FARM ROUTINE GROUNDWATER MONITORING REPORT

CPD ALASKA, LLC

ILIAMNA, ALASKA

Project No. 15036.001.003.0003
Drawn by: SWD
Checked by: LME
Date: 6/18/13

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INFERRED GROUNDWATER CONTOURS (MAY 2013)

2013 ILIAMNA TANK FARM ROUTINE GROUNDWATER
MONITORING REPORT
CPD ALASKA, LLC
ILIAMNA, ALASKA

Project No: 15036.001.003.0003

Drawn by: SWD

Checked by:

Date: 7/01/13

Version: DRAFT

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FIGURE

4

ATTACHMENT 2

Tables

TABLE 1
Historical Groundwater Analytical Results 2010 - 2013
 May 2013 Iliamna Tank Farm Routine Groundwater Monitoring Report
 CPD Alaska, LLC
 Iliamna, Alaska

Well ID	Sample No.	Sample Date	Duplicate	GRO (mg/L)	DRO (mg/L)	RRO (mg/L)	BTEX (mg/L)			
							Benzene	Toluene	Ethylbenzene	Total Xylenes
ADEC Groundwater Cleanup Level ⁽¹⁾ :				2.2	1.5	1.1	0.005	1.0	0.7	10
Drinking Water Wells										
DOT	10-ILM-DT-01-GW	8/25/2010		ND (0.050) JS	ND (0.0004)	ND (0.0004)	ND (0.0005) JS	ND (0.001) JS	ND (0.001) JS	ND (0.003) JS
	11-ILM-DT-01-GW	3/30/2011		ND (0.100)	ND (0.800)	ND (0.200)	ND (0.001)	ND (0.005)	ND (0.001)	ND (0.003)
Groundwater Monitoring Wells										
MW-1	10-ILM-MW1-01-GW	8/27/2010		0.0623 J, JS, B	ND (0.400)	ND (0.400)	ND (0.0005) R	ND (0.001) R	ND (0.001) R	ND (0.0003) R
	11-ILM-105-GW	3/30/2011		ND (0.100)	ND (0.800)	ND (0.200)	ND (0.001)	ND (0.005)	ND (0.001)	ND (0.003)
	11-ILM-211-GW	6/21/2011		ND (0.100)	ND (0.800)	ND (0.200)	ND (0.001)	ND (0.005)	ND (0.001)	ND (0.003)
	11-ILM-301-GW	9/18/2011		0.057 J	0.028 J	ND (0.200)	ND (0.001)	ND (0.005)	ND (0.001)	ND (0.003)
	12-ILI-107-GW	7/8/2012		0.0106J	0.66J	0.60J	ND (0.000053)	0.00016J	ND (0.000071)	ND (0.00017)
	12-ILI-202-GW	10/23/2012		0.0344J	0.34J	0.76J	ND (0.000062)	ND (0.000077)	ND (0.000081)	ND (0.00022)
MW-2	10-ILM-MW2-01-GW	8/27/2010		4.24 J, JS	0.495	ND (0.400)	0.00757 J, JS	1.6 J, JS	0.0208 J, JS	0.0838 J, JS
	11-ILM-103-GW	3/30/2011		4.6 JD	0.31 J, E	ND (0.200) E	ND (0.001)	0.0097	0.0093 B	0.02 B
	11-ILM-104-GW		✓	1.7 JD	0.250 J, E	ND (0.200) E	ND (0.001)	0.0083	0.0093 B	0.02 B
	11-ILM-212-GW	6/21/2011		0.917	2.400 JH	ND (0.200) JH	0.00073 J, JS	0.0012 J, JS	0.00055 J, JS	0.0049 J, JS
	11-ILM-213-GW	✓	1.00	2.2 JH	0.87 JH	0.0011 JS	0.0015 J, JS	0.00044 J, JS	0.0042 JS	
	11-ILM-304-GW	9/18/2011		2.10	0.360 J	ND (0.200)	0.00057 J	0.00036 J	ND (0.001)	0.0026 J
	11-ILM-305-GW		✓	1.90	0.360 J	0.068 J	ND (0.001)	0.00035 J	0.00034 J	0.0028 J
	12-ILI-104-GW	7/8/2012		1.09J	1.2	0.81J	0.0162	ND (0.000076)	0.0044	0.0077
	12-ILI-105-GW		✓	1.11J	1.2	0.75J	0.0156	ND (0.000076)	0.0044	0.0072
	12-ILI-205-GW	10/23/2012		0.523 J	0.44J	0.80J	0.00071J	ND (0.000077)	ND (0.000081)	0.00032J
	12-ILI-206-GW		✓	0.625 J	0.40J	0.71J	0.00063J	ND (0.000077)	ND (0.000081)	0.00031J
	13-ILI-111-GW	5/21/2013		0.32	0.15J	0.079J	ND (0.00033)	ND (0.00078)	ND (0.00038)	ND (0.0011)
	13-ILI-112-GW		✓	0.42	0.13J	ND (0.066)	ND (0.00033)	ND (0.00078)	ND (0.00038)	ND (0.0011)
MW-3	10-ILM-MW3-01-GW	8/28/2010		0.08 J, B	ND (0.417)	ND (0.417)	ND (0.0005) J	ND (0.001) J	ND (0.001) J	ND (0.0003) J
	11-ILM-101-GW	3/30/2011		ND (0.100)	ND (0.800)	ND (0.200)	ND (0.001)	ND (0.005)	ND (0.001)	ND (0.003)
	11-ILM-214-GW	6/21/2011		ND (0.100)	ND (0.800) JH	ND (0.200) JH	ND (0.100)	0.0015 J,JS	ND (0.001)	ND (0.003)
	11-ILM-303-GW	9/18/2011		ND (0.100)	0.025 J	ND (0.200)	ND (0.001)	ND (0.005)	ND (0.001)	ND (0.003)
	12-ILI-110-GW	7/8/2012		0.011J	0.74J	0.77J	ND (0.000053)	ND (0.000076)	ND (0.000071)	ND (0.00017)
	12-ILI-204-GW	10/23/2012		0.021J	0.35J	0.72J	ND (0.000062)	ND (0.000077)	ND (0.000081)	ND (0.00022)
MW-4	10-ILM-MW4-01-GW	8/28/2010		0.917 J	ND (0.400)	ND (0.400)	ND (0.0005) J	0.136 J	ND (0.001) J	ND (0.0003) J
	10-ILM-MW5-01-GW		✓	0.977 J, JS	ND (0.435)	ND (0.435)	ND (0.0005) J	0.145 J, JS	ND (0.001) J	ND (0.0003) J
	11-ILM-101-GW	3/30/2011		0.51	ND (0.800)	ND (0.200)	ND (0.001)	0.02	ND (0.001)	ND (0.003)
	11-ILM-210-GW	6/21/2011		0.180	0.023 J,JH	ND (0.200) JH	ND (0.001)	0.092	ND (0.001)	ND (0.003)
	11-ILM-302-GW	9/18/2011		6.0	0.12	ND (0.200)	0.0046	2.3	ND (0.001)	0.0014
	12-ILI-106-GW	7/8/2012		0.0579J	0.77J	0.62J	ND (0.000053)	0.0086	ND (0.000071)	ND (0.00017)
	12-ILI-203-GW	10/23/2012		0.273	0.40J	0.85J	0.00076J	0.0297	0.002	0.0242
	13-ILI-107-GW	5/21/2013		0.30	ND (0.022)	ND (0.066)	ND (0.00033)	0.1	ND (0.00038)	ND (0.0011)
MW-5	11-ILM-208-GW	6/20/2011		ND (0.100)	0.026 J,JH	ND (0.200) JH	ND (0.001)	ND (0.005)	ND (0.001)	ND (0.003)
	11-ILM-307-GW	9/18/2011		2.00	0.57 J	ND (0.200)	0.00091 J	0.00038 J	0.0021	0.0047
	12-ILI-108-GW	7/8/2012		0.0119J	0.67J	0.73J	ND (0.000053)	ND (0.000076)	ND (0.000071)	ND (0.00017)
	12-ILI-212-GW	10/24/2012		1.99	0.48J	0.65J	0.0092	0.00048J	0.014	0.11
	13-ILI-109-GW	5/21/2013		ND (0.031)	ND (0.022)	ND (0.066)	ND (0.00033)	ND (0.00078)	ND (0.00038)	ND (0.0011)
	13-ILI-110-GW		✓	ND (0.031)	ND (0.022)	0.07J	ND (0.00033)	ND (0.00078)	ND (0.00038)	ND (0.0011)
MW-6	11-ILM-209-GW	6/20/2011		0.050 J	0.029 J,JH	ND (0.200) JH	ND (0.001)	ND (0.005)	ND (0.001)	ND (0.003)
	11-ILM-306-GW	9/18/2011		2.5	0.15	ND (0.200)	0.0013	0.84	0.0018	0.0077
	12-ILI-109-GW	7/8/2012		1.1	0.87J	0.73J	0.191	0.00043	0.0013	0.0089
	12-ILI-210-GW	10/24/2012		0.852	0.43J	0.70J	0.0134	0.00081J	0.0067	0.0646
	12-ILI-211-GW		✓	0.802	0.51J	0.83J	0.0139	0.00094J	0.0074	0.0692
	13-ILI-108-GW	5/21/2013		ND (0.031)	ND (0.022)	ND (0.066)	ND (0.00033)	ND (0.00078)	ND (0.00038)	ND (0.0011)
MW-7	12-ILI-112-GW	7/8/2012		0.0286J	0.60J	0.69J	ND (0.000053)	ND (0.000076)	ND (0.000071)	ND (0.00017)
	12-ILI-201-GW	10/23/2012		0.0292	0.35J	1.1J	ND (0.000062)	0.00008J	ND (0.000081)	ND (0.00022)

TABLE 1
Historical Groundwater Analytical Results 2010 - 2013
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 CPD Alaska, LLC
 Iliamna, Alaska

Well ID	Sample No.	Sample Date	Duplicate	GRO (mg/L)	DRO (mg/L)	RRO (mg/L)	BTEX (mg/L)			
							Benzene	Toluene	Ethylbenzene	Total Xylenes
ADEC Groundwater Cleanup Level ⁽¹⁾ :				2.2	1.5	1.1	0.005	1.0	0.7	10
	13-ILI-101-GW	5/20/2013		ND (0.031)	ND (0.022)	ND (0.066)	ND (0.00033)	ND (0.00078)	ND (0.00038)	ND (0.0011)
MW-8	12-ILI-111-GW	7/8/2012		0.0145J	0.72J	1.0J	ND (0.000053)	ND (0.000076)	ND (0.000071)	ND (0.00017)
	--	10/23/2012		Frozen - No sample collected						
	13-ILI-102-GW	5/20/2013		ND (0.031)	ND (0.022)	0.068J	ND (0.00033)	ND (0.00078)	ND (0.00038)	ND (0.0011)
MW-9	12-ILI-113-GW	7/8/2012		0.0174J	0.72J	0.85J	ND (0.000053)	ND (0.000076)	ND (0.000071)	ND (0.00017)
	12-ILI-209-GW	10/24/2012		0.0552J	0.60J	0.90J	ND (0.000062)	ND (0.000077)	ND (0.000081)	ND (0.00022)
MW-10	12-ILI-115-GW	7/8/2012		0.0179J	0.71J	0.77J	ND (0.000053)	ND (0.000076)	ND (0.000071)	ND (0.00017)
	12-ILI-213-GW	10/24/2012		0.0352J	0.37J	0.71J	ND (0.000062)	ND (0.000077)	ND (0.000081)	ND (0.00022)
	13-ILI-106-GW	5/21/2013		ND (0.031)	0.032J	0.076J	ND (0.00033)	ND (0.00078)	ND (0.00038)	ND (0.0011)
MW-11	12-ILI-114-GW	7/8/2012		ND (0.007)	0.72J	0.61J	ND (0.000053)	ND (0.000076)	ND (0.000071)	ND (0.00017)
	12-ILI-214-GW	10/24/2012		0.0441J	0.36J	0.67J	ND (0.000062)	ND (0.000077)	ND (0.000081)	ND (0.00022)
MW-12	12-ILI-117-GW	7/10/2012		1.17	0.47J	0.38J	ND (0.000053)	0.00008J	0.00064J	0.0014J
	--	7/24/2012		Frozen - No sample collected						
	13-ILI-104-GW	5/21/2013		1.2	0.25J	0.65	0.0037	ND (0.00078)	0.0016	0.028
MW-13	12-ILI-116-GW	7/8/2012		0.62	0.66J	0.61J	ND (0.000053)	ND (0.000076)	ND (0.000071)	ND (0.00017)
	12-ILI-207-GW	10/24/2012		0.343	0.36J	0.65J	ND (0.000062)	ND (0.000077)	ND (0.000081)	ND (0.00022)
	13-ILI-103-GW	5/20/2013		ND (0.031)	ND (0.022)	ND (0.066)	ND (0.00033)	ND (0.00078)	ND (0.00038)	ND (0.0011)
MW-14	12-ILI-118-GW	7/10/2012		ND (0.007)	0.38J	0.44J	ND (0.000053)	ND (0.000076)	ND (0.000071)	ND (0.00017)
	12-ILI-208-GW	10/24/2012		0.0332J	0.33J	0.59J	ND (0.000062)	ND (0.000077)	ND (0.000081)	ND (0.00022)
	13-ILI-105-GW	5/21/2013		ND (0.031)	ND (0.022)	0.081J	ND (0.00033)	ND (0.00078)	ND (0.00038)	ND (0.0011)
Temporary Well Points										
TWP-1*	11-ILM-203-GW	6/16/2011		0.8	1.2	ND (0.2)	0.00074 J	ND (0.005)	0.00033 J	ND (0.003)
TWP-2*	11-ILM-204-GW	6/16/2011		23.0	4.5	0.074 J	0.0054	10.0	0.023	0.091
	11-ILM-205-GW		✓	21.0	4.9	ND (0.2)	0.0049	9.7	0.02	0.08
TWP-3*	11-ILM-206-GW	6/16/2011		13.0	2.1	ND (0.2)	0.0038	4.4	0.0066	0.018
TWP-4*	11-ILM-201-GW	6/15/2011		0.075 J	0.6 J	0.075 J	ND (0.001)	0.0069	ND (0.001)	ND (0.003)
TWP-5*	11-ILM-202-GW	6/15/2011		1.7	0.93	ND (0.2)	ND (0.001)	0.94	0.0016	0.0044
TWP-6*	11-ILM-207-GW	6/17/2011		6.0	0.66 J	ND (0.2)	ND (0.02)	2.4	0.0045 J	ND (0.06)
SP-01*	12-ILI-101-GW	7/6/2012		0.659	ND (0.57)	ND (1.1)	0.0318	0.0067	0.0174	0.0973
	12-ILI-102-GW	7/6/2012		0.655	0.59	ND (1.1)	0.0324	0.0065	0.0164	0.0986
SP-02*	12-ILI-103-GW	7/6/2012		0.249	ND (0.57)	ND (1.1)	ND (0.001)	ND (0.001)	ND (0.001)	0.0058

Notes: Results above ADEC cleanup values are underlined, bolded, and highlighted yellow.

⁽¹⁾ 18 AAC 75.345, Table C

* = One time sampling event

All 2012 ND data are reported as laboratory MDL

Key:

-- = Not analyzed or not applicable

AAC = Alaska Administrative Code

ADEC = Alaska Department of Environmental Conservation

DOT = Department of Transportation

BTEX = Benzene, toluene, ethylbenzene, and total xylenes

DRO = Diesel-range organics

GRO = Gasoline-range organics

RRO = Residual-range organics

RDL = Reported Detection Limit

MDL = Method Detection Limit

mg/L = Milligrams per liter

ND = Analyte not detected

J = Estimated Value. Analyte detected at less than the RDL and greater than or equal to the MDL.

JS = Estimated value. Surrogate recoveries outside of method acceptance limits.

JH = Values estimated due to holding time exceedences.

JD = Estimated value due to RPD between primary and duplicate exceeding ADEC recommended limits (<30%) for water.

R = Reject due to surrogate recovery < 10%. Data is usable for screening purposes.

B = Blank contamination, the analyte was detected within 5 times of blank sample.

