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Chevron Environmental Management Company

First Semi-annual 2009 Groundwater Monitoring Report and Geochemical Parameter Monitoring Results

Former Chevron Facility 301726
Lot 5A, Block 10, West Ramp
Fairbanks International Airport
Fairbanks, Alaska

August 25, 2009

ARCADIS

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Scientist I

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Project Scientist

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Lot 5A, Block 10, West Ramp
Fairbanks International Airport
Fairbanks, Alaska

Prepared for:
Chevron Environmental Management Company

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Appendices

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Introduction

On behalf of Chevron Environmental Management Company (Chevron), ARCADIS US, Inc. (ARCADIS), has prepared this report to document the first semi-annual 2009 groundwater sampling event and geochemical parameter monitoring results for former Chevron facility 301726 (the site) located at Lot 5A, Block 10, West Ramp at Fairbanks International Airport in Fairbanks, Alaska. The site location and surrounding area are shown on **Figure 1**. This report summarizes the groundwater sampling events conducted by ARCADIS on May 6 and 10, 2009. Work was conducted under the direction of a "qualified person" as defined in 18 Alaska Administrative Code (AAC) 75.990 (100), and 18 AAC 78.995 (118).

Site Description and Background

The site is approximately one acre and located on the southwestern portion of the Fairbanks International Airport (FIA), west of Airport Industrial Road. The site was originally designated as Block 10, Lots 5A and 5B; however, the lots were subsequently combined and are now referred to as Block 10, Lot 5A.

The site is currently vacant with no features remaining associated with the previous land uses. An abandoned six-inch diameter fuel pipeline crosses through the southeast portion of the site, adjacent to Airport Industrial Road. The former Texaco Bulk Terminal occupied the southeastern portion of the site facing Airport Industrial Road. This portion of the site is now covered with dirt and gravel and is used for truck staging and as an access road for a business located adjacent to the northeast portion of the site. The northwestern portion of the site is primarily unimproved land that is covered with mature vegetation. The Chena River is located approximately 700 feet west of the site.

Land use in the site vicinity is mixed industrial and unimproved (vegetation). The nearest residential properties are located approximately 600 feet west of the site. Domestic water production wells have been reported at the residential properties. Airplane hangars, tarmacs, and other facilities associated with airport land uses are across Airport Industrial Road from the site are commercial businesses.

The former Texaco bulk fuel terminal began operation at the site in July 1969 and was closed in September 1989. There were three 25,000-gallon aboveground storage tanks (ASTs) and a warehouse. The three ASTs and structures were relocated to another

facility in 1989 by MAPCO Alaska Petroleum, Inc. and the parcel has since remained vacant.

Seven documented petroleum releases of aviation fuel and diesel fuel occurred at the site during operation. Petroleum hydrocarbons have been detected and observed during routine utility maintenance operations and site investigations since 1992 and in groundwater samples since 2004.

The site geology consists of fill materials and unconsolidated alluvium deposited by the Chena and Tanana Rivers. Based on observations made during well installation approximately 200 feet northeast of the site, the alluvium deposit is overlain by gravel fill material to depths of up to 5 feet below ground surface (bgs) and underlain by silty sand that becomes coarser with depth and grades into a gravelly sand (SAIC, 2005).

Groundwater Monitoring Methods

Groundwater Gauging Methods

Groundwater elevations were measured in groundwater monitoring wells MW-1, MW-2, MW-4 and MW-6 on May 6, 2009. Groundwater elevations were measured using an oil/water interface probe. Immediately after opening each well for monitoring, the well casing organic vapor concentration was measured using a photoionization detector (PID).

Non-disposable groundwater monitoring equipment was decontaminated prior to and after each use with an Alconox® solution and rinsed in potable water.

