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Memorandum

Date: June 23, 2015

To: Dennis Harwood, Contract Manager, ADEC
Grant Lidren, Project Manager, ADEC

From: Ahtna Engineering Services, LLC

Subject: Focused Groundwater Characterization, Alaska Real Estate Parking Lot, Anchorage, Alaska

Ahtna Engineering Services (Ahtna) is providing the Alaska Department of Environmental Conservation (ADEC) with this memorandum documenting additional characterization activities and results for the Alaska Real Estate Parking Lot site in Anchorage, Alaska. Notice to Proceed 18-8036-01-008D modified the existing scope of work as follows:

- Acquire historical aerial photographs for review of potential up-gradient sources,
- Sample ML&P MW-B-3 for volatile organic compounds (VOCs),
- Sample new monitoring wells GMW-13, GMW-14, GMW-15, and MW-28 for petroleum constituents: diesel range organics (DRO), gasoline range organics (GRO), and benzene/toluene/ethylbenzene/xylenes (BTEX),
- Sample surface water at the base of the bluff for VOCs, and
- Sample two monitoring wells in the Alaska Railroad Corporation (ARRC) Groundwater 2/3 plume for VOCs. The ARRC Groundwater 2/3 plume was identified in 2008 by CH2M Hill and is located south of Ship Creek.

Prior to the modification of the scope of work described above, Ahtna deployed three levelloggers and one barologger in May 2014 in three groundwater monitoring wells: DPB24, 4GMW-14, and MW-12S. The dataloggers were retrieved and downloaded on April 21, 2015. A summary of the data results is presented below.

Ahtna sampled the groundwater monitoring wells identified above on April 21 and 22, 2015. The samples were delivered to TestAmerica Laboratories (TestAmerica) in Anchorage, Alaska on April 22, and the analytical report was received on May 4.

Four historical aerial photographs of the site were purchased from Quantum Spatial of Anchorage, Alaska. The years represented by the aerial photographs include 1950, 1964, 1977, and 1994. The images were submitted to Grant Lidren, ADEC, via CD in April 2015. The aerial photographs are not discussed further in this memorandum.

The surface water seep samples proposed for the bluff near the intersection of Ingra Street and East 1st Avenue were unable to be collected because the seep was entirely enclosed within a new fence during the April 2015 field activities.

Figure 1 shows the location for the elements of the scope of work.

METHODOLOGY

All field activities and notes were recorded in a field notebook by personnel while performing the sampling. The scanned pages are available in Attachment A.

Groundwater elevation was monitored using dataloggers, including three levelloggers and one barologger. The dataloggers were deployed in May 2014 into three wells: MW-12S, DPB24, and 4GMW-14. The barologger was initially deployed below the water table and was adjusted in July 2014 to ensure that it would remain above the water level, recording current barometric pressure in the area. The depth to water was recorded when the dataloggers were retrieved to relate the pressure data to a specific depth.

The groundwater sampling was conducted using low-flow purge and sample techniques with a peristaltic pump. Dedicated sample tubing was used for each well. Flow rates were kept between 0.1 and 0.5 liters per minute. Groundwater drawdown during purging and sampling did not exceed 0.3 feet, and was monitored by routinely measuring the depth to groundwater. Water quality parameters were recorded every three to five minutes until four of the five parameters stabilized based on the following criteria:

- pH stable within 0.1 pH units;
- Temperature stable within 0.2 degrees Celsius (°C);
- Conductivity stable within 3 percent (%);
- Oxidation-reduction potential (ORP) stable within 10 millivolts; or
- Dissolved oxygen (DO) stable within 10%.

The parameters were recorded on groundwater sampling data sheets, provided in Attachment B. After stabilization, the water quality meter was disconnected, and groundwater samples were collected directly from sample tubing. The analytical program was as follows:

- ML&P MW-B-3, AKRRMW-22, and AKRRMW-24S: VOCs by EPA Method 8260, and
- GMW-13, GMW-14, GMW-15, and MW-28: GRO by AK-101, DRO by AK-102, and BTEX by EPA Method 8021.

VOC and GRO/BTEX samples were collected into 40-milliliter vials pre-preserved with hydrochloric acid. The vial was filled completely such that a positive meniscus formed and no air (i.e., headspace) was present in the vial. The cap was secured and the bottle inverted, tapped firmly, and checked for the presence of air bubbles. DRO samples were collected into 125-milliliter bottles pre-preserved with hydrochloric acid. All sample containers were kept cool following sample collection and submitted to TestAmerica for analysis.

MONITORING AND ANALYTICAL RESULTS

The following subsections summarize the results of monitoring and sampling.

Monitoring Well Sampling

As mentioned previously, three wells were sampled for VOCs and four wells were sampled for petroleum hydrocarbons. Several field parameters were monitored during the sampling process. Temperature of the water was generally low, between 1.20 and 4.97 Celsius (°C). The water was neutral to slightly acidic, with a pH range of 5.98 to 7.06. Conductivity measurements ranged from 316 microSiemens per centimeter (µS/cm) to 659 µS/cm. ORP was negative at every well, between -55 millivolts (mV) and -12 mV. DO was below 1.0 milligrams per liter (mg/L) for five of the seven wells, with the remaining two only slightly above, at 1.11 and 1.64 mg/L. The water sampled was clear, with turbidity ranging from 0.25 to 6.41 nephelometric turbidity units (NTU). All water samples had a clear appearance and a petroleum odor. Table 1 summarizes the water quality parameters for each well.

Table 1: Groundwater Sampling Field Parameters

Monitoring Well	Date	Time	Water Level (ft BTOC)	Total Depth (ft BTOC)	Temperature (°C)	pH (pH units)	Conductivity (µS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)
GMW-13-GW	4/21/2015	10:15	8.84	12.46	2.82	6.76	659	-12	0.29	1.02
MW-B-3-GW	4/21/2015	11:45	5.91	12.79	3.67	6.49	397	-22	0.48	4.74
4GMW-15-GW	4/21/2015	13:05	5.98	8.95	4.97	5.98	365	-24	0.54	1.30
4GMW-14-GW	4/21/2015	16:00	6.13	12.97	3.93	6.49	658	-55	0.27	0.25
AKRRMW-22-GW	4/22/2015	9:50	4.56	6.97	2.70	7.03	497	-52	1.11	6.41
AKRRMW-24S-GW	4/22/2015	10:40	4.16	6.02	1.20	6.96	316	-13	0.47	0.34
MW-28-GW	4/22/2015	11:25	9.59	11.89	2.37	7.06	646	-24	1.64	0.38

Note:
ft BTOC = feet below top of casing
°C = degrees Celsius
µS/cm = microSiemens per centimeter
mV = millivolts
mg/L = micrograms per liter
NTU = nephelometric turbidity units

VOC Sampling

Each well was analyzed for 60 different VOCs, most of which were not detected in any of the wells. Eight compounds were detected in one or more wells. The complete lab report is available in Attachment C. The following is a summary of the detections.

- Dichlorodifluoromethane (Freon 12) was detected at AKRRMW-22 and AKRRMW-24S.

- Isopropylbenzene, n-propylbenzene, sec-butylbenzene, 4-isopropyltoluene, and n-butylbenzene were detected in AKRRMW-22.
- 1,2,4-Trimethylbenzene and naphthalene were detected at AKRRMW-22 and MW-B-3.
- No chlorinated alkenes were detected in any of the wells.

No cleanup levels were exceeded for any of the detected parameters. Table 2 summarizes the detected concentrations.

Table 2: Groundwater Sampling VOC Detectable Results in µg/L

Well ID	Sample ID	Freon-12	Isopropylbenzene	N-Propylbenzene	1,2,4-Trimethylbenzene	sec-Butylbenzene	4-Isopropyltoluene	n-Butylbenzene	Naphthalene
AKRRMW-22	15-AREPL-AKRRMW-220-GW	2.7	6.6	11	5.1	5.6	4.2	7.3	32
	15-AREPL-AKRRMW-22-GW	2.6	6.5	11	4.8	5.5	4.0	7.1	30
MW-B-3	15-AREPL-MW-B-3-GW	U (2.0)	U (2.0)	U (3.0)	6.2	U (3.0)	U (3.0)	U (3.0)	4.7
AKRRMW-24S	15-AREPL-AKRRMW-245-GW	13.0	U (2.0)	U (3.0)	U (3.0)	U (3.0)	U (3.0)	U (3.0)	U (2.0)
	ADEC Cleanup Levels	*7,300*	*3,700*	*370*	*1,800*	*370*	--	*370*	*730*

Note:
Samples were collected April 21-22, 2015
Units are micrograms per liter (µg/L)
Cleanup levels are from 18 AAC 75.345 Table C
Data in parentheses are practical quantitation limit (PQL)
Pink highlighting and bold text indicates the result is greater than cleanup level
U - Analyte not detected
All other VOCs tested were not detected in any samples

Petroleum Hydrocarbon Sampling

Four wells were sampled and analyzed for petroleum hydrocarbons, including BTEX, GRO, and DRO. In general, BTEX parameters were not detected in any wells, with the exception of m,p-xylenes in 4GMW-14. GRO and DRO were detected in all four wells. Two wells exceeded the DRO cleanup level of 1,500 µg/L: 4GMW-13 (1,600 µg/L) and 4GMW-14 (2,100 µg/L). Table 3 below summarizes all sampling results. The laboratory results for GRO and DRO are included on Figure 1. It is important to note that GRO did not exceed any cleanup standard, but as it was regularly detected, the figure presents a spatial comparison of concentrations for the four wells analyzed.

Table 3: Groundwater Sampling Petroleum Hydrocarbon Results in µg/L

Well ID	Sample ID	Benzene	Toluene	Ethylbenzene	m-Xylene & p-Xylene	o-Xylene	GRO	DRO
4GMW-13	15-AREPL-4GMW-13-GW	U (2.0)	U (2.0)	U (3.0)	U (3.0)	U (2.0)	170	**1,600**
	15-AREPL-4GMW-16-GW	U (2.0)	U (2.0)	U (3.0)	U (3.0)	U (2.0)	130	1,200
4GMW-14	15-AREPL-4GMW-14-GW	U (2.0)	U (2.0)	U (3.0)	3.2	U (2.0)	720	**2,100**
4GMW-15	15-AREPL-4GMW-15-GW	U (2.0)	U (2.0)	U (3.0)	U (3.0)	U (2.0)	450	1,300
MW-28	15-AREPL-MW-28-GW	U (2.0)	U (2.0)	U (3.0)	U (3.0)	U (2.0)	840 QL	830
ADEC Cleanup Levels		*5*	*1,000*	*700*	*10,000*		*2,200*	*1,500*

Note:
Samples were collected April 21-22, 2015
Units are micrograms per liter (µg/L)
Cleanup levels are from 18 AAC 75.345 Table C
Data in parentheses are practical quantitation limit (PQL)
Pink highlighting and bold text indicates the result is greater than cleanup level
QL - Low bias due to a failed matrix spike duplicate recovery
U - Analyte not detected

Data Quality Review

The laboratory data received from TestAmerica was review according to ADEC protocol. The Data Quality Review Checklist is included as Attachment D. The data review found that all data are considered usable for the purposes of this memorandum. One sample, 15-AREPL-MW-28-GW, contains a qualifier of "QL" on the GRO result due to failed accuracy criteria.

Groundwater Levels

Figure 2 shows groundwater elevation contours for April 2015. These contours show that groundwater in the area at the time of sampling was flowing to the northwest.

The dataloggers were deployed in May 2014 to obtain continuous groundwater elevation data. The barologger was originally deploy below the water level and was repositioned in July 2014. The loggers were retrieved in April 2015. The groundwater data were corrected using the barologger data and depth to water measurements. The usable data, between July 2014 and April 2015, represent nine months of continuous monitoring.

The available data were used to calculate flow direction and gradient for the duration of the datalogger deployment. On average, the groundwater in the area flows to the northwest (310 degrees) at a gradient of 0.007 feet/feet (ft/ft). The direction varied between approximately 290 degrees, or west-northwest, (observed in February 2015) and 317 degrees, or northwest, (observed in September 2014). The range and frequency of flow direction is presented in Figure 3, which demonstrates that the flow had little variation and continuously flowed to the northwest. The gradient ranged from 0.006 ft/ft (September 2014) to 0.007 ft/ft (February 2015). Over the

nine month monitoring period, the gradient gradually increased and the flow shifted slightly northward. The groundwater elevation monitoring data are included in Attachment E.

In general, the groundwater gradient decreases as groundwater elevation increases in the area. Additionally, there were hydrological events between January and March 2015 that demonstrated interesting behavior in the area groundwater. During these events, groundwater elevations rose, indicating an influx of water into the system. The groundwater gradient during these periods decreased and the flow direction shifted to a west-northwest flow.

The groundwater elevation measurements were also compared to a USGS stream gauge on Ship Creek which measure discharge and stage. The elevation of the stream generally followed the same trends as groundwater in the area, with the exception of a few high-stage events in the winter and spring (Figure 4). These high stages may be related to higher discharge events; however, the stream discharge could not be measured during this time due to ice on the creek.

CONCLUSIONS

Groundwater sampling in April 2015 shows that VOC concentrations in the three wells sampled were generally below detection limits, with few parameters detected at low concentrations and no detection of chlorinated ethenes. Therefore, the known plume of chlorinated ethenes around 4GMW-14 and MW-28 does not appear to extend to other locations or be influenced by other sources near the sampled wells. Petroleum hydrocarbon contamination exists in the area, with DRO concentrations above cleanup levels at the two upgradient wells (4GMW-13 and 4GMW-14) of the four wells sampled for petroleum hydrocarbons.

The groundwater elevation, gradient, and flow direction are fairly consistent, with an average gradient of approximately 0.007 ft/ft flowing to the northwest. The surface water elevation recorded in Ship Creek appears to correlate with the groundwater elevations measured with the dataloggers, demonstrating a close hydrological connection between Ship Creek and groundwater.

Attachments

Attachment A	Field Notes
Attachment B	Groundwater Sampling Forms
Attachment C	Laboratory Report
Attachment D	Data Quality Review Checklist
Attachment E	Groundwater Gradient and Direction Calculations

Figures

Figure 1	April 2015 GRO and DRO Concentrations
Figure 2	April 2015 Groundwater Elevation
Figure 3	Groundwater Flow Direction
Figure 4	Groundwater and Ship Creek Elevation

FIGURES

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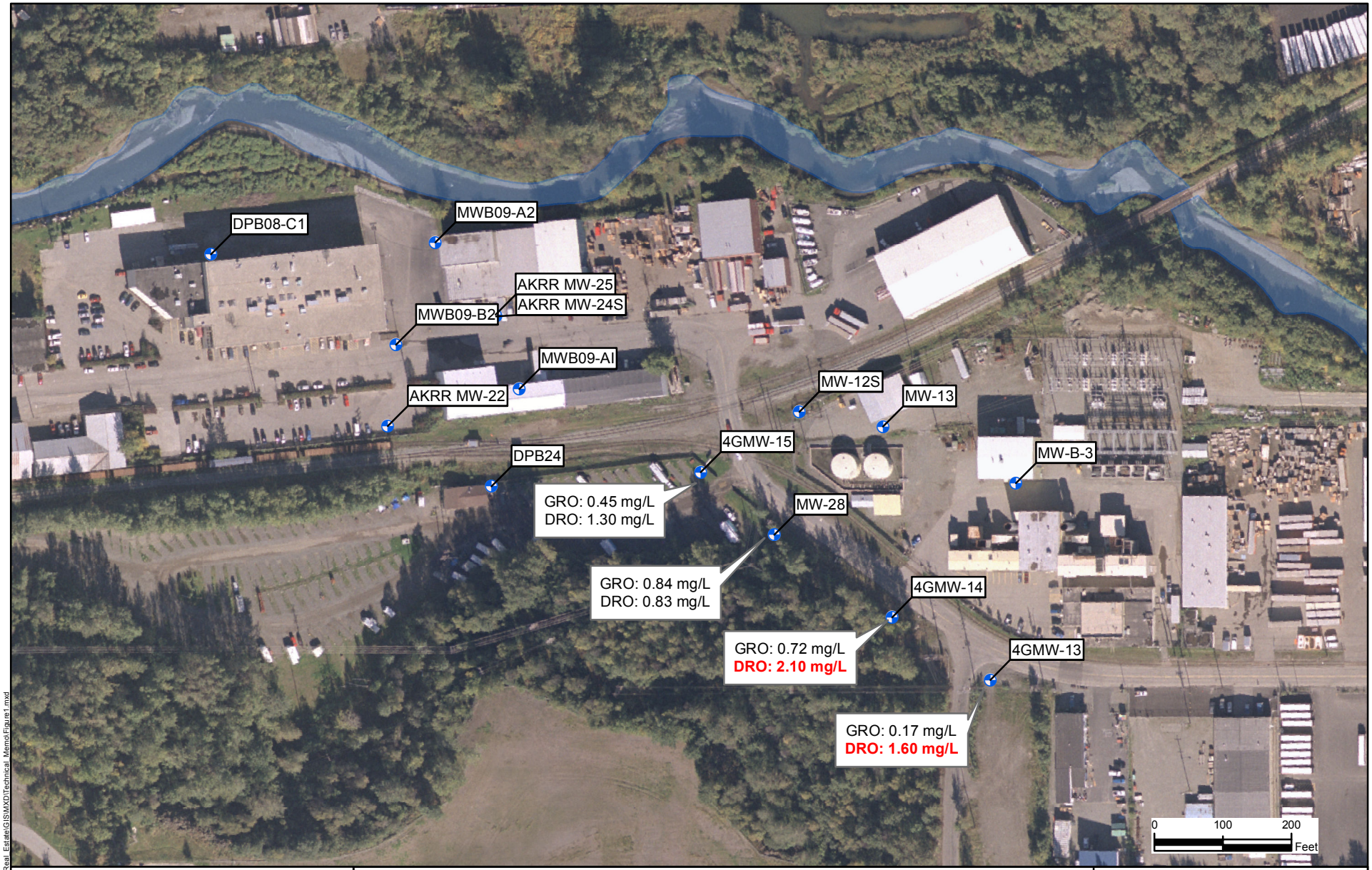

Legend

- Monitoring Well
- Ship Creek

NOTES:
Red text indicates exceeded cleanup level.

ADDITIONAL GROUNDWATER CHARACTERIZATION
ALASKA REAL ESTATE PARKING LOT, ANCHORAGE, ALASKA

DRO AND GRO CONCENTRATIONS - APRIL 2015

Ahtna Engineering

Project Number:	Figure Number:
20266.008	1
Date: 5/28/2015	
Drafted By: SFox	

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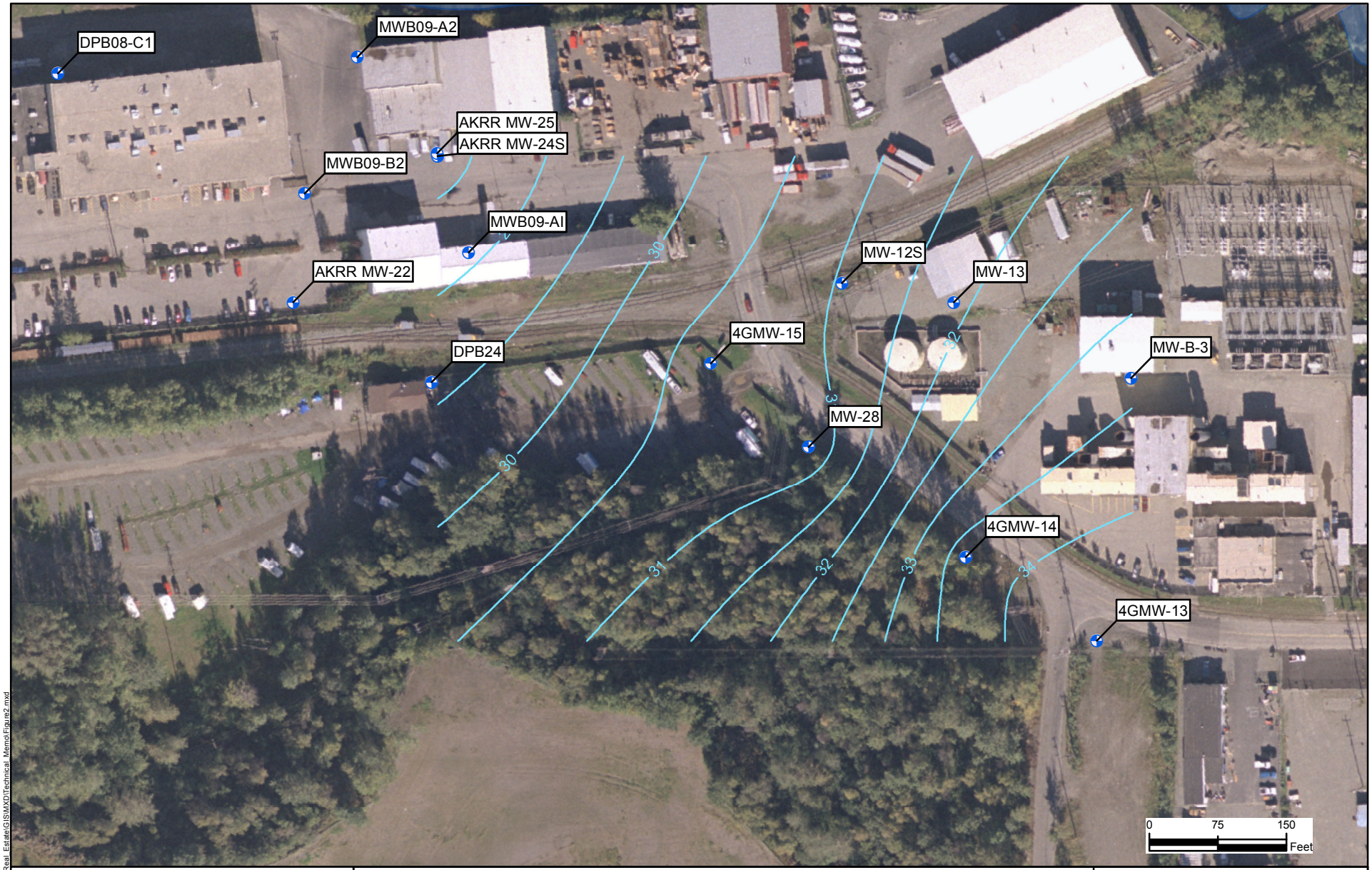