TABLE 2
Historical Groundwater Elevation Trends from 2010 - 2013
 May 2013 Iliamna Tank Farm Routine Groundwater Monitoring Report
 CPD Alaska, LLC
 Iliamna, Alaska

Well ID	Northing ⁽¹⁾	Easting ⁽¹⁾	MP Elevation ^(2,3) (feet AMSL)	Screened Interval (feet BTOC)	Gauge Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet AMSL)	Groundwater Elevation within Screening Interval?
MW-1	2103211.60	1473192.07	158.88	4.18-12.68	8/28/2010	4.53	154.35	Yes
					3/30/2011	9.86	149.02	Yes
					6/21/2011	6.75	152.13	Yes
					9/18/2011	5.21	153.67	Yes
					7/8/2012	7.24	151.64	Yes
					10/23/2012	5.76	153.12	Yes
					5/21/2013	7.40	151.48	Yes
MW-2	2103189.52	1473353.70	156.79	3.29-11.79	8/28/2010	3.92	152.87	Yes
			156.96	4.16-12.66	3/30/2011	9.39	147.40	Yes
					6/21/2011	5.67	151.29	Yes
					9/18/2011	4.61	152.35	Yes
			157.16	4.46-12.96	7/8/2012	6.61	150.55	Yes
					10/23/2012	5.30	151.86	Yes
					5/21/2013	6.73	150.43	Yes
MW-3	2103355.19	1473377.88	157.99	3.49-13.49	8/28/2010	5.13	152.86	Yes
			158.04	4.24-14.24	3/30/2011	9.86	148.13	Yes
					6/21/2011	6.74	151.30	Yes
					9/18/2011	5.52	152.52	Yes
			158.11	4.21-14.21	7/8/2012	7.04	151.07	Yes
					10/23/2012	5.93	152.18	Yes
					5/21/2013	7.28	150.83	Yes
MW-4	2103248.09	1473284.27	159.49	5.09-15.09	8/28/2010	5.80	153.69	Yes
					3/30/2011	11.07	148.42	Yes
					6/21/2011	8.23	151.26	Yes
					9/18/2011	6.37	153.12	Yes
					7/8/2012	8.21	151.28	Yes
					10/23/2012	6.82	152.67	Yes
					5/21/2013	8.39	151.10	Yes
MW-5	2103249.738	1473459.977	155.12	4.52-14.52	6/20/2011	5.50	149.62	Yes
			155.59	4.99-14.99	9/18/2011	4.35	150.77	Yes
					7/8/2012	6.30	149.29	Yes
					10/24/2012	5.26	150.33	Yes
					5/21/2013	6.91	148.68	Yes
MW-6	2103181.414	1473477.932	153.24	3.64-13.64	6/20/2011	5.50	147.74	Yes
					9/18/2011	3.93	149.31	Yes
					7/8/2012	5.22	148.02	Yes
					10/24/2012	4.36	148.88	Yes
					5/21/2013	5.25	147.99	Yes
MW-7	2103295.03	1473230.73	156.68	4.28-14.28	7/8/2012	4.99	151.69	Yes
					10/23/2012	3.53	153.15	No
					5/20/2013	5.14	151.54	Yes
MW-8	2103354.80	1473255.28	156.59	1.69-11.69	7/8/2012	4.81	151.78	Yes
					10/24/2012	Frozen		

TABLE 2
Historical Groundwater Elevation Trends from 2010 - 2013
 May 2013 Iliamna Tank Farm Routine Groundwater Monitoring Report
 CPD Alaska, LLC
 Iliamna, Alaska

Well ID	Northing ⁽¹⁾	Easting ⁽¹⁾	MP Elevation ^(2,3) (feet AMSL)	Screened Interval (feet BTOC)	Gauge Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet AMSL)	Groundwater Elevation within Screening Interval?
					5/20/2013	4.99	151.60	Yes
MW-9	2103003.85	1473740.42	153.00	8.40-18.40	7/8/2012	8.05	144.95	No
					10/24/2012	7.32	145.68	No
					5/21/2013	8.10	144.90	No
MW-10	2102867.23	1473429.21	151.65	6.65-16.65	7/8/2012	6.05	145.60	No
					10/24/2012	8.37	143.28	Yes
					5/21/2013	6.09	145.56	No
MW-11	2102689.40	1473565.28	149.31	4.71-14.71	7/8/2012	7.22	142.09	Yes
					10/24/2012	6.04	143.27	Yes
					5/21/2013	7.22	142.09	Yes
MW-12	2103070.42	1473525.02	151.90	4.70-14.70	7/10/2012	5.34	146.56	Yes
					10/24/2012	Frozen		
					5/21/2013	5.27	146.63	Yes
MW-13	2103048.61	1473321.44	156.49	4.89-14.89	7/8/2012	7.10	149.39	Yes
					10/23/2012	5.70	150.79	Yes
					5/20/2013	7.51	148.98	Yes
MW-14	2103178.16	1473626.78	153.98	6.58-16.58	7/10/2012	7.18	146.80	Yes
					10/24/2012	6.30	147.68	No
					5/21/2013	7.15	146.83	Yes

Notes: All measurements are in units of feet. Mammoth Consulting, August 2012.

⁽¹⁾ NAD83 Alaska State Plane Zone 5; US Feet

⁽²⁾ NAVD88; US Feet

⁽³⁾ Top of (PVC) pipe elev's are at black mark; From trig levels - accuracy is +/- 0.01'.

Key:

AMSL = Above mean seal level

BTOC = Below top of casing, a.k.a. below measuring point

MP = Measuring point (a.k.a. PVC Elevation/top of casing)

TABLE 3
May 2013 Sample Collection Summary
 May 2013 Iliamna Tank Farm Routine Groundwater Monitoring Report
 CPD Alaska, LLC
 Iliamna, Alaska

Sample Location	Sample No. 13-ILI-	Duplicate	MS/MSD	Sample Date	Sample Time	Laboratory Analyses			
						GRO (AK 101)	DRO (AK 102)	RRO (AK 103)	BTEX (EPA 8260)
Groundwater									
MW-2	111-GW			5/21/2013	1705	✓	✓	✓	✓
	112-GW	✓		5/21/2013	1800	✓	✓	✓	✓
MW-4	107-GW			5/21/2013	1330	✓	✓	✓	✓
MW-5	109-GW			5/21/2013	1530	✓	✓	✓	✓
	110-GW	✓		5/21/2013	1615	✓	✓	✓	✓
MW-6	108-GW			5/21/2013	1440	✓	✓	✓	✓
MW-7	101-GW			5/20/2013	1525	✓	✓	✓	✓
MW-8	102-GW			5/20/2013	1640	✓	✓	✓	✓
MW-10	106-GW			5/21/2013	1220	✓	✓	✓	✓
MW-12	104-GW		✓	5/21/2013	1010	✓	✓	✓	✓
MW-13	103-GW			5/20/2013	1735	✓	✓	✓	✓
MW-14	105-GW			5/21/2013	1105	✓	✓	✓	✓
Trip Blanks									
--	TB101-GW			5/20/2013	0800	✓			✓

Key:

AK = Alaska

BTEX = Benzene, toluene, ethylbenzene, xylenes

DRO = Diesel-range organics

EPA = United States Environmental Protection Agency

GRO = Gasoline-range organics

MS/MSD = Matrix spike/matrix spike duplicate

RRO = Residual-range organics

TABLE 4
May 2013 Groundwater Elevation Data
 May 2013 Iliamna Tank Farm Routine Groundwater Monitoring Report
 CPD Alaska, LLC
 Iliamna, Alaska

Well ID	Measuring Point Elevation ^(1,2)	Ground Elevation (feet)	Top of Screen (BTOC)	Bottom of Screen (BTOC)	Top of Screen (bgs)	Bottom of Screen (bgs)	Gauge Date	Depth from MP		Depth bgs		Groundwater Elevation	Groundwater Elevation within Screening Interval?
								Depth to Water	Total Well Depth	Depth to Water	Total Well Depth		
MW-1	158.88	156.2	4.18	12.68	1.50	10.00	5/21/2013	7.4	12.16	4.72	12.16	151.48	Yes
MW-2	157.16	154.2	4.46	12.96	1.50	10.00	5/21/2013	6.73	12.15	3.77	12.15	150.43	Yes
MW-3	158.11	155.4	4.21	14.21	1.50	11.50	5/21/2013	7.28	14.23	4.57	14.23	150.83	Yes
MW-4	159.49	156.9	5.09	15.09	2.50	12.50	5/21/2013	8.39	16.05	5.80	16.05	151.10	Yes
MW-5	155.59	152.6	4.99	14.99	2.00	12.00	5/21/2013	6.91	15.35	3.92	15.35	148.68	Yes
MW-6	153.24	150.6	3.64	13.64	1.00	11.00	5/21/2013	5.25	13.82	2.61	13.82	147.99	Yes
MW-7	156.68	156.9	4.28	14.28	4.50	14.50	5/20/2013	5.14	14.10	5.36	14.10	151.54	Yes
MW-8	156.59	156.9	1.69	11.69	2.00	12.00	5/20/2013	4.99	12.40	5.30	12.40	151.60	Yes
MW-9	153.00	150.6	8.40	18.40	6.00	16.00	5/21/2013	8.10	18.57	5.70	18.57	144.90	No
MW-10	151.65	149.0	6.65	16.65	4.00	14.00	5/21/2013	6.09	17.65	3.44	17.65	145.56	No
MW-11	149.31	149.6	4.71	14.71	5.00	15.00	5/21/2013	7.22	15.34	7.51	15.34	142.09	Yes
MW-12	151.90	152.2	4.70	14.70	5.00	15.00	5/21/2013	5.27	15.50	5.57	15.50	146.63	Yes
MW-13	156.49	153.6	4.89	14.89	2.00	12.00	5/20/2013	7.51	15.60	4.62	15.60	148.98	Yes
MW-14	153.98	152.4	6.58	16.58	5.00	15.00	5/21/2013	7.15	16.95	5.57	16.95	146.83	Yes

Notes: All measurements are in units of feet. Mammoth Consulting, August 2012.

⁽¹⁾ NAVD88; US Feet

⁽²⁾ Top of (PVC) pipe elev's are at black mark; From trig levels - accuracy is +/- 0.01'.

Key:

bgs = Below ground surface

BTOC = Below top of casing, a.k.a. below measuring point

MP = Measuring point (a.k.a. PVC Elevation/TOC)

TABLE 5
May 2013 Field-Collected Groundwater Quality Parameters
 May 2013 Iliamna Tank Farm Routine Groundwater Monitoring Report
 CPD Alaska, LLC
 Iliamna, Alaska

Well	Purge/Sample Date	Color	Odor	pH	Temperature (°C)	Conductivity (mS/cm)	DO (mg/L)	ORP (mV)
MW-2	5/21/2013	clear	none noted	5.49	2.44	0.051	7.39	302.9
MW-4	5/21/2013	clear	none noted	5.94	2.55	0.070	14.52	283.7
MW-5	5/21/2013	clear	none noted	5.60	2.88	0.068	11.65	250.3
MW-6	5/21/2013	clear	none noted	5.73	3.27	0.069	8.66	250.5
MW-7	5/20/2013	clear	none noted	5.97	3.18	0.074	14.88	246.4
MW-8	5/20/2013	clear	none noted	5.88	2.80	0.062	14.72	271.4
MW-10	5/21/2013	clear	none noted	6.14	3.91	0.097	7.94	282.0
MW-12	5/21/2013	clear	none noted	5.62	2.39	0.078	4.90	247.1
MW-13	5/20/2013	clear	none noted	5.85	3.70	0.074	9.80	281.4
MW-14	5/21/2013	clear	none noted	6.33	3.57	0.096	9.14	268.8

Key:

°C = Degrees Celsius

mV = Millivolts

DO = Dissolved oxygen

ORP = Oxidation-reduction potential

mg/L = milligrams per liter

mS/cm = Microsiemens per centimeter

TABLE 6
May 2013 Groundwater Analytical Results Summary
 May 2013 Iliamna Tank Farm Routine Groundwater Monitoring Report
 CPD Alaska, LLC
 Iliamna, Alaska

Location:	Groundwater Cleanup Level ⁽¹⁾	MW-2		MW-4	MW-5		MW-6	MW-7
Sample ID (13-ILI-):		111-GW	112-GW	107-GW	109-GW	110-GW	108-GW	101-GW
Sample Date:		5/21/2013		5/21/2013	5/21/2013		5/21/2013	5/20/2013
ADEC Fuels (AK101, AK102, AK103; mg/L)								
Gasoline Range Organics	2.2	0.32	0.42	0.30	ND (0.031)	ND (0.031)	ND (0.031)	ND (0.031)
Diesel Range Organics	1.5	0.15 J	0.13 J	ND (0.022)	ND (0.022)	ND (0.022)	ND (0.022)	ND (0.022)
Residual Range Organics	1.1	0.079 J	ND (0.066)	ND (0.066)	ND (0.066)	0.070 J	ND (0.066)	ND (0.066)
BTEX (8260B; mg/L)								
Benzene	0.005	ND (0.00033)	ND (0.00033)	ND (0.00033)	ND (0.00033)	ND (0.00033)	ND (0.00033)	ND (0.00033)
Toluene	1.0	ND (0.00078)	ND (0.00078)	0.10	ND (0.00078)	ND (0.00078)	ND (0.00078)	ND (0.00078)
Ethylbenzene	0.7	ND (0.00038)	ND (0.00038)	ND (0.00038)	ND (0.00038)	ND (0.00038)	ND (0.00038)	ND (0.00038)
Total Xylenes	10	ND (0.0011)	ND (0.0011)	ND (0.0011)	ND (0.0011)	ND (0.0011)	ND (0.0011)	ND (0.0011)

Location:	Groundwater Cleanup Level ⁽¹⁾	MW-8	MW-10	MW-12	MW-13	MW-14	Trip Blank
Sample ID (13-ILI-):		102-GW	106-GW	104-GW	103-GW	105-GW	TB101
Sample Date:		5/20/2013	5/21/2013	5/21/2013	5/20/2013	5/21/2013	5/20/2013
ADEC Fuels (AK101, AK102, AK103; mg/L)							
Gasoline Range Organics	2.2	ND (0.031)	ND (0.031)	1.2	ND (0.031)	ND (0.031)	ND (0.031)
Diesel Range Organics	1.5	ND (0.022)	0.032 J	0.25 J	ND (0.022)	ND (0.022)	--
Residual Range Organics	1.1	0.068 J	0.076 J	0.65	ND (0.066)	0.081 J	--
BTEX (8260B; mg/L)							
Benzene	0.005	ND (0.00033)	ND (0.00033)	0.0037	ND (0.00033)	ND (0.00033)	ND (0.00033)
Toluene	1.0	ND (0.00078)	ND (0.00078)	ND (0.00078)	ND (0.00078)	ND (0.00078)	ND (0.00078)
Ethylbenzene	0.7	ND (0.00038)	ND (0.00038)	0.0016	ND (0.00038)	ND (0.00038)	ND (0.00038)
Total Xylenes	10	ND (0.0011)	ND (0.0011)	0.028	ND (0.0011)	ND (0.0011)	ND (0.0011)

Notes :

⁽¹⁾ 18 AAC 75.345, Table C

Key:

mg/L = Milligrams per liter

AAC = Alaska Administrative Code

ADEC = Alaska Department of Environmental Conservation

BTEX = Benzene, toluene, ethylbenzene, and total xylenes

RL = Reporting Limit

MDL = Method detection limit

ND = Analyte not detected above the RL, RL value in parentheses

-- = Not analyzed

J= Estimated concentration above the adjusted MDL and below the adjusted RL.

ATTACHMENT 3
Field Notes and Forms



Daily Tailgate Safety Meeting

Site Location: 141 Frank Farm

Date: 5/21/13

40°F, 3mph wind, overcast

HSE Hazard Identification/Considerations

Hazard possibilities	Considerations	Comments
<input checked="" type="checkbox"/> Slips, trips & falls	<input checked="" type="checkbox"/> Hazard areas acknowledged	
<input checked="" type="checkbox"/> Adverse weather conditions	<input checked="" type="checkbox"/> Proper clothing available	layer
<input type="checkbox"/> Noise	<input type="checkbox"/> Hearing protection	
<input checked="" type="checkbox"/> Power tools/hand tools	<input checked="" type="checkbox"/> Inspected & in good working condition	
<input type="checkbox"/>	<input checked="" type="checkbox"/> Operator familiar with proper use	
<input type="checkbox"/> Presence of heavy equipment	<input type="checkbox"/> Communication/eye contact w/ operator	
<input type="checkbox"/> Electrical	<input type="checkbox"/> GFCI/Power shut-off switch or breaker	
<input checked="" type="checkbox"/> Flam./explosive materials	<input checked="" type="checkbox"/> Correct storage/secure if transporting	
<input checked="" type="checkbox"/> Hazardous materials	<input checked="" type="checkbox"/> Spill prevention measures in place	
	<input checked="" type="checkbox"/> MSDS readily available	
<input checked="" type="checkbox"/> Travel to and from site	<input checked="" type="checkbox"/> Load secured	
	<input type="checkbox"/> Vehicle in good working condition	
<input checked="" type="checkbox"/> Wildlife interaction	<input checked="" type="checkbox"/> Right of way to wildlife/avoid interaction	
<input type="checkbox"/> Travel over sensitive areas	<input type="checkbox"/> Minimize unnecessary impacts	
<input type="checkbox"/> Hazardous atmospheres	<input type="checkbox"/> Atmospheric monitoring devices (i.e. PID)	
<input type="checkbox"/> Below ground utilities	<input type="checkbox"/> Utility location complete	
<input checked="" type="checkbox"/> Pinch Points	<input checked="" type="checkbox"/> Hand protection	
<input type="checkbox"/> Vibration	<input type="checkbox"/> Anti-vibration gloves	
<input type="checkbox"/> Overhead hazards	<input type="checkbox"/> Power lines, loose items, pipelines, etc.	
<input checked="" type="checkbox"/> Site traffic	<input checked="" type="checkbox"/> Reflective and/or bright colored clothing	
Other -- Perform site walk and talk through activities to recognize other hazards(Use comment section if necessary)		
<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	

PPE (As necessary to reduce or eliminate hazards)

<input checked="" type="checkbox"/> Hard hats	<input checked="" type="checkbox"/> Foot protection (i.e. steel toes,	<input type="checkbox"/> H2S monitor, PID, Multi-gas meter
<input checked="" type="checkbox"/> Safety glasses	<input checked="" type="checkbox"/> Hand (i.e anti-vibration, nitrile)	<input type="checkbox"/> Respirators or dust guard
<input type="checkbox"/> Hearing protection	<input type="checkbox"/> Flotation devices	<input type="checkbox"/> Fall protection
<input type="checkbox"/> Fire resistant clothing	<input type="checkbox"/> Slip Protection (ice grippers)	<input type="checkbox"/> Face Shields
<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:

Other considerations

<input type="checkbox"/> Spill kit	<input checked="" type="checkbox"/> Viable means of communication available	<input checked="" type="checkbox"/> Safe site access/egress
<input checked="" type="checkbox"/> Fire extinguisher	<input type="checkbox"/> Ensure necessary permits are in place	<input type="checkbox"/> Proper waste disposal
<input checked="" type="checkbox"/> First aid kit	<input type="checkbox"/> Confined space/trenching hazards	

Emergency gathering area: TRUCK

Location of nearest medical facility: clinic

Emergency contacts:

Police: 911 Ambulance: 911 Fire: 911

Comments or special considerations:

I understand the HSE hazards of this job and agree to work safe and work smart.