Legend

- Monitoring Well
- Groundwater Elevation Contour

ADDITIONAL GROUNDWATER CHARACTERIZATION
ALASKA REAL ESTATE PARKING LOT, ANCHORAGE, ALASKA

GROUNDWATER ELEVATION - APRIL 2015

Ahtna Engineering

Project Number:	Figure Number:
20266.008	2
Date: 5/28/2015	
Drafted By: SFox	

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Figure 3: Groundwater Flow Direction
July 2014 - April 2015

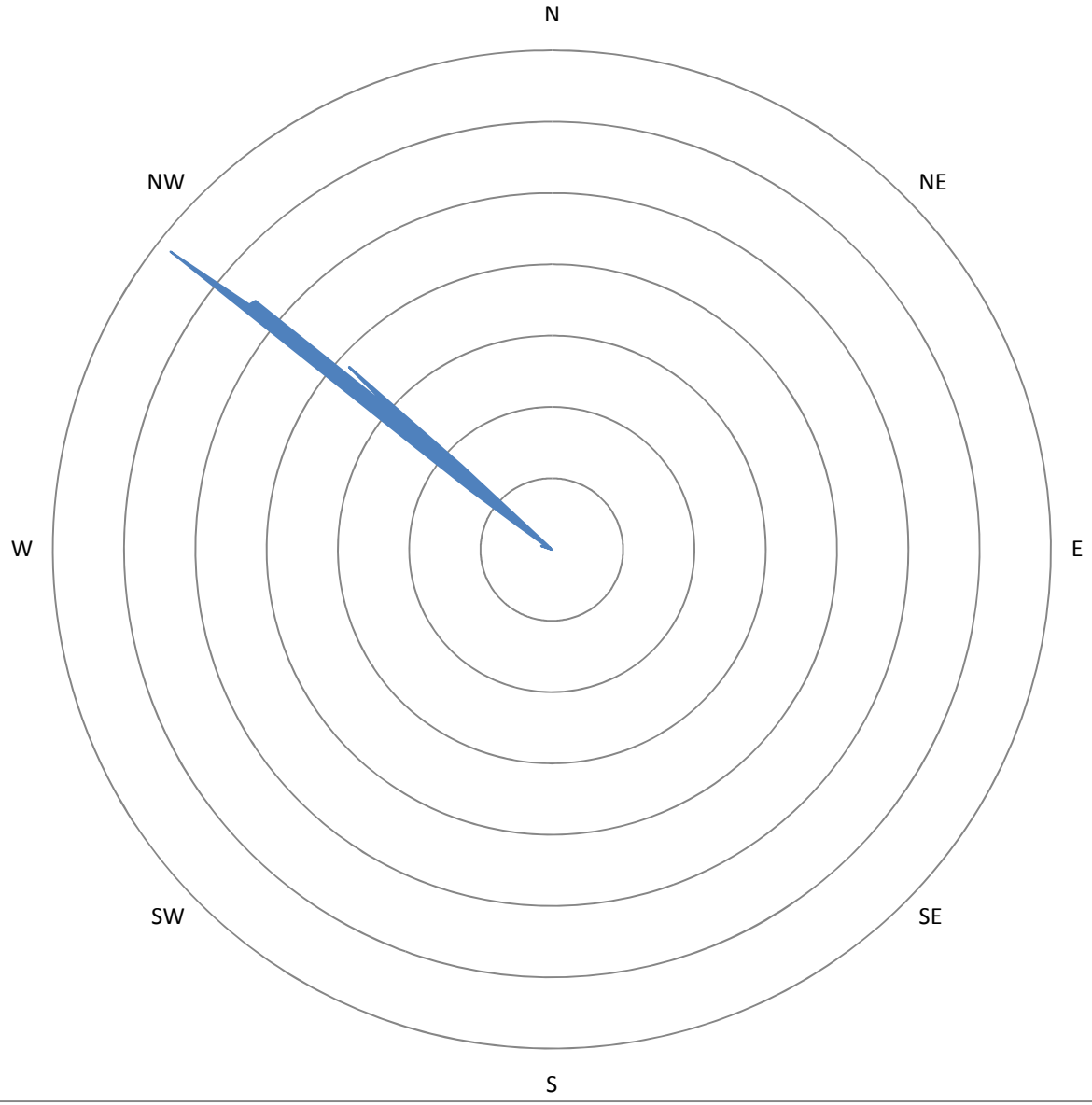

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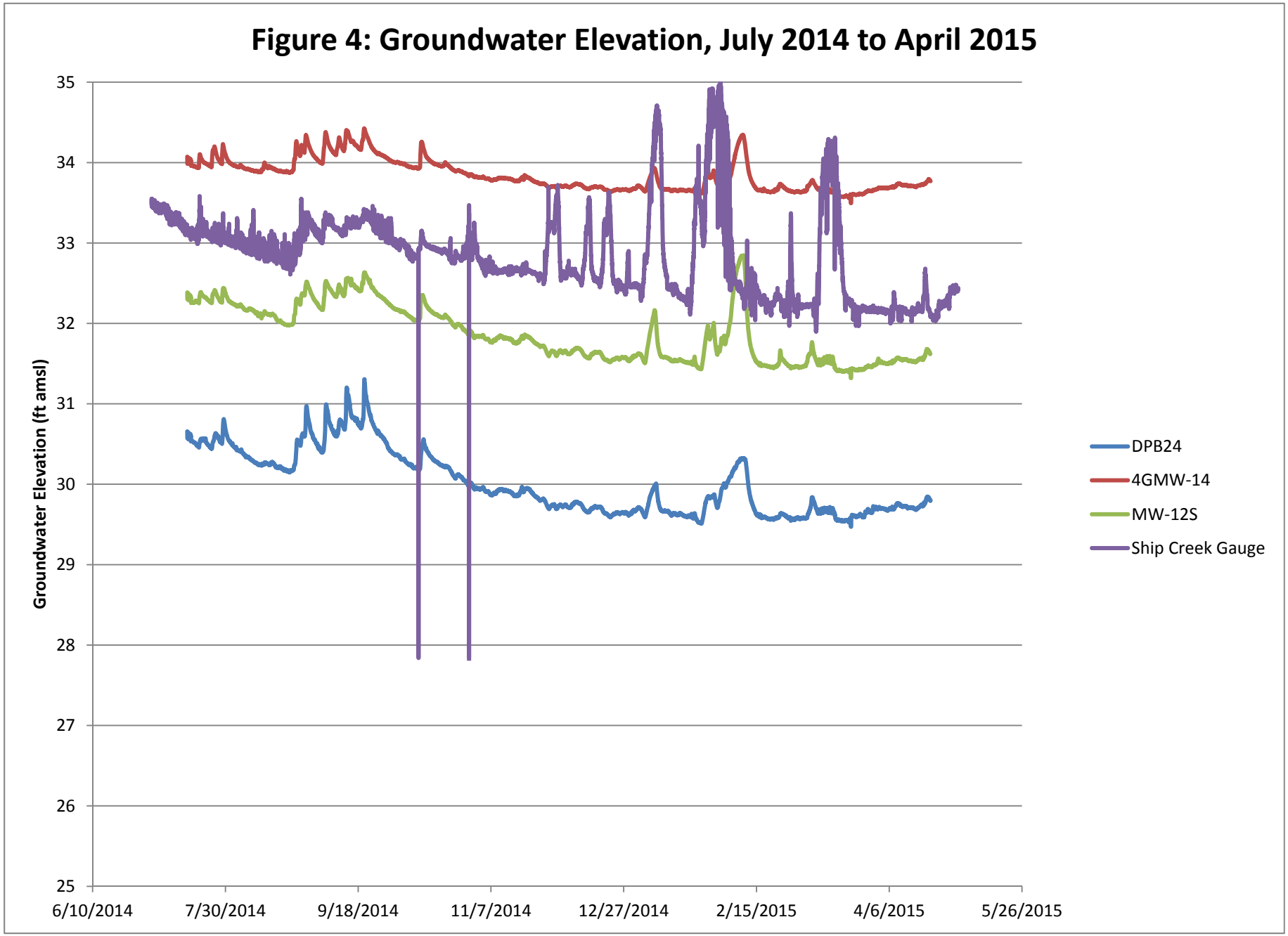
Figure 4: Groundwater Elevation, July 2014 to April 2015



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ATTACHMENT A

FIELD NOTES

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Rite in the Rain
ALL-WEATHER WRITING PAPER

Name Ahtna Engineering Services

Address 110 W. 38th Ave. Suite 200A
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Phone 646.2969

Project Alaska Real Estate
ADEC

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.

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CONTENTS

PAGE	REFERENCE	DATE
	GeoTek Alaska 569.5900 Glenn	
	Emerald Alaska 258.1558 Maria	
	Ship Creek RV lot 277.0877 John Saari cell 720.7240	

O. Stewart
A. Geilich

20266.008
AK Real Estate

5/7/14
50°, Partly Cloudy

1000 Depart office for site.
Will start by drilling well 4GMW-15 inside the boundary of Ship Creek RV Lot.

1015 Meet with GeoTek Alaska drillers Glenn and Logan. Discuss plan.
Meet with John Saari, the operater of Ship Creek RV lot to confirm access.
No utilities designated in area around proposed 4GMW-15.

1030 Gauge well MW-28 on the corner (stick-up).
Depth to water (DTW) is 8.88' from TOC.
DTW = 6.06' from ground surface.
Gauge well DPB24 near RV lot office bldg.
DTW = 6.55' from TOC at ground surface.
Casing is only 1-inch diameter. Tubing in well.

1045 Set up Color-Tec test kit for screening soils.

1100 Conduct health and safety briefing and Daily tailgate meeting with team.
Label drum for soil cuttings as non-haz waste. Set up PID for air monitoring.

1115 Begin drilling well 4GMW-15. Drill down to 5' bgs with DT45 tooling. Retrieve soil in plastic sleeve from 5-10' and 10-15' bgs.

Olga Stewart 5/7/14

Rite in the Rain

Cont. Soil is sandy gravel with fuel impacts observed by odor & color. (boring log)
ColorTec screening samples collected at 6.5'-0ppm
10'-0ppm 14'-0ppm.
11'-1ppm
Confining Layer at 10.5' bgs.
Set well 4-9' bgs. (well construction log)
screen
Excess cuttings placed in 55-gal drum Labelled non-hazardous and placed at the corner of 1st and Ingra streets.

1315 Done with well completion and off-site for Lunch.
Get 2 additional drums from GeoTek Alaska shop.

1415 Back to 4th & Gambell parking lot.
Uncover MW-3. Unable to knock out well bottom because well is nearly full of dirt/bentonite. Fill up remaining ~7 ft. with bentonite chips hydrated in place. Take out steel mount and backfill with native material.
GPS coordinate collected before decomm.

Olga Stewart 5/7/14

1440 To MW-1 and uncover. PVC full of dirt/bentonite. Dig out around the concrete apron. Remove steel mount. Backfill with native material & pea gravel.

1500 To MW-4 and uncover. PVC nearly full of dirt/bentonite. Backfill ~30 ft. with bentonite chips hydrated in place. Dig out around the monument and apron. Apron strangely made of cold patch. Remove steel mount.

1515 To MW-2 and uncover. PVC nearly full of dirt/bentonite. Backfill ~15 ft with bentonite chips hydrated in place. Dig out around mount and apron. Apron of cold patch. Remove mount. Backfill with native material and pea gravel.
Since no PVC removed from the ground, no hazardous waste generated. Monuments taken as debris for disposal by GeoTek.

1530 Finish up daily quantities with drillers. Off site for the day.

Olga Stewart 5/7/14

0815 Leave office for site.
Meet up with GeoTek drillers Glenn and Logan. Check out site for well 4GMW-12. In front of Grubstake Realty driveway. No utility conflicts.
Set up ColorTec and get drilling situated.

0915 Go thru Daily Tailgate Safety Meeting.

0930 Begin drilling 4GMW-12. Drill down to 15' with no recovery. Recover soil from 15-20'. Water ~18'. Sample to 30'. Heaving sands. Clay tagged at 30'. (see boring log)
Will set well screen from 24-29'. (see well construction log.)

1300 Finish well 4GMW-12.
Mobilize to 4GMW-13. Set up on spot. Nearby utilities, but no conflicts.

1330 Begin drilling 4GMW-13. Drill down to 5' with no recovery. Recover soil 5-20'.
Unable to get sleeve from sample barrel for 5-10' section. Collect from end of barrel. Clay at 15'. (see boring log).
Well screen 8.5-13.5' bgs.

1400 Will finish mount and concrete later.
Move to 4GMW-14.

5/8/14

1415 Begin drilling 4G-MW-14. Drill down to 5' bgs. Recover soil from 5-15' bgs. Unable to retrieve soil from 5-10' sample barrel. Collect from end of barrel. Clay at 13.5'. (see boring log).
Well screen ~~8-13'~~ 8.5-13.5'.

1630 Finish drilling and setting well. Start on completions of both wells in flush mounts in concrete.
All soil cuttings placed in drum labelled non-hazardous and left on site near telephone pole on west side of Inga at the intersection with 1st/Warehouse.
No purge or decon water generated.
All other IDW - gloves, paper towels, plastic bags, etc placed in 2 garbage bags for disposal at Anchorage regional Landfill.

1700 Off site for the day.

5.8.14

Rite in the Rain

6

A Geilich
D Hickey

20266.008
AK Real Estate

5/9/13

1240 - Arrive at site, discuss plan to survey monitoring wells
- Conduct Health & Safety meeting
- Surveying data will be collected in notebook by D Hickey.

1715 off site for day. Survey will be finished another day

NOTE: O. Stewart on site at 1630 to collect sample of drummed soil cuttings for waste disposal 14-AKRE-Cuttings.

AG

E. Freitas
O. Stewat

20266.008
AK Real Estate

5/13/13

7

0840 At office. calibrate YSI
Serial NO: 04.F10639 AD

~~pH~~	initial	final
pH	3.72	4.00
	7.13	7.00
	9.86	9.99
ORP	261.4	240.0
spec cond	1.428	1.413
D.O.	98.7%	100%

940 On site MW-7
O. Stewart, E. Freitas
1000 Depth to water 36.7'
1018 Begin pumping.
1045 Parameters stable. Collect sample,
" Offsite. Go to dump water, ppe into drums
1130 Mob to MW-6.
1134 On site MW-6.
1147 Not enough time to sample. off site

Rite in the Rain

S. Fox
E. Freitas
20266.008
AK Real Estate
5/13/14

1230 On site M and P with S. Fox
1235 Arrive at MW-12S
1250 Begin pumping
1300 ~~Tubing~~ No flow. Changed out tubing.
1310 Began pumping
1324 Began field parameters. DTW = 6.3
1350 Parameters stabilize, collect sample
14-AREPL-MW12S-GW
1400 measure DTW for datalogger. DTW = 6.3 There was a bit of trouble with the well cap. Subtract 0.3' from depth because wire was ran to top of well cap.
1430 Off-site. Mob to MW-13. Well is western most of two wells.
1450 Begin pumping.
1505 Begin measuring field parameters.

E. Freitas
S. Fox
20266.008
AK Real Estate
5/13/14

1530 Parameters stabilize. Collect 14-AREPL-MW13-GW
1600 Dumped purge water into tanks
1620 Arrive at MW-6
1630 Take DTW.
1646 Start purge
1704 Parameters stabilize.
1708 Collect
14-AREPL-MW6-GW
and
duplicate
14-AREPL-MW60-GW.
Duplicate is for QC only.
1800 Site cleanup and labeling
1830 Off-site
1835 Dump purge water into drums.
1900 Return to office.
Place samples in sample fridge.

5/13/14

A Gelich 5/13/14

0930 - arrive at 46 MW-12
- decon pump with alconox & water rinse
- Conduct Health & Safety meeting

0944 - Take water level DTW = 18.73 ft
DT bottom well = 28.55 ft
9.82 ft water in well, = 1.67 gallons
Development to proceed to 16.7 gallons which is 10 well volumes

0959 start purge with submersible pump

1053 stop purge at 23 gallons. water beginning to clear last few gallons

1055 - take water level readings. same as above
- bring purge water to accumulation area

1135 - arrive at 46 MW-13
depth to water = 8.51 ft
depth to bottom well = 12.69 ft
water in casing = 4.18 ft well volume: 0.71 gal
7.1 gallons = 10 well volume
- decon pump

1201 - start purge & surge
- observe heavy fuel odor, sheen/small droplets of fuel, water color = black

5/13/14 A Gelich

1207 stop purge. 8 gallons removed from well

1210. decon pump. Record water level = same as previous.

1230 Move to surveying activity w/ Dylan Hickey. survey data in separate notebook.

1500 End survey. Begin development at 46 MW-14
DTW = 5.93 ft | 7.22 feet H2O
DT bottom well = 13.15 ft | 1.23 gallons in well
Development to proceed to 12.3 gallons

1505 Begin surge & purge

1517 stop purge, remove 13 gallons

1530 leave well

1535 arrive at well 46 MW-15

1543 start purge DTW = 5.31 ft

1546 stop purge DT bottom = 9.17 ft

1555 decon, leave site 3.86 ft water in well
0.65 gallons in well

1603 arrive at drum storage area to dispose of PPE & purge water

AG

A Gelich
E Freitas
5/14/14

1000 - Arrive at well DPB24 and set up
- take water level
DTW = 6.57 ft
DT base = 11.82 Ft

1018 Begin purge and begin taking water quality parameters w/ YSI

1047 Finish purge & collect sample
~~14-AKREPL-DPB24-GW~~ AG
14-AREPL-DPB24-GW
well purged with peristaltic pump due to 1 inch diameter casing

1057 install data logger- 11.37 Ft below top of casing.

1125 move to well MW-8, take water level
~~1216~~ DTW = 43.57 ft
Depth to base = 46.92 ft
sand overflowing around casing. Appears to have gone down well and bottom of well felt soft.

1216 - Begin purge with bladder pump
- collect water quality parameters with YSI

A Gelich
E. Freitas
5/14/14

1245 Parameter stabilize,
collect sample ~~MW8-GW~~ &
14-AREPL-~~DPB24-GW~~ and
dup 14-AREPL-MW80-GW

1330 off-site, lunch

~~SS~~ 1400 check MW10, car is on top of well and will need to move to sample.

1410 move to 4GMW-12, take ~~14~~ water level.
DTW = 18.68'
TD = 28.57'

1427 Begin purge with bladder pump. Collect water quality parameters with YSI.

1451 Parameters stable.
collect 14-AREPL-4GMW12-GW

1520 clean up site, ± dup
move to MW-28

1525 DTW = 8.85'
TD = 11.17'

1548 Begin pumping and taking parameters using bladder pump and YSI.

Rite in the Rain

A. Geilich
E. Freitas

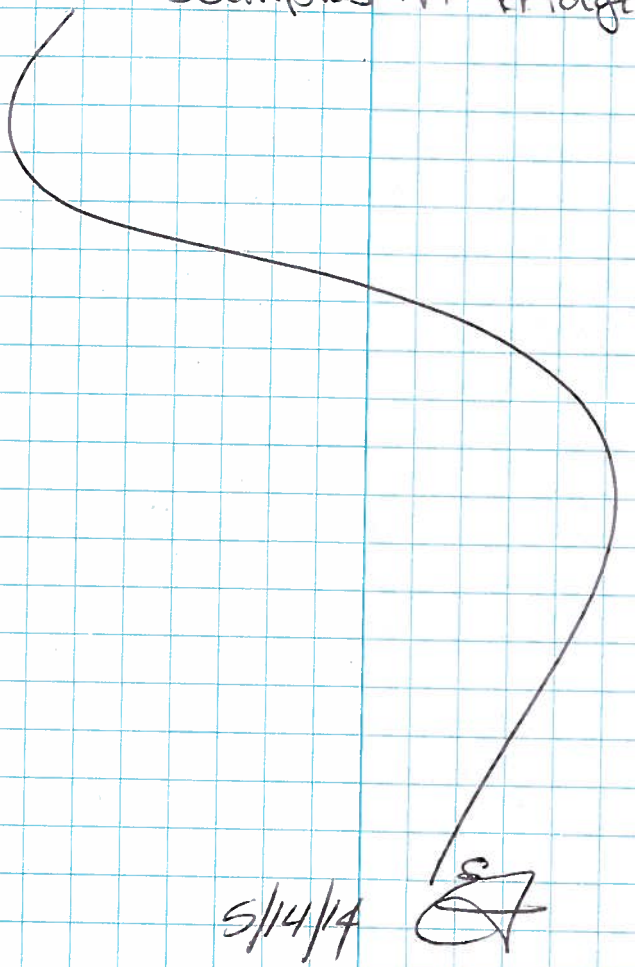
5/14/14

1603 Parameters stabilize. Collect
14-AREPL-MW28-GW
~~No~~ VOC's -1603
1610 collect Dhc samples
1620 collect MNA samples
1635 collect CSIA samples
1655 Clean up.
1710 Off site. move to MW-5.
1730 DTW = 43.26'
TD = 50.0'
1738 Begin collecting parameters with YSI. Purging done with bladder pump.
1753 collect sample-Dhc
14-AREPL-MW5-GW
1800 collect MNA samples
1810 collect CSIA samples
1820 collect VOC samples
1840 Clean up. site
1845 Dump water purged and PPE into drums at containment area.

A. Geilich
E. Freitas

5/14/14

1900 Off-site. Head back to office to get samples in fridge.



5/14/14

AGeilich
S Fox

5/15/14

0830 calibrate YSI

	initial	final
pH		
7	7.13	7.01
4	4.00	4.00
10	10.05	10.06
cond	1.389	1.414
ORP	226.9	240.1
DO	93.2 %	100.8 %

Finish calibration. Pack up and go to site

1011 set up at well ~~4~~ 4G MW-15

1026 start purge at 460 mL/min

1054 stop purge collect YSI readings, collect sample 14-AREPL-4GMW-15-GW for VOC, MNA, CSIA.

1130 decon equipment, change bladder, move to next well.

1140 talk to printing business about moving truck on top of well MW-10. will try to move before end of day.

1210 set up at well 4GMW-13

1243 begin purging w/ bladder pump heavy fuel odor & sheen noted

1310 - collect sample 14-AREPL-4GMW13-GW
- move to well 4GMW-14
- decon pump & other equipment

1400 set up at well 4GMW-14

1423 begin purge heavy fuel odor & product droplets observed

1448 collect sample 14-AREPL-4GMW-14-GW decontaminate equipment. ~4 gallons purge water produced

1520 ask for truck to be moved off well MW-10

1530 set up at MW-10

1550 Begin purge at MW-10 w/ bladder pump

1612 collect sample 14-AREPL-MW-10-GW decon equipment

1642 drop off waste & PPE at accumulation area

1701 leave site

AG

L Hess
S. Fox 7/15/14

1420 On site at 4GMW14
well site in good condition

DTW (TOC) 7.99'

Depth to barologger 2.0'
Depth to PT 12.89'

PT serial # 0042030206
Barologger #: 0012030250

1455 Offsite, back to office.

SA

A Geilch 5/16/14

- Prepare samples for shipment
  - VOC & MNA samples will be shipped to Onsite Environmental
  - CSIA samples ship to Pace/Microseeps
  - Gene-Trac DHC samples ship to SIREM
- Onsite & Microseeps shipments shipped 5/16. Via AK Air & FedEx respectively.
- SIREM samples shipped 5/19 because of no weekend staff at lab. Via FedEx

Waybill #s

Onsite 027-1096 2814
SIREM
Microseeps 8055 8696 2392

1500 return to well 4GMW14 to deploy level logger and barologger. Both set at 12.84 ft bgs

AG

A Geilich 5/22/14

1430 - on site at 4th/Barbell to meet w/ Grant Lidren of ADEC & Emerald Alaska to coordinate disposal of drums.

1440 - Grant Lidren on site. Grant signs disposal paper-work for 1 drum PPE, 1 drum soil, 2 drums purge water.

1500 Emerald removes drums from site

AG

AG

7/22/14 A Geitch

1425 on site at Ship Creek RU 6ft to retrieve data logger serial #. at DPB24
#=00420168 79
depth when placed on 5/14/14 was 11.37 ft btoc

1475 off site

AG

6/12/14

1300 meet Lena at MLAP to get GPS coordinates & datalogger readings. Datalogger at 9.06 ft BTOC
- take water level reading at MW125 = 7.26 ft BTOC
- download data from logger. serial # = 00220290 89
- collect GPS coordinates for MW125 & MW13

1335 Leave MLAP

1340 - Collect GPS coordinates for AKRR MW24, AKRR MW-25 & AKRR MW-22

1405 move to DPB24 DTW = 7.41 ft BTOC
download data from logger

1420 move to 4GMW-14 DTW = 7.96 ft
download data from barologger and level logger

1445 leave site

AG

Rite in the Rain

4/21/15 A Golich S Fox 40°F

0915 On site

0925 Check surface water seep behind fence, Water ponded & flowing

0950 set up at 46MW-13. Start purge & record water quality readings

1015 Collect sample 15-AREPL-46MW-13-GW and dup 15-AREPL-46MW-16-GW at 1040

1040 Leave site. Go to MW-B-3 w/ Lena Seville w/ MLP

1055 Begin purge at MW-B-3

1145 Collect sample 15-AREPL-MW-B-3-GW

1120 Remove data logger from well MW-12S at 1120. Water level is 7.02 ft BTOC

1230 set up at 46MW-15

1305 Collect sample 15-AREPL-~~MW-13~~ 46MW-15-GW

1315 Remove data logger From well DPB24 at 1315. Water level is 7.42 ft BTOC

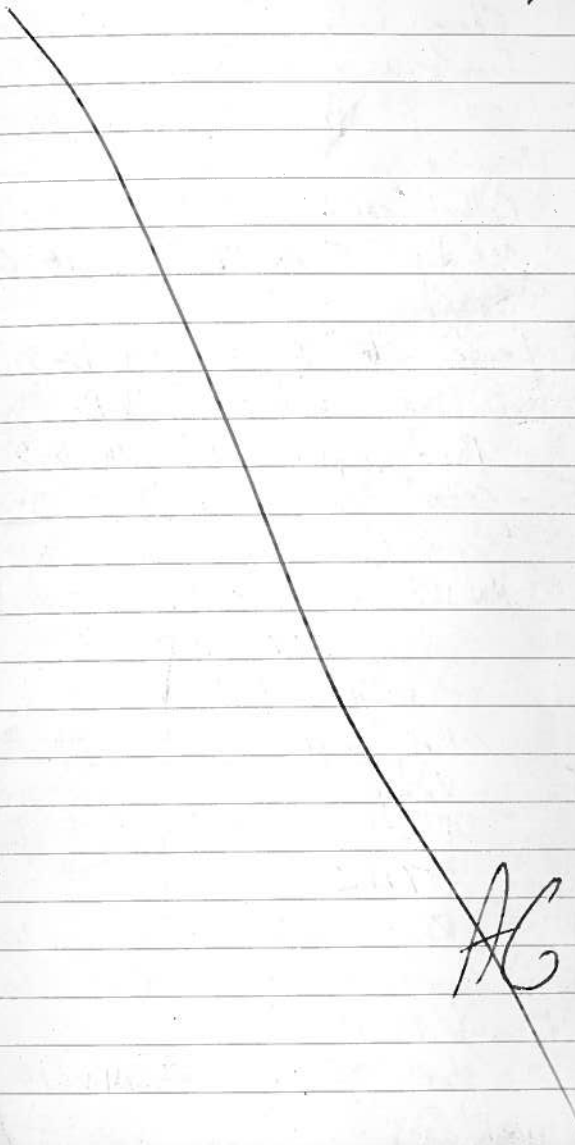
1325 Remove data logger & baro logger from well 46MW-14. Water level is 6.13 ft bgs

1350 start purge at 46MW-14

Rite in the Rain

1415 Collect sample 15-AREPL-46MW-14-GW

1435 Leave site for day



4/22/15 AK Real Estate 40°F

A Gedich S Fox

0900 on site. check well MW309-A1. Has been covered w/ asphalt -Will sample AKRR MW-22 instead.

0935 Start purge at AKRR MW-22

0950 collect sample 15-AREPL-AKRR MW-22-GW and duplicate 15-AREPL-AKRR MW-220-GW dup time = 1025

1010 move to well AKRR MW-24S TD=6.0Z -Check AKRR-MW-25 TD= 12.08 ft

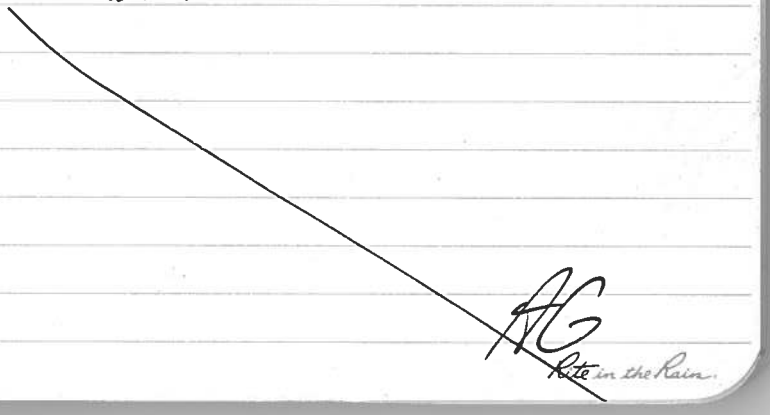
1020 start purge at AKRR MW-24S

1040 collect sample 15-AREPL-AKRR MW-24S-GW

1110 start purge at MW-28

1125 collect sample 15-AREPL-MW-28-GW

1140 clean up. off site, will return w/ emerald Alaska to pick up purge water.



Rite in the Rain.

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ATTACHMENT B

GROUNDWATER SAMPLING FORMS

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GROUNDWATER SAMPLING FORM

Ahtna Engineering

PROJECT NUMBER:	WELL NUMBER:	SHEET:
	4CMW-14	1 of 1

PROJECT NAME: AK Real Estate
CLIENT: ADEC
DATE: 4/21/15
SITE: 4CMW-14
GEOLOGIST: A Deitch S Fox
WEATHER/ TEMPERATURE: 40-45 Partly cloudy
WIND: light

WELL CONDITION: good
DAMAGE PRESENT: no
DEPTH TO BASE (FROM TOC): 12.97
DEPTH TO WATER (FROM TOC): ~~6.03~~ 6.13
HEIGHT OF WATER COLUMN: 6.84
WELL VOLUME: 1.16 gal
3 WELL VOLUMES: 3.48 gal

NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
1"	1.315"	1.049"	0.04
1.5"	1.9"	1.610"	0.11
(2")	2.375"	2.067"	0.17
3"	3.5"	3.068"	0.38
4"	4.5"	4.026"	0.66

SAMPLING DATA

SAMPLE TYPE (GW, PRODUCT, OTHER): GW

SAMPLE COLLECTED WITH: __ Bailer; X Pump, Type: Peristaltic; __ Other, Specify:

MADE OF: __ Stainless Steel; __ PVC; __ Teflon; X Disposable LDPE; __ Other, Specify:

SAMPLING DECON PROCEDURE: Alconox + DI water

SAMPLE DESCRIPTION: (color, free product thickness, odor, turbidity) clear, petroleum odor

FIELD WATER QUALITY PARAMETERS

						Stabilization Requirements (3 must be stable)						
						3%	10%	0.1	10 mV	10%		
Time	Purged Volume ~~(Gal)~~ Liter	Purge Rate (mL/min)	Water Level	Draw Down (ft)	Temperature (°C)	Spec. Cond. (µS/cm)[c]	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
1350	0	300	6.14	0.01		start purge				~~1045~~	clear	petroleum
1355	1.5	"	"	"	4.31	6.34	1.36	6.26	-51.0	1.03		
1400	3	"	"	"	3.96	6.52	0.54	6.33	-58.6	0.95		
1405	4.5	"	"	"	3.70	6.59	0.40	6.40	-60.5	0.59		
1410	6	"	"	"	3.73	6.58	0.30	6.47	-60.5	0.70		
1415	7.5	"	"	"	3.43	6.58	0.27	6.49	-51.5	0.25		

ANALYTICAL SAMPLE INFORMATION

Sample ID	Time	Analytes
15-AREPL-4CMW-14-GW	1415	(DRO) RRO (GRO) (BTEX) PAH VOCs PEST HERB
		DRO RRO GRO BTEX PAH VOCs PEST HERB
		DRO RRO GRO BTEX PAH VOCs PEST HERB

Sampling Notes:

GROUNDWATER SAMPLING FORM

Ahtna Engineering

PROJECT NUMBER:

WELL NUMBER: MW-B-3

SHEET: 1 of 1

PROJECT NAME	AK Rail	WELL CONDITION	good
CLIENT	ADEC	DAMAGE PRESENT	no cover
DATE	4/21/15	DEPTH TO BASE (FROM TOC)	18.70
SITE	MW-B-3	DEPTH TO WATER (FROM TOC)	5.91
GEOLOGIST	A Gelich S Fox	HEIGHT OF WATER COLUMN	12.79
WEATHER/ TEMPERATURE	40 Cloudy	WELL VOLUME	2.17 gal
WIND	light	3 WELL VOLUMES	6.52

NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
1"	1.315"	1.049"	0.04
1.5"	1.9"	1.610"	0.11
(2")	2.375"	2.067"	0.17
3"	3.5"	3.068"	0.38
4"	4.5"	4.026"	0.66

SAMPLING DATA

SAMPLE TYPE (GW, PRODUCT, OTHER): GW

SAMPLE COLLECTED WITH: __ Bailer; X Pump, Type: peristaltic; __ Other, Specify:

MADE OF: __ Stainless Steel; __ PVC; __ Teflon; X Disposable LDPE; __ Other, Specify:

SAMPLING DECON PROCEDURE: Alconox + DI water

SAMPLE DESCRIPTION: (color, free product thickness, odor, turbidity) Sheen on purge water, petroleum odor

FIELD WATER QUALITY PARAMETERS

						Stabilization Requirements (3 must be stable)						
						3%	10%	0.1	10 mV	10%		
Time	Purged Volume (Gal) Liter	Purge Rate (mL/min)	Water Level	Draw Down (ft)	Temperature (°C)	Spec. Cond. (µS/cm)[c]	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
1055	0	250			Start Pump						clear	Petroleum
1100	1.25	250	5.97	0.06	3.82	632	3.17	8.74	-126.2	7.09		
1105	2.5				3.92	624	1.31	8.46	-137.1	9.31		
1110	3.75				3.87	558	0.69	7.78	-127.6	7.37		
1115	5.00				3.77	530	1.02	7.08	-71.0	10.0		
1120	6.25				3.93	494	0.76	6.66	-64.0	12.42		
1125	7.5				3.72	465	0.85	6.05	-45.1	9.65		
1130	8.75				3.64	440	0.67	6.19	-32.8	6.21		
1135	10.0				3.62	420	0.54	6.35	-21.9	8.60		
1140	11.25				3.60	410	0.47	6.48	-18.4	4.53		
1145	12.50				3.67	397	0.48	6.49	-22.0	4.74		

ANALYTICAL SAMPLE INFORMATION

Sample ID	Time	Analytes	Sampling Notes:
15-AREPL-MW-B-3-GW	1145	DRO RRO GRO BTEX PAH (VOCs) PEST HERB	small black flecks in purge water
		DRO RRO GRO BTEX PAH VOCs PEST HERB	
		DRO RRO GRO BTEX PAH VOCs PEST HERB	

GROUNDWATER SAMPLING FORM

Ahtna Engineering

PROJECT NUMBER:	WELL NUMBER:	SHEET:
	46MW-13	1 of 1

PROJECT NAME: AK Real Estate
CLIENT: ADEC
DATE: 4/21/15
SITE: 46MW-13
GEOLOGIST: AGelch S Fox
WEATHER/ TEMPERATURE: Partly cloudy 40°F
WIND: 12 mi

WELL CONDITION: good
DAMAGE PRESENT: none
DEPTH TO BASE (FROM TOC): 12.46
DEPTH TO WATER (FROM TOC): 8.84
HEIGHT OF WATER COLUMN: 3.62
WELL VOLUME: 0.61 gal
3 WELL VOLUMES: 1.83

NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
1"	1.315"	1.049"	0.04
1.5"	1.9"	1.610"	0.11
2"	2.375"	2.067"	0.17
3"	3.5"	3.068"	0.38
4"	4.5"	4.026"	0.66

SAMPLING DATA

SAMPLE TYPE (GW, PRODUCT, OTHER): GW

SAMPLE COLLECTED WITH: __ Bailer; X Pump, Type: Peristaltic; __ Other, Specify:

MADE OF: __ Stainless Steel; __ PVC; __ Teflon; X Disposable LDPE; __ Other, Specify:

SAMPLING DECON PROCEDURE: Alconox + water (DI)

SAMPLE DESCRIPTION: (color, free product thickness, odor, turbidity): clear

FIELD WATER QUALITY PARAMETERS

Time	Purged Volume (Liters)	Purge Rate (mL/min)	Water Level	Draw Down (ft)	Temperature (°C)	Stabilization Requirements (3 must be stable) Spec. Cond. (µS/cm)[C] 3%	D.O. (mg/L) 10%	pH 0.1	ORP (mV) 10 mV	Turbidity (NTU) 10%	Color	Odor
0950	0	500	9.86	0.02	2.73	661	1.60	6.35	+15.8	6.60	clear	Petroleum
0955	0.5 2.5				2.74	667	0.72	6.62	-35.2	2.49		
1000	X 5				2.76	660	0.42	6.68	-27.5	1.95		
1005	1.5 7.5				2.81	659	0.27	6.72	-21.3	2.37		
1010	2.0 10				2.82	659	0.28	6.74	-13.9	1.02		
1015	2.5 12.5				2.82	659	0.29	6.76	-12.1	1.02		

ANALYTICAL SAMPLE INFORMATION

Sample ID	Time	Analytes
15-AREFL-46MW-13-GW	1015	(DRO) RRO (GRO) (BTEX) PAH VOCs PEST HERB
15-AREFL-46MW-16-GW (duplicate sample)	1040	(DRO) RRO (GRO) (BTEX) PAH VOCs PEST HERB
		DRO RRO GRO BTEX PAH VOCs PEST HERB

Sampling Notes:

GROUNDWATER SAMPLING FORM

Ahtna Engineering

PROJECT NUMBER:	WELL NUMBER:	SHEET:
	46MW-15	1 of 1

PROJECT NAME: AK Real Estate
CLIENT: ADEC
DATE: 4/21/15
SITE: 46mw-15
GEOLOGIST: A Gulch S Fox
WEATHER/ TEMPERATURE: 45°F Sunny
WIND: 10

WELL CONDITION: good
DAMAGE PRESENT: no
DEPTH TO BASE (FROM TOC): 8.95
DEPTH TO WATER (FROM TOC): 5.98
HEIGHT OF WATER COLUMN: 3.03
WELL VOLUME: 0.51 gal
3 WELL VOLUMES: 1.55

NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
1"	1.315"	1.049"	0.04
1.5"	1.9"	1.610"	0.11
2"	2.375"	2.067"	0.17
3"	3.5"	3.068"	0.38
4"	4.5"	4.026"	0.66

SAMPLING DATA

SAMPLE TYPE (GW, PRODUCT, OTHER): GW

SAMPLE COLLECTED WITH: __ Bailer; X Pump, Type: Peristaltic; __ Other, Specify:

MADE OF: __ Stainless Steel; __ PVC; __ Teflon; X Disposable LDPE; __ Other, Specify:

SAMPLING DECON PROCEDURE: Alconox + DI water

SAMPLE DESCRIPTION: (color, free product thickness, odor, turbidity) clear

FIELD WATER QUALITY PARAMETERS

						Stabilization Requirements (3 must be stable)						
						3%	10%	0.1	10 mV	10%		
Time	Purged Volume (Gal) Lit	Purge Rate (mL/min)	Water Level	Draw Down (ft)	Temperature (°C)	Spec. Cond. (µS/cm)[c]	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
1235	0	350	5.98	0	Start purge							
1240	1.75	350	6.00	0.02	4.73	376	2.62	6.75	-35.5	40.1	clear	petroleum
1245	3.5				4.48	372	1.11	6.24	-33.9	13.17		
1250	5.25				4.42	373	0.72	6.33	-42.6	5.84		
1255	7				4.26	373	0.53	6.16	-31.0	2.60		
1300	8.75				4.44	373	0.58	6.14	-32.8	1.27		
1305	10.5				4.97	365	0.54	5.98	-24.1	1.30		

ANALYTICAL SAMPLE INFORMATION

Sample ID	Time	Analytes	Sampling Notes:
15-AREE-46MW-15-GW	1305	(DRO) RRO (GRO) (BTEX) PAH VOCs PEST HERB	
		DRO RRO GRO BTEX PAH VOCs PEST HERB	
		DRO RRO GRO BTEX PAH VOCs PEST HERB	

GROUNDWATER SAMPLING FORM

Ahtna Engineering

PROJECT NUMBER:	WELL NUMBER:	SHEET:
	AKRR MW-22	1 of 1

PROJECT NAME	AK Real Estate	WELL CONDITION	good
CLIENT	ADEC	DAMAGE PRESENT	none
DATE	4/22/15	DEPTH TO BASE (FROM TOC)	6.97 ft
SITE	~~AK Real Est~~ AC AKRR MW-22	DEPTH TO WATER (FROM TOC)	4.56 ft
GEOLOGIST	A Geilich S Fox	HEIGHT OF WATER COLUMN	2.41 ft
WEATHER/ TEMPERATURE	cloudy 35-40° F	WELL VOLUME	0.41 gal
WIND	none	3 WELL VOLUMES	1.2 gal

NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
1"	1.315"	1.049"	0.04
1.5"	1.9"	1.610"	0.11
2"	2.375"	2.067"	0.17
3"	3.5"	3.068"	0.38
4"	4.5"	4.026"	0.66

SAMPLING DATA

SAMPLE TYPE (GW, PRODUCT, OTHER): GW

SAMPLE COLLECTED WITH: __ Bailer; X Pump, Type: peristaltic; __ Other, Specify:

MADE OF: __ Stainless Steel; PVC; __ Teflon; X Disposable LDPE; __ Other, Specify:

SAMPLING DECON PROCEDURE: Alconox + DI water

SAMPLE DESCRIPTION: (color, free product thickness, odor, turbidity) clear, petroleum odor, sheen present

FIELD WATER QUALITY PARAMETERS

						Stabilization Requirements (3 must be stable)						
						3%	10%	0.1	10 mV	10%		
Time	Purged Volume (Gal)	Purge Rate (mL/min)	Water Level	Draw Down (ft)	Temperature (°C)	Spec. Cond. (µS/cm)[c]	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
0935	0	300	4.60	0.04	2.52	492	3.21	6.79	-37.7	158.4	brown	petroleum
0940	1.5	"	"	"	2.65	493	1.77	6.99	-56.6	21.8	"	"
0945	3	"	"	"	2.66	495	1.71	7.01	-55.0	9.03	clear	"
0950	4.5	"	"	"	2.70	497	1.11	7.03	-51.7	6.41	"	"

ANALYTICAL SAMPLE INFORMATION

Sample ID	Time	Analytes
15-AREPL-AKRR MW-22-GW	0950	DRO RRO GRO BTEX PAH (VOCs) PEST HERB
15-AREPL-AKRR MW-220-GW (duplicate)	1025	DRO RRO GRO BTEX PAH (VOCs) PEST HERB
		DRO RRO GRO BTEX PAH VOCs PEST HERB

Sampling Notes:

GROUNDWATER SAMPLING FORM

Ahtna Engineering

PROJECT NUMBER:

WELL NUMBER: AKRR MW-24S

SHEET: 1 of 1

PROJECT NAME	AK Real Estate	WELL CONDITION	no well plug
CLIENT	ADEC	DAMAGE PRESENT	riser has frost jacked up
DATE	4/22/15	DEPTH TO BASE (FROM TOC)	6.02
SITE	AKRR MW-24S	DEPTH TO WATER (FROM TOC)	4.16
GEOLOGIST	A Geilich S Ford	HEIGHT OF WATER COLUMN	1.86
WEATHER/ TEMPERATURE	40 °F Cloudy	WELL VOLUME	0.32 gal
WIND	10 12	3 WELL VOLUMES	0.96

NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
1"	1.315"	1.049"	0.04
1.5"	1.9"	1.610"	0.11
(2")	2.375"	2.067"	0.17
3"	3.5"	3.068"	0.38
4"	4.5"	4.026"	0.66

SAMPLING DATA

SAMPLE TYPE (GW, PRODUCT, OTHER): GW

SAMPLE COLLECTED WITH: __ Bailer; X Pump, Type: peristaltic; __ Other, Specify:

MADE OF: __ Stainless Steel; __ PVC; __ Teflon; ~ Disposable LDPE; __ Other, Specify:

SAMPLING DECON PROCEDURE: Alconox + DI water

SAMPLE DESCRIPTION: (color, free product thickness, odor, turbidity)

FIELD WATER QUALITY PARAMETERS

						Stabilization Requirements (3 must be stable)						
						3%	10%	0.1	10 mV	10%	56.5	
Time	Purged Volume (Gal)	Purge Rate (mL/min)	Water Level	Draw Down (ft)	Temperature (°C)	Spec. Cond. (µS/cm)[C]	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
1020	0	350	4.22	0.06	1.65	329	1.77	6.62	16.7	~~4.22~~	brown	petroleum
1025	1.75	|	|	|	1.20	324	1.15	6.80	3.6	9.96	|	|
1030	3.5	|	|	|	1.07	323	0.72	6.91	-6.4	1.33	clear	|
1035	5.25	|	|	|	1.12	318	0.61	6.93	-13.0	1.48	|	|
1040	7	|	|	|	1.20	316	0.47	6.96	-13.0	0.34	|	|

ANALYTICAL SAMPLE INFORMATION

Sample ID	Time	Analytes
15-AREPL-AKRR MW-24S-GW	1040	DRO RRO GRO BTEX PAH (VOCs) PEST HERB
		DRO RRO GRO BTEX PAH VOCs PEST HERB
		DRO RRO GRO BTEX PAH VOCs PEST HERB

Sampling Notes:

Ahtna Engineering

GROUNDWATER SAMPLING FORM

PROJECT NUMBER:

WELL NUMBER: MW-28

SHEET: 1 of 1

PROJECT NAME	AK Real Estate	WELL CONDITION	Good	NOMINAL DIAMETER	O.D.	I.D.	VOLUME (GAL/LIN FT)
CLIENT	ADEC	DAMAGE PRESENT	none	1"	1.315"	1.049"	0.04
DATE	4/22	DEPTH TO BASE (FROM TOC)	11.89	1.5"	1.9"	1.610"	0.11
SITE	MW-28	DEPTH TO WATER (FROM TOC)	9.59	(2")	2.375"	2.067"	0.17
GEOLOGIST	A Geilich S Fox	HEIGHT OF WATER COLUMN		3"	3.5"	3.068"	0.38
WEATHER/ TEMPERATURE	40-45° F	WELL VOLUME		4"	4.5"	4.026"	0.66
WIND	10 10	3 WELL VOLUMES					

SAMPLING DATA

SAMPLE TYPE (GW, PRODUCT, OTHER): GW

SAMPLE COLLECTED WITH: __ Bailer X Pump, Type: peristaltic __ Other, Specify:

MADE OF: __ Stainless Steel __ PVC

__ Teflon X Disposable LDPE __ Other, Specify:

SAMPLING DECON PROCEDURE: Alconox + DI water

SAMPLE DESCRIPTION: (color, free product thickness, odor, turbidity) clear

FIELD WATER QUALITY PARAMETERS

						Stabilization Requirements (3 must be stable)						
						3%	10%	0.1	10 mV	10%		
Time	Purged Volume (~~Gal~~) L	Purge Rate (mL/min)	Water Level	Draw Down (ft)	Temperature (°C)	Spec. Cond. (µS/cm)[c]	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
1110	0	300	9.61	0.02	2.50	637	2.72	6.82	30.5	4.39	clear	petroleum
1115	1.5				2.45	647	2.36	7.05	-16.1	1.00		
1120	3				2.35	647	2.12	7.06	-21.5	0.78		
1125	4.5				2.37	646	1.64	7.06	-24.1	0.38		

ANALYTICAL SAMPLE INFORMATION

Sample ID	Time	Analytes	Sampling Notes:
15-AREPL-MW-28-GW	1125	(DRO) RRO (GRO) (BTEX) PAH VOCs PEST HERB	
		DRO RRO GRO BTEX PAH VOCs PEST HERB	
		DRO RRO GRO BTEX PAH VOCs PEST HERB	

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ATTACHMENT C

LABORATORY REPORT

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TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Anchorage
2000 West International Airport Road
Suite A10
Anchorage, AK 99502-1119
Tel: (907)563-9200

TestAmerica Job ID: 230-467-1
Client Project/Site: AK Real Estate

For:
Ahtna Engineering Services LLC
1896 Marika Road, suite *
Fairbanks, Alaska 99709

Attn: Andrew Weller

Kelly A Garretts

Authorized for release by:
5/4/2015 10:07:23 AM

Kelly Garretts, Project Manager II
(253)248-4961
kelly.garretts@testamericainc.com

Table of Contents

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
*	LCS or LCSD is outside acceptance limits.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
E	Result exceeded calibration range.

GC Semi VOA

Qualifier	Qualifier Description
Y	The chromatographic response resembles a typical fuel pattern.

Glossary

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

Client: Ahtna Engineering Services LLC
Project/Site: AK Real Estate

TestAmerica Job ID: 230-467-1

Job ID: 230-467-1

Laboratory: TestAmerica Anchorage

Narrative

Job Narrative
230-467-1

Comments
No additional comments.

Receipt
The samples were received on 4/22/2015 3:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.4º C.

GC/MS VOA
Method 8260C: The continuing calibration verification (CCV) associated with batch 188126 recovered above the upper control limit for multi analyte. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following sample is impacted: (CCVIS 580-188126/2).

Method 8260C: The laboratory control sample (LCS) for batch 188126 recovered outside control limits for the following analytes: Dichlorobromomethane. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

Method 8260C: The following samples were reanalyzed due to a potential high bias of naphthalene during the original analysis.

15-AREPL-MW-B-3-GW (230-467-4), 15-AREPL-AKRRMW-22-GW (230-467-8) and 15-AREPL-AKRRMW-220-GW (230-467-9)

Method AK101: The continuing calibration verification (CCV) associated with batch 188124 recovered above the upper control limit for C6-C10. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following sample is impacted: (CCV 580-188124/43).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA
Methods AK102 & 103: In analysis batch 580-188090, the following samples from prep batch 580-188080 contained a hydrocarbon pattern in the diesel range; however, the elution pattern was earlier than the typical diesel fuel pattern used by the laboratory for quantitative purposes: 15-AREPL-4GMW-14-GW (230-467-3) and 15-AREPL-4GMW-15-GW (230-467-5).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Ahtna Engineering Services LLC
Project/Site: AK Real Estate

TestAmerica Job ID: 230-467-1

Client Sample ID: 15-AREPL-4GMW-13-GW — Lab Sample ID: 230-467-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Organics (GRO) -C6-C10	0.17		0.060		mg/L	1		AK101	Total/NA
DRO (nC10-<nC25)	1.6	Y	0.10		mg/L	1		AK102 & 103	Total/NA

Client Sample ID: 15-AREPL-4GMW-16-GW — Lab Sample ID: 230-467-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Organics (GRO) -C6-C10	0.13		0.060		mg/L	1		AK101	Total/NA
DRO (nC10-<nC25)	1.5	Y	0.099		mg/L	1		AK102 & 103	Total/NA

Client Sample ID: 15-AREPL-4GMW-14-GW — Lab Sample ID: 230-467-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
m-Xylene & p-Xylene	3.2		3.0		ug/L	1		8260B	Total/NA
Gasoline Range Organics (GRO) -C6-C10	0.72		0.060		mg/L	1		AK101	Total/NA
DRO (nC10-<nC25)	2.1	Y	0.10		mg/L	1		AK102 & 103	Total/NA

Client Sample ID: 15-AREPL-MW-B-3-GW — Lab Sample ID: 230-467-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene	6.2		3.0		ug/L	1		8260C	Total/NA
Naphthalene - RA	4.7		2.0		ug/L	1		8260C	Total/NA

Client Sample ID: 15-AREPL-4GMW-15-GW — Lab Sample ID: 230-467-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Organics (GRO) -C6-C10	0.45		0.060		mg/L	1		AK101	Total/NA
DRO (nC10-<nC25)	1.3	Y	0.11		mg/L	1		AK102 & 103	Total/NA

Client Sample ID: 15-AREPL-TB — Lab Sample ID: 230-467-6

No Detections.

Client Sample ID: 15-AREPL-MW-28-GW — Lab Sample ID: 230-467-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Organics (GRO) -C6-C10	0.84		0.060		mg/L	1		AK101	Total/NA
DRO (nC10-<nC25)	0.83	Y	0.098		mg/L	1		AK102 & 103	Total/NA

Client Sample ID: 15-AREPL-AKRRMW-22-GW — Lab Sample ID: 230-467-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Dichlorodifluoromethane	2.6		2.0		ug/L	1		8260C	Total/NA
Isopropylbenzene	6.5		2.0		ug/L	1		8260C	Total/NA
N-Propylbenzene	11		3.0		ug/L	1		8260C	Total/NA
1,2,4-Trimethylbenzene	4.8		3.0		ug/L	1		8260C	Total/NA
sec-Butylbenzene	5.5		3.0		ug/L	1		8260C	Total/NA
4-Isopropyltoluene	4.0		3.0		ug/L	1		8260C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 15-AREPL-AKRRMW-22-GW (Continued) — Lab Sample ID: 230-467-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
n-Butylbenzene	7.1		3.0		ug/L	1		8260C	Total/NA
Naphthalene - RA	30		2.0		ug/L	1		8260C	Total/NA

Client Sample ID: 15-AREPL-AKRRMW-220-GW — Lab Sample ID: 230-467-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Dichlorodifluoromethane	2.7		2.0		ug/L	1		8260C	Total/NA
Isopropylbenzene	6.6		2.0		ug/L	1		8260C	Total/NA
N-Propylbenzene	11		3.0		ug/L	1		8260C	Total/NA
1,2,4-Trimethylbenzene	5.1		3.0		ug/L	1		8260C	Total/NA
sec-Butylbenzene	5.6		3.0		ug/L	1		8260C	Total/NA
4-Isopropyltoluene	4.2		3.0		ug/L	1		8260C	Total/NA
n-Butylbenzene	7.3		3.0		ug/L	1		8260C	Total/NA
Naphthalene - RA	32		2.0		ug/L	1		8260C	Total/NA

Client Sample ID: 15-AREPL-AKRRMW-245-GW — Lab Sample ID: 230-467-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Dichlorodifluoromethane	13		2.0		ug/L	1		8260C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 15-AREPL-4GMW-13-GW

Lab Sample ID: 230-467-1

Date Collected: 04/21/15 10:15

Matrix: Water

Date Received: 04/22/15 15:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		2.0		ug/L			04/29/15 19:59	1
Toluene	ND		2.0		ug/L			04/29/15 19:59	1
Ethylbenzene	ND		3.0		ug/L			04/29/15 19:59	1
m-Xylene & p-Xylene	ND		3.0		ug/L			04/29/15 19:59	1
o-Xylene	ND		2.0		ug/L			04/29/15 19:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*99*		*85 - 120*		*04/29/15 19:59*	*1*
Trifluorotoluene (Surr)	*104*		*70 - 136*		*04/29/15 19:59*	*1*
4-Bromofluorobenzene (Surr)	*95*		*75 - 120*		*04/29/15 19:59*	*1*
Dibromofluoromethane (Surr)	*107*		*85 - 115*		*04/29/15 19:59*	*1*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 120*		*04/29/15 19:59*	*1*

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	**0.17**		0.060		mg/L			05/02/15 16:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*102*		*50 - 150*		*05/02/15 16:02*	*1*
4-Bromofluorobenzene (Surr)	*100*		*50 - 150*		*05/02/15 16:02*	*1*

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	**1.6**	**Y**	0.10		mg/L		04/28/15 17:02	04/29/15 19:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*77*		*50 - 150*	*04/28/15 17:02*	*04/29/15 19:15*	*1*

Client Sample ID: 15-AREPL-4GMW-16-GW

Lab Sample ID: 230-467-2

Date Collected: 04/21/15 10:40

Matrix: Water

Date Received: 04/22/15 15:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		2.0		ug/L			04/29/15 20:26	1
Toluene	ND		2.0		ug/L			04/29/15 20:26	1
Ethylbenzene	ND		3.0		ug/L			04/29/15 20:26	1
m-Xylene & p-Xylene	ND		3.0		ug/L			04/29/15 20:26	1
o-Xylene	ND		2.0		ug/L			04/29/15 20:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*95*		*85 - 120*		*04/29/15 20:26*	*1*
Trifluorotoluene (Surr)	*102*		*70 - 136*		*04/29/15 20:26*	*1*
4-Bromofluorobenzene (Surr)	*95*		*75 - 120*		*04/29/15 20:26*	*1*
Dibromofluoromethane (Surr)	*100*		*85 - 115*		*04/29/15 20:26*	*1*
1,2-Dichloroethane-d4 (Surr)	*97*		*70 - 120*		*04/29/15 20:26*	*1*

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	**0.13**		0.060		mg/L			05/02/15 16:55	1

Client Sample ID: 15-AREPL-4GMW-16-GW

Lab Sample ID: 230-467-2

Date Collected: 04/21/15 10:40

Matrix: Water

Date Received: 04/22/15 15:00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	*99*		*50 - 150*		*05/02/15 16:55*	*1*
4-Bromofluorobenzene (Surr)	*99*		*50 - 150*		*05/02/15 16:55*	*1*

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	**1.5**	**Y**	0.099		mg/L		04/28/15 17:02	04/29/15 19:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	*81*		*50 - 150*	*04/28/15 17:02*	*04/29/15 19:33*	*1*

Client Sample ID: 15-AREPL-4GMW-14-GW

Lab Sample ID: 230-467-3

Date Collected: 04/21/15 14:15

Matrix: Water

Date Received: 04/22/15 15:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		2.0		ug/L			04/29/15 20:53	1
Toluene	ND		2.0		ug/L			04/29/15 20:53	1
Ethylbenzene	ND		3.0		ug/L			04/29/15 20:53	1
m-Xylene & p-Xylene	**3.2**		3.0		ug/L			04/29/15 20:53	1
o-Xylene	ND		2.0		ug/L			04/29/15 20:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	*100*		*85 - 120*		*04/29/15 20:53*	*1*
Trifluorotoluene (Surr)	*106*		*70 - 136*		*04/29/15 20:53*	*1*
4-Bromofluorobenzene (Surr)	*97*		*75 - 120*		*04/29/15 20:53*	*1*
Dibromofluoromethane (Surr)	*105*		*85 - 115*		*04/29/15 20:53*	*1*
1,2-Dichloroethane-d4 (Surr)	*100*		*70 - 120*		*04/29/15 20:53*	*1*

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	**0.72**		0.060		mg/L			05/02/15 17:21	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	*105*		*50 - 150*		*05/02/15 17:21*	*1*
4-Bromofluorobenzene (Surr)	*100*		*50 - 150*		*05/02/15 17:21*	*1*

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	**2.1**	**Y**	0.10		mg/L		04/28/15 17:02	04/29/15 19:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	*80*		*50 - 150*	*04/28/15 17:02*	*04/29/15 19:51*	*1*

Client Sample ID: 15-AREPL-MW-B-3-GW

Lab Sample ID: 230-467-4

Date Collected: 04/21/15 11:45

Matrix: Water

Date Received: 04/22/15 15:00

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	ND		2.0		ug/L			04/29/15 21:20	1

Client: Ahtna Engineering Services LLC
Project/Site: AK Real Estate

TestAmerica Job ID: 230-467-1

Client Sample ID: 15-AREPL-MW-B-3-GW — **Lab Sample ID: 230-467-4**
Date Collected: 04/21/15 11:45 — **Matrix: Water**
Date Received: 04/22/15 15:00

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloromethane	ND		5.0		ug/L			04/29/15 21:20	1
Vinyl chloride	ND		1.0		ug/L			04/29/15 21:20	1
Bromomethane	ND		5.0		ug/L			04/29/15 21:20	1
Chloroethane	ND		5.0		ug/L			04/29/15 21:20	1
Trichlorofluoromethane	ND		3.0		ug/L			04/29/15 21:20	1
1,1-Dichloroethene	ND		2.0		ug/L			04/29/15 21:20	1
Methylene Chloride	ND		5.0		ug/L			04/29/15 21:20	1
trans-1,2-Dichloroethene	ND		1.0		ug/L			04/29/15 21:20	1
1,1-Dichloroethane	ND		2.0		ug/L			04/29/15 21:20	1
2,2-Dichloropropane	ND		3.0		ug/L			04/29/15 21:20	1
cis-1,2-Dichloroethene	ND		1.0		ug/L			04/29/15 21:20	1
Bromochloromethane	ND		2.0		ug/L			04/29/15 21:20	1
Chloroform	ND		1.0		ug/L			04/29/15 21:20	1
1,1,1-Trichloroethane	ND		3.0		ug/L			04/29/15 21:20	1
Carbon tetrachloride	ND		3.0		ug/L			04/29/15 21:20	1
1,1-Dichloropropene	ND		3.0		ug/L			04/29/15 21:20	1
Benzene	ND		2.0		ug/L			04/29/15 21:20	1
1,2-Dichloroethane	ND		1.0		ug/L			04/29/15 21:20	1
Trichloroethene	ND		3.0		ug/L			04/29/15 21:20	1
1,2-Dichloropropane	ND		1.0		ug/L			04/29/15 21:20	1
Dibromomethane	ND	^	1.0		ug/L			04/29/15 21:20	1
Bromodichloromethane	ND	* ^	2.0		ug/L			04/29/15 21:20	1
cis-1,3-Dichloropropene	ND		1.0		ug/L			04/29/15 21:20	1
Toluene	ND		2.0		ug/L			04/29/15 21:20	1
trans-1,3-Dichloropropene	ND	^	1.0		ug/L			04/29/15 21:20	1
1,1,2-Trichloroethane	ND	^	1.0		ug/L			04/29/15 21:20	1
Tetrachloroethene	ND		3.0		ug/L			04/29/15 21:20	1
1,3-Dichloropropane	ND	^	1.0		ug/L			04/29/15 21:20	1
Dibromochloromethane	ND	^	1.0		ug/L			04/29/15 21:20	1
1,2-Dibromoethane	ND	^	1.0		ug/L			04/29/15 21:20	1
Chlorobenzene	ND		2.0		ug/L			04/29/15 21:20	1
Ethylbenzene	ND		3.0		ug/L			04/29/15 21:20	1
1,1,1,2-Tetrachloroethane	ND		2.0		ug/L			04/29/15 21:20	1
1,1,2,2-Tetrachloroethane	ND	^	1.0		ug/L			04/29/15 21:20	1
m-Xylene & p-Xylene	ND		3.0		ug/L			04/29/15 21:20	1
o-Xylene	ND		2.0		ug/L			04/29/15 21:20	1
Styrene	ND		5.0		ug/L			04/29/15 21:20	1
Bromoform	ND	^	1.0		ug/L			04/29/15 21:20	1
Isopropylbenzene	ND		2.0		ug/L			04/29/15 21:20	1
Bromobenzene	ND		2.0		ug/L			04/29/15 21:20	1
N-Propylbenzene	ND		3.0		ug/L			04/29/15 21:20	1
1,2,3-Trichloropropane	ND	^	2.0		ug/L			04/29/15 21:20	1
2-Chlorotoluene	ND		3.0		ug/L			04/29/15 21:20	1
1,3,5-Trimethylbenzene	ND		3.0		ug/L			04/29/15 21:20	1
4-Chlorotoluene	ND		2.0		ug/L			04/29/15 21:20	1
t-Butylbenzene	ND		3.0		ug/L			04/29/15 21:20	1
1,2,4-Trimethylbenzene	**6.2**		3.0		ug/L			04/29/15 21:20	1
sec-Butylbenzene	ND		3.0		ug/L			04/29/15 21:20	1
1,3-Dichlorobenzene	ND		2.0		ug/L			04/29/15 21:20	1

Client Sample ID: 15-AREPL-MW-B-3-GW

Lab Sample ID: 230-467-4

Date Collected: 04/21/15 11:45

Matrix: Water

Date Received: 04/22/15 15:00

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Isopropyltoluene	ND		3.0		ug/L			04/29/15 21:20	1
1,4-Dichlorobenzene	ND		2.0		ug/L			04/29/15 21:20	1
n-Butylbenzene	ND		3.0		ug/L			04/29/15 21:20	1
1,2-Dichlorobenzene	ND		2.0		ug/L			04/29/15 21:20	1
1,2-Dibromo-3-Chloropropane	ND	^	2.0		ug/L			04/29/15 21:20	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			04/29/15 21:20	1
1,2,3-Trichlorobenzene	ND		2.0		ug/L			04/29/15 21:20	1
Hexachlorobutadiene	ND		2.0		ug/L			04/29/15 21:20	1
Methyl tert-butyl ether	ND	^	1.0		ug/L			04/29/15 21:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*99*		*85 - 120*		*04/29/15 21:20*	*1*
4-Bromofluorobenzene (Surr)	*92*		*75 - 120*		*04/29/15 21:20*	*1*
Dibromofluoromethane (Surr)	*104*		*85 - 115*		*04/29/15 21:20*	*1*
Trifluorotoluene (Surr)	*102*		*70 - 136*		*04/29/15 21:20*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*70 - 120*		*04/29/15 21:20*	*1*