Print name/company	Signature
Ashley Olson / Weston	
Callie Gates / Weston	



Daily Tailgate Safety Meeting 350-4897

Site Location: ILIamna

Date: 5/20/15

45°F, 5-10 mph wind, overcast

HSE Hazard Identification/Considerations

Hazard possibilities	Considerations	Comments
<input checked="" type="checkbox"/> Slips, trips & falls	<input checked="" type="checkbox"/> Hazard areas acknowledged	
<input checked="" type="checkbox"/> Adverse weather conditions	<input checked="" type="checkbox"/> Proper clothing available	<u>layer</u>
<input type="checkbox"/> Noise	<input type="checkbox"/> Hearing protection	
<input checked="" type="checkbox"/> Power tools/hand tools	<input checked="" type="checkbox"/> Inspected & in good working condition	
<input type="checkbox"/> Presence of heavy equipment	<input checked="" type="checkbox"/> Operator familiar with proper use	
<input type="checkbox"/> Electrical	<input type="checkbox"/> Communication/eye contact w/ operator	
<input type="checkbox"/> GFCI/Power shut-off switch or breaker		
<input checked="" type="checkbox"/> Flam./explosive materials	<input checked="" type="checkbox"/> Correct storage/secure if transporting	
<input checked="" type="checkbox"/> Hazardous materials	<input checked="" type="checkbox"/> Spill prevention measures in place	
	<input checked="" type="checkbox"/> MSDS readily available	
<input checked="" type="checkbox"/> Travel to and from site	<input checked="" type="checkbox"/> Load secured	
	<input checked="" type="checkbox"/> Vehicle in good working condition	
<input checked="" type="checkbox"/> Wildlife interaction	<input checked="" type="checkbox"/> Right of way to wildlife/avoid interaction	
<input type="checkbox"/> Travel over sensitive areas	<input type="checkbox"/> Minimize unnecessary impacts	
<input type="checkbox"/> Hazardous atmospheres	<input type="checkbox"/> Atmospheric monitoring devices (i.e. PID)	
<input type="checkbox"/> Below ground utilities	<input type="checkbox"/> Utility location complete	
<input checked="" type="checkbox"/> Pinch Points	<input checked="" type="checkbox"/> Hand protection	
<input type="checkbox"/> Vibration	<input type="checkbox"/> Anti-vibration gloves	
<input type="checkbox"/> Overhead hazards	<input type="checkbox"/> Power lines, loose items, pipelines, etc.	
<input checked="" type="checkbox"/> Site traffic	<input checked="" type="checkbox"/> Reflective and/or bright colored clothing	
Other -- Perform site walk and talk through activities to recognize other hazards(Use comment section if necessary)		
<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	

PPE (As necessary to reduce or eliminate hazards)

<input checked="" type="checkbox"/> Hard hats	<input checked="" type="checkbox"/> Foot protection (i.e. steel toes,	<input type="checkbox"/> H2S monitor, PID, Multi-gas meter
<input checked="" type="checkbox"/> Safety glasses	<input checked="" type="checkbox"/> Hand (i.e anti-vibration, nitrile)	<input type="checkbox"/> Respirators or dust guard
<input type="checkbox"/> Hearing protection	<input type="checkbox"/> Flotation devices	<input type="checkbox"/> Fall protection
<input type="checkbox"/> Fire resistant clothing	<input type="checkbox"/> Slip Protection (ice grippers)	<input type="checkbox"/> Face Shields
<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:

Other considerations

<input type="checkbox"/> Spill kit	<input checked="" type="checkbox"/> Viable means of communication available	<input checked="" type="checkbox"/> Safe site access/egress
<input type="checkbox"/> Fire extinguisher	<input type="checkbox"/> Ensure necessary permits are in place	<input checked="" type="checkbox"/> Proper waste disposal
<input checked="" type="checkbox"/> First aid kit	<input type="checkbox"/> Confined space/trenching hazards	

Emergency gathering area: truck

Location of nearest medical facility: clinic

Emergency contacts:

Police: 911 Ambulance: 911 Fire: 911

Comments or special considerations:

I understand the HSE hazards of this job and agree to work safe and work smart.

Print name/company	Signature
<u>Ashley Olson / Weston</u>	<u>Ashley Olson</u>
<u>Callie Gates / Weston</u>	<u>Callie Gates</u>

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Project #:		Well ID:	MW-2		
Project Name:		Date:	5/21/13		
Site:	1L1 TF	Start Time:	1615		
Field Team:	CG, AD	End Time:	1715		
Sample ID:	13-1L1-111-GW / 1705	primary	dup	split	ms/msd
Sample ID:	13-1L1-112-GW / 1800	primary	dup	split	ms/msd
Sample ID:		primary	dup	split	ms/msd

Purging and Sampling Method (e.g. peristaltic, bladder, submersible): peri
 Total Volume Purged: 1.5 gal

Weather Conditions: 45, 15-20 mph winds, partly sunny

Depth to Top of Product (ft BTOC): _____ Depth to Water (ft BTOC): 6.73
 Depth to Oil/Water Interface* (ft BTOC): _____ Total Depth (ft BTOC): 12.15

* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Notes
Temperature	>0.00 °C	
pH	0-14	
Conductivity	0-999 mS/m	
ORP	± 1999 mV	
Dissolved Oxygen	0-19.99 mg/L	
Turbidity	0-800 NTU	

Sensory Observations

Color: Clear Amber, Tan, Brown, Grey, Milky White, Other:
 Odor: None Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
 Turbidity: None Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Flowrate (ml/min)	Time	Temp °C	pH	Conductivity (mS/cm)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
210	1620						clear	none	7.48	0.95
100	1625						clear	none	7.35	0.62
100	1640	2.54	5.39	0.047	8.70	298.6	clear	none	7.35	0.62
100	1649	2.18	5.40	0.048	8.80	300.2	clear	none	7.35	0.62
100	1652	2.46	5.45	0.048	8.41	300.7	clear	none	7.35	0.62
100	1655	2.47	5.46	0.049	8.02	301.2	clear	none	7.35	0.62
100	1658	2.45	5.48	0.050	7.54	302.2	clear	none	7.35	0.62
100	1701	2.44	5.49	0.051	7.34	302.9	clear	none	7.35	0.62

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
BTEX 8260	6 - 40ml VOA HCL	Site conditions will not allow us for the flow rate to be reduced below 100ml/min.
GR0 AK-101	4 - 40ml VOA HCL	
DRY RPD 104103	4 - 100ml 2mb HCL	

Signed: _____ Date: _____

Signed/reviewer _____ Date: _____

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Project #:		Well ID:	MW-4		
Project Name:		Date:	5/21/13		
Site:	141 TF	Start Time:	1256		
Field Team:	CG, AD	End Time:	1340		
Sample ID:	13-141-107-GW/1330	primary	dup	split	ms/msd
Sample ID:		primary	dup	split	ms/msd
Sample ID:		primary	dup	split	ms/msd

Purging and Sampling Method (e.g. peristaltic, bladder, submersible):

Total Volume Purged:

Weather Conditions:

40°F, 10-15 mph winds, partly sunny

Depth to Top of Product (ft BTOC):

Depth to Oil/Water Interface* (ft BTOC):

Depth to Water (ft BTOC): 8.39

Total Depth (ft BTOC): 16.05

* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Notes
Temperature	>0.00 °C	
pH	0-14	
Conductivity	0-999 mS/m	
ORP	± 1999 mV	
Dissolved Oxygen	0-19.99 mg/L	
Turbidity	0-800 NTU	

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:

Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown

Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Flowrate (ml/min)	Time	Temp °C	pH	Conductivity (mS/cm)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
200	1307	2.10					clear	none	8.41	0.02
200	1322	2.10	5.95	0.071	15.56	284.2	clear	none	8.41	0.02
200	1325	2.61	5.94	0.071	15.10	284.9	clear	none	8.41	0.02
200	1328	2.55	5.94	0.070	14.52	283.7	clear	none	8.41	0.02

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
BTEX 8260	3-40ml VOA HCL	
GR0 AK/01	2-40ml VOA HCL	
DEQ/R0102/103	2-100ml amb HCL	

Signed: _____

Date: _____

Signed/reviewer

Date:

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Project #: _____ Well ID: MW-5
 Project Name: _____ Date: 5/21/13
 Site: 141 TE Start Time: 1440
 Field Team: CG, AD End Time: 1540
 Sample ID: 13-141-109-GW/1530 ☒ primary ☐ dup ☐ split ☐ ms/msd
 Sample ID: 13-141-100-GW/1615 ☐ primary ☒ dup ☐ split ☐ ms/msd
 Sample ID: _____ ☐ primary ☐ dup ☐ split ☐ ms/msd

Purging and Sampling Method (e.g. peristaltic, bladder, submersible): peri

Total Volume Purged: 1.5 gal

Weather Conditions: 47°F, 15 mph winds, sunny

Depth to Top of Product (ft BTOC): _____

Depth to Water (ft BTOC): 6.91

Depth to Oil/Water Interface* (ft BTOC): _____

Total Depth (ft BTOC): 15.35

* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Notes
Temperature	>0.00 °C	
pH	0-14	
Conductivity	0-999 mS/m	
ORP	± 1999 mV	
Dissolved Oxygen	0-19.99 mg/L	
Turbidity	0-800 NTU	

Sensory Observations

Color: ☒ Clear, ☐ Amber, Tan, Brown, Grey, Milky White, Other: _____
 Odor: ☒ None, ☐ Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
 Turbidity: ☒ None, ☐ Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Flowrate (ml/min)	Time	Temp °C	pH	Conductivity (mS/cm)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
200	1500						clear	none	—	—
200	1518	2.95	5.58	0.069	12.25	250.4	clear	none	—	—
200	1521	2.93	5.59	0.068	11.87	249.7	clear	none	—	—
200	1524	2.88	5.60	0.068	11.65	250.3	clear	none	—	—

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
BTEX 8260	4 - 40ml VOA HCl	Obstruction when tubing and interface probe both in well, unable to record drawdown
GR0 AX101	4 - 40ml VOA HCl	
DR0/RRO 102/103	4 - 100ml amb HCl	

Signed: _____

Date: _____

Signed/reviewer

Date:

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Project #: _____ Project Name: _____ Site: <u>1L1 TF</u> Field Team: <u>CG, AD</u> Sample ID: <u>13-1L1-108-GW/1440</u> Sample ID: _____ Sample ID: _____	Well ID: <u>MW-6</u> Date: <u>5/21/13</u> Start Time: <u>1405</u> End Time: <u>1445</u> <div style="display: flex; justify-content: space-between;"> <div> <u>primary</u> dup split ms/msd <u>primary</u> dup split ms/msd <u>primary</u> dup split ms/msd </div> </div>
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Purging and Sampling Method (e.g. peristaltic, bladder, submersible): peri
 Total Volume Purged: 1.5 gal

Weather Conditions: 47° F, 15 mph winds, mostly sunny

Depth to Top of Product (ft BTOC): _____	Depth to Water (ft BTOC): <u>5.25</u>
Depth to Oil/Water Interface* (ft BTOC): _____	Total Depth (ft BTOC): <u>13.82</u>

* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Notes
Temperature	>0.00 °C	
pH	0-14	
Conductivity	0-999 mS/m	
ORP	± 1999 mV	
Dissolved Oxygen	0-19.99 mg/L	
Turbidity	0-800 NTU	

Sensory Observations

Color: Clear Amber, Tan, Brown, Grey, Milky White, Other:
 Odor: None Low, Medium, High, Very Strong, H₂S, Fuel Like, Chemical ?, Unknown
 Turbidity: None Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Flowrate (ml/min)	Time	Temp °C	pH	Conductivity (mS/cm)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
210	1413						clear	none	5.27	0.02
210	1432	3.26	5.71	0.070	9.26	246.9	clear	none	5.27	0.02
210	1435	3.27	5.72	0.069	8.88	248.9	clear	none	5.27	0.02
210	1438	3.27	5.73	0.069	8.66	250.5	clear	none	5.27	0.02

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
BTEX 8260	3-40ml VOA HCl	
GRD AX101	2-40ml VOA HCl	
DR/PRD 102/103	2-100ml 2mb HCl	

Signed: _____ Date: _____

Signed/reviewer _____ Date: _____

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Project #: _____
 Project Name: _____
 Site: Hamna TE
 Field Team: CGAO
 Sample ID: 13-111-101-GW/1525
 Sample ID: _____
 Sample ID: _____

Well ID: MW-7
 Date: 5/20/13
 Start Time: 14:30
 End Time: 1535

primary	dup	split	ms/msd
primary	dup	split	ms/msd
primary	dup	split	ms/msd

Purging and Sampling Method (e.g. peristaltic, bladder, submersible): Peri pump
 Total Volume Purged: 1.5 gal

Weather Conditions: 45° F, 5-10 mph winds, overcast

Depth to Top of Product (ft BTOC): _____
 Depth to Oil/Water Interface* (ft BTOC): _____

Depth to Water (ft BTOC): 5.14
 Total Depth (ft BTOC): 14.10

* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Notes
Temperature	>0.00 °C	
pH	0-14	
Conductivity	0-999 mS/m	
ORP	± 1999 mV	
Dissolved Oxygen	0-19.99 mg/L	
Turbidity	0-800 NTU	

Sensory Observations

Color: Clear Amber, Tan, Brown, Grey, Milky White, Other:
 Odor: None Low, Medium, High, Very Strong, H₂S, Fuel Like, Chemical ?, Unknown
 Turbidity: None Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Flowrate (ml/min)	Time	Temp °C	pH	Conductivity (mS/cm)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
170	1453						clear	none	5.14	
170	1518	3.21	5.93	0.073	15.40	244.7	clear	none	5.14	
170	1521	3.18	5.95	0.073	15.12	245.6	clear	none	5.14	
170	1524	3.18	5.97	0.074	14.88	246.4	clear	none	5.14	

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
BTEX 8260	3 - 40ml VOA HCl	DO took an abnormally long time to stabilize get below saturation limit of 12 mg/L. Will use ORP as a stabilizing parameter in place of DO.
GRO-AR 101	2 - 40ml VOA HCl	
DRd PEO 102/102	2 - 100ml 2mb HCl	

Signed: _____

Date: _____

Signed/reviewer

Date:

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Project # : _____	Well ID: <u>MW 8</u>
Project Name: _____	Date: <u>5/20/13</u>
Site: <u>Wismar TP</u>	Start Time: <u>1600</u>
Field Team: <u>CGAD</u>	End Time: <u>1650</u>
Sample ID: <u>13-1L1-102-GW / 1640</u>	primary dup split ms/msd
Sample ID: _____	primary dup split ms/msd
Sample ID: _____	primary dup split ms/msd

Purging and Sampling Method (e.g. peristaltic, bladder, submersible): peri

Total Volume Purged: 2 gals

Weather Conditions: 45°F, 5-10 mph winds, overcast

Depth to Top of Product (ft BTOC): —

Depth to Water (ft BTOC): 4.99

Depth to Oil/Water Interface* (ft BTOC): —

Total Depth (ft BTOC): 12.40

* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Notes
Temperature	>0.00 °C	
pH	0-14	
Conductivity	0-999 mS/m	
ORP	± 1999 mV	
Dissolved Oxygen	0-19.99 mg/L	
Turbidity	0-800 NTU	

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other: _____

Odor: None, Low, Medium, High, Very Strong, H₂S, Fuel Like, Chemical ?, Unknown

Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Flowrate (ml/min)	Time	Temp °C	pH	Conductivity (mS/cm)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
190	1608						clear	none	4.99	—
190	1629	2.89	5.88	0.063	14.95	268.7	clear	none	4.99	—
190	1633	2.80	5.90	0.063	14.80	270.8	clear	none	4.99	—
190	1636	2.80	5.88	0.062	14.72	271.4	clear	none	4.99	—
	1640G									

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
BTEX 8260	3 - 40ml VOA HCl	
GR0 AIC 101	2 - 40ml VOA HCl	
DRY/RO 102/103	2 - 100ml 2MB HCl	

Signed: _____

Date: _____

Signed/reviewer

Date: _____

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Project #: _____ Project Name: _____ Site: <u>121 TF</u> Field Team: <u>CG, AD</u> Sample ID: <u>13-121-166-GW/1220</u> Sample ID: _____ Sample ID: _____	Well ID: <u>MW-10</u> Date: <u>5/21/13</u> Start Time: <u>1135</u> End Time: <u>1222</u> dup split ms/msd dup split ms/msd dup split ms/msd
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Purging and Sampling Method (e.g. peristaltic, bladder, submersible): peri
 Total Volume Purged: 1.5 gal

Weather Conditions: 40°F, 10-15 mph winds, overcast

Depth to Top of Product (ft BTOC): _____
 Depth to Oil/Water Interface* (ft BTOC): _____
 Depth to Water (ft BTOC): 6.09
 Total Depth (ft BTOC): 17.65

* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Notes
Temperature	>0.00 °C	
pH	0-14	
Conductivity	0-999 mS/m	
ORP	± 1999 mV	
Dissolved Oxygen	0-19.99 mg/L	
Turbidity	0-800 NTU	

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
 Odor: None, Low, Medium, High, Very Strong, H₂S, Fuel Like, Chemical ?, Unknown
 Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Flowrate (ml/min)	Time	Temp °C	pH	Conductivity (mS/cm)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
215	1148						clear	none	6.12	0.03
215	1209	3.89	6.14	0.096	8.17	280.9	clear	none	6.12	0.03
215	1212	3.91	6.14	0.096	8.00	281.5	clear	none	6.12	0.03
215	1215	3.91	6.14	0.097	7.94	282.0	clear	none	6.12	0.03

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
BT EX 8260	3-40ml VOA HCl	
GRO AK101	2-40ml VOA HCl	
DRO/PRD 102/103	2-100ml amb HCl	

Signed: _____ Date: _____
 Signed/reviewer _____ Date: _____

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Project #:		Well ID:	MW-12		
Project Name:		Date:	5/21/13		
Site:	161 TP	Start Time:	0930		
Field Team:	CG, AD	End Time:	1020		
Sample ID:	13-161-104-GW / 1010	primary	dup	split	ms/msd
Sample ID:	13-161-104-GW / 1010	primary	dup	split	ms/msd
Sample ID:		primary	dup	split	ms/msd

Purging and Sampling Method (e.g. peristaltic, bladder, submersible): peri

Total Volume Purged: 1 gal

Weather Conditions: 40°, 5-10 mph winds, overcast

Depth to Top of Product (ft BTOC): —

Depth to Water (ft BTOC): 5.27

Depth to Oil/Water Interface* (ft BTOC): —

Total Depth (ft BTOC): 15.50

* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Notes
Temperature	>0.00 °C	
pH	0-14	
Conductivity	0-999 mS/m	
ORP	± 1999 mV	
Dissolved Oxygen	0-19.99 mg/L	
Turbidity	0-800 NTU	

Sensory Observations

Color: Clear Amber, Tan, Brown, Grey, Milky White, Other:
 Odor: None Low, Medium, High, Very Strong, H₂S, Fuel Like, Chemical ?, Unknown
 Turbidity: None Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Flowrate (ml/min)	Time	Temp °C	pH	Conductivity (mS/cm)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
210	0948						clear	none	5.29	0.02
210	1000	2.48	5.51	0.080	5.02	247.9	clear	none	5.28	0.01
210	1003	2.39	5.58	0.078	4.86	247.9	clear	none	5.29	0.02
210	1006	2.39	5.62	0.078	4.90	247.1	clear	none	5.29	0.02

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
BTEX 8260	6-40 ml VOA HCl	
GRE AL-101	6-40 ml VOA HCl	
DEU/RED 102/101	6-100 ml 2mb HCl	

Signed: _____

Date: _____

Signed/reviewer

Date:

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet												
Project # : _____					Well ID: <u>MW-13</u>							
Project Name: _____					Date: <u>5/20/13</u>							
Site: <u>112mn2 TE</u>					Start Time: <u>1705</u>							
Field Team: <u>CG, AD</u>					End Time: <u>1740</u>							
Sample ID: <u>13-1L1-103-GW/1735</u>					<input checked="" type="checkbox"/> primary		<input type="checkbox"/> dup		<input type="checkbox"/> split		ms/msd	
Sample ID: _____					<input type="checkbox"/> primary		<input type="checkbox"/> dup		<input type="checkbox"/> split		ms/msd	
Sample ID: _____					<input type="checkbox"/> primary		<input type="checkbox"/> dup		<input type="checkbox"/> split		ms/msd	
Purging and Sampling Method (e.g. peristaltic, bladder, submersible): <u>peri</u>												
Total Volume Purged: <u>1 gal</u>												
Weather Conditions: <u>45°F, 5-10-15 mph winds, overcast</u>												
Depth to Top of Product (ft BTOC): _____					Depth to Water (ft BTOC): <u>7.51</u>							
Depth to Oil/Water Interface* (ft BTOC): _____					Total Depth (ft BTOC): <u>15.60</u>							
* Note: Same as depth to water												
Criteria for Stable Parameters												
Parameter		Working Range				Notes						
Temperature		>0.00 °C										
pH		0-14										
Conductivity		0-999 mS/m										
ORP		± 1999 mV										
Dissolved Oxygen		0-19.99 mg/L										
Turbidity		0-800 NTU										
Sensory Observations												
Color: <input checked="" type="checkbox"/> Clear, <input type="checkbox"/> Amber, <input type="checkbox"/> Tan, <input type="checkbox"/> Brown, <input type="checkbox"/> Grey, <input type="checkbox"/> Milky White, <input type="checkbox"/> Other:												
Odor: <input checked="" type="checkbox"/> None, <input type="checkbox"/> Low, <input type="checkbox"/> Medium, <input type="checkbox"/> High, <input type="checkbox"/> Very Strong, <input type="checkbox"/> H2S, <input type="checkbox"/> Fuel Like, <input type="checkbox"/> Chemical ?, <input type="checkbox"/> Unknown												
Turbidity: <input checked="" type="checkbox"/> None, <input type="checkbox"/> Low, <input type="checkbox"/> Medium, <input type="checkbox"/> High, <input type="checkbox"/> Very Turbid, <input type="checkbox"/> Heavy Silts												
Instrument Observations												
Flowrate (ml/min)	Time	Temp °C	pH	Conduct'ity (mS/cm)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down		
180	1715						clear	none	7.55	0.04		
180	1726	3.60	5.83	0.074	10.10	280.0	clear	none	8.55	1.0 - CG		
180	1729	3.79	5.82	0.073	9.75	281.8	clear	none	7.55	-0.04		
180	1732	3.70	5.85	0.074	9.80	281.4	clear	none	7.55	-0.04		
Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hydrogeology may make it difficult to achieve this specification.												
Analyses		# of Bottles Collected		Comments:								
BTEX S260		3-40ml VOA HCl										
GRO AK101		2-40ml VOA HCl										
DRO/RRO 102/103		2-100ml 2mb HCl										
Signed: _____ Date: _____												
Signed/reviewer _____ Date: _____												

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Project #:		Well ID:	MW-14		
Project Name:		Date:	5/21/13		
Site:	ILI TF	Start Time:	1035		
Field Team:	CG, AO	End Time:	1110		
Sample ID:	13-14-105-GW / 1105	primary	dup	split	ms/msd
Sample ID:		primary	dup	split	ms/msd
Sample ID:		primary	dup	split	ms/msd

Purging and Sampling Method (e.g. peristaltic, bladder, submersible): per

Total Volume Purged: 1 gal

Weather Conditions: 40°F, 10-15 mph, overcast

Depth to Top of Product (ft BTOC): -

Depth to Water (ft BTOC): 7.15

Depth to Oil/Water Interface* (ft BTOC): -

Total Depth (ft BTOC): 16.95

* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Notes
Temperature	>0.00 °C	
pH	0-14	
Conductivity	0-999 mS/m	
ORP	± 1999 mV	
Dissolved Oxygen	0-19.99 mg/L	
Turbidity	0-800 NTU	

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
 Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
 Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Flowrate (ml/min)	Time	Temp °C	pH	Conductivity (mS/cm)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
190	1040						clear	none	7.15	0
190	1055	3.54	6.33	0.097	9.43	269.2	clear	none	7.15	0
190	1058	3.46	6.33	0.098	9.31	269.1	clear	none	7.15	0
190	1101	3.57	6.33	0.096	9.14	268.8	clear	none	7.15	0

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
BTX 8260	3-40 ml VOA HCl	
GEO AR101	2-40 ml VOA HCl	
DEU/RRO 102103	2-100 ml sub HCl	

Signed: _____

Date: _____

Signed/reviewer

Date:

Crowley

SITE-SPECIFIC HEADLINE

By their specific signature, the undersigned (SSHSP) is approved for use during actual



Rite in the Rain

ALL-WEATHER

FIELD

Nº 353N

WESTON

Project Manager / Site Safety and Health
Dale A. Greinke

WESTON

Program Manager
Douglas W. Johnson

Ilamna

Additional GW. characterization

15036.001.001 - GWM 2012
15036.001.002 - Drilling 2012
15036.001.003 - GWM 2013

Name Weston Solutions

Address 425 G St, Ste 300
Anchorage AK 99501

Phone (907) 343-2777

Project Iliamna

Rite in the Rain -- A patented, environmentally responsible, all-weather writing paper that sheds water and enables you to write anywhere, in any weather. Using a pencil or all-weather pen, *Rite in the Rain* ensures that your notes survive the rigors of the field, regardless of the conditions.

RiteintheRain.com

lock code for wells $\rightarrow 1099$

CONTENTS

PAGE	REFERENCE	DATE
	Pm → Dan Frank (907) 350-4897	
	FTL → Ashley Olson (907) 268-9024	
	Client Rep → Mark Dchmlow (907) 571-1278	
	Crowley WiFi Password → Crowley606	
	Crowley Shop code → 99606 11453	
	Clint - Dot 571-7171	
	CHIP - 571-8111	

5/20/13
Monday

Flamma Hum

45°F
16 mph wind
cloudy

Atolson C. Gates

0800 Arrived @ Flamma our
checked in gear.

0900 Departed Anc for ICI

1000 Arrived in ICI.

mobbed gear, Van didn't
start. Talked to Doug,
got marks Truck.

1200 Conducted Site recon
in ICI & Newhalen. Drove
by clinic.

1300 conducted tailgate
safety meeting

1310 calibrated YSI rented from
TTT.

<u>Solution</u>	<u>STD</u>	<u>Cal'd</u>
7.0 pH	6.98	7.00
4.0 pH	4.01	4.00
10.0 pH	10.00	10.00
Cond 1.413 mS/cm	1.337	1.413
ORP 240 mV	250.1	240.0
DO 100 %	83.7	102.2

1425 set up on mw-7

1518 Having difficulties achieving
the optimal mV/L reading

Atolson 5/20/13 1/2
Rite in the Rain

5/20/13
30
Monday

121amin Gwm
A. Olson & C. Gates

40°F, 5-10 mph
overcast
5/21/13
Tuesday

ILI Gwm
A. Olson & C. Gates

40°F, 3 mph
overcast
ST

Decided to use ORP as
a stabilizing parameter in
the place of DO.

1525 collected sample from
mw-7 13-121-101-GW
GRO AK102 (2 voo)
BTEX 8260 (3 voo)
DRO/RO AK102/103 (2-100ml)

1540 Set up on mw-8

1601 Removed transducer &
downloaded data.

1640 collected sample from
mw-8 13-121-102-GW
DRO/RO
GRO
BTEX

1700 setup on mw-13

1735 collected sample @ mw-13
13-121-103-GW
DRO/RO
GRO
BTEX

1745 Departed site for camp
to upack samples & gear up
for tomorrow.

Ashlyn 5/21/13 2/2

0830 calibrated YSI fentel from
TTT.

STD	Initial	Calied
pH7	7.00	7.00
pH4	4.01	4.00
pH10	9.98	10.00
Cond 1.413 ^{ms/cm}	1.409	1.413
ORP 240 mv	241.6	240.0
DO 100%	114.0	101.6

0835 called DOT to see if
we could get access to
their yard & the yard
across the street. No
answer, left message.

0910 Departed for site

0920 Arrived @ DOT yard, gate
shut, gave Clint another
call. He answered & let us
in. Needs to "round up" remote
for across the street.

0930 Set up on mw-12

1010 Collected sample @ mw-12
13-121-104-GW → ms/msd ^{GRO, BTEX} DRO/RO

1030 Set up on mw-14

Ashlyn

5/21/13

1/4
Rate in the Rain

5/21/13

32

Tuesday

IL1 GWM

A. Olson / C. Gates

41°F, 3-5 mph
overcast5/21/13
Tuesday

IL1 GWM

A. Olson / C. Gates

45°F, sunny
5-10 mph
wind1105 Collected sample from
mw-14 13-141-105-GW

GRO

BTEx

DRO/RRO

1135 Setup on mw-10

1220 Collected sample from

mw-10 13-141-106-GW

GRO

BTEx

DRO/RRO

1230 Gauged DTW @ mw-11

+ pulled & down transducer

DTW = NA

Transducer frozen, could
not measure DTW either.
obstruction located ~ 2'bag^{AD} BTEx1235 pulled baro logger + transducer
from mw-9

DTW = 8.10' BTEx

1255 Setup on mw-4

1330 Collected sample @ mw-24

13-141-107-GW (BTEx DRO/RRO)

Ashlyn

5/21/13

2/4

1340 Gauged DTW @ mw-1
DTW = 7.40' BTEx1345 Gauged DTW @ mw-3
DTW = 7.28' BTEx

1405 Setup on mw-6

1440 Collected sample @ mw-6

13-141-108-GW

GRO

BTEx

DRO/RRO

1450 Set up @ mw-5, protective
monument frost jacked
~ 6 inches.

1530 Collected sample @ mw-6

13-141-109-GW + Dup sample

13-141-110-GW @ 1615

DRO/RRO

BTEx

GRO

1610 Setup on mw-2

1705 Collected sample @ mw-2

13-141-111-GW + dup 13-141-112
@ 1800

GRO, BTEx, DRO/RRO

Ashlyn

5/21/13

3/
Rite in the Rain

5/21/13

34

Tuesday

161 GWM

A. Olson / C. Gates

4100F
10-15mph
overcast

1715 finished sampling mw-2,
well has heaved so cap
no longer fits & the lock
no longer locks.

1730 Departed site for camp to
unload gear, pack coolers,
& update COC.

0800 Trip Blank → GRO, BTEX
13-141-TB101 5/20/13

Aglyon
5/21/13
4/4

35

Rite in the Rain

ATTACHMENT 4

Analytical Results, ADEC Data Review Checklist, QAR Memo

Laboratory Data Review Checklist

Completed by:

Title: Date:

CS Report Name:

Report Date:

Consultant Firm:

Laboratory Name: Laboratory Report Number:

ADEC File Number: ADEC Hazard ID:

1. Laboratory

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

- b. If the samples were transferred to another “network” laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?
☐ Yes ☐ No ☒ NA (Please explain.) Comments:

2. Chain of Custody (COC)

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

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

3. Laboratory Sample Receipt Documentation

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

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

☒ Yes

☐ No

☐ NA (Please explain.)

Comments:

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

☒ Yes

☐ No

☐ NA (Please explain.)

Comments:

All samples were received in good condition and in proper containers.

- 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 discrepancies with the samples in the shipment.

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

Comments:

Not applicable.

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:

QC items identified in the case narrative or definitions/glossary are discussed in the relevant sections of this checklist. No additional QC items were identified.

- c. Were all corrective actions documented?

☐ Yes

☐ No

☒ NA (Please explain.)

Comments:

No further corrective actions were noted.

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

Comments:

There was no effect 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:

No soil samples were collected for analysis

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

☒ Yes

☐ No

☐ NA (Please explain.)

Comments:

e. Data quality or usability affected?

Comments:

Groundwater data met acceptance criteria, and were usable for project purposes.

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:

All method blanks were reported as non-detected at the PQL.

iii. If above PQL, what samples are affected?

Comments:

Not applicable.

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

☐ Yes

☐ No

☒ NA (Please explain.)

Comments:

No data flags were required.

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

Comments:

There was no effect on the data quality or usability.

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 samples were submitted or analyzed for this sample delivery group.

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:

All LCS recoveries were within QC limits.

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:

RPDs for the duplicate LCS results were within QC limits

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

Comments:

Recoveries for the LCS pairs were acceptable.

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

☐ Yes

☐ No

☒ NA (Please explain.)

Comments:

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

Comments:

Data quality or usability were not affected.

Comments:

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 data flags were required.

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

There was no effect on data quality or usability.

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:

A water trip blank accompanied groundwater samples to the laboratory. No soils were collected.

- 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 one cooler.

- iii. All results less than PQL?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

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

Not applicable.

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

Comments:

Not applicable.

e. Field Duplicate

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

☒ Yes

☐ No

☐ NA (Please explain.)

Comments:

Two field duplicates were submitted for this sample delivery group. Frequency criteria only required one field duplicate pair.

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:

RPD for the detected GRO results for field duplicate pair 13-ILI-111-GW/13-ILI-112-GW was less than 30%. Detected concentrations of DRO and ORO in the field duplicates were less than the reporting limit, so the 30% RPD criteria does not apply. BTEX was not detected in any of the field duplicate samples.

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

Comments:

There was no effect on data quality or usability.