Method: 8260C - Volatile Organic Compounds by GC/MS - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**4.7**		2.0		ug/L			05/01/15 18:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*85 - 120*		*05/01/15 18:23*	*1*
4-Bromofluorobenzene (Surr)	*104*		*75 - 120*		*05/01/15 18:23*	*1*
Dibromofluoromethane (Surr)	*108*		*85 - 115*		*05/01/15 18:23*	*1*
Trifluorotoluene (Surr)	*94*		*70 - 136*		*05/01/15 18:23*	*1*
1,2-Dichloroethane-d4 (Surr)	*112*		*70 - 120*		*05/01/15 18:23*	*1*

Client Sample ID: 15-AREPL-4GMW-15-GW

Lab Sample ID: 230-467-5

Date Collected: 04/21/15 13:05

Matrix: Water

Date Received: 04/22/15 15:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		2.0		ug/L			04/29/15 21:46	1
Toluene	ND		2.0		ug/L			04/29/15 21:46	1
Ethylbenzene	ND		3.0		ug/L			04/29/15 21:46	1
m-Xylene & p-Xylene	ND		3.0		ug/L			04/29/15 21:46	1
o-Xylene	ND		2.0		ug/L			04/29/15 21:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*98*		*85 - 120*		*04/29/15 21:46*	*1*
Trifluorotoluene (Surr)	*99*		*70 - 136*		*04/29/15 21:46*	*1*
4-Bromofluorobenzene (Surr)	*94*		*75 - 120*		*04/29/15 21:46*	*1*
Dibromofluoromethane (Surr)	*104*		*85 - 115*		*04/29/15 21:46*	*1*
1,2-Dichloroethane-d4 (Surr)	*96*		*70 - 120*		*04/29/15 21:46*	*1*

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	**0.45**		0.060		mg/L			05/02/15 17:48	1

Client Sample ID: 15-AREPL-4GMW-15-GW

Lab Sample ID: 230-467-5

Date Collected: 04/21/15 13:05

Matrix: Water

Date Received: 04/22/15 15:00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	*103*		*50 - 150*		*05/02/15 17:48*	*1*
4-Bromofluorobenzene (Surr)	*95*		*50 - 150*		*05/02/15 17:48*	*1*

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	1.3	Y	0.11		mg/L		04/28/15 17:02	04/29/15 20:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	*76*		*50 - 150*	*04/28/15 17:02*	*04/29/15 20:09*	*1*

Client Sample ID: 15-AREPL-TB

Lab Sample ID: 230-467-6

Date Collected: 04/21/15 12:00

Matrix: Water

Date Received: 04/22/15 15:00

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	ND		2.0		ug/L			04/29/15 19:33	1
Chloromethane	ND		5.0		ug/L			04/29/15 19:33	1
Vinyl chloride	ND		1.0		ug/L			04/29/15 19:33	1
Bromomethane	ND		5.0		ug/L			04/29/15 19:33	1
Chloroethane	ND		5.0		ug/L			04/29/15 19:33	1
Trichlorofluoromethane	ND		3.0		ug/L			04/29/15 19:33	1
1,1-Dichloroethene	ND		2.0		ug/L			04/29/15 19:33	1
Methylene Chloride	ND		5.0		ug/L			04/29/15 19:33	1
trans-1,2-Dichloroethene	ND		1.0		ug/L			04/29/15 19:33	1
1,1-Dichloroethane	ND		2.0		ug/L			04/29/15 19:33	1
2,2-Dichloropropane	ND		3.0		ug/L			04/29/15 19:33	1
cis-1,2-Dichloroethene	ND		1.0		ug/L			04/29/15 19:33	1
Bromochloromethane	ND		2.0		ug/L			04/29/15 19:33	1
Chloroform	ND		1.0		ug/L			04/29/15 19:33	1
1,1,1-Trichloroethane	ND		3.0		ug/L			04/29/15 19:33	1
Carbon tetrachloride	ND		3.0		ug/L			04/29/15 19:33	1
1,1-Dichloropropene	ND		3.0		ug/L			04/29/15 19:33	1
Benzene	ND		2.0		ug/L			04/29/15 19:33	1
1,2-Dichloroethane	ND		1.0		ug/L			04/29/15 19:33	1
Trichloroethene	ND		3.0		ug/L			04/29/15 19:33	1
1,2-Dichloropropane	ND		1.0		ug/L			04/29/15 19:33	1
Dibromomethane	ND	^	1.0		ug/L			04/29/15 19:33	1
Bromodichloromethane	ND	* ^	2.0		ug/L			04/29/15 19:33	1
cis-1,3-Dichloropropene	ND		1.0		ug/L			04/29/15 19:33	1
Toluene	ND		2.0		ug/L			04/29/15 19:33	1
trans-1,3-Dichloropropene	ND	^	1.0		ug/L			04/29/15 19:33	1
1,1,2-Trichloroethane	ND	^	1.0		ug/L			04/29/15 19:33	1
Tetrachloroethene	ND		3.0		ug/L			04/29/15 19:33	1
1,3-Dichloropropane	ND	^	1.0		ug/L			04/29/15 19:33	1
Dibromochloromethane	ND	^	1.0		ug/L			04/29/15 19:33	1
1,2-Dibromoethane	ND	^	1.0		ug/L			04/29/15 19:33	1
Chlorobenzene	ND		2.0		ug/L			04/29/15 19:33	1
Ethylbenzene	ND		3.0		ug/L			04/29/15 19:33	1
1,1,1,2-Tetrachloroethane	ND		2.0		ug/L			04/29/15 19:33	1
1,1,2,2-Tetrachloroethane	ND	^	1.0		ug/L			04/29/15 19:33	1

Client Sample ID: 15-AREPL-TB

Lab Sample ID: 230-467-6

Date Collected: 04/21/15 12:00

Matrix: Water

Date Received: 04/22/15 15:00

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m-Xylene & p-Xylene	ND		3.0		ug/L			04/29/15 19:33	1
o-Xylene	ND		2.0		ug/L			04/29/15 19:33	1
Styrene	ND		5.0		ug/L			04/29/15 19:33	1
Bromoform	ND	^	1.0		ug/L			04/29/15 19:33	1
Isopropylbenzene	ND		2.0		ug/L			04/29/15 19:33	1
Bromobenzene	ND		2.0		ug/L			04/29/15 19:33	1
N-Propylbenzene	ND		3.0		ug/L			04/29/15 19:33	1
1,2,3-Trichloropropane	ND	^	2.0		ug/L			04/29/15 19:33	1
2-Chlorotoluene	ND		3.0		ug/L			04/29/15 19:33	1
1,3,5-Trimethylbenzene	ND		3.0		ug/L			04/29/15 19:33	1
4-Chlorotoluene	ND		2.0		ug/L			04/29/15 19:33	1
t-Butylbenzene	ND		3.0		ug/L			04/29/15 19:33	1
1,2,4-Trimethylbenzene	ND		3.0		ug/L			04/29/15 19:33	1
sec-Butylbenzene	ND		3.0		ug/L			04/29/15 19:33	1
1,3-Dichlorobenzene	ND		2.0		ug/L			04/29/15 19:33	1
4-Isopropyltoluene	ND		3.0		ug/L			04/29/15 19:33	1
1,4-Dichlorobenzene	ND		2.0		ug/L			04/29/15 19:33	1
n-Butylbenzene	ND		3.0		ug/L			04/29/15 19:33	1
1,2-Dichlorobenzene	ND		2.0		ug/L			04/29/15 19:33	1
1,2-Dibromo-3-Chloropropane	ND	^	2.0		ug/L			04/29/15 19:33	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			04/29/15 19:33	1
1,2,3-Trichlorobenzene	ND		2.0		ug/L			04/29/15 19:33	1
Hexachlorobutadiene	ND		2.0		ug/L			04/29/15 19:33	1
Naphthalene	ND	^	2.0		ug/L			04/29/15 19:33	1
Methyl tert-butyl ether	ND	^	1.0		ug/L			04/29/15 19:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*94*		*85 - 120*		*04/29/15 19:33*	*1*
4-Bromofluorobenzene (Surr)	*92*		*75 - 120*		*04/29/15 19:33*	*1*
Dibromofluoromethane (Surr)	*104*		*85 - 115*		*04/29/15 19:33*	*1*
Trifluorotoluene (Surr)	*103*		*70 - 136*		*04/29/15 19:33*	*1*
1,2-Dichloroethane-d4 (Surr)	*97*		*70 - 120*		*04/29/15 19:33*	*1*

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	ND		0.060		mg/L			04/29/15 19:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*103*		*50 - 150*		*04/29/15 19:33*	*1*
4-Bromofluorobenzene (Surr)	*92*		*50 - 150*		*04/29/15 19:33*	*1*

Client Sample ID: 15-AREPL-MW-28-GW

Lab Sample ID: 230-467-7

Date Collected: 04/22/15 11:25

Matrix: Water

Date Received: 04/22/15 15:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		2.0		ug/L			04/29/15 17:46	1
Toluene	ND		2.0		ug/L			04/29/15 17:46	1
Ethylbenzene	ND		3.0		ug/L			04/29/15 17:46	1

Client Sample ID: 15-AREPL-MW-28-GW

Lab Sample ID: 230-467-7

Date Collected: 04/22/15 11:25

Matrix: Water

Date Received: 04/22/15 15:00

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m-Xylene & p-Xylene	ND		3.0		ug/L			04/29/15 17:46	1
o-Xylene	ND		2.0		ug/L			04/29/15 17:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*94*		*85 - 120*		*04/29/15 17:46*	*1*
Trifluorotoluene (Surr)	*101*		*70 - 136*		*04/29/15 17:46*	*1*
4-Bromofluorobenzene (Surr)	*98*		*75 - 120*		*04/29/15 17:46*	*1*
Dibromofluoromethane (Surr)	*100*		*85 - 115*		*04/29/15 17:46*	*1*
1,2-Dichloroethane-d4 (Surr)	*103*		*70 - 120*		*04/29/15 17:46*	*1*

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	**0.84**		0.060		mg/L			04/29/15 17:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*101*		*50 - 150*		*04/29/15 17:46*	*1*
4-Bromofluorobenzene (Surr)	*98*		*50 - 150*		*04/29/15 17:46*	*1*

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	**0.83**	**Y**	0.098		mg/L		04/28/15 17:02	04/29/15 20:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*80*		*50 - 150*	*04/28/15 17:02*	*04/29/15 20:27*	*1*

Client Sample ID: 15-AREPL-AKRRMW-22-GW

Lab Sample ID: 230-467-8

Date Collected: 04/22/15 09:50

Matrix: Water

Date Received: 04/22/15 15:00

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	**2.6**		2.0		ug/L			04/29/15 22:13	1
Chloromethane	ND		5.0		ug/L			04/29/15 22:13	1
Vinyl chloride	ND		1.0		ug/L			04/29/15 22:13	1
Bromomethane	ND		5.0		ug/L			04/29/15 22:13	1
Chloroethane	ND		5.0		ug/L			04/29/15 22:13	1
Trichlorofluoromethane	ND		3.0		ug/L			04/29/15 22:13	1
1,1-Dichloroethene	ND		2.0		ug/L			04/29/15 22:13	1
Methylene Chloride	ND		5.0		ug/L			04/29/15 22:13	1
trans-1,2-Dichloroethene	ND		1.0		ug/L			04/29/15 22:13	1
1,1-Dichloroethane	ND		2.0		ug/L			04/29/15 22:13	1
2,2-Dichloropropane	ND		3.0		ug/L			04/29/15 22:13	1
cis-1,2-Dichloroethene	ND		1.0		ug/L			04/29/15 22:13	1
Bromochloromethane	ND		2.0		ug/L			04/29/15 22:13	1
Chloroform	ND		1.0		ug/L			04/29/15 22:13	1
1,1,1-Trichloroethane	ND		3.0		ug/L			04/29/15 22:13	1
Carbon tetrachloride	ND		3.0		ug/L			04/29/15 22:13	1
1,1-Dichloropropene	ND		3.0		ug/L			04/29/15 22:13	1
Benzene	ND		2.0		ug/L			04/29/15 22:13	1
1,2-Dichloroethane	ND		1.0		ug/L			04/29/15 22:13	1

Client: Ahtna Engineering Services LLC
Project/Site: AK Real Estate

TestAmerica Job ID: 230-467-1

Client Sample ID: 15-AREPL-AKRRMW-22-GW
Date Collected: 04/22/15 09:50
Date Received: 04/22/15 15:00

Lab Sample ID: 230-467-8
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichloroethene	ND		3.0		ug/L			04/29/15 22:13	1
1,2-Dichloropropane	ND		1.0		ug/L			04/29/15 22:13	1
Dibromomethane	ND	^	1.0		ug/L			04/29/15 22:13	1
Bromodichloromethane	ND	* ^	2.0		ug/L			04/29/15 22:13	1
cis-1,3-Dichloropropene	ND		1.0		ug/L			04/29/15 22:13	1
Toluene	ND		2.0		ug/L			04/29/15 22:13	1
trans-1,3-Dichloropropene	ND	^	1.0		ug/L			04/29/15 22:13	1
1,1,2-Trichloroethane	ND	^	1.0		ug/L			04/29/15 22:13	1
Tetrachloroethene	ND		3.0		ug/L			04/29/15 22:13	1
1,3-Dichloropropane	ND	^	1.0		ug/L			04/29/15 22:13	1
Dibromochloromethane	ND	^	1.0		ug/L			04/29/15 22:13	1
1,2-Dibromoethane	ND	^	1.0		ug/L			04/29/15 22:13	1
Chlorobenzene	ND		2.0		ug/L			04/29/15 22:13	1
Ethylbenzene	ND		3.0		ug/L			04/29/15 22:13	1
1,1,1,2-Tetrachloroethane	ND		2.0		ug/L			04/29/15 22:13	1
1,1,2,2-Tetrachloroethane	ND	^	1.0		ug/L			04/29/15 22:13	1
m-Xylene & p-Xylene	ND		3.0		ug/L			04/29/15 22:13	1
o-Xylene	ND		2.0		ug/L			04/29/15 22:13	1
Styrene	ND		5.0		ug/L			04/29/15 22:13	1
Bromoform	ND	^	1.0		ug/L			04/29/15 22:13	1
Isopropylbenzene	**6.5**		2.0		ug/L			04/29/15 22:13	1
Bromobenzene	ND		2.0		ug/L			04/29/15 22:13	1
N-Propylbenzene	**11**		3.0		ug/L			04/29/15 22:13	1
1,2,3-Trichloropropane	ND	^	2.0		ug/L			04/29/15 22:13	1
2-Chlorotoluene	ND		3.0		ug/L			04/29/15 22:13	1
1,3,5-Trimethylbenzene	ND		3.0		ug/L			04/29/15 22:13	1
4-Chlorotoluene	ND		2.0		ug/L			04/29/15 22:13	1
t-Butylbenzene	ND		3.0		ug/L			04/29/15 22:13	1
1,2,4-Trimethylbenzene	**4.8**		3.0		ug/L			04/29/15 22:13	1
sec-Butylbenzene	**5.5**		3.0		ug/L			04/29/15 22:13	1
1,3-Dichlorobenzene	ND		2.0		ug/L			04/29/15 22:13	1
4-Isopropyltoluene	**4.0**		3.0		ug/L			04/29/15 22:13	1
1,4-Dichlorobenzene	ND		2.0		ug/L			04/29/15 22:13	1
n-Butylbenzene	**7.1**		3.0		ug/L			04/29/15 22:13	1
1,2-Dichlorobenzene	ND		2.0		ug/L			04/29/15 22:13	1
1,2-Dibromo-3-Chloropropane	ND	^	2.0		ug/L			04/29/15 22:13	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			04/29/15 22:13	1
1,2,3-Trichlorobenzene	ND		2.0		ug/L			04/29/15 22:13	1
Hexachlorobutadiene	ND		2.0		ug/L			04/29/15 22:13	1
Methyl tert-butyl ether	ND	^	1.0		ug/L			04/29/15 22:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*101*		*85 - 120*		*04/29/15 22:13*	*1*
4-Bromofluorobenzene (Surr)	*94*		*75 - 120*		*04/29/15 22:13*	*1*
Dibromofluoromethane (Surr)	*108*		*85 - 115*		*04/29/15 22:13*	*1*
Trifluorotoluene (Surr)	*111*		*70 - 136*		*04/29/15 22:13*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*70 - 120*		*04/29/15 22:13*	*1*

Client: Ahtna Engineering Services LLC
Project/Site: AK Real Estate

TestAmerica Job ID: 230-467-1

Client Sample ID: 15-AREPL-AKRRMW-22-GW

Lab Sample ID: 230-467-8

Date Collected: 04/22/15 09:50

Matrix: Water

Date Received: 04/22/15 15:00

Method: 8260C - Volatile Organic Compounds by GC/MS - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	30		2.0		ug/L			05/01/15 18:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*102*		*85 - 120*		*05/01/15 18:49*	*1*
4-Bromofluorobenzene (Surr)	*111*		*75 - 120*		*05/01/15 18:49*	*1*
Dibromofluoromethane (Surr)	*111*		*85 - 115*		*05/01/15 18:49*	*1*
Trifluorotoluene (Surr)	*93*		*70 - 136*		*05/01/15 18:49*	*1*
1,2-Dichloroethane-d4 (Surr)	*113*		*70 - 120*		*05/01/15 18:49*	*1*

Client Sample ID: 15-AREPL-AKRRMW-220-GW

Lab Sample ID: 230-467-9

Date Collected: 04/22/15 10:25

Matrix: Water

Date Received: 04/22/15 15:00

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	2.7		2.0		ug/L			04/29/15 22:40	1
Chloromethane	ND		5.0		ug/L			04/29/15 22:40	1
Vinyl chloride	ND		1.0		ug/L			04/29/15 22:40	1
Bromomethane	ND		5.0		ug/L			04/29/15 22:40	1
Chloroethane	ND		5.0		ug/L			04/29/15 22:40	1
Trichlorofluoromethane	ND		3.0		ug/L			04/29/15 22:40	1
1,1-Dichloroethene	ND		2.0		ug/L			04/29/15 22:40	1
Methylene Chloride	ND		5.0		ug/L			04/29/15 22:40	1
trans-1,2-Dichloroethene	ND		1.0		ug/L			04/29/15 22:40	1
1,1-Dichloroethane	ND		2.0		ug/L			04/29/15 22:40	1
2,2-Dichloropropane	ND		3.0		ug/L			04/29/15 22:40	1
cis-1,2-Dichloroethene	ND		1.0		ug/L			04/29/15 22:40	1
Bromochloromethane	ND		2.0		ug/L			04/29/15 22:40	1
Chloroform	ND		1.0		ug/L			04/29/15 22:40	1
1,1,1-Trichloroethane	ND		3.0		ug/L			04/29/15 22:40	1
Carbon tetrachloride	ND		3.0		ug/L			04/29/15 22:40	1
1,1-Dichloropropene	ND		3.0		ug/L			04/29/15 22:40	1
Benzene	ND		2.0		ug/L			04/29/15 22:40	1
1,2-Dichloroethane	ND		1.0		ug/L			04/29/15 22:40	1
Trichloroethene	ND		3.0		ug/L			04/29/15 22:40	1
1,2-Dichloropropane	ND		1.0		ug/L			04/29/15 22:40	1
Dibromomethane	ND	^	1.0		ug/L			04/29/15 22:40	1
Bromodichloromethane	ND	* ^	2.0		ug/L			04/29/15 22:40	1
cis-1,3-Dichloropropene	ND		1.0		ug/L			04/29/15 22:40	1
Toluene	ND		2.0		ug/L			04/29/15 22:40	1
trans-1,3-Dichloropropene	ND	^	1.0		ug/L			04/29/15 22:40	1
1,1,2-Trichloroethane	ND	^	1.0		ug/L			04/29/15 22:40	1
Tetrachloroethene	ND		3.0		ug/L			04/29/15 22:40	1
1,3-Dichloropropane	ND	^	1.0		ug/L			04/29/15 22:40	1
Dibromochloromethane	ND	^	1.0		ug/L			04/29/15 22:40	1
1,2-Dibromoethane	ND	^	1.0		ug/L			04/29/15 22:40	1
Chlorobenzene	ND		2.0		ug/L			04/29/15 22:40	1
Ethylbenzene	ND		3.0		ug/L			04/29/15 22:40	1
1,1,1,2-Tetrachloroethane	ND		2.0		ug/L			04/29/15 22:40	1
1,1,2,2-Tetrachloroethane	ND	^	1.0		ug/L			04/29/15 22:40	1