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

☐ Yes

☐ No

☒ NA (Please explain.)

Comments:

Collection of decon/equipment blanks was not required for this project due to the use of dedicated tubing.

i. All results less than PQL?

☐ Yes

☐ No

☒ NA (Please explain.)

Comments:

No decon/equipment blanks were collected.

ii. If above PQL, what samples are affected?

Comments:

Not applicable. No decon/equipment blanks were collected.

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

Comments:

Not applicable. No decon/equipment blanks were collected.

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

a. Defined and appropriate?

☒ Yes

☐ No

☐ NA (Please explain.)

Comments:

Qualification of results that do not meet project DQOs generally follows the EPA National Functional Guidelines.

Weston Solutions- Anchorage, AK 425 G Street, Suite 300 Anchorage, AK 99501				Billing information: Accounts Payable 425 G St., Ste. 300 Anchorage, AK 99501				Analysis/Container/Preservative <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> AK101 40mlAmb HCl AK101- Trip Blank 40mlAmb-HCl-Bik AK102/103 100ml Amb HCl V8260BTEX 40mlAmb-HCl V8260BTEX-Trip Blank 40mlAmb-HCl-Bik </div> <div style="width: 45%; background-color: #f0f0f0;"></div> </div>				Chain of Custody Page <u>1</u> of <u>2</u> L-A-B S-C-I-E-N-C-E-S 12065 Lebanon Road Mt. Juliet, TN 37122 Phone: (800) 767-5859 Phone: (615) 758-5858 Fax: (615) 758-5859 E032	
Report to: Dan Frank / Ashley Olson				Email: daniel.frank@westonsolution.com									
Project Description: Iliamna				City/State Collected:									
Phone: (907) 276-6610 FAX:		Client Project #:		Lab Project # WESTONAAK-ILIAMNA									
Collected by (print): Ashley Olson / Callie		Site/Facility ID#:		P.O.#: 0082665									
Collected by (signature): <i>Ashley Olson</i>		Rush? (Lab MUST Be Notified) Same Day200% Next Day100% Two Day50% Three Day25%		Date Results Needed 10 day turn Email? <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes FAX? <input type="checkbox"/> No <input type="checkbox"/> Yes		No. of Cntrs							
Packed on Ice N <input type="checkbox"/> Y <input checked="" type="checkbox"/>													
Sample ID	Comp/Grab	Matrix*	Depth	Date	Time					Remarks/Contaminant	Sample # (lab only)		
13-141-101-GW		GW		5/20/13	1525	7	X		X	X		L637950-01	
13-141-102-GW		GW		5/20/13	1640	7	X		X	X		-02	
13-141-103-GW		GW		5/20/13	1735	7	X		X	X		-03	
13-141-104-GW		GW		5/21/13	1010	7	X		X	X		MS/MSD -04	
TRIP BLANK TB-141-TB101		GW		5/20/13	0800	2		X		X		-05	
13-141-105-GW		GW		5/21/13	1105	7	X		X	X		-06	
13-141-106-GW		GW		5/21/13	1220	7	X		X	X		-07	
13-141-107-GW		GW		5/21/13	1330	7	X		X	X		-08	
13-141-108-GW		GW		5/21/13	1440	7	X		X	X		-09	

*Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other _____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

5547 0242 1680

Relinquished by: (Signature) <i>Ashley Olson</i>	Date: 5/23/13 Time: 0800	Received by: (Signature) <i>Dan Frank</i>	Date: 5/24/13 Time: 1000	Samples returned via: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Courier	Condition: (lab use only)
Relinquished by: (Signature) <i>[Signature]</i>	Date: 5/24/13 Time: 1145	Received by: (Signature) <i>[Signature]</i>	Date: 5/25/13 Time: 0900	Temp: 3.1°C Bottles Received: 93	COC Seal Intact: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Relinquished by: (Signature) <i>[Signature]</i>	Date: _____ Time: _____	Received for lab by: (Signature) <i>Summer Brothers</i>	Date: 5/25/13 Time: 0900	pH Checked: _____	NCF: _____

Weston Solutions- Anchorage,
AK
 425 G Street, Suite 300
 Anchorage, AK 99501

Billing information:

Accounts Payable
 425 G St., Ste. 300
 Anchorage, AK 99501

Analysis/Container/Preservative

Chain of Custody
 Page 1 of 2



12065 Lebanon Road
 Mt. Juliet, TN 37122

Phone: (800) 767-5859
 Phone: (615) 758-5858
 Fax: (615) 758-5859

Report to: **Dan Frank / Ashley Olson**

Email: **daniel.frank@westonsolution.**

Project Description: **Iliamna**

City/State Collected

Phone: (907) 276-6610
 FAX:

Client Project #:

Lab Project #

WESTONAAK-ILIAMNA

Collected by (print):

Ashley Olson / Callic

Site/Facility ID#:

P.O.#:

6082665

Collected by (signature):

ASHLEY OLSON

Rush? (Lab MUST Be Notified)

___ Same Day 200%
 ___ Next Day 100%
 ___ Two Day 50%
 ___ Three Day 25%

Date Results Needed

Email? ___ No ___ Yes
 FAX? ___ No ___ Yes

No. of Cntrs

Immediately
 Packed on Ice N ___ Y X

Acctnum: **WESTONAAK** (lab use only)
 Template/Prelogin: **T86650 P429629**
 Cooler #: *5-818*
 Shipped Via: **FedEX 2nd Day**

Remarks/Contaminant Sample # (lab only)

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	AK101 40ml Amb HCl	AK101- Trip Blank 40ml Amb-HCl-Bik	AK102/103 100ml Amb HCl	V8260BTEX 40ml Amb-HCl	V8260BTEX-Trip Blank 40ml Amb-HCl-Bik
13-121-109-GW		GW		5/21/13	1530	7	X		X	X	
13-121-110-GW		GW			1615	7	X		X	X	
13-121-111-GW		GW			1705	7	X		X	X	
13-121-112-GW		GW			1800	7	X		X	X	
		GW				7	X		X	X	
		GW				7	X		X	X	
		GW				7	X		X	X	
		GW				7	X		X	X	
		GW				7	X		X	X	
		GW				7	X		X	X	

*Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other _____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Relinquished by: (Signature) <i>[Signature]</i>	Date: 5/23/13	Time: 0800	Received by: (Signature) <i>[Signature]</i>	Date: 5/24/13	Time: 1000	Samples returned via: <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> Courier	Condition: <i>OK</i> (lab use only)
Relinquished by: (Signature) <i>[Signature]</i>	Date: 5/24/13	Time: 1145	Received by: (Signature) <i>[Signature]</i>	Date: 5/25/13	Time: 0900	Temp: 3.1°C Bottles Received: 93	COC Seal Intact: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received for lab by: (Signature) <i>[Signature]</i>	Date:	Time:	pH Checked:	NCF:

Quality Control Summary

SDG: L637950

For: Weston Solutions- Anchorage, AK

Project: Iliamna

June 05, 2013

Sample Receiving and Handling

All sample aliquots were received at the correct temperature, in the proper containers, and with the appropriate preservatives. All method specified holding times were met.

Method AK101

Laboratory Control Sample

Samples L637950-02, -05, -06, -09, -12, -04, -08, -11, -10, -13, -03, -07, and -01 were analyzed in analytical batch WG663354. The laboratory control sample associated with these samples was within the laboratory control limits for all compounds.

Matrix Spike/Matrix Spike Duplicate

For analytical batch WG663354 matrix spike/matrix spike duplicate analysis was performed on sample L637950-04. The matrix spike recoveries and relative percent differences were within laboratory control limits for all target analytes.

Blank Analysis

The method blank, the initial, and all continuing calibration blanks contained no analytes at concentrations above the method reporting limit.

Volatile Organic Compounds by Method 8260B

Laboratory Control Sample

Samples L637950-01, -05, -06, -09, -12, -13, -03, -08, -02, -04, -07, -10, and -11 were analyzed in analytical batch WG663317. The laboratory control sample associated with these samples was within the laboratory control limits for all compounds.

Matrix Spike/Matrix Spike Duplicate

For analytical batch WG663317 matrix spike/matrix spike duplicate analysis was performed on sample L637950-04. The matrix spike recoveries and relative percent differences were within laboratory control limits for all target analytes.

Blank Analysis

The method blank, the initial, and all continuing calibration blanks contained no analytes at concentrations above the method reporting limit.

AK102 / AK103

Laboratory Control Sample

Samples L637950-06, -01, -03, -09, -11, -13, -02, -08, -07, -12, -04, and -10 were analyzed in analytical batch WG663712. The laboratory control sample associated with these samples was within the laboratory control limits.

Matrix Spike/Matrix Spike Duplicate

For analytical batch WG663712, matrix spike/matrix spike duplicate analysis was performed on sample L637950-04. The spike recoveries were below the laboratory control limits. The relative percent difference was within control limits.

For analytical batch WG663712, matrix spike/matrix spike duplicate analysis was performed on sample L637957-01. The matrix spike recoveries and relative percent differences were within laboratory control limits for all target analytes.



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Quality Control Summary

SDG: L637950

For: Weston Solutions- Anchorage, AK

Project: Iliamna

June 05, 2013

Blank Analysis

The method blank, the initial, and all continuing calibration blanks contained no analytes at concentrations above the method reporting limit.

Nancy F. McLain
ESC Representative
ESC Lab Sciences



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Dan Frank / Ashley Olson
Weston Solutions- Anchorage, AK
425 G Street, Suite 300
Anchorage, AK 99501

Report Summary

Thursday June 06, 2013

Report Number: L637950


Samples Received: 05/25/13

Client Project:

Description: Iliamna

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:


Jarred Willis , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-IN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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REPORT OF ANALYSIS

Dan Frank / Ashley Olson
Weston Solutions- Anchorage, AK
425 G Street, Suite 300
Anchorage, AK 99501

June 06, 2013

Date Received : May 25, 2013
Description : Iliamna
Sample ID : 13-ILI-101-GW
Collected By : AO/CG
Collection Date : 05/20/13 15:25

ESC Sample # : L637950-01

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
TPHGAK C6 to C10	U	31.	100	ug/l		AK101	05/29/13	1
Surrogate Recovery-% a,a,a-Trifluorotoluene(FID)	97.5			% Rec.		AK101	05/29/13	1
Benzene	U	0.33	1.0	ug/l		8260B	05/28/13	1
Toluene	U	0.78	5.0	ug/l		8260B	05/28/13	1
Ethylbenzene	U	0.38	1.0	ug/l		8260B	05/28/13	1
Total Xylenes	U	1.1	3.0	ug/l		8260B	05/28/13	1
Surrogate Recovery								
Toluene-d8	103.			% Rec.		8260B	05/28/13	1
Dibromofluoromethane	98.9			% Rec.		8260B	05/28/13	1
a,a,a-Trifluorotoluene	106.			% Rec.		8260B	05/28/13	1
4-Bromofluorobenzene	100.			% Rec.		8260B	05/28/13	1
AK102 DRO C10-C25	U	22.	800	ug/l		AK102/1	06/03/13	1
AK103 Modified for H2O								
AK103 RRO C25-C36	U	66.	200	ug/l		AK102/1	06/03/13	1
Surrogate Recovery								
o-Terphenyl	79.9			% Rec.		AK102/1	06/03/13	1
n-Triacontane d62	67.5			% Rec.		AK102/1	06/03/13	1

U = ND (Not Detected)

RDL = Reported Detection Limit = LOQ = PQL = EQL = TRRP MQL

MDL = Minimum Detection Limit = LOD = TRRP SDL

Note:

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REPORT OF ANALYSIS

Dan Frank / Ashley Olson
Weston Solutions- Anchorage, AK
425 G Street, Suite 300
Anchorage, AK 99501

June 06, 2013

Date Received : May 25, 2013
Description : Iliamna
Sample ID : 13-ILI-102-GW
Collected By : AO/CG
Collection Date : 05/20/13 16:40

ESC Sample # : L637950-02
Site ID :
Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
TPHGAK C6 to C10	U	31.	100	ug/l		AK101	05/29/13	1
Surrogate Recovery-% a,a,a-Trifluorotoluene(FID)	97.5			% Rec.		AK101	05/29/13	1
Benzene	U	0.33	1.0	ug/l		8260B	05/28/13	1
Toluene	U	0.78	5.0	ug/l		8260B	05/28/13	1
Ethylbenzene	U	0.38	1.0	ug/l		8260B	05/28/13	1
Total Xylenes	U	1.1	3.0	ug/l		8260B	05/28/13	1
Surrogate Recovery								
Toluene-d8	102.			% Rec.		8260B	05/28/13	1
Dibromofluoromethane	98.1			% Rec.		8260B	05/28/13	1
a,a,a-Trifluorotoluene	106.			% Rec.		8260B	05/28/13	1
4-Bromofluorobenzene	100.			% Rec.		8260B	05/28/13	1
AK102 DRO C10-C25	U	22.	800	ug/l		AK102/1	06/03/13	1
AK103 Modified for H2O								
AK103 RRO C25-C36	68.	66.	200	ug/l	J	AK102/1	06/03/13	1
Surrogate Recovery								
o-Terphenyl	80.2			% Rec.		AK102/1	06/03/13	1
n-Triacontane d62	78.0			% Rec.		AK102/1	06/03/13	1

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June 06, 2013

Date Received : May 25, 2013
Description : Iliamna
Sample ID : 13-ILI-103-GW
Collected By : AO/CG
Collection Date : 05/20/13 17:35

ESC Sample # : L637950-03

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
TPHGAK C6 to C10	U	31.	100	ug/l		AK101	05/29/13	1
Surrogate Recovery-% a,a,a-Trifluorotoluene(FID)	97.7			% Rec.		AK101	05/29/13	1
Benzene	U	0.33	1.0	ug/l		8260B	05/28/13	1
Toluene	U	0.78	5.0	ug/l		8260B	05/28/13	1
Ethylbenzene	U	0.38	1.0	ug/l		8260B	05/28/13	1
Total Xylenes	U	1.1	3.0	ug/l		8260B	05/28/13	1
Surrogate Recovery								
Toluene-d8	104.			% Rec.		8260B	05/28/13	1
Dibromofluoromethane	98.3			% Rec.		8260B	05/28/13	1
a,a,a-Trifluorotoluene	106.			% Rec.		8260B	05/28/13	1
4-Bromofluorobenzene	101.			% Rec.		8260B	05/28/13	1
AK102 DRO C10-C25	U	22.	800	ug/l		AK102/1	06/03/13	1
AK103 Modified for H2O								
AK103 RRO C25-C36	U	66.	200	ug/l		AK102/1	06/03/13	1
Surrogate Recovery								
o-Terphenyl	71.9			% Rec.		AK102/1	06/03/13	1
n-Triacontane d62	70.0			% Rec.		AK102/1	06/03/13	1

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June 06, 2013

Date Received : May 25, 2013
Description : Iliamna
Sample ID : 13-ILI-104-GW
Collected By : AO/CG
Collection Date : 05/21/13 10:10

ESC Sample # : L637950-04

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
TPHGAK C6 to C10	1200	31.	100	ug/l		AK101	05/29/13	1
Surrogate Recovery-% a,a,a-Trifluorotoluene(FID)	96.2			% Rec.		AK101	05/29/13	1
Benzene	3.7	0.33	1.0	ug/l		8260B	05/28/13	1
Toluene	U	0.78	5.0	ug/l		8260B	05/28/13	1
Ethylbenzene	1.6	0.38	1.0	ug/l		8260B	05/28/13	1
Total Xylenes	28.	1.1	3.0	ug/l		8260B	05/28/13	1
Surrogate Recovery								
Toluene-d8	104.			% Rec.		8260B	05/28/13	1
Dibromofluoromethane	98.7			% Rec.		8260B	05/28/13	1
a,a,a-Trifluorotoluene	107.			% Rec.		8260B	05/28/13	1
4-Bromofluorobenzene	103.			% Rec.		8260B	05/28/13	1
AK102 DRO C10-C25	250	22.	800	ug/l	JJ6	AK102/1	06/03/13	1
AK103 Modified for H2O								
AK103 RRO C25-C36	650	66.	200	ug/l		AK102/1	06/03/13	1
Surrogate Recovery								
o-Terphenyl	83.5			% Rec.		AK102/1	06/03/13	1
n-Triacontane d62	88.9			% Rec.		AK102/1	06/03/13	1

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June 06, 2013

Date Received : May 25, 2013
Description : Iliamna
Sample ID : TB-ILI-TB101
Collected By : AO/CG
Collection Date : 05/20/13 08:00

ESC Sample # : L637950-05

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
TPHGAK C6 to C10	U	31.	100	ug/l		AK101	05/29/13	1
Surrogate Recovery-% a,a,a-Trifluorotoluene(FID)	97.4			% Rec.		AK101	05/29/13	1
Benzene	U	0.33	1.0	ug/l		8260B	05/28/13	1
Toluene	U	0.78	5.0	ug/l		8260B	05/28/13	1
Ethylbenzene	U	0.38	1.0	ug/l		8260B	05/28/13	1
Total Xylenes	U	1.1	3.0	ug/l		8260B	05/28/13	1
Surrogate Recovery								
Toluene-d8	103.			% Rec.		8260B	05/28/13	1
Dibromofluoromethane	98.7			% Rec.		8260B	05/28/13	1
a,a,a-Trifluorotoluene	107.			% Rec.		8260B	05/28/13	1
4-Bromofluorobenzene	96.4			% Rec.		8260B	05/28/13	1

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REPORT OF ANALYSIS

Dan Frank / Ashley Olson
Weston Solutions- Anchorage, AK
425 G Street, Suite 300
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June 06, 2013

Date Received : May 25, 2013
Description : Iliamna
Sample ID : 13-ILI-105-GW
Collected By : AO/CG
Collection Date : 05/21/13 11:05

ESC Sample # : L637950-06

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
TPHGAK C6 to C10	U	31.	100	ug/l		AK101	05/29/13	1
Surrogate Recovery-% a,a,a-Trifluorotoluene(FID)	97.1			% Rec.		AK101	05/29/13	1
Benzene	U	0.33	1.0	ug/l		8260B	05/28/13	1
Toluene	U	0.78	5.0	ug/l		8260B	05/28/13	1
Ethylbenzene	U	0.38	1.0	ug/l		8260B	05/28/13	1
Total Xylenes	U	1.1	3.0	ug/l		8260B	05/28/13	1
Surrogate Recovery								
Toluene-d8	104.			% Rec.		8260B	05/28/13	1
Dibromofluoromethane	97.2			% Rec.		8260B	05/28/13	1
a,a,a-Trifluorotoluene	105.			% Rec.		8260B	05/28/13	1
4-Bromofluorobenzene	102.			% Rec.		8260B	05/28/13	1
AK102 DRO C10-C25	U	22.	800	ug/l		AK102/1	06/03/13	1
AK103 Modified for H2O								
AK103 RRO C25-C36	81.	66.	200	ug/l	J	AK102/1	06/03/13	1
Surrogate Recovery								
o-Terphenyl	74.8			% Rec.		AK102/1	06/03/13	1
n-Triacontane d62	75.7			% Rec.		AK102/1	06/03/13	1

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MDL = Minimum Detection Limit = LOD = TRRP SDL

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REPORT OF ANALYSIS

Dan Frank / Ashley Olson
Weston Solutions- Anchorage, AK
425 G Street, Suite 300
Anchorage, AK 99501

June 06, 2013

Date Received : May 25, 2013
Description : Iliamna
Sample ID : 13-ILI-106-GW
Collected By : AO/CG
Collection Date : 05/21/13 12:20

ESC Sample # : L637950-07

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
TPHGAK C6 to C10	U	31.	100	ug/l		AK101	05/29/13	1
Surrogate Recovery-% a,a,a-Trifluorotoluene(FID)	97.4			% Rec.		AK101	05/29/13	1
Benzene	U	0.33	1.0	ug/l		8260B	05/28/13	1
Toluene	U	0.78	5.0	ug/l		8260B	05/28/13	1
Ethylbenzene	U	0.38	1.0	ug/l		8260B	05/28/13	1
Total Xylenes	U	1.1	3.0	ug/l		8260B	05/28/13	1
Surrogate Recovery								
Toluene-d8	103.			% Rec.		8260B	05/28/13	1
Dibromofluoromethane	96.4			% Rec.		8260B	05/28/13	1
a,a,a-Trifluorotoluene	106.			% Rec.		8260B	05/28/13	1
4-Bromofluorobenzene	98.8			% Rec.		8260B	05/28/13	1
AK102 DRO C10-C25	32.	22.	800	ug/l	J	AK102/1	06/03/13	1
AK103 Modified for H2O								
AK103 RRO C25-C36	76.	66.	200	ug/l	J	AK102/1	06/03/13	1
Surrogate Recovery								
o-Terphenyl	79.3			% Rec.		AK102/1	06/03/13	1
n-Triacontane d62	78.9			% Rec.		AK102/1	06/03/13	1

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REPORT OF ANALYSIS

Dan Frank / Ashley Olson
Weston Solutions- Anchorage, AK
425 G Street, Suite 300
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June 06, 2013

Date Received : May 25, 2013
Description : Iliamna
Sample ID : 13-ILI-107-GW
Collected By : AO/CG
Collection Date : 05/21/13 13:30

ESC Sample # : L637950-08

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
TPHGAK C6 to C10	300	31.	100	ug/l		AK101	05/29/13	1
Surrogate Recovery-% a,a,a-Trifluorotoluene(FID)	97.2			% Rec.		AK101	05/29/13	1
Benzene	U	0.33	1.0	ug/l		8260B	05/28/13	1
Toluene	100	0.78	5.0	ug/l		8260B	05/28/13	1
Ethylbenzene	U	0.38	1.0	ug/l		8260B	05/28/13	1
Total Xylenes	U	1.1	3.0	ug/l		8260B	05/28/13	1
Surrogate Recovery								
Toluene-d8	104.			% Rec.		8260B	05/28/13	1
Dibromofluoromethane	97.6			% Rec.		8260B	05/28/13	1
a,a,a-Trifluorotoluene	106.			% Rec.		8260B	05/28/13	1
4-Bromofluorobenzene	99.1			% Rec.		8260B	05/28/13	1
AK102 DRO C10-C25	U	22.	800	ug/l		AK102/1	06/03/13	1
AK103 Modified for H2O								
AK103 RRO C25-C36	U	66.	200	ug/l		AK102/1	06/03/13	1
Surrogate Recovery								
o-Terphenyl	84.3			% Rec.		AK102/1	06/03/13	1
n-Triacontane d62	82.1			% Rec.		AK102/1	06/03/13	1

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REPORT OF ANALYSIS

Dan Frank / Ashley Olson
Weston Solutions- Anchorage, AK
425 G Street, Suite 300
Anchorage, AK 99501

June 06, 2013

Date Received : May 25, 2013
Description : Iliamna
Sample ID : 13-ILI-108-GW
Collected By : AO/CG
Collection Date : 05/21/13 14:40

ESC Sample # : L637950-09
Site ID :
Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
TPHGAK C6 to C10	U	31.	100	ug/l		AK101	05/29/13	1
Surrogate Recovery-% a,a,a-Trifluorotoluene(FID)	97.2			% Rec.		AK101	05/29/13	1
Benzene	U	0.33	1.0	ug/l		8260B	05/28/13	1
Toluene	U	0.78	5.0	ug/l		8260B	05/28/13	1
Ethylbenzene	U	0.38	1.0	ug/l		8260B	05/28/13	1
Total Xylenes	U	1.1	3.0	ug/l		8260B	05/28/13	1
Surrogate Recovery								
Toluene-d8	105.			% Rec.		8260B	05/28/13	1
Dibromofluoromethane	98.0			% Rec.		8260B	05/28/13	1
a,a,a-Trifluorotoluene	107.			% Rec.		8260B	05/28/13	1
4-Bromofluorobenzene	98.4			% Rec.		8260B	05/28/13	1
AK102 DRO C10-C25	U	22.	800	ug/l		AK102/1	06/03/13	1
AK103 Modified for H2O								
AK103 RRO C25-C36	U	66.	200	ug/l		AK102/1	06/03/13	1
Surrogate Recovery								
o-Terphenyl	67.0			% Rec.		AK102/1	06/03/13	1
n-Triacontane d62	65.9			% Rec.		AK102/1	06/03/13	1

U = ND (Not Detected)

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Reported: 06/04/13 15:56 Revised: 06/06/13 10:14



12065 Lebanon Rd.
Mt. Juliet, TN 37122
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1-800-767-5859
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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Dan Frank / Ashley Olson
Weston Solutions- Anchorage, AK
425 G Street, Suite 300
Anchorage, AK 99501

June 06, 2013

Date Received : May 25, 2013
Description : Iliamna
Sample ID : 13-ILI-109-GW
Collected By : AO/CG
Collection Date : 05/21/13 15:30

ESC Sample # : L637950-10

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
TPHGAK C6 to C10	U	31.	100	ug/l		AK101	05/29/13	1
Surrogate Recovery-% a,a,a-Trifluorotoluene(FID)	97.4			% Rec.		AK101	05/29/13	1
Benzene	U	0.33	1.0	ug/l		8260B	05/28/13	1
Toluene	U	0.78	5.0	ug/l		8260B	05/28/13	1
Ethylbenzene	U	0.38	1.0	ug/l		8260B	05/28/13	1
Total Xylenes	U	1.1	3.0	ug/l		8260B	05/28/13	1
Surrogate Recovery								
Toluene-d8	103.			% Rec.		8260B	05/28/13	1
Dibromofluoromethane	96.4			% Rec.		8260B	05/28/13	1
a,a,a-Trifluorotoluene	105.			% Rec.		8260B	05/28/13	1
4-Bromofluorobenzene	102.			% Rec.		8260B	05/28/13	1
AK102 DRO C10-C25	U	22.	800	ug/l		AK102/1	06/03/13	1
AK103 Modified for H2O								
AK103 RRO C25-C36	U	66.	200	ug/l		AK102/1	06/03/13	1
Surrogate Recovery								
o-Terphenyl	80.4			% Rec.		AK102/1	06/03/13	1
n-Triacontane d62	76.6			% Rec.		AK102/1	06/03/13	1

U = ND (Not Detected)

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REPORT OF ANALYSIS

Dan Frank / Ashley Olson
Weston Solutions- Anchorage, AK
425 G Street, Suite 300
Anchorage, AK 99501

June 06, 2013

Date Received : May 25, 2013
Description : Iliamna
Sample ID : 13-ILI-110-GW
Collected By : AO/CG
Collection Date : 05/21/13 16:15

ESC Sample # : L637950-11

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
TPHGAK C6 to C10	U	31.	100	ug/l		AK101	05/29/13	1
Surrogate Recovery-% a,a,a-Trifluorotoluene(FID)	97.4			% Rec.		AK101	05/29/13	1
Benzene	U	0.33	1.0	ug/l		8260B	05/28/13	1
Toluene	U	0.78	5.0	ug/l		8260B	05/28/13	1
Ethylbenzene	U	0.38	1.0	ug/l		8260B	05/28/13	1
Total Xylenes	U	1.1	3.0	ug/l		8260B	05/28/13	1
Surrogate Recovery								
Toluene-d8	104.			% Rec.		8260B	05/28/13	1
Dibromofluoromethane	98.1			% Rec.		8260B	05/28/13	1
a,a,a-Trifluorotoluene	105.			% Rec.		8260B	05/28/13	1
4-Bromofluorobenzene	98.3			% Rec.		8260B	05/28/13	1
AK102 DRO C10-C25	U	22.	800	ug/l		AK102/1	06/03/13	1
AK103 Modified for H2O								
AK103 RRO C25-C36	70.	66.	200	ug/l	J	AK102/1	06/03/13	1
Surrogate Recovery								
o-Terphenyl	86.6			% Rec.		AK102/1	06/03/13	1
n-Triacontane d62	85.2			% Rec.		AK102/1	06/03/13	1

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REPORT OF ANALYSIS

Dan Frank / Ashley Olson
Weston Solutions- Anchorage, AK
425 G Street, Suite 300
Anchorage, AK 99501

June 06, 2013

Date Received : May 25, 2013
Description : Iliamna
Sample ID : 13-ILI-111-GW
Collected By : AO/CG
Collection Date : 05/21/13 17:05

ESC Sample # : L637950-12

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
TPHGAK C6 to C10	320	31.	100	ug/l		AK101	05/29/13	1
Surrogate Recovery-% a,a,a-Trifluorotoluene(FID)	97.3			% Rec.		AK101	05/29/13	1
Benzene	U	0.33	1.0	ug/l		8260B	05/28/13	1
Toluene	U	0.78	5.0	ug/l		8260B	05/28/13	1
Ethylbenzene	U	0.38	1.0	ug/l		8260B	05/28/13	1
Total Xylenes	U	1.1	3.0	ug/l		8260B	05/28/13	1
Surrogate Recovery								
Toluene-d8	103.			% Rec.		8260B	05/28/13	1
Dibromofluoromethane	96.6			% Rec.		8260B	05/28/13	1
a,a,a-Trifluorotoluene	105.			% Rec.		8260B	05/28/13	1
4-Bromofluorobenzene	102.			% Rec.		8260B	05/28/13	1
AK102 DRO C10-C25	150	22.	800	ug/l	J	AK102/1	06/04/13	1
AK103 Modified for H2O								
AK103 RRO C25-C36	79.	66.	200	ug/l	J	AK102/1	06/04/13	1
Surrogate Recovery								
o-Terphenyl	78.8			% Rec.		AK102/1	06/04/13	1
n-Triacontane d62	74.6			% Rec.		AK102/1	06/04/13	1

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MDL = Minimum Detection Limit = LOD = TRRP SDL

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REPORT OF ANALYSIS

Dan Frank / Ashley Olson
Weston Solutions- Anchorage, AK
425 G Street, Suite 300
Anchorage, AK 99501

June 06, 2013

Date Received : May 25, 2013
Description : Iliamna
Sample ID : 13-ILI-112-GW
Collected By : AO/CG
Collection Date : 05/21/13 18:00

ESC Sample # : L637950-13

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
TPHGAK C6 to C10	420	31.	100	ug/l		AK101	05/29/13	1
Surrogate Recovery-% a,a,a-Trifluorotoluene(FID)	97.4			% Rec.		AK101	05/29/13	1
Benzene	U	0.33	1.0	ug/l		8260B	05/28/13	1
Toluene	U	0.78	5.0	ug/l		8260B	05/28/13	1
Ethylbenzene	U	0.38	1.0	ug/l		8260B	05/28/13	1
Total Xylenes	U	1.1	3.0	ug/l		8260B	05/28/13	1
Surrogate Recovery								
Toluene-d8	103.			% Rec.		8260B	05/28/13	1
Dibromofluoromethane	96.4			% Rec.		8260B	05/28/13	1
a,a,a-Trifluorotoluene	106.			% Rec.		8260B	05/28/13	1
4-Bromofluorobenzene	94.6			% Rec.		8260B	05/28/13	1
AK102 DRO C10-C25	130	22.	800	ug/l	J	AK102/1	06/04/13	1
AK103 Modified for H2O								
AK103 RRO C25-C36	U	66.	200	ug/l		AK102/1	06/04/13	1
Surrogate Recovery								
o-Terphenyl	73.1			% Rec.		AK102/1	06/04/13	1
n-Triacontane d62	69.8			% Rec.		AK102/1	06/04/13	1

U = ND (Not Detected)

RDL = Reported Detection Limit = LOQ = PQL = EQL = TRRP MQL

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Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L637950-02	WG663712	SAMP	AK103 RRO C25-C36	R2693820	J
L637950-04	WG663712	SAMP	AK102 DRO C10-C25	R2693820	JJ6
L637950-06	WG663712	SAMP	AK103 RRO C25-C36	R2693820	J
L637950-07	WG663712	SAMP	AK102 DRO C10-C25	R2693820	J
	WG663712	SAMP	AK103 RRO C25-C36	R2693820	J
L637950-11	WG663712	SAMP	AK103 RRO C25-C36	R2693820	J
L637950-12	WG663712	SAMP	AK102 DRO C10-C25	R2693820	J
	WG663712	SAMP	AK103 RRO C25-C36	R2693820	J
L637950-13	WG663712	SAMP	AK102 DRO C10-C25	R2693820	J

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J	(EPA) - Estimated value below the lowest calibration point. Confidence correlates with concentration.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Quality Control Summary

SDG: L637950

Weston Solutions- Anchorage, AK

Test:	Method AK101	Matrix:	Water - mg/L
Project No:		EPA ID:	TN00003
Project:	Iliamna	Analytic Batch:	WG663354
Collection Date:	5/20/2013	Analyst:	403
Analysis Date:	5/29/2013		
Instrument ID:	VOCGC1		
Sample Numbers:	L637950-02, -05, -06, -09, -12, -04, -08, -11, -10, -13, -03, -07, -01		

Method Blank

Analyte	CAS	PQL	Qualifiers
TPHGAK C6 to C10		<0.100	

Laboratory Control Sample (LCS)

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
TPHGAK C6 to C10	5.50	4.35	79.1	60 - 120	

Laboratory Control Sample Duplicate (LCSD)

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
TPHGAK C6 to C10	5.50	4.47	81.3	60 - 120	

Quality Control Summary

SDG: L637950

Weston Solutions- Anchorage, AK

Test:	Method AK101	Matrix:	Water - mg/L
Project No:		EPA ID:	TN00003
Project:	Iliamna	Analytic Batch:	WG663354
Collection Date:	5/20/2013	Analyst:	403
Analysis Date:	5/29/2013		
Instrument ID:	VOCGC1		
Sample Numbers:	L637950-02, -05, -06, -09, -12, -04, -08, -11, -10, -13, -03, -07, -01		

Surrogate Summary

Laboratory Sample ID	a,a,a-Trifluorotoluene - FID		a,a,a-Trifluorotoluene - PID	
	ppb	% Rec	ppb	% Rec
LCS WG663354	199	99.3		
LCSD WG663354	197	98.4		
MS WG663354	197	98.3		
MSD WG663354	198	99.2		
Blank WG663354	195	97.6		
L637950-05	195	97.4		
L637950-04	192	96.2		
L637950-01	195	97.5		
L637950-02	195	97.5		
L637950-03	195	97.7		
L637950-06	194	97.1		
L637950-07	195	97.4		
L637950-08	194	97.2		
L637950-09	194	97.2		
L637950-10	195	97.4		
L637950-11	195	97.4		
L637950-12	195	97.3		
L637950-13	195	97.4		

a,a,a-Trifluorotoluene (FID)	200 ppb	Limits - 62 - 128
a,a,a-Trifluorotoluene (PID)	200 ppb	Limits - 0 - 0