Client Sample ID: 15-AREPL-AKRRMW-220-GW

Lab Sample ID: 230-467-9

Date Collected: 04/22/15 10:25

Matrix: Water

Date Received: 04/22/15 15:00

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m-Xylene & p-Xylene	ND		3.0		ug/L			04/29/15 22:40	1
o-Xylene	ND		2.0		ug/L			04/29/15 22:40	1
Styrene	ND		5.0		ug/L			04/29/15 22:40	1
Bromoform	ND	^	1.0		ug/L			04/29/15 22:40	1
Isopropylbenzene	**6.6**		2.0		ug/L			04/29/15 22:40	1
Bromobenzene	ND		2.0		ug/L			04/29/15 22:40	1
N-Propylbenzene	**11**		3.0		ug/L			04/29/15 22:40	1
1,2,3-Trichloropropane	ND	^	2.0		ug/L			04/29/15 22:40	1
2-Chlorotoluene	ND		3.0		ug/L			04/29/15 22:40	1
1,3,5-Trimethylbenzene	ND		3.0		ug/L			04/29/15 22:40	1
4-Chlorotoluene	ND		2.0		ug/L			04/29/15 22:40	1
t-Butylbenzene	ND		3.0		ug/L			04/29/15 22:40	1
1,2,4-Trimethylbenzene	**5.1**		3.0		ug/L			04/29/15 22:40	1
sec-Butylbenzene	**5.6**		3.0		ug/L			04/29/15 22:40	1
1,3-Dichlorobenzene	ND		2.0		ug/L			04/29/15 22:40	1
4-Isopropyltoluene	**4.2**		3.0		ug/L			04/29/15 22:40	1
1,4-Dichlorobenzene	ND		2.0		ug/L			04/29/15 22:40	1
n-Butylbenzene	**7.3**		3.0		ug/L			04/29/15 22:40	1
1,2-Dichlorobenzene	ND		2.0		ug/L			04/29/15 22:40	1
1,2-Dibromo-3-Chloropropane	ND	^	2.0		ug/L			04/29/15 22:40	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			04/29/15 22:40	1
1,2,3-Trichlorobenzene	ND		2.0		ug/L			04/29/15 22:40	1
Hexachlorobutadiene	ND		2.0		ug/L			04/29/15 22:40	1
Methyl tert-butyl ether	ND	^	1.0		ug/L			04/29/15 22:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*101*		*85 - 120*		*04/29/15 22:40*	*1*
4-Bromofluorobenzene (Surr)	*92*		*75 - 120*		*04/29/15 22:40*	*1*
Dibromofluoromethane (Surr)	*107*		*85 - 115*		*04/29/15 22:40*	*1*
Trifluorotoluene (Surr)	*102*		*70 - 136*		*04/29/15 22:40*	*1*
1,2-Dichloroethane-d4 (Surr)	*96*		*70 - 120*		*04/29/15 22:40*	*1*

Method: 8260C - Volatile Organic Compounds by GC/MS - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**32**		2.0		ug/L			05/01/15 19:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*85 - 120*		*05/01/15 19:16*	*1*
4-Bromofluorobenzene (Surr)	*110*		*75 - 120*		*05/01/15 19:16*	*1*
Dibromofluoromethane (Surr)	*112*		*85 - 115*		*05/01/15 19:16*	*1*
Trifluorotoluene (Surr)	*95*		*70 - 136*		*05/01/15 19:16*	*1*
1,2-Dichloroethane-d4 (Surr)	*116*		*70 - 120*		*05/01/15 19:16*	*1*

Client Sample ID: 15-AREPL-AKRRMW-245-GW

Lab Sample ID: 230-467-10

Date Collected: 04/22/15 10:40

Matrix: Water

Date Received: 04/22/15 15:00

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	**13**		2.0		ug/L			04/29/15 23:06	1

Client: Ahtna Engineering Services LLC
Project/Site: AK Real Estate

TestAmerica Job ID: 230-467-1

Client Sample ID: 15-AREPL-AKRRMW-245-GW — **Lab Sample ID: 230-467-10**
Date Collected: 04/22/15 10:40 — **Matrix: Water**
Date Received: 04/22/15 15:00

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloromethane	ND		5.0		ug/L			04/29/15 23:06	1
Vinyl chloride	ND		1.0		ug/L			04/29/15 23:06	1
Bromomethane	ND		5.0		ug/L			04/29/15 23:06	1
Chloroethane	ND		5.0		ug/L			04/29/15 23:06	1
Trichlorofluoromethane	ND		3.0		ug/L			04/29/15 23:06	1
1,1-Dichloroethene	ND		2.0		ug/L			04/29/15 23:06	1
Methylene Chloride	ND		5.0		ug/L			04/29/15 23:06	1
trans-1,2-Dichloroethene	ND		1.0		ug/L			04/29/15 23:06	1
1,1-Dichloroethane	ND		2.0		ug/L			04/29/15 23:06	1
2,2-Dichloropropane	ND		3.0		ug/L			04/29/15 23:06	1
cis-1,2-Dichloroethene	ND		1.0		ug/L			04/29/15 23:06	1
Bromochloromethane	ND		2.0		ug/L			04/29/15 23:06	1
Chloroform	ND		1.0		ug/L			04/29/15 23:06	1
1,1,1-Trichloroethane	ND		3.0		ug/L			04/29/15 23:06	1
Carbon tetrachloride	ND		3.0		ug/L			04/29/15 23:06	1
1,1-Dichloropropene	ND		3.0		ug/L			04/29/15 23:06	1
Benzene	ND		2.0		ug/L			04/29/15 23:06	1
1,2-Dichloroethane	ND		1.0		ug/L			04/29/15 23:06	1
Trichloroethene	ND		3.0		ug/L			04/29/15 23:06	1
1,2-Dichloropropane	ND		1.0		ug/L			04/29/15 23:06	1
Dibromomethane	ND	^	1.0		ug/L			04/29/15 23:06	1
Bromodichloromethane	ND	* ^	2.0		ug/L			04/29/15 23:06	1
cis-1,3-Dichloropropene	ND		1.0		ug/L			04/29/15 23:06	1
Toluene	ND		2.0		ug/L			04/29/15 23:06	1
trans-1,3-Dichloropropene	ND	^	1.0		ug/L			04/29/15 23:06	1
1,1,2-Trichloroethane	ND	^	1.0		ug/L			04/29/15 23:06	1
Tetrachloroethene	ND		3.0		ug/L			04/29/15 23:06	1
1,3-Dichloropropane	ND	^	1.0		ug/L			04/29/15 23:06	1
Dibromochloromethane	ND	^	1.0		ug/L			04/29/15 23:06	1
1,2-Dibromoethane	ND	^	1.0		ug/L			04/29/15 23:06	1
Chlorobenzene	ND		2.0		ug/L			04/29/15 23:06	1
Ethylbenzene	ND		3.0		ug/L			04/29/15 23:06	1
1,1,1,2-Tetrachloroethane	ND		2.0		ug/L			04/29/15 23:06	1
1,1,2,2-Tetrachloroethane	ND	^	1.0		ug/L			04/29/15 23:06	1
m-Xylene & p-Xylene	ND		3.0		ug/L			04/29/15 23:06	1
o-Xylene	ND		2.0		ug/L			04/29/15 23:06	1
Styrene	ND		5.0		ug/L			04/29/15 23:06	1
Bromoform	ND	^	1.0		ug/L			04/29/15 23:06	1
Isopropylbenzene	ND		2.0		ug/L			04/29/15 23:06	1
Bromobenzene	ND		2.0		ug/L			04/29/15 23:06	1
N-Propylbenzene	ND		3.0		ug/L			04/29/15 23:06	1
1,2,3-Trichloropropane	ND	^	2.0		ug/L			04/29/15 23:06	1
2-Chlorotoluene	ND		3.0		ug/L			04/29/15 23:06	1
1,3,5-Trimethylbenzene	ND		3.0		ug/L			04/29/15 23:06	1
4-Chlorotoluene	ND		2.0		ug/L			04/29/15 23:06	1
t-Butylbenzene	ND		3.0		ug/L			04/29/15 23:06	1
1,2,4-Trimethylbenzene	ND		3.0		ug/L			04/29/15 23:06	1
sec-Butylbenzene	ND		3.0		ug/L			04/29/15 23:06	1
1,3-Dichlorobenzene	ND		2.0		ug/L			04/29/15 23:06	1

Client: Ahtna Engineering Services LLC
Project/Site: AK Real Estate

TestAmerica Job ID: 230-467-1

Client Sample ID: 15-AREPL-AKRRMW-245-GW
Date Collected: 04/22/15 10:40
Date Received: 04/22/15 15:00

Lab Sample ID: 230-467-10
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Isopropyltoluene	ND		3.0		ug/L			04/29/15 23:06	1
1,4-Dichlorobenzene	ND		2.0		ug/L			04/29/15 23:06	1
n-Butylbenzene	ND		3.0		ug/L			04/29/15 23:06	1
1,2-Dichlorobenzene	ND		2.0		ug/L			04/29/15 23:06	1
1,2-Dibromo-3-Chloropropane	ND	^	2.0		ug/L			04/29/15 23:06	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			04/29/15 23:06	1
1,2,3-Trichlorobenzene	ND		2.0		ug/L			04/29/15 23:06	1
Hexachlorobutadiene	ND		2.0		ug/L			04/29/15 23:06	1
Naphthalene	ND	^	2.0		ug/L			04/29/15 23:06	1
Methyl tert-butyl ether	ND	^	1.0		ug/L			04/29/15 23:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*85 - 120*		*04/29/15 23:06*	*1*
4-Bromofluorobenzene (Surr)	*93*		*75 - 120*		*04/29/15 23:06*	*1*
Dibromofluoromethane (Surr)	*108*		*85 - 115*		*04/29/15 23:06*	*1*
Trifluorotoluene (Surr)	*106*		*70 - 136*		*04/29/15 23:06*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*70 - 120*		*04/29/15 23:06*	*1*

Surrogate Summary

Client: Ahtna Engineering Services LLC
Project/Site: AK Real Estate

TestAmerica Job ID: 230-467-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)				
		TOL	TFT	BFB	DBFM	12DCE
Lab Sample ID	Client Sample ID	(85-120)	(70-136)	(75-120)	(85-115)	(70-120)
230-467-1	15-AREPL-4GMW-13-GW	99	104	95	107	98
230-467-2	15-AREPL-4GMW-16-GW	95	102	95	100	97
230-467-3	15-AREPL-4GMW-14-GW	100	106	97	105	100
230-467-5	15-AREPL-4GMW-15-GW	98	99	94	104	96
230-467-7	15-AREPL-MW-28-GW	94	101	98	100	103
LCS 580-188125/5	Lab Control Sample	98	103	95	109	108
LCSD 580-188125/6	Lab Control Sample Dup	98	104	99	101	99
MB 580-188125/4	Method Blank	95	89	96	109	114

Surrogate Legend

TOL = Toluene-d8 (Surr)
TFT = Trifluorotoluene (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
12DCE = 1,2-Dichloroethane-d4 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)				
		TOL	BFB	DBFM	TFT	12DCE
Lab Sample ID	Client Sample ID	(85-120)	(75-120)	(85-115)	(70-136)	(70-120)
230-467-4	15-AREPL-MW-B-3-GW	99	92	104	102	93
230-467-4 - RA	15-AREPL-MW-B-3-GW	104	104	108	94	112
230-467-6	15-AREPL-TB	94	92	104	103	97
230-467-8	15-AREPL-AKRRMW-22-GW	101	94	108	111	95
230-467-8 - RA	15-AREPL-AKRRMW-22-GW	102	111	111	93	113
230-467-9	15-AREPL-AKRRMW-220-GW	101	92	107	102	96
230-467-9 - RA	15-AREPL-AKRRMW-220-GW	103	110	112	95	116
230-467-10	15-AREPL-AKRRMW-245-GW	103	93	108	106	93
LCS 580-188126/5	Lab Control Sample	98	95	109	103	108
LCS 580-188362/5	Lab Control Sample	108	98	101	97	107
LCSD 580-188126/6	Lab Control Sample Dup	98	99	101	104	99
LCSD 580-188362/6	Lab Control Sample Dup	100	106	107	98	105
MB 580-188126/4	Method Blank	95	96	109	89	114
MB 580-188362/4	Method Blank	103	102	105	98	108

Surrogate Legend

TOL = Toluene-d8 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TFT = Trifluorotoluene (Surr)
12DCE = 1,2-Dichloroethane-d4 (Surr)

Surrogate Summary

Client: Ahtna Engineering Services LLC
Project/Site: AK Real Estate

TestAmerica Job ID: 230-467-1

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TFT	BFB						
Lab Sample ID	Client Sample ID	(50-150)	(50-150)						
230-467-1	15-AREPL-4GMW-13-GW	102	100						
230-467-2	15-AREPL-4GMW-16-GW	99	99						
230-467-3	15-AREPL-4GMW-14-GW	105	100						
230-467-5	15-AREPL-4GMW-15-GW	103	95						
230-467-6	15-AREPL-TB	103	92						
230-467-7	15-AREPL-MW-28-GW	101	98						
230-467-7 MS	15-AREPL-MW-28-GW	103	95						
230-467-7 MSD	15-AREPL-MW-28-GW	104	96						
LCS 580-188124/27	Lab Control Sample	100	96						
LCS 580-188437/9	Lab Control Sample	105	95						
LCSD 580-188124/28	Lab Control Sample Dup	99	94						
LCSD 580-188437/10	Lab Control Sample Dup	105	97						
MB 580-188124/4	Method Blank	89	96						
MB 580-188437/6	Method Blank	102	95						

Surrogate Legend

TFT = Trifluorotoluene (Surr)

BFB = 4-Bromofluorobenzene (Surr)

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		OTPH							
Lab Sample ID	Client Sample ID	(50-150)							
230-467-1	15-AREPL-4GMW-13-GW	77							
230-467-2	15-AREPL-4GMW-16-GW	81							
230-467-3	15-AREPL-4GMW-14-GW	80							
230-467-5	15-AREPL-4GMW-15-GW	76							
230-467-7	15-AREPL-MW-28-GW	80							
LCS 580-188080/2-A	Lab Control Sample	82							
LCSD 580-188080/3-A	Lab Control Sample Dup	83							
MB 580-188080/1-A	Method Blank	77							

Surrogate Legend

OTPH = o-Terphenyl

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 580-188125/4
Matrix: Water
Analysis Batch: 188125

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		2.0		ug/L			04/29/15 15:31	1
Toluene	ND		2.0		ug/L			04/29/15 15:31	1
Ethylbenzene	ND		3.0		ug/L			04/29/15 15:31	1
m-Xylene & p-Xylene	ND		3.0		ug/L			04/29/15 15:31	1
o-Xylene	ND		2.0		ug/L			04/29/15 15:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*95*		*85 - 120*		*04/29/15 15:31*	*1*
Trifluorotoluene (Surr)	*89*		*70 - 136*		*04/29/15 15:31*	*1*
4-Bromofluorobenzene (Surr)	*96*		*75 - 120*		*04/29/15 15:31*	*1*
Dibromofluoromethane (Surr)	*109*		*85 - 115*		*04/29/15 15:31*	*1*
1,2-Dichloroethane-d4 (Surr)	*114*		*70 - 120*		*04/29/15 15:31*	*1*

Lab Sample ID: LCS 580-188125/5
Matrix: Water
Analysis Batch: 188125

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			20.0	21.0		ug/L		105	80 - 120		
Toluene			20.0	19.4		ug/L		97	75 - 120		
Ethylbenzene			20.0	20.2		ug/L		101	75 - 125		
m-Xylene & p-Xylene			20.0	20.8		ug/L		104	75 - 130		
o-Xylene			20.0	21.0		ug/L		105	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*98*		*85 - 120*
Trifluorotoluene (Surr)	*103*		*70 - 136*
4-Bromofluorobenzene (Surr)	*95*		*75 - 120*
Dibromofluoromethane (Surr)	*109*		*85 - 115*
1,2-Dichloroethane-d4 (Surr)	*108*		*70 - 120*

Lab Sample ID: LCSD 580-188125/6
Matrix: Water
Analysis Batch: 188125

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			20.0	21.1		ug/L		106	80 - 120	1	30
Toluene			20.0	19.9		ug/L		100	75 - 120	3	30
Ethylbenzene			20.0	20.3		ug/L		102	75 - 125	1	30
m-Xylene & p-Xylene			20.0	20.8		ug/L		104	75 - 130	0	30
o-Xylene			20.0	20.6		ug/L		103	80 - 120	2	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*98*		*85 - 120*
Trifluorotoluene (Surr)	*104*		*70 - 136*
4-Bromofluorobenzene (Surr)	*99*		*75 - 120*
Dibromofluoromethane (Surr)	*101*		*85 - 115*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 580-188125/6
Matrix: Water
Analysis Batch: 188125

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*99*		*70 - 120*

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-188126/4
Matrix: Water
Analysis Batch: 188126

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	ND		2.0		ug/L			04/29/15 15:31	1
Chloromethane	ND		5.0		ug/L			04/29/15 15:31	1
Vinyl chloride	ND		1.0		ug/L			04/29/15 15:31	1
Bromomethane	ND		5.0		ug/L			04/29/15 15:31	1
Chloroethane	ND		5.0		ug/L			04/29/15 15:31	1
Trichlorofluoromethane	ND		3.0		ug/L			04/29/15 15:31	1
1,1-Dichloroethene	ND		2.0		ug/L			04/29/15 15:31	1
Methylene Chloride	ND		5.0		ug/L			04/29/15 15:31	1
trans-1,2-Dichloroethene	ND		1.0		ug/L			04/29/15 15:31	1
1,1-Dichloroethane	ND		2.0		ug/L			04/29/15 15:31	1
2,2-Dichloropropane	ND		3.0		ug/L			04/29/15 15:31	1
cis-1,2-Dichloroethene	ND		1.0		ug/L			04/29/15 15:31	1
Bromochloromethane	ND		2.0		ug/L			04/29/15 15:31	1
Chloroform	ND		1.0		ug/L			04/29/15 15:31	1
1,1,1-Trichloroethane	ND		3.0		ug/L			04/29/15 15:31	1
Carbon tetrachloride	ND		3.0		ug/L			04/29/15 15:31	1
1,1-Dichloropropene	ND		3.0		ug/L			04/29/15 15:31	1
Benzene	ND		2.0		ug/L			04/29/15 15:31	1
1,2-Dichloroethane	ND		1.0		ug/L			04/29/15 15:31	1
Trichloroethene	ND		3.0		ug/L			04/29/15 15:31	1
1,2-Dichloropropane	ND		1.0		ug/L			04/29/15 15:31	1
Dibromomethane	ND	^	1.0		ug/L			04/29/15 15:31	1
Bromodichloromethane	ND	^	2.0		ug/L			04/29/15 15:31	1
cis-1,3-Dichloropropene	ND		1.0		ug/L			04/29/15 15:31	1
Toluene	ND		2.0		ug/L			04/29/15 15:31	1
trans-1,3-Dichloropropene	ND	^	1.0		ug/L			04/29/15 15:31	1
1,1,2-Trichloroethane	ND	^	1.0		ug/L			04/29/15 15:31	1
Tetrachloroethene	ND		3.0		ug/L			04/29/15 15:31	1
1,3-Dichloropropane	ND	^	1.0		ug/L			04/29/15 15:31	1
Dibromochloromethane	ND	^	1.0		ug/L			04/29/15 15:31	1
1,2-Dibromoethane	ND	^	1.0		ug/L			04/29/15 15:31	1
Chlorobenzene	ND		2.0		ug/L			04/29/15 15:31	1
Ethylbenzene	ND		3.0		ug/L			04/29/15 15:31	1
1,1,1,2-Tetrachloroethane	ND		2.0		ug/L			04/29/15 15:31	1
1,1,2,2-Tetrachloroethane	ND	^	1.0		ug/L			04/29/15 15:31	1
m-Xylene & p-Xylene	ND		3.0		ug/L			04/29/15 15:31	1
o-Xylene	ND		2.0		ug/L			04/29/15 15:31	1
Styrene	ND		5.0		ug/L			04/29/15 15:31	1
Bromoform	ND	^	1.0		ug/L			04/29/15 15:31	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 580-188126/4
Matrix: Water
Analysis Batch: 188126

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isopropylbenzene	ND		2.0		ug/L			04/29/15 15:31	1
Bromobenzene	ND		2.0		ug/L			04/29/15 15:31	1
N-Propylbenzene	ND		3.0		ug/L			04/29/15 15:31	1
1,2,3-Trichloropropane	ND	^	2.0		ug/L			04/29/15 15:31	1
2-Chlorotoluene	ND		3.0		ug/L			04/29/15 15:31	1
1,3,5-Trimethylbenzene	ND		3.0		ug/L			04/29/15 15:31	1
4-Chlorotoluene	ND		2.0		ug/L			04/29/15 15:31	1
t-Butylbenzene	ND		3.0		ug/L			04/29/15 15:31	1
1,2,4-Trimethylbenzene	ND		3.0		ug/L			04/29/15 15:31	1
sec-Butylbenzene	ND		3.0		ug/L			04/29/15 15:31	1
1,3-Dichlorobenzene	ND		2.0		ug/L			04/29/15 15:31	1
4-Isopropyltoluene	ND		3.0		ug/L			04/29/15 15:31	1
1,4-Dichlorobenzene	ND		2.0		ug/L			04/29/15 15:31	1
n-Butylbenzene	ND		3.0		ug/L			04/29/15 15:31	1
1,2-Dichlorobenzene	ND		2.0		ug/L			04/29/15 15:31	1
1,2-Dibromo-3-Chloropropane	ND	^	2.0		ug/L			04/29/15 15:31	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			04/29/15 15:31	1
1,2,3-Trichlorobenzene	ND		2.0		ug/L			04/29/15 15:31	1
Hexachlorobutadiene	ND		2.0		ug/L			04/29/15 15:31	1
Naphthalene	ND	^	2.0		ug/L			04/29/15 15:31	1
Methyl tert-butyl ether	ND	^	1.0		ug/L			04/29/15 15:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*95*		*85 - 120*		*04/29/15 15:31*	*1*
4-Bromofluorobenzene (Surr)	*96*		*75 - 120*		*04/29/15 15:31*	*1*
Dibromofluoromethane (Surr)	*109*		*85 - 115*		*04/29/15 15:31*	*1*
Trifluorotoluene (Surr)	*89*		*70 - 136*		*04/29/15 15:31*	*1*
1,2-Dichloroethane-d4 (Surr)	*114*		*70 - 120*		*04/29/15 15:31*	*1*

Lab Sample ID: LCS 580-188126/5
Matrix: Water
Analysis Batch: 188126

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dichlorodifluoromethane	20.0	23.2		ug/L		116	30 - 155
Chloromethane	20.0	20.9		ug/L		105	40 - 125
Vinyl chloride	20.0	20.9		ug/L		105	50 - 145
Bromomethane	20.0	23.2		ug/L		116	30 - 145
Chloroethane	20.0	20.5		ug/L		103	60 - 135
Trichlorofluoromethane	20.0	23.4		ug/L		117	60 - 145
1,1-Dichloroethene	20.0	20.6		ug/L		103	70 - 130
Methylene Chloride	20.0	21.7		ug/L		109	55 - 140
trans-1,2-Dichloroethene	20.0	22.2		ug/L		111	60 - 140
1,1-Dichloroethane	20.0	21.1		ug/L		106	70 - 135
2,2-Dichloropropane	20.0	23.9		ug/L		119	70 - 135
cis-1,2-Dichloroethene	20.0	22.3		ug/L		111	70 - 125
Bromochloromethane	20.0	23.3		ug/L		116	65 - 130
Chloroform	20.0	23.6		ug/L		118	65 - 135