Quality Control Summary

SDG: L637950

Weston Solutions- Anchorage, AK

Test: Method AK101
Project No: Matrix: Water - mg/L
Project: Iliamna EPA ID: TN00003
Collection Date: 5/20/2013 Analytic Batch: WG663354
Analysis Date: 5/29/2013 Analyst: 403
Instrument ID: VOCGC1
Sample Numbers: L637950-02, -05, -06, -09, -12, -04, -08, -11, -10, -13, -03, -07, -01

Laboratory Control Sample/ Laboratory Control Sample Duplicate

Analyte	Spike	LCS	% Rec	LCSD	% Rec	Control Limits	Qualifier	% RPD	Control Limits	Qualifier
TPHGAK C6 to C10	5.50	4.35	79.1	4.47	81.3	60-120		2.8	20	

Matrix Spike/Matrix Spike Duplicate

L637950-04

Analyte	Spike Value	Sample	MS	% Rec	MSD	% Rec	Control Limits	% Rec Qualifier	% RPD	Control Limits	RPD Qual
TPHGAK C6 to C10	5.50	1.26	5.42	75.7	5.33	74.0	58-122		1.8	20	

Quality Control Summary

SDG: L637950

Weston Solutions- Anchorage, AK

Test:	Method AK101	Matrix:	Water - mg/L
Project No:		EPA ID:	TN00003
Project:	Iliamna	Analytic Batch:	WG663354
Collection Date:	5/20/2013	Analyst:	403
Analysis Date:	5/29/2013		
Instrument ID:	VOCGC1		
Sample Numbers:	L637950-02, -05, -06, -09, -12, -04, -08, -11, -10, -13, -03, -07, -01		

Internal Standard Response and Retention Time Summary

FileID:0529_03.D

Date:5/29/2013

Time:10:04 AM

	Response	IS - FID RT	Response	IS - PID RT
12 Hour Std	20328645	6.54	6923514	6.54
Upper Limit	40657290	7.04	13847028	7.04
Lower Limit	10164322.5	6.04	3461757	6.04
<hr/>				
Sample ID	Response	RT	Response	RT
Blank WG663354	19282282	6.57	6732774	6.57
L637950-01	19378731	6.58	6837045	6.58
L637950-02	19455605	6.58	6877302	6.58
L637950-03	19506434	6.58	6951057	6.58
L637950-04	19672731	6.57	6823303	6.57
L637950-05	19214943	6.57	6794532	6.57
L637950-06	19736419	6.58	6975245	6.58
L637950-07	19491398	6.59	6903090	6.59
L637950-08	19534327	6.58	6890684	6.58
L637950-09	19697127	6.59	6994680	6.59
LCS WG663354	20670360	6.55	6860413	6.55
LCSD WG663354	19880124	6.55	6674715	6.55
MS WG663354	19528980	6.56	6555857	6.56
MSD WG663354	20096999	6.56	6702240	6.56

Quality Control Summary

SDG: L637950

Weston Solutions- Anchorage, AK

Test:	Method AK101	Matrix:	Water - mg/L
Project No:		EPA ID:	TN00003
Project:	Iliamna	Analytic Batch:	WG663354
Collection Date:	5/20/2013	Analyst:	403
Analysis Date:	5/29/2013		
Instrument ID:	VOCGC1		
Sample Numbers:	L637950-02, -05, -06, -09, -12, -04, -08, -11, -10, -13, -03, -07, -01		

Internal Standard Response and Retention Time Summary

FileID:0529_23.D

Date:5/29/2013

Time:8:19 PM

		IS - FID		IS - PID	
	Response	RT	Response	RT	
12 Hour Std	20258451	6.56	7136028	6.56	
Upper Limit	40516902	7.06	14272056	7.06	
Lower Limit	10129225.5	6.06	3568014	6.06	
Sample ID		Response	RT	Response	RT
L637950-10	19340684	6.55	6715641	6.55	
L637950-11	19135771	6.55	6618765	6.55	
L637950-12	19132035	6.55	6578570	6.55	
L637950-13	18589844	6.55	6388023	6.55	

Quality Control Summary

SDG: L637950

Weston Solutions- Anchorage, AK

Test: Volatile Organic Compounds by Method 8260B
Project No: Matrix: Water - mg/L
Project: Iliamna EPA ID: TN00003
Collection Date: 5/20/2013 Analytic Batch: **WG663317**
Analysis Date: 5/28/2013 Analyst: 209
Instrument ID: VOCMS24
Sample Numbers: L637950-01, -05, -06, -09, -12, -13, -03, -08, -02, -04, -07, -10, -11

Method Blank

Analyte	CAS	PQL	Qualifiers
Benzene	71-43-2	<0.0010	
Toluene	108-88-3	<0.0050	
Ethylbenzene	100-41-4	<0.0010	
m&p-Xylene	1330-20-7	<0.0030	
o-Xylene	1330-20-7	<0.0030	

Laboratory Control Sample (LCS)

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
Benzene	0.0250	0.0218	87.3	72 - 119	
Toluene	0.0250	0.0235	94.2	75 - 114	
Ethylbenzene	0.0250	0.0238	95.1	77 - 124	
m&p-Xylene	0.0500	0.0462	92.5	76 - 123	
o-Xylene	0.0250	0.0224	89.6	77 - 125	

Laboratory Control Sample Duplicate (LCSD)

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
Benzene	0.0250	0.0221	88.4	72 - 119	
Toluene	0.0250	0.0229	91.6	75 - 114	
Ethylbenzene	0.0250	0.0239	95.5	77 - 124	
m&p-Xylene	0.0500	0.0460	92.1	76 - 123	
o-Xylene	0.0250	0.0226	90.6	77 - 125	

Quality Control Summary

SDG: L637950

Weston Solutions- Anchorage, AK

Test: Volatile Organic Compounds by Method 8260B
Project No: Matrix: Water - mg/L
Project: Iliamna EPA ID: TN00003
Collection Date: 5/20/2013 Analytic Batch: WG663317
Analysis Date: 5/28/2013 Analyst: 209
Instrument ID: VOCMS24
Sample Numbers: L637950-01, -05, -06, -09, -12, -13, -03, -08, -02, -04, -07, -10, -11

Surrogate Summary

Laboratory Sample ID	Dibromofluoromethane		Toluene-d8		4-Bromofluorobenzene		Alternate Surrogate a,a,a-Trifluorotoluene	
	ppb	% Rec	ppb	% Rec	ppb	% Rec	ppb	% Rec
LCS WG663317	39.4	98.4	42.7	107	40.6	101	43.7	109
LCSD WG663317	39.8	99.5	42.5	106	40.7	102	43.5	109
MS WG663317	40.0	99.9	42.0	105	40.9	102	43.2	108
MSD WG663317	40.5	101	41.4	104	41.6	104	42.9	107
Blank WG663317	39.4	98.4	42.3	106	40.9	102	43.0	107
L637950-05	39.5	98.7	41.0	103	38.5	96.4	42.8	107
L637950-04	39.5	98.7	41.6	104	41.2	103	42.9	107
L637950-01	39.6	98.9	41.3	103	40.0	100.0	42.3	106
L637950-02	39.3	98.1	41.0	102	40.1	100	42.2	106
L637950-03	39.3	98.3	41.7	104	40.3	101	42.3	106
L637950-06	38.9	97.2	41.5	104	41.0	102	42.1	105
L637950-07	38.6	96.4	41.0	103	39.5	98.8	42.3	106
L637950-08	39.0	97.6	41.5	104	39.6	99.1	42.4	106
L637950-09	39.2	98.0	42.0	105	39.4	98.4	42.7	107
L637950-10	38.6	96.4	41.2	103	40.9	102	41.9	105
L637950-11	39.2	98.1	41.6	104	39.3	98.3	42.2	105
L637950-12	38.7	96.6	41.3	103	41.0	102	42.1	105
L637950-13	38.6	96.4	41.2	103	37.8	94.6	42.4	106

Dibromofluoromethane	40 ppb	82 - 126
Toluene - d8	40 ppb	92 - 112
4-Bromofluorobenzene	40 ppb	82 - 120
Alternate Surrogate		
a,a,a-Trifluorotoluene	40 ppb	90 - 116

Quality Control Summary

SDG: L637950

Weston Solutions- Anchorage, AK

Test: Volatile Organic Compounds by Method 8260B
Project No: Matrix: Water - mg/L
Project: Iliamna EPA ID: TN00003
Collection Date: 5/20/2013 Analytic Batch: WG663317
Analysis Date: 5/28/2013 Analyst: 209
Instrument ID: VOCMS24
Sample Numbers: L637950-01, -05, -06, -09, -12, -13, -03, -08, -02, -04, -07, -10, -11

Laboratory Control Sample/ Laboratory Control Sample Duplicate

Analyte	Spike	LCS	% Rec	LCSD	% Rec	Control Limits	Qualifier	% RPD	Control Limits	Qualifier
Benzene	0.0250	0.0218	87.3	0.0221	88.4	72-119		1.2	20	
Toluene	0.0250	0.0235	94.2	0.0229	91.6	75-114		2.8	20	
Ethylbenzene	0.0250	0.0238	95.1	0.0239	95.5	77-124		0.4	20	
m&p-Xylene	0.0500	0.0462	92.5	0.0460	92.1	76-123		0.4	20	
o-Xylene	0.0250	0.0224	89.6	0.0226	90.6	77-125		1.1	20	

Matrix Spike/Matrix Spike Duplicate

L637950-04

Analyte	Spike Value	Sample	MS	% Rec	MSD	% Rec	Control Limits	% Rec Qualifier	% RPD	Control Limits	RPD Qual
Benzene	0.0250	0.0037	0.0252	85.9	0.0257	88.0	51-134		2.1	20	
Toluene	0.0250	0.0000	0.0227	90.7	0.0230	91.9	61-126		1.3	20	
Ethylbenzene	0.0250	0.0016	0.0258	96.8	0.0260	97.4	64-135		0.6	20	
m&p-Xylene	0.0500	0.0000	0.0455	90.9	0.0487	97.5	62-135		7.0	20	
o-Xylene	0.0250	0.0281	0.0491	84.3	0.0505	89.7	63-135		2.7	20	

Quality Control Summary

SDG: L637950

Weston Solutions- Anchorage, AK

Test: Volatile Organic Compounds by Method 8260B
Project No: Matrix: Water - mg/L
Project: Iliamna EPA ID: TN00003
Collection Date: 5/20/2013 Analytic Batch: **WG663317**
Analysis Date: 5/28/2013 Analyst: 209
Instrument ID: VOCMS24
Sample Numbers: L637950-01, -05, -06, -09, -12, -13, -03, -08, -02, -04, -07, -10, -11

Internal Standard Response and Retention Time Summary

FileID:0528_03.D

Date:5/28/2013

Time:12:10 PM

	IS1		IS2		IS3		IS4	
	Response	RT	Response	RT	Response	RT	Response	RT
12 Hour Std	251272	5.3	416803	5.78	71595	7.46	193774	10.67
Upper Limit	502544	5.8	833606	6.28	143190	7.96	387548	11.17
Lower Limit	125636	4.8	208401.5	5.28	35797.5	6.96	96887	10.17

Sample ID	Response	RT	Response	RT	Response	RT	Response	RT
Blank WG663317	287639	5.3	469665	5.78	78301	7.47	214565	10.67
L637950-01	442123	5.3	738065	5.78	117851	7.47	321277	10.67
L637950-02	444984	5.3	743850	5.79	116581	7.47	318200	10.67
L637950-03	441992	5.3	734166	5.78	117981	7.47	326593	10.67
L637950-04	270450	5.3	443955	5.78	72163	7.47	199789	10.67
L637950-05	269886	5.3	444030	5.78	73951	7.47	180280	10.67
L637950-06	433417	5.3	710595	5.78	112752	7.47	305713	10.67
L637950-07	429842	5.3	712059	5.78	112434	7.47	289978	10.67
L637950-08	428552	5.3	697489	5.79	110819	7.47	292368	10.67
L637950-09	415095	5.3	677243	5.78	110291	7.47	290644	10.67
L637950-10	395355	5.3	648746	5.79	100911	7.47	279165	10.67
L637950-11	387524	5.3	633599	5.78	101730	7.47	262827	10.67
L637950-12	384477	5.3	628232	5.78	98674	7.47	267088	10.67
L637950-13	362152	5.3	589874	5.78	98876	7.47	242933	10.67
LCS WG663317	262431	5.3	423596	5.78	72396	7.46	194666	10.67
LCSD WG663317	270401	5.3	447012	5.78	76591	7.47	204613	10.67
MS WG663317	276550	5.29	458874	5.78	79921	7.46	224588	10.67
MSD WG663317	290115	5.3	481534	5.78	80584	7.47	222247	10.67

Quality Control Summary

SDG: L637950

Weston Solutions- Anchorage, AK

Test:	AK102 / AK103	Matrix:	Water - mg/L
Project No:		EPA ID:	TN00003
Project:	Iliamna	Analytic Batch:	WG663712
Collection Date:	5/20/2013	Analyst:	187
Analysis Date:	6/3/2013	Extraction Date:	5/29/2013
Instrument ID:	SVGC21		
Sample Numbers:	L637950-06, -01, -03, -09, -11, -13, -02, -08, -07, -12, -04, -10		

Method Blank

Analyte	CAS	PQL	Qualifiers
AK102 DRO C10-C25		<0.800	
AK103 RRO C25-C36		<0.200	

Laboratory Control Sample (LCS)

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
AK102 DRO C10-C25	3.00	2.53	84.2	75 - 125	
AK103 RRO C25-C36	3.00	2.35	78.3	60 - 120	

Laboratory Control Sample Duplicate (LCSD)

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
AK102 DRO C10-C25	3.00	2.41	80.3	75 - 125	
AK103 RRO C25-C36	3.00	2.39	79.8	60 - 120	

Quality Control Summary

SDG: L637950

Weston Solutions- Anchorage, AK

Test:	AK102 / AK103	Matrix:	Water - mg/L
Project No:		EPA ID:	TN00003
Project:	Iliamna	Analytic Batch:	WG663712
Collection Date:	5/20/2013	Analyst:	187
Analysis Date:	6/3/2013	Extraction Date:	5/29/2013
Instrument ID:	SVGC21		
Sample Numbers:	L637950-06, -01, -03, -09, -11, -13, -02, -08, -07, -12, -04, -10		

Surrogate Summary

Laboratory Sample ID	o-Terphenyl		n-Triacontane d62	
	ppm	% Rec	ppm	% Rec
Blank WG663712	0.0274	68.6	0.0726	72.6
LCSD WG663712	0.0355	88.9	0.0757	75.7
LCSD WG663712	0.0350	87.4	0.0773	77.3
LCS WG663712	0.0317	79.3	0.0772	77.2
LCSD WG663712	0.0321	80.3	0.0802	80.2
L637950-01	0.0320	79.9	0.0675	67.5
L637950-02	0.0321	80.2	0.0780	78.0
L637950-03	0.0288	71.9	0.0700	70.0
L637950-04	0.0334	83.5	0.0889	88.9
MS WG663712	0.0358	89.6	0.0875	87.5
MSD WG663712	0.0317	79.3	0.0734	73.4
L637950-06	0.0299	74.8	0.0757	75.7
L637950-07	0.0317	79.3	0.0789	78.9

o-Terphenyl	True Value: 0.04ppm Limits: 50 - 150
n-Triacontane d62	True Value: 0.1ppm Limits: 50 - 150

Quality Control Summary

SDG: L637950

Weston Solutions- Anchorage, AK

Test: AK102 / AK103

Project No:

Project: Iliamna

Collection Date: 5/20/2013

Analysis Date: 6/3/2013

Instrument ID: SVGC21

Sample Numbers: L637950-06, -01, -03, -09, -11, -13, -02, -08, -07, -12, -04, -10

Matrix: Water - mg/L

EPA ID: TN00003

Analytic Batch: WG663712

Analyst: 187

Extraction Date: 5/29/2013

Surrogate Summary

Laboratory Sample ID	o-Terphenyl		n-Triacontane d62	
	ppm	% Rec	ppm	% Rec
L637950-08	0.0337	84.3	0.0821	82.1
L637950-09	0.0268	67.0	0.0659	65.9
L637950-10	0.0321	80.4	0.0766	76.6
L637950-11	0.0346	86.6	0.0852	85.2
L637950-12	0.0315	78.8	0.0746	74.6
L637950-13	0.0292	73.1	0.0698	69.8
MS WG663712	0.0375	93.7	0.0883	88.3
MSD WG663712	0.0362	90.4	0.0846	84.6

o-Terphenyl

True Value: 0.04ppm Limits: 50 - 150

n-Triacontane d62

True Value: 0.1ppm Limits: 50 - 150

Quality Control Summary

SDG: L637950

Weston Solutions- Anchorage, AK

Test:	AK102 / AK103	Matrix:	Water - mg/L
Project No:		EPA ID:	TN00003
Project:	Iliamna	Analytic Batch:	WG663712
Collection Date:	5/20/2013	Analyst:	187
Analysis Date:	6/3/2013	Extraction Date:	5/29/2013
Instrument ID:	SVGC21		
Sample Numbers:	L637950-06, -01, -03, -09, -11, -13, -02, -08, -07, -12, -04, -10		

Laboratory Control Sample/ Laboratory Control Sample Duplicate

Analyte	Spike	LCS	% Rec	LCSD	% Rec	Control Limits	Qualifier	% RPD	Control Limits	Qualifier
AK102 DRO C10-C25	3.00	2.53	84.2	2.41	80.3	75-125		4.8	20	
AK103 RRO C25-C36	3.00	2.35	78.3	2.39	79.8	60-120		1.9	20	

Matrix Spike/Matrix Spike Duplicate

L637950-04

Analyte	Spike Value	Sample	MS	% Rec	MSD	% Rec	Control Limits	% Rec Qualifier	% RPD	Control Limits	RPD Qual
AK102 DRO C10-C25	3.00	0.253	2.61	78.6	2.25	66.7	75-125	J6	15	20	

Matrix Spike/Matrix Spike Duplicate

L637957-01

Analyte	Spike Value	Sample	MS	% Rec	MSD	% Rec	Control Limits	% Rec Qualifier	% RPD	Control Limits	RPD Qual
AK102 DRO C10-C25	3.00	0.153	2.64	83.0	2.65	83.3	75-125		0.3	20	

Weston Solutions- Anchorage, AK 425 G Street, Suite 300 Anchorage, AK 99501				Billing information: Accounts Payable 425 G St., Ste. 300 Anchorage, AK 99501				Analysis/Container/Preservative <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> AK101 40mlAmb HCl AK101- Trip Blank 40mlAmb-HCl-Bik AK102/103 100ml Amb HCl V8260BTEX 40mlAmb-HCl V8260BTEX-Trip Blank 40mlAmb-HCl-Bik </div> <div style="width: 45%; background-color: #f0f0f0;"></div> </div>				Chain of Custody Page <u>1</u> of <u>2</u> L-A-B S-C-I-E-N-C-E-S 12065 Lebanon Road Mt. Juliet, TN 37122 Phone: (800) 767-5859 Phone: (615) 758-5858 Fax: (615) 758-5859 E032			
Report to: Dan Frank / Ashley Olson				Email: daniel.frank@westonsolution.com											
Project Description: Iliamna				City/State Collected:											
Phone: (907) 276-6610 FAX:		Client Project #:		Lab Project #											
				WESTONAAK-ILIAMNA											
Collected by (print): Ashley Olson / Callie		Site/Facility ID#:		P.O.#: 0082665											
Collected by (signature): <i>Ashley Olson</i>		Rush? (Lab MUST Be Notified) Same Day200% Next Day100% Two Day50% Three Day25%		Date Results Needed 10 day turn Email? <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes FAX? <input type="checkbox"/> No <input type="checkbox"/> Yes		No. of Cntrs									
Packed on Ice N <input type="checkbox"/> Y <input checked="" type="checkbox"/>															
Sample ID	Comp/Grab	Matrix*	Depth	Date	Time										
13-141-101-GW		GW		5/20/13	1525	7	X		X	X					
13-141-102-GW		GW		5/20/13	1640	7	X		X	X					
13-141-103-GW		GW		5/20/13	1735	7	X		X	X					
13-141-104-GW		GW		5/21/13	1010	7	X		X	X					
TRIP BLANK TB-141-TB101		GW		5/20/13	0800	2		X		X					
13-141-105-GW		GW		5/21/13	1105	7	X		X	X					
13-141-106-GW		GW		5/21/13	1220	7	X		X	X					
13-141-107-GW		GW		5/21/13	1330	7	X		X	X					
13-141-108-GW		GW		5/21/13	1440	7	X		X	X					

Acctnum: **WESTONAAK** (lab use only)
 Template/Prelogin: **T86742/P429871**
 Cooler #: **513 1118**
 Shipped Via: **FedEX 2nd Day**

Remarks/Contaminant Sample # (lab only)

L637950-01
 -02
 -03
 MS/MSD -04
 -05
 -06
 -07
 -08
 -09

*Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other _____

pH _____ Temp _____

Remarks:

Flow _____ Other _____

5547 0242 1680

Relinquished by: (Signature) <i>Ashley Olson</i>	Date: 5/23/13 Time: 0800	Received by: (Signature) <i>Dan Frank</i>	Date: 5/24/13 Time: 1000	Samples returned via: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/>	Condition: <input checked="" type="checkbox"/> OK <input type="checkbox"/> J (lab use only)
Relinquished by: (Signature) <i>[Signature]</i>	Date: 5/24/13 Time: 1145	Received by: (Signature) <i>[Signature]</i>		Temp: 31.00 Bottles Received: 93	COC Seal Intact: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Relinquished by: (Signature) <i>[Signature]</i>		Received for lab by: (Signature) <i>Summer Brothers</i>	Date: 5/25/13 Time: 0900	pH Checked: _____ NCF: _____	

Weston Solutions- Anchorage,
AK
 425 G Street, Suite 300
 Anchorage, AK 99501

Billing information:

Accounts Payable
 425 G St., Ste. 300
 Anchorage, AK 99501

Analysis/Container/Preservative

Chain of Custody
 Page 1 of 2



12065 Lebanon Road
 Mt. Juliet, TN 37122

Phone: (800) 767-5859
 Phone: (615) 758-5858
 Fax: (615) 758-5859

Report to: **Dan Frank / Ashley Olson**

Email: **daniel.frank@westonsolution.**

Project Description: **Iliamna**

City/State Collected

Phone: **(907) 276-6610**
 FAX:

Client Project #:

Lab Project #

WESTONAAK-ILIAMNA

Collected by (print):

Ashley Olson / Calie

Site/Facility ID#:

P.O.#:

6082665

Collected by (signature):

ASHLEY OLSON

Rush? (Lab MUST Be Notified)

___ Same Day 200%
 ___ Next Day 100%
 ___ Two Day 50%
 ___ Three Day 25%

Date Results Needed

Email? ___ No ___ Yes
 FAX? ___ No ___ Yes

No. of Cntrs

Immediately
 Packed on Ice N ___ Y X

Acctnum: **WESTONAAK** (lab use only)
 Template/Prelogin: **T86650 P429629**
 Cooler #: *5-818*
 Shipped Via: **FedEX 2nd Day**

Remarks/Contaminant Sample # (lab only)

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	AK101 40ml Amb HCl	AK101- Trip Blank 40ml Amb-HCl-Bik	AK102/103 100ml Amb HCl	V8260BTEX 40ml Amb-HCl	V8260BTEX-Trip Blank 40ml Amb-HCl-Bik
13-121-109-GW		GW		5/21/13	1530	7	X		X	X	
13-121-110-GW		GW			1615	7	X		X	X	
13-121-111-GW		GW			1705	7	X		X	X	
13-121-112-GW		GW			1800	7	X		X	X	
		GW				7	X		X	X	
		GW				7	X		X	X	
		GW				7	X		X	X	
		GW				7	X		X	X	
		GW				7	X		X	X	
		GW				7	X		X	X	

*Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other _____

pH _____ Temp _____

Remarks:

Flow _____ Other _____

Relinquished by: (Signature) <i>[Signature]</i>	Date: 5/23/13	Time: 0800	Received by: (Signature) <i>[Signature]</i>	Date: 5/24/13	Time: 1000	Samples returned via: <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> UPS <input type="checkbox"/> Courier	Condition: <i>OK</i> (lab use only)
Relinquished by: (Signature) <i>[Signature]</i>	Date: 5/24/13	Time: 1145	Received by: (Signature) <i>[Signature]</i>	Date: 5/25/13	Time: 0900	Temp: 3.1°C Bottles Received: 93	COC Seal Intact: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received for lab by: (Signature) <i>[Signature]</i>	Date:	Time:	pH Checked:	NCF:



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MEMORANDUM

Date: June 25, 2013
From: Gretchen Fodor, Data Validation Chemist, Weston Solutions, Inc., West Chester, Pennsylvania
To: Daniel Frank, Project Manager, Weston Solutions, Inc., Anchorage, Alaska
Subject: **Quality Assurance Review, 2013 Iliamna Tank Farm Routine Groundwater Monitoring Report, Iliamna, Alaska**
Ref: Weston Project Number: 15036.001.003.0003

Laboratory Quality Assurance/Quality Control (QA/QC) data associated with the analysis of project samples was reviewed to evaluate the integrity of the analytical data generated during the May 2013 groundwater monitoring event for the Iliamna Tank Farm project in Iliamna, Alaska. Environmental samples collected in May 2013 were shipped to ESC Lab Sciences (ESC) in Mt. Juliet, Tennessee. One sample delivery group (SDG) was submitted (L637950). Sample identification included the prefix 13-ILI to indicate samples were collected from the Iliamna Tank Farm project in 2013. Samples were collected, reported, and shipped in general accordance with the Alaska Department of Environmental Conservation (ADEC)-approved work plan (Weston Solutions, Inc. [Weston] 2013).

All data were reviewed in accordance with appropriate United States Environmental Protection Agency (EPA) procedural guidance documents (EPA 2008) and ADEC regulatory guidance documents (ADEC 2009; 2010). This data review focuses on criteria for the following QA/QC parameters and their effect on the quality of data and usability: sample handling and chain-of-custody (CoC) documentation; holding time compliance; field QA/QC (trip blanks, field duplicate) results; laboratory QA/QC (method blanks, laboratory control samples, surrogates, matrix spike and matrix spike duplicate [MS/MSD]) results and analytical methods; method reporting limits; precision and accuracy; and completeness. In the absence of other regulatory QC guidance, method and/or standard operating procedure (SOP) QC limits were utilized to apply qualifiers to the data.

Samples were tested using the following methods for the associated analytes:

- Gasoline-range organics (GRO) by Alaska Method (AK101)
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Solid Waste (SW) Method 8260B
- Diesel-range organics (DRO) by AK102
- Residual-range organics (RRO) by AK103

All sample results are considered usable and meet project objectives; however, a few results are considered estimated. The completeness for this project is 100%. The details of this review and qualification of the data are summarized in the following sections.

SAMPLE HANDLING AND CHAIN OF CUSTODY

The sample cooler was delivered with custody seals intact. CoC forms and the case narrative were reviewed to determine if any sample handling activities might affect the integrity of the samples and the quality of the associated data.

All sample containers in the sample cooler were received at the laboratory intact and with proper documentation. The cooler containing the samples listed on the CoCs were received at the laboratory at 3.1 degrees Celsius ($^{\circ}\text{C}$), within the temperature range of $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$. Weston provided additional sample volume for MS/MSD analysis for sample 13-ILI-104-GW. The laboratory performed an MS/MSD for GRO, BTEX, and DRO but not RRO. The AK103 method specifies that there are no acceptance criteria for spike recoveries and relative percent difference (RPD) for RRO, and that the MS and MSD are for informational purposes only. Since the RRO MS/MSD samples are for informational purposes only, the missing RRO MS/MSD had minimal effect on the data, so no data qualifiers were applied.

FIELD QA/QC

Field QA/QC protocols are designed to monitor for possible contamination during collection and transport of samples collected in the field. Collection and analysis of field duplicates also facilitates an evaluation of precision that takes into account potential variables associated with sampling procedures and laboratory analyses. For this project, trip blanks and field duplicates were submitted for analysis.

Trip Blanks

A water trip blank was prepared by the laboratory, shipped to the site with the empty sample bottles/containers, stored with sample containers during the field event, and transported with the collected samples back to the laboratory for analysis. The trip blanks were placed in the same cooler as the other project volatile organics samples (GRO/BTEX).

Trip blank samples were analyzed for BTEX and GRO and results were less than the practical quantitation limit (PQL) for all analytes.

Field Duplicates

Ten primary water samples, 1 water trip blank, and two water field duplicate samples were submitted to the laboratory for analysis. The field duplicate primary and duplicate water sample codes are listed below.

Primary Sample	Duplicate Sample
13-ILI-111-GW	13-ILI-112-GW
13-ILI-109-GW	13-ILI-110-GW

The frequency of field duplicate collection met the 10% frequency requirements specified in the work plan. When analytes were present in concentrations below the reporting limit (RL) in one or both samples, no valid comparison could be made.

All primary sample and field duplicate RPDs met applicable ADEC recommended limits of <30% in water for analytes with concentrations exceeding the RL. Overall, there was adequate comparability of field duplicate results to meet project data quality objectives.

LABORATORY QA/QC

Method Blanks

Method blanks were analyzed concurrently with a batch of 20 or fewer samples for each of the analytical procedures performed for this project. Method blanks were analyzed at the required frequency and target analytes were not detected in the method blanks at concentrations above the PQL.

Laboratory Control Samples

The laboratory monitors internal precision and accuracy for each analytical batch using a pair of blank spike samples referred to as the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD). A known quantity of target analytes are added to the blank laboratory control samples prior to extraction and analysis, and recoveries are calculated. Acceptable recovery criteria vary with each analytical method, analyte, and matrix. All LCS/LCSD percent recoveries (%R) met laboratory and project QC goals.

Matrix Spikes

Extra volume for one primary field sample, 13-ILI-104-GW, was collected and submitted to the laboratory for MS/MSD analyses for GRO, BTEX, and DRO/RRO. ESC analyzed a MS/MSD analysis for DRO using sample 13-ILI-104-GW but did not perform a RRO MS/MSD on this sample. Since a water MS/MSD for RRO is not a method requirement, ESC routinely analyzes an RRO MS/MSD every other extraction batch, rather than once per each extraction batch. Since the RRO MS/MSD samples were informative, and not a compliance sample, the missing RRO MS/MSD had minimal effect on the data and no data flags were applied.

The MS/MSD samples for GRO, BTEX, and DRO met recovery and RPD QC limits except for the DRO MSD which had a 66.7%R, slightly below the 75%R QC acceptance limit. The DRO result in sample 13-ILI-104-GW was already estimated (J) since the detected result was greater than the method detection limit (MDL) but less than the RL. The low MSD recovery would have resulted in estimating the DRO result in the parent sample with a low bias, but since the J qualifier was already present, no further qualifications were necessary.

Internal Standard Recovery

Internal standards (IS) are chemical substances that are added in a constant amount to field and QC samples, blanks, and calibration standards and are used for quantitation. All IS recoveries met laboratory and project QC goals for target analytes in this SDG.

Surrogates

System Monitoring Compounds (surrogates) are specified for organic chromatographic analytical procedures. Surrogates are compounds similar to target analytes. These compounds are added to each sample prior to extraction or analysis. Surrogate recovery indicates overall method performance. Surrogate recoveries were within prescribed control limits for all primary samples, LCS/LCSD and MS/MSD.

Method Detection Limits

The laboratory-established MDLs and PQLs were below the ADEC cleanup levels for all analytes. There were no detections of analytes that exceeded the ADEC cleanup levels in this SDG.

The following table lists DRO results reported between the MDL and PQL and were qualified as estimated (J) by the laboratory.

13-ILI-104-GW	13-ILI-111-GW
13-ILI-106-GW	13-ILI-112-GW

The following table lists the RRO results reported between the MDL and PQL that were qualified as estimated (J) by the laboratory.

13-ILI-102-GW	13-ILI-110-GW
13-ILI-105-GW	13-ILI-111-GW
13-ILI-106-GW	

PRECISION AND ACCURACY

Precision criteria monitor analytical reproducibility. Accuracy criteria monitor agreement of measured results with “true values” established by spiking applicable samples with a known quantity of analyte or surrogate. Precision and accuracy were evaluated by comparing LCS/LCSDs, MS/MSDs and field duplicate pairs for this project. Field duplicates and MS/MSD samples were collected in accordance with Work Plan specifications. Field duplicate RPDs met applicable control limits. Recoveries and RPDs for all LCS/LCSD and MS/MSD samples were within required limits, with any exceptions noted in previous sections. The Data Quality Objective (DQO) of at least an overall 90% accuracy in QC samples was met.

COMPLETENESS

Data completeness is defined as the percentage of usable data (usable data divided by the total possible data). The overall project completeness goal is 100%:

$$\% \text{ completeness} = \frac{\text{number of valid (i.e., non-R flagged) results}}{\text{number of possible results}}$$

All requested analyses were performed in accordance with work plan specifications. Completeness for this project is 100%.

REPRESENTATIVENESS

Data representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or environmental condition. The number and selection of samples were specified in the work plan and verified in the field to account accurately for site variations and sample matrices. The DQO for representativeness was met.

COMPARABILITY

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another. Data produced for this project followed applicable field sampling techniques and specific analytical methodology. The DQO for comparability was met.

DATA SUMMARY

Based upon the information provided, all data are acceptable for use. All requested analyses were performed in accordance with work plan specifications. Completeness for this project is 100%. The EPA National Functional Guidelines (EPA 2008) were used to evaluate the acceptability of the data. Overall, data quality meets DQOs established in the work plan for this project.

REFERENCES:

- ADEC. 2009. Technical Memorandum: Environmental Laboratory Data and Quality Assurance Requirements. March.
- ADEC. 2010. Laboratory Data Review Checklist. Version 2.7. January.
- WESTON. 2013. 2013 Groundwater Monitoring Work Plan; Iliamna Tank Farm, Iliamna, Alaska. ADEC File Number 2560.38.012.
- USEPA. 2008. Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA 540/R-94/012).