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 580-188126/5
Matrix: Water
Analysis Batch: 188126

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	20.0	23.6		ug/L		118	65 - 130
Carbon tetrachloride	20.0	24.3		ug/L		121	65 - 140
1,1-Dichloropropene	20.0	23.9		ug/L		120	75 - 130
Benzene	20.0	21.0		ug/L		105	80 - 120
1,2-Dichloroethane	20.0	22.6		ug/L		113	70 - 130
Trichloroethene	20.0	23.2		ug/L		116	70 - 125
1,2-Dichloropropane	20.0	20.1		ug/L		100	75 - 125
Dibromomethane	20.0	23.1	^	ug/L		115	75 - 125
Bromodichloromethane	20.0	24.2	* ^	ug/L		121	75 - 120
cis-1,3-Dichloropropene	20.0	21.6		ug/L		108	70 - 130
Toluene	20.0	19.4		ug/L		97	75 - 120
trans-1,3-Dichloropropene	20.0	23.7	^	ug/L		118	55 - 140
1,1,2-Trichloroethane	20.0	21.7	^	ug/L		108	75 - 125
Tetrachloroethene	20.0	22.9		ug/L		115	45 - 150
1,3-Dichloropropane	20.0	20.3	^	ug/L		101	75 - 125
Dibromochloromethane	20.0	23.4	^	ug/L		117	60 - 135
1,2-Dibromoethane	20.0	22.0	^	ug/L		110	80 - 120
Chlorobenzene	20.0	20.2		ug/L		101	80 - 120
Ethylbenzene	20.0	20.2		ug/L		101	75 - 125
1,1,1,2-Tetrachloroethane	20.0	23.7		ug/L		119	80 - 130
1,1,2,2-Tetrachloroethane	20.0	23.0	^	ug/L		115	65 - 130
m-Xylene & p-Xylene	20.0	20.8		ug/L		104	75 - 130
o-Xylene	20.0	21.0		ug/L		105	80 - 120
Styrene	20.0	20.2		ug/L		101	65 - 135
Bromoform	20.0	22.0	^	ug/L		110	70 - 130
Isopropylbenzene	20.0	21.7		ug/L		108	75 - 125
Bromobenzene	20.0	20.1		ug/L		101	75 - 125
N-Propylbenzene	20.0	20.8		ug/L		104	70 - 130
1,2,3-Trichloropropane	20.0	22.8	^	ug/L		114	75 - 125
2-Chlorotoluene	20.0	21.0		ug/L		105	75 - 125
1,3,5-Trimethylbenzene	20.0	20.4		ug/L		102	75 - 130
4-Chlorotoluene	20.0	19.6		ug/L		98	75 - 130
t-Butylbenzene	20.0	21.7		ug/L		108	70 - 130
1,2,4-Trimethylbenzene	20.0	19.9		ug/L		100	75 - 130
sec-Butylbenzene	20.0	20.6		ug/L		103	70 - 125
1,3-Dichlorobenzene	20.0	20.6		ug/L		103	75 - 125
4-Isopropyltoluene	20.0	20.3		ug/L		101	75 - 130
1,4-Dichlorobenzene	20.0	20.5		ug/L		102	75 - 125
n-Butylbenzene	20.0	20.7		ug/L		104	70 - 135
1,2-Dichlorobenzene	20.0	21.3		ug/L		106	70 - 120
1,2-Dibromo-3-Chloropropane	20.0	23.0	^	ug/L		115	50 - 130
1,2,4-Trichlorobenzene	20.0	21.5		ug/L		107	65 - 135
1,2,3-Trichlorobenzene	20.0	21.4		ug/L		107	55 - 140
Hexachlorobutadiene	20.0	20.5		ug/L		102	50 - 140
Naphthalene	20.0	22.9	^	ug/L		114	55 - 140
Methyl tert-butyl ether	20.0	23.3	^	ug/L		116	65 - 125

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 580-188126/5
Matrix: Water
Analysis Batch: 188126

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	98		85 - 120
4-Bromofluorobenzene (Surr)	95		75 - 120
Dibromofluoromethane (Surr)	109		85 - 115
Trifluorotoluene (Surr)	103		70 - 136
1,2-Dichloroethane-d4 (Surr)	108		70 - 120

Lab Sample ID: LCSD 580-188126/6
Matrix: Water
Analysis Batch: 188126

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dichlorodifluoromethane			20.0	21.1		ug/L		105	30 - 155	10	30
Chloromethane			20.0	19.4		ug/L		97	40 - 125	7	30
Vinyl chloride			20.0	19.3		ug/L		97	50 - 145	8	30
Bromomethane			20.0	21.5		ug/L		107	30 - 145	8	30
Chloroethane			20.0	19.3		ug/L		97	60 - 135	6	30
Trichlorofluoromethane			20.0	20.7		ug/L		103	60 - 145	13	30
1,1-Dichloroethene			20.0	20.6		ug/L		103	70 - 130	0	30
Methylene Chloride			20.0	20.6		ug/L		103	55 - 140	5	30
trans-1,2-Dichloroethene			20.0	21.5		ug/L		108	60 - 140	3	30
1,1-Dichloroethane			20.0	20.2		ug/L		101	70 - 135	5	30
2,2-Dichloropropane			20.0	22.3		ug/L		111	70 - 135	7	30
cis-1,2-Dichloroethene			20.0	21.4		ug/L		107	70 - 125	4	30
Bromochloromethane			20.0	22.5		ug/L		113	65 - 130	3	30
Chloroform			20.0	22.5		ug/L		112	65 - 135	5	30
1,1,1-Trichloroethane			20.0	22.5		ug/L		112	65 - 130	5	30
Carbon tetrachloride			20.0	23.4		ug/L		117	65 - 140	3	30
1,1-Dichloropropene			20.0	24.1		ug/L		120	75 - 130	1	30
Benzene			20.0	21.1		ug/L		106	80 - 120	1	30
1,2-Dichloroethane			20.0	21.8		ug/L		109	70 - 130	3	30
Trichloroethene			20.0	23.8		ug/L		119	70 - 125	3	30
1,2-Dichloropropane			20.0	20.4		ug/L		102	75 - 125	1	30
Dibromomethane			20.0	22.7	^	ug/L		114	75 - 125	2	30
Bromodichloromethane			20.0	23.9	^	ug/L		120	75 - 120	1	30
cis-1,3-Dichloropropene			20.0	23.0		ug/L		115	70 - 130	6	30
Toluene			20.0	19.9		ug/L		100	75 - 120	3	30
trans-1,3-Dichloropropene			20.0	26.3	^	ug/L		131	55 - 140	10	30
1,1,2-Trichloroethane			20.0	22.3	^	ug/L		112	75 - 125	3	30
Tetrachloroethene			20.0	23.9		ug/L		119	45 - 150	4	30
1,3-Dichloropropane			20.0	21.6	^	ug/L		108	75 - 125	6	30
Dibromochloromethane			20.0	23.8	^	ug/L		119	60 - 135	2	30
1,2-Dibromoethane			20.0	23.6	^	ug/L		118	80 - 120	7	30
Chlorobenzene			20.0	21.1		ug/L		106	80 - 120	5	30
Ethylbenzene			20.0	20.3		ug/L		102	75 - 125	1	30
1,1,1,2-Tetrachloroethane			20.0	22.8		ug/L		114	80 - 130	4	30
1,1,2,2-Tetrachloroethane			20.0	22.5	^	ug/L		113	65 - 130	2	30
m-Xylene & p-Xylene			20.0	20.8		ug/L		104	75 - 130	0	30
o-Xylene			20.0	20.6		ug/L		103	80 - 120	2	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 580-188126/6
Matrix: Water
Analysis Batch: 188126

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Styrene	20.0	20.7		ug/L		104	65 - 135	3	30
Bromoform	20.0	22.7	^	ug/L		113	70 - 130	3	30
Isopropylbenzene	20.0	21.5		ug/L		108	75 - 125	1	30
Bromobenzene	20.0	21.2		ug/L		106	75 - 125	5	30
N-Propylbenzene	20.0	21.9		ug/L		109	70 - 130	5	30
1,2,3-Trichloropropane	20.0	22.4	^	ug/L		112	75 - 125	2	30
2-Chlorotoluene	20.0	21.3		ug/L		107	75 - 125	1	30
1,3,5-Trimethylbenzene	20.0	21.1		ug/L		105	75 - 130	3	30
4-Chlorotoluene	20.0	20.4		ug/L		102	75 - 130	4	30
t-Butylbenzene	20.0	23.1		ug/L		116	70 - 130	7	30
1,2,4-Trimethylbenzene	20.0	20.7		ug/L		104	75 - 130	4	30
sec-Butylbenzene	20.0	21.8		ug/L		109	70 - 125	6	30
1,3-Dichlorobenzene	20.0	21.3		ug/L		107	75 - 125	4	30
4-Isopropyltoluene	20.0	21.4		ug/L		107	75 - 130	6	30
1,4-Dichlorobenzene	20.0	21.5		ug/L		107	75 - 125	5	30
n-Butylbenzene	20.0	21.6		ug/L		108	70 - 135	4	30
1,2-Dichlorobenzene	20.0	21.6		ug/L		108	70 - 120	1	30
1,2-Dibromo-3-Chloropropane	20.0	23.9	^	ug/L		119	50 - 130	4	30
1,2,4-Trichlorobenzene	20.0	22.3		ug/L		112	65 - 135	4	30
1,2,3-Trichlorobenzene	20.0	22.2		ug/L		111	55 - 140	4	30
Hexachlorobutadiene	20.0	23.2		ug/L		116	50 - 140	13	30
Naphthalene	20.0	23.4	^	ug/L		117	55 - 140	2	30
Methyl tert-butyl ether	20.0	21.8	^	ug/L		109	65 - 125	7	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*98*		*85 - 120*
4-Bromofluorobenzene (Surr)	*99*		*75 - 120*
Dibromofluoromethane (Surr)	*101*		*85 - 115*
Trifluorotoluene (Surr)	*104*		*70 - 136*
1,2-Dichloroethane-d4 (Surr)	*99*		*70 - 120*

Lab Sample ID: MB 580-188362/4
Matrix: Water
Analysis Batch: 188362

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		2.0		ug/L			05/01/15 11:34	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*85 - 120*		*05/01/15 11:34*	*1*
4-Bromofluorobenzene (Surr)	*102*		*75 - 120*		*05/01/15 11:34*	*1*
Dibromofluoromethane (Surr)	*105*		*85 - 115*		*05/01/15 11:34*	*1*
Trifluorotoluene (Surr)	*98*		*70 - 136*		*05/01/15 11:34*	*1*
1,2-Dichloroethane-d4 (Surr)	*108*		*70 - 120*		*05/01/15 11:34*	*1*

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 580-188362/5
Matrix: Water
Analysis Batch: 188362

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Naphthalene			20.0	21.1		ug/L		106	55 - 140		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*108*		*85 - 120*
4-Bromofluorobenzene (Surr)	*98*		*75 - 120*
Dibromofluoromethane (Surr)	*101*		*85 - 115*
Trifluorotoluene (Surr)	*97*		*70 - 136*
1,2-Dichloroethane-d4 (Surr)	*107*		*70 - 120*

Lab Sample ID: LCSD 580-188362/6
Matrix: Water
Analysis Batch: 188362

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Naphthalene			20.0	23.9		ug/L		120	55 - 140	12	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*100*		*85 - 120*
4-Bromofluorobenzene (Surr)	*106*		*75 - 120*
Dibromofluoromethane (Surr)	*107*		*85 - 115*
Trifluorotoluene (Surr)	*98*		*70 - 136*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 120*

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Lab Sample ID: MB 580-188124/4
Matrix: Water
Analysis Batch: 188124

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	ND		0.060		mg/L			04/29/15 15:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*89*		*50 - 150*		*04/29/15 15:31*	*1*
4-Bromofluorobenzene (Surr)	*96*		*50 - 150*		*04/29/15 15:31*	*1*

Lab Sample ID: LCS 580-188124/27
Matrix: Water
Analysis Batch: 188124

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline Range Organics (GRO) -C6-C10			0.200	0.228		mg/L		114	60 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Trifluorotoluene (Surr)	*100*		*50 - 150*

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS) (Continued)

Lab Sample ID: LCS 580-188124/27
Matrix: Water
Analysis Batch: 188124

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	96		50 - 150

Lab Sample ID: LCSD 580-188124/28
Matrix: Water
Analysis Batch: 188124

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics (GRO) -C6-C10			0.200	0.230		mg/L		115	60 - 120	1	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Trifluorotoluene (Surr)	99		50 - 150
4-Bromofluorobenzene (Surr)	94		50 - 150

Lab Sample ID: 230-467-7 MS
Matrix: Water
Analysis Batch: 188124

Client Sample ID: 15-AREPL-MW-28-GW
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline Range Organics (GRO) -C6-C10	0.84		0.200	1.00	E 4	mg/L		80	60 - 120		

Surrogate	MS %Recovery	MS Qualifier	Limits
Trifluorotoluene (Surr)	103		50 - 150
4-Bromofluorobenzene (Surr)	95		50 - 150

Lab Sample ID: 230-467-7 MSD
Matrix: Water
Analysis Batch: 188124

Client Sample ID: 15-AREPL-MW-28-GW
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics (GRO) -C6-C10	0.84		0.200	0.960	4	mg/L		58	60 - 120	5	20

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Trifluorotoluene (Surr)	104		50 - 150
4-Bromofluorobenzene (Surr)	96		50 - 150

Lab Sample ID: MB 580-188437/6
Matrix: Water
Analysis Batch: 188437

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	ND		0.060		mg/L			05/02/15 11:36	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	102		50 - 150		05/02/15 11:36	1

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS) (Continued)

Lab Sample ID: MB 580-188437/6
Matrix: Water
Analysis Batch: 188437

Client Sample ID: Method Blank
Prep Type: Total/NA

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		50 - 150		05/02/15 11:36	1

Lab Sample ID: LCS 580-188437/9
Matrix: Water
Analysis Batch: 188437

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline Range Organics (GRO) -C6-C10			0.200	0.174		mg/L		87	60 - 120		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Trifluorotoluene (Surr)	105		50 - 150
4-Bromofluorobenzene (Surr)	95		50 - 150

Lab Sample ID: LCSD 580-188437/10
Matrix: Water
Analysis Batch: 188437

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics (GRO) -C6-C10			0.200	0.185		mg/L		92	60 - 120	6	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Trifluorotoluene (Surr)	105		50 - 150
4-Bromofluorobenzene (Surr)	97		50 - 150

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Lab Sample ID: MB 580-188080/1-A
Matrix: Water
Analysis Batch: 188090

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 188080

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	ND		0.10		mg/L		04/28/15 17:02	04/29/15 18:20	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	77		50 - 150	04/28/15 17:02	04/29/15 18:20	1

Lab Sample ID: LCS 580-188080/2-A
Matrix: Water
Analysis Batch: 188090

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 188080

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
DRO (nC10-<nC25)			4.00	3.47		mg/L		87	75 - 125		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
o-Terphenyl	82		50 - 150

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC) (Continued)

Lab Sample ID: LCSD 580-188080/3-A
Matrix: Water
Analysis Batch: 188090

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 188080

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
DRO (nC10-<nC25)			4.00	3.50		mg/L		87	75 - 125	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*83*		*50 - 150*

GC/MS VOA

Analysis Batch: 188124

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
230-467-6	15-AREPL-TB	Total/NA	Water	AK101	
230-467-7	15-AREPL-MW-28-GW	Total/NA	Water	AK101	
230-467-7 MS	15-AREPL-MW-28-GW	Total/NA	Water	AK101	
230-467-7 MSD	15-AREPL-MW-28-GW	Total/NA	Water	AK101	
LCS 580-188124/27	Lab Control Sample	Total/NA	Water	AK101	
LCSD 580-188124/28	Lab Control Sample Dup	Total/NA	Water	AK101	
MB 580-188124/4	Method Blank	Total/NA	Water	AK101	

Analysis Batch: 188125

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
230-467-1	15-AREPL-4GMW-13-GW	Total/NA	Water	8260B	
230-467-2	15-AREPL-4GMW-16-GW	Total/NA	Water	8260B	
230-467-3	15-AREPL-4GMW-14-GW	Total/NA	Water	8260B	
230-467-5	15-AREPL-4GMW-15-GW	Total/NA	Water	8260B	
230-467-7	15-AREPL-MW-28-GW	Total/NA	Water	8260B	
LCS 580-188125/5	Lab Control Sample	Total/NA	Water	8260B	
LCSD 580-188125/6	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 580-188125/4	Method Blank	Total/NA	Water	8260B	

Analysis Batch: 188126

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
230-467-4	15-AREPL-MW-B-3-GW	Total/NA	Water	8260C	
230-467-6	15-AREPL-TB	Total/NA	Water	8260C	
230-467-8	15-AREPL-AKRRMW-22-GW	Total/NA	Water	8260C	
230-467-9	15-AREPL-AKRRMW-220-GW	Total/NA	Water	8260C	
230-467-10	15-AREPL-AKRRMW-245-GW	Total/NA	Water	8260C	
LCS 580-188126/5	Lab Control Sample	Total/NA	Water	8260C	
LCSD 580-188126/6	Lab Control Sample Dup	Total/NA	Water	8260C	
MB 580-188126/4	Method Blank	Total/NA	Water	8260C	

Analysis Batch: 188362

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
230-467-4 - RA	15-AREPL-MW-B-3-GW	Total/NA	Water	8260C	
230-467-8 - RA	15-AREPL-AKRRMW-22-GW	Total/NA	Water	8260C	
230-467-9 - RA	15-AREPL-AKRRMW-220-GW	Total/NA	Water	8260C	
LCS 580-188362/5	Lab Control Sample	Total/NA	Water	8260C	
LCSD 580-188362/6	Lab Control Sample Dup	Total/NA	Water	8260C	
MB 580-188362/4	Method Blank	Total/NA	Water	8260C	

Analysis Batch: 188437

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
230-467-1	15-AREPL-4GMW-13-GW	Total/NA	Water	AK101	
230-467-2	15-AREPL-4GMW-16-GW	Total/NA	Water	AK101	
230-467-3	15-AREPL-4GMW-14-GW	Total/NA	Water	AK101	
230-467-5	15-AREPL-4GMW-15-GW	Total/NA	Water	AK101	
LCS 580-188437/9	Lab Control Sample	Total/NA	Water	AK101	
LCSD 580-188437/10	Lab Control Sample Dup	Total/NA	Water	AK101	
MB 580-188437/6	Method Blank	Total/NA	Water	AK101	

GC Semi VOA

Prep Batch: 188080

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
230-467-1	15-AREPL-4GMW-13-GW	Total/NA	Water	3510C	
230-467-2	15-AREPL-4GMW-16-GW	Total/NA	Water	3510C	
230-467-3	15-AREPL-4GMW-14-GW	Total/NA	Water	3510C	
230-467-5	15-AREPL-4GMW-15-GW	Total/NA	Water	3510C	
230-467-7	15-AREPL-MW-28-GW	Total/NA	Water	3510C	
LCS 580-188080/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 580-188080/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	
MB 580-188080/1-A	Method Blank	Total/NA	Water	3510C	

Analysis Batch: 188090

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
230-467-1	15-AREPL-4GMW-13-GW	Total/NA	Water	AK102 & 103	188080
230-467-2	15-AREPL-4GMW-16-GW	Total/NA	Water	AK102 & 103	188080
230-467-3	15-AREPL-4GMW-14-GW	Total/NA	Water	AK102 & 103	188080
230-467-5	15-AREPL-4GMW-15-GW	Total/NA	Water	AK102 & 103	188080
230-467-7	15-AREPL-MW-28-GW	Total/NA	Water	AK102 & 103	188080
LCS 580-188080/2-A	Lab Control Sample	Total/NA	Water	AK102 & 103	188080
LCSD 580-188080/3-A	Lab Control Sample Dup	Total/NA	Water	AK102 & 103	188080
MB 580-188080/1-A	Method Blank	Total/NA	Water	AK102 & 103	188080

Lab Chronicle

Client: Ahtna Engineering Services LLC
Project/Site: AK Real Estate

TestAmerica Job ID: 230-467-1

Client Sample ID: 15-AREPL-4GMW-13-GW — Lab Sample ID: 230-467-1

Date Collected: 04/21/15 10:15 — **Matrix: Water**
Date Received: 04/22/15 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	188125	04/29/15 19:59	TL1	TAL SEA
Total/NA	Analysis	AK101		1	188437	05/02/15 16:02	TL1	TAL SEA
Total/NA	Prep	3510C			188080	04/28/15 17:02	RBL	TAL SEA
Total/NA	Analysis	AK102 & 103		1	188090	04/29/15 19:15	EKK	TAL SEA

Client Sample ID: 15-AREPL-4GMW-16-GW — Lab Sample ID: 230-467-2

Date Collected: 04/21/15 10:40 — **Matrix: Water**
Date Received: 04/22/15 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	188125	04/29/15 20:26	TL1	TAL SEA
Total/NA	Analysis	AK101		1	188437	05/02/15 16:55	TL1	TAL SEA
Total/NA	Prep	3510C			188080	04/28/15 17:02	RBL	TAL SEA
Total/NA	Analysis	AK102 & 103		1	188090	04/29/15 19:33	EKK	TAL SEA

Client Sample ID: 15-AREPL-4GMW-14-GW — Lab Sample ID: 230-467-3

Date Collected: 04/21/15 14:15 — **Matrix: Water**
Date Received: 04/22/15 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	188125	04/29/15 20:53	TL1	TAL SEA
Total/NA	Analysis	AK101		1	188437	05/02/15 17:21	TL1	TAL SEA
Total/NA	Prep	3510C			188080	04/28/15 17:02	RBL	TAL SEA
Total/NA	Analysis	AK102 & 103		1	188090	04/29/15 19:51	EKK	TAL SEA

Client Sample ID: 15-AREPL-MW-B-3-GW — Lab Sample ID: 230-467-4

Date Collected: 04/21/15 11:45 — **Matrix: Water**
Date Received: 04/22/15 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	188126	04/29/15 21:20	TL1	TAL SEA
Total/NA	Analysis	8260C	RA	1	188362	05/01/15 18:23	TL1	TAL SEA

Client Sample ID: 15-AREPL-4GMW-15-GW — Lab Sample ID: 230-467-5

Date Collected: 04/21/15 13:05 — **Matrix: Water**
Date Received: 04/22/15 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	188125	04/29/15 21:46	TL1	TAL SEA
Total/NA	Analysis	AK101		1	188437	05/02/15 17:48	TL1	TAL SEA
Total/NA	Prep	3510C			188080	04/28/15 17:02	RBL	TAL SEA
Total/NA	Analysis	AK102 & 103		1	188090	04/29/15 20:09	EKK	TAL SEA

Lab Chronicle

Client: Ahtna Engineering Services LLC
Project/Site: AK Real Estate

TestAmerica Job ID: 230-467-1

Client Sample ID: 15-AREPL-TB — Lab Sample ID: 230-467-6

Date Collected: 04/21/15 12:00 — **Matrix: Water**
Date Received: 04/22/15 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	188126	04/29/15 19:33	TL1	TAL SEA
Total/NA	Analysis	AK101		1	188124	04/29/15 19:33	TL1	TAL SEA

Client Sample ID: 15-AREPL-MW-28-GW — Lab Sample ID: 230-467-7

Date Collected: 04/22/15 11:25 — **Matrix: Water**
Date Received: 04/22/15 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	188125	04/29/15 17:46	TL1	TAL SEA
Total/NA	Analysis	AK101		1	188124	04/29/15 17:46	TL1	TAL SEA
Total/NA	Prep	3510C			188080	04/28/15 17:02	RBL	TAL SEA
Total/NA	Analysis	AK102 & 103		1	188090	04/29/15 20:27	EKK	TAL SEA

Client Sample ID: 15-AREPL-AKRRMW-22-GW — Lab Sample ID: 230-467-8

Date Collected: 04/22/15 09:50 — **Matrix: Water**
Date Received: 04/22/15 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	188126	04/29/15 22:13	TL1	TAL SEA
Total/NA	Analysis	8260C	RA	1	188362	05/01/15 18:49	TL1	TAL SEA

Client Sample ID: 15-AREPL-AKRRMW-220-GW — Lab Sample ID: 230-467-9

Date Collected: 04/22/15 10:25 — **Matrix: Water**
Date Received: 04/22/15 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	188126	04/29/15 22:40	TL1	TAL SEA
Total/NA	Analysis	8260C	RA	1	188362	05/01/15 19:16	TL1	TAL SEA

Client Sample ID: 15-AREPL-AKRRMW-245-GW — Lab Sample ID: 230-467-10

Date Collected: 04/22/15 10:40 — **Matrix: Water**
Date Received: 04/22/15 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	188126	04/29/15 23:06	TL1	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Certification Summary

Client: Ahtna Engineering Services LLC
Project/Site: AK Real Estate

TestAmerica Job ID: 230-467-1

Laboratory: TestAmerica Anchorage

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska	State Program	10	AK00975	06-30-15
Alaska (UST)	State Program	10	UST-067	06-16-15

Laboratory: TestAmerica Seattle

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska (UST)	State Program	10	UST-022	03-02-16
California	State Program	9	2901	01-31-17
L-A-B	DoD ELAP		L2236	01-19-16
L-A-B	ISO/IEC 17025		L2236	01-19-16
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-06-15
US Fish & Wildlife	Federal		LE192332-0	02-28-16
USDA	Federal		P330-11-00222	04-08-17
Washington	State Program	10	C553	02-17-16

Method Summary

Client: Ahtna Engineering Services LLC
Project/Site: AK Real Estate

TestAmerica Job ID: 230-467-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SEA
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL SEA
AK101	Alaska - Gasoline Range Organics (GC/MS)	ADEC	TAL SEA
AK102 & 103	Alaska - Diesel Range Organics & Residual Range Organics (GC)	ADEC	TAL SEA

Protocol References:

ADEC = Alaska Department of Environmental Conservation

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Sample Summary

Client: Ahtna Engineering Services LLC
Project/Site: AK Real Estate

TestAmerica Job ID: 230-467-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
230-467-1	15-AREPL-4GMW-13-GW	Water	04/21/15 10:15	04/22/15 15:00
230-467-2	15-AREPL-4GMW-16-GW	Water	04/21/15 10:40	04/22/15 15:00
230-467-3	15-AREPL-4GMW-14-GW	Water	04/21/15 14:15	04/22/15 15:00
230-467-4	15-AREPL-MW-B-3-GW	Water	04/21/15 11:45	04/22/15 15:00
230-467-5	15-AREPL-4GMW-15-GW	Water	04/21/15 13:05	04/22/15 15:00
230-467-6	15-AREPL-TB	Water	04/21/15 12:00	04/22/15 15:00
230-467-7	15-AREPL-MW-28-GW	Water	04/22/15 11:25	04/22/15 15:00
230-467-8	15-AREPL-AKRRMW-22-GW	Water	04/22/15 09:50	04/22/15 15:00
230-467-9	15-AREPL-AKRRMW-220-GW	Water	04/22/15 10:25	04/22/15 15:00
230-467-10	15-AREPL-AKRRMW-245-GW	Water	04/22/15 10:40	04/22/15 15:00

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

2000 W International Airport Rd ... 230-467 Chain of Custody

509-924-9200 FAX 924-9290
503-906-9200 FAX 906-9210
907-563-9200 FAX 563-9210

CHAIN OF CUSTODY REPORT

Work Order #: 230-467

CLIENT: Ahtna Engineering

INVOICE TO: Ahtna Engineering

REPORT TO: Alex Geilich ageilich@ahtna.net

ADDRESS: 110 W 38th Ave Suite 200A Anchorage AK 99503

PHONE: 907 646 2969 FAX:

P.O. NUMBER: 20266.008.01.05

PROJECT NAME: AK Real Estate

PROJECT NUMBER: 20266.008.01.05

SAMPLED BY: A Geilich

TURNAROUND REQUEST in Business Days *

Organic & Inorganic Analyses: 10 (STD.) | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses: 5 (STD.) | 4 | 3 | 2 | 1 | <1

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	PRESERVATIVE	GRO	BTEX	VOC	DRO	MATRIX (W, S, O)	# OF CONT.	LOCATION/ COMMENTS	TA WO ID
				HCl	HCl	HCl	HCl				
1	15-AREPL-46MW-13-GW	4/21/15 1015		X	X		X	W	5		01
2	15-AREPL-46MW-16-GW	4/21/15 1040		X	X		X	W	5		02
3	15-AREPL-46MW-14-GW	4/21/15 1415		X	X		X	W	5		03
4	15-AREPL-MW-B-3-GW	4/21/15 1145				X		W	3		04
5	15-AREPL-46MW-15-GW	4/21/15 1305		X	X		X	W	5		05
6	15-AREPL-TB	4/21/15 1200		X	X	X		W	3	Trip Blank	06
7	15-AREPL-MW-28-GW	4/22/15 1125		X	X		X	W	5		07
8	15-AREPL-AKRR MW-27-GW	4/22/15 0950				X		W	3		08
9	15-AREPL-AKRR MW-220-GW	4/22/15 1025				X		W	3		09
10	15-AREPL-AKRR MW-245-GW	4/22/15 1046				X		W	3		10

RELEASED BY: Alex Geilich — DATE: 4/22/15 — TIME: 1400

PRINT NAME: — FIRM: Ahtna

RECEIVED BY: — DATE: 4/22/15 — TIME: 1500

PRINT NAME: K Grange IV — FIRM: TAL

RELEASED BY: — DATE: — TIME:

PRINT NAME: — FIRM:

RECEIVED BY: — DATE: — TIME:

PRINT NAME: — FIRM:

ADDITIONAL REMARKS:

TEMP: 1.4

PAGE 1 OF 1

TAL-1000 (0714)

950167

Custody Seal

DATE 4/22

SIGNATURE

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

950167

230-4167

950168

Custody Seal

DATE 4/22

SIGNATURE

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

950168

Login Sample Receipt Checklist

Client: Ahtna Engineering Services LLC

Job Number: 230-467-1

Login Number: 467

List Source: TestAmerica Anchorage

List Number: 1

Creator: Pilch, Andrew C

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.4 C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Ahtna Engineering Services LLC

Job Number: 230-467-1

Login Number: 467
List Number: 2
Creator: Blankinship, Tom X

List Source: TestAmerica Seattle
List Creation: 04/24/15 12:46 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.2°C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	False	Preservation labels on samples match COC
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Ahtna Engineering Services LLC

Job Number: 230-467-1

Login Number: 467
List Number: 3
Creator: Blankinship, Tom X

List Source: TestAmerica Seattle
List Creation: 04/24/15 12:56 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.2°C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ATTACHMENT D

DATA QUALITY REVIEW CHECKLIST

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DATA QUALITY REVIEW SUMMARY

Date: May 26, 2015
Project: Alaska Real Estate 2015 Sampling Activities
Laboratory: TestAmerica, Inc.
Work Order: 230-467-1
Analysis: AK102/103, AK101, 8260B

Reviewer Name: Emily Freitas
Reviewer Title: Project Chemist

INTRODUCTION

Table 1 lists the field sample numbers, corresponding laboratory numbers, requested analyses, and identifies quality control (QC) samples.

TABLE 1: WORK ORDER OVERVIEW

Field Sample ID	Lab Sample ID	Analyses Requested	Quality Control
15-AREPL-4GMW-13-GW	230-467-1	GRO, BTEX, DRO	
15-AREPL-4GMW-16-GW	230-467-2	GRO, BTEX, DRO	
15-AREPL-4GMW-14-GW	230-467-3	GRO, BTEX, DRO	
15-AREPL-MW-B-3-GW	230-467-4	VOC	
15-AREPL-4GMW-15-GW	230-467-5	GRO, BTEX, DRO	
15-AREPL-TB	230-467-6	GRO, BTEX, VOC	Trip Blank
15-AREPL-MW-28-GW	230-467-7	GRO, BTEX, DRO	
15-AREPL-AKRRMW-22-GW	230-467-8	VOC	
15-AREPL-AKRRMW-220-GW	230-467-9	VOC	
15-AREPL-AKRRMW-245-GW	230-467-10	VOC	

Key:
DRO diesel-range organics
GRO gasoline range organics
BTEX benzene, toluene, ethylbenzene, xylenes
VOC volatile organic compounds

DATA QUALIFIER DEFINITIONS

For the purpose of this data quality review (DQR), the following code letters and associated definitions are provided for use by the project chemist to summarize the data quality.

R Reported value is "rejected." Resampling or reanalysis may be necessary to verify the presence or absence of the compound.

Q Analyte result is considered an estimated value with uncertain bias due to a QC failure. "QL" indicates a low bias and "QH" indicates a high bias.

J Analyte result is considered an estimated value because the level is below the laboratory limit of quantitation (LOQ) but above the DL (detection limit).

B Method blank associated with the analyte result contained a detection above the method detection limit.

DATA REVIEW

This DQR follows the guidelines as provided in the Alaska Department of Environmental Conservation (ADEC) Technical Memorandum *Environmental Laboratory Data and Quality Assurance Requirements* (2009) and includes a review, where appropriate, of the following parameters:

- Data completeness
- Chain of Custody (CoC) and Cooler Receipt Forms
- Holding times and preservation
- Analytical reporting limits (RL) and method detection limits (MDL)
- Blank analysis results
- Surrogate recoveries (organics only)
- Field duplicates
- Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- Matrix spike (MS) and matrix spike duplicate (MSD) results

Each analysis that was performed is evaluated in the following subsections of this report, and only the criteria exceedances that impact data qualification or require assessment beyond laboratory documentation are discussed.

The data review for this DQR was conducted in accordance with the

- USEPA document "Test Methods for Evaluating Solid Wastes, SW-846, revision 6" (February, 2007 and updates),
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic (October, 1994) and Organic (October, 1999) Review,

Sample Receipt Conditions

Samples were submitted to TestAmerica in Anchorage, AK. Ten groundwater samples, including one trip blank, were submitted in one cooler under intact custody seals in one laboratory batch on April 22, 2015. Samples were transferred from TestAmerica Anchorage to TestAmerica Seattle in Tacoma, WA. The samples are reported under TestAmerica work order 230-467-1. All samples were received with proper preservation and in good condition but just outside the ADEC's recommended temperatures of 4±2°C at 1.4°C in Anchorage and 1.2°C in Tacoma.

Holding Times and Preservatives

Holding time and preservative criteria were met and no qualifications were made based on these parameters.

Precision

Field Duplicates

Precision was assessed by calculating the relative percent differences (RPD) between the primary and duplicate field samples, the laboratory control samples (LCS), and the matrix spike (MS) samples. The RPD for LCS and MS were calculated and reported by the laboratory.

Sample 15-AREPL-AKRRMW-22-GW was collected as a duplicate of 15-AREPL-AKRRMW-220-GW. Sample 15-AREPL-4GMW-16-GW was collected as a duplicate of 15-AREPL-4GMW-13-GW. This meets the data quality objective (DQO) of 10% for samples.

Sample RPDs are calculated between field duplicate and primary sample results to assess sources of variability arising from the field sampling protocol and distribution of the target analytes within the sample matrix. RPDs were calculated for the primary and duplicate field samples when both results are detected above the reporting limit using the following equation.

$$\left[\frac{(R_1 - R_2)}{\frac{(R_1 + R_2)}{2}}\right] X\ 100$$

Where R_1 = Sample Concentration and R_2 = Field Duplicate Concentration

RPDs for samples and associated duplicates can be viewed in Table 2 below.

TABLE 2: RPD FOR FIELD DUPLICATES

Analyte	Units	15-AREPL-AKRRMW-220-GW Primary	15-AREPL-AKRRMW-22-GW Duplicate	RPD ≤ 30%	Flag
Dichlorodifluoromethane	ug/L	2.7	2.6	4	
Isopropylbenzene	ug/L	6.6	6.5	2	
n-Propylbenznene	ug/L	11	11	0	
1,2,4-Trimethylbenzene	ug/L	5.1	4.8	6	
sec-Butylbenzene	ug/L	5.6	5.5	2	
4-Isopropyltoluene	ug/L	4.2	4.0	5	
n-Butylbenzene	ug/L	7.3	7.1	3	
Naphthalene	ug/L	32	30	6	
Analyte	**Units**	**15-AREPL-4GMW-13-GW Primary**	**15-AREPL-4GMW-16-GW Duplicate**	**RPD ≤ 30%**	**Flag**
GRO	mg/L	0.17	0.13	27	
DRO	mg/L	1.6	1.2	29	

Key:

GRO	gasoline-range organics	ug/L	micrograms per liter
DRO	diesel-range organics	mg/L	milligrams per litere
RPD	relative percent difference		

No RPDs between the primary and duplicate samples were above the recommended limits therefore no qualifications were made based on this.

Laboratory Control Samples/Duplicates and Matrix Spike/Duplicates

The LCS/LCSD RPDs were within control limits.

All MS/MSD RPDs were within control limits.

Accuracy

Laboratory Control Samples/Duplicates and Matrix Spike/Duplicates and Internal Standards

In LCS 580-188126/5, Bromodichloromethane was recovered above control limits. No qualifications were made based on this because no associated analytes were detected.

MSD 230-467-7 was recovered below control limits for GRO. A qualifier of "QL" was applied to the GRO result for sample 230-476-7 to indicate a low bias due to a failed MSD recovery.

Surrogate Percent Recoveries

All surrogate percent recoveries were within the established control limits. No qualifications were made based on this.

Representativeness

All samples were collected using standardized sampling methods in accordance with the work plans. Samples collected are considered representative of soil conditions and meet DQOs discussed in the work plan.

Comparability

Samples in this work order were analyzed at the TestAmerica laboratory in Anchorage, Alaska. The results, methods, procedures, quantitation units and data presentation format of the work order are comparable in quality and data validity.

Completeness

All data necessary to complete a level II data validation on this work order was provided. No samples were rejected therefore, the data are considered 100% complete and usable. This exceeds the 85% minimum completeness goal suggested by ADEC.

Sensitivity

All results are evaluated to the method reporting limits. No reporting limits were adjusted for dilutions. No qualifications were made based on reporting limits exceeding the applicable ADEC site groundwater cleanup levels.

One trip blank was submitted within this work order. No analytes were detected above the reporting limit in the trip blank.

The method blanks (MB) were analyzed at the required frequencies of one per matrix, analysis, and 20 samples. No analytes were detected in the method blanks. The continuing calibration verification (CCV) recovery for batches 188126 and 188124 were recovered above control limits for multiple analytes. All associated sample analytes were non-detect therefore, data usability was not considered impacted.

OVERALL ASSESSMENT

Based on the review completed on the one laboratory work order data, all data are considered usable for the purpose of evaluating the presence or absence and magnitude of the suspected site contaminants. One sample, 15-AREPL-MW-28-GW, contains a qualifier of "QL" on the GRO result due to failed accuracy criteria. The ADEC checklist associated with this work order is attached.

Laboratory Data Review Checklist

Completed by: Emily Freitas

Title: Chemist Date: 5/26/2015

CS Report Name: Technical Memo Report Date: 5/4/2015

Consultant Firm: Ahtna Engineering Services LLC

Laboratory Name: Test America Anchorage Laboratory Report Number: 230-467-1

ADEC File Number: ADEC RecKey Number:

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

      Test America Anchorage and TestAmerica Seattle are ADEC approved laboratories.

   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:

      Samples were transferred from TestAmerica Anchorage to Test America Seattle.

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

      COC information was completed correctly.

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

      Correct analyses were requested

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      ☐Yes ☒ No ☐NA (Please explain.) Comments:

      Samples were received at TestAmerica Anchorage with a cooler temperature of 1.4°C and 1.2°C at TestAmerica Seattle.

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

      Samples were correctly preserved according to analyses requested.

☒Yes ☐ No ☐NA (Please explain.) Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒Yes ☐ No ☐NA (Please explain.) Comments:

Sample condition documented. There were no errors in sample condition.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
☒Yes ☐ No ☐NA (Please explain.) Comments:

The coolers were received outside the acceptable temperature range

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

Data quality or usability would have potentially been impacted by the unacceptable temperature upon sample receipt. The temperature range for sample preservation is generally established to maintain groundwater in a condidtion that would minimize the loss of volatile compounds from the water, and minimize the potential loss of contaminants through biodegradation, as low temperatures are documented to diminish or mitigate these factors. The lack of ice on the samples at receipt confirmed no additional moisture was present and biodegradation was unlikely to have occurred as a result of the lower temperature.

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 errors were identified by the lab.

   c. Were all corrective actions documented?
   ☒Yes ☐ No ☐NA (Please explain.) Comments:

All corrective actions were documented. Where corrective actions were not necessary, laboratory actions of reporting data were documented.

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

Data usability was not affected by the case narrative.

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:

All applicable holding times were met.

c. All soils reported on a dry weight basis?
☐Yes ☐ No ☒NA (Please explain.) Comments:

No soil samples were submitted within this work order.

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:

Data quality or usability was not affected by the sample results reported.

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:

Method blanks did not contain detections above the reporting limits. The continuing calibration verification(CCV) recovery for batches 188126 and 188124 were recovered above control limits for multiple analytes.

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

No sample results were affected. Detections were below the recommended limits.

      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 applied based on method blank detections or CCV results.

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

Comments:

Data usability is not affected

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

☒Yes ☐ No ☐NA (Please explain.) Comments:

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

☐Yes ☐ No ☒NA (Please explain.) Comments:

No metals or inorganic analyses were requested.

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:

MSD 230-467-7 was recovered below control limits for GRO. All additional %R's were within recommended limits.In LCS 580-188126/5, Bromodichloromethane was recovered above control 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:

All RPDs were within established control limits.

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

Comments:

A qualifier of "QL" was placed on the GRO result for sample 230-467-7 due to a low MSD recovery. No samples were affected by the high LCS recovery because no associated samples contained detetions above the reporting limit.

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

☒Yes ☐ No ☐NA (Please explain.) Comments:

The affected sample was flagged "QL" indicating that it is biased. This information can be viewed in the report.

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

Sample results were sensitive and accurate enough to accomplish the project objectives.

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:

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

Data quality was not affected by surrogate results.

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:

One groundwater trip blank was submitted.

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:

The trip blank was transported in the cooler with the samples.

iii. All results less than PQL?

☒Yes ☐ No ☐NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

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

Comments:

Data quality was not affected by the trip blank.

e. Field Duplicate

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

☒Yes ☐ No ☐NA (Please explain.) Comments:

Ten samples were submitted within this SDG including two duplicate pairs. Primary sample 15-AREPL-AKRRMW-220-GW was submitted with duplicate 15-AREPL-AKRRMW-22-GW. Primary sample 15-AREPL-4GMW-13-GW was submitted with duplicate 15-AREPL-4GMW-16-GW .

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)

RPD (%) = 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:

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

Comments:

All results were below the recommended RPD levels and therefore, no qualifications were made.

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

No equipment blank necessary. Disposable equipment was used.

☐Yes ☒ No ☐NA (Please explain.) Comments:

i. All results less than PQL?

☒Yes ☐ No ☐NA (Please explain.) Comments:

ii. If above PQL, what samples are affected?

Comments:

NA.

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

Comments:

No.

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

a. Defined and appropriate?

☒Yes ☐ No ☐NA (Please explain.) Comments:

Lab-specific qualifiers identifying the nature of the samples and laboratory QC errors are defined in the case narrative. Additional qualifiers have been defined in the report and analytical tables.

ATTACHMENT E

GROUNDWATER GRADIENT AND DIRECTION CALCULATIONS

(on accompanying CD only)

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