Groundwater Sampling Methods

Groundwater samples were collected using dedicated, disposable Teflon® tubing with an In-Situ® 9500 meter, peristaltic pump, and flow-through cell. Geochemical parameters measured include turbidity, dissolved oxygen (DO), oxidation-reduction potential (ORP), specific conductivity, temperature, pH, and oxidation-reduction potential (ORP). These parameters were recorded on low-flow field data sheets presented in **Appendix A.** Groundwater was purged until the geochemical parameters stabilized within criteria limits established by the Environmental Protection Agency, as listed below (Puls and Barcelona, 1996):

- Turbidity (10% for values greater than 1 nephelometric turbidity unit (NTU)

- DO (10%)
- Specific conductance (3%)
- Temperature (3%)
- pH (± 0.1 unit)
- ORP (± 10 millivolts)

The groundwater samples were labeled and stored in a cooler packed with ice and submitted to TestAmerica in Bothell, Washington for the following chemical analyses:

- Gasoline range organics (GRO) by method AK101
- Diesel range organics (DRO) by method AK102
- Residual range organics (RRO) by method AK103
- Benzene, toluene, ethylbenzene and total xylenes (BTEX) by EPA method 8021B
- Total alkalinity by EPA method 310.1
- Sulfate by EPA method 300.0
- Nitrate as nitrogen by EPA method 300.0 and Hach® colorimetric field kit
- Ferrous Iron by Hach® colorimetric field kit
- Methane by method RSK 175

Groundwater Monitoring Results

Groundwater Elevation and Flow Direction

Depths to groundwater measured in groundwater monitoring wells MW-1 through MW-6 were consistent with historical measurements and ranged from 8.43 feet below top of casing (btoc) in monitoring well MW-2 to 8.71 feet btoc in monitoring well MW-4. Groundwater elevations ranged from 418.27 feet above mean sea level (feet amsl) in monitoring well MW-6 to 418.31 feet amsl in monitoring well MW-4. Groundwater elevations for monitoring wells MW-3 and MW-5 were not obtained as ice was present in both wells at the time of the May 2009 sampling event.

The inferred groundwater flow direction is to the south-southwest; historical inferred groundwater directions were to the east and southeast. The difference in flow direction may be due to seasonal groundwater fluctuation. Groundwater elevations are

summarized in **Table 1**. Groundwater elevations and inferred flow direction are shown on **Figure 3**.

Groundwater Analytical Results

Constituent-of-concern (COC) concentrations have generally decreased since the previous monitoring event conducted in September 2008. Groundwater samples collected from monitoring well MW-1 contained GRO and benzene at concentrations exceeding their respective ADEC groundwater cleanup level (GCL). DRO, RRO, toluene, ethylbenzene, and total xylenes were not detected above their respective ADEC GCLs in the samples collected in May 2009. Samples collected from monitoring wells MW-2, MW-4 and MW-6 did not contain COC concentrations exceeding their respective laboratory reporting limit. Groundwater analytical results are summarized in **Table 1** and are shown on **Figure 4**.

Geochemical Parameter Monitoring Results

Due to the relatively low concentrations of petroleum-related hydrocarbons currently detected in groundwater samples collected from monitoring wells at the site, natural attenuation via bioremediation may be viable. To determine the potential for natural attenuation at the site, monitoring wells MW-1, MW-2, MW-4 and MW-6 (ice obstruction was encountered in MW-3 and MW-5) were monitored for geochemical parameters to characterize the potential bioremediation of petroleum-related hydrocarbons. Geochemical parameter monitoring was conducted in conjunction with groundwater monitoring activities on May10, 2009. This was the second geochemical parameter monitoring event conducted at the site. A summary of geochemical parameter monitoring results is shown on **Table 2**.

Due to the low frequency of sampling conducted since monitoring began in 2004, it is difficult to assess the long term COC concentration trends in on-site monitoring wells, however, COC concentrations appear to be decreasing in samples collected from on-site monitoring wells since monitoring began in August 2004.

Temperature measurements ranged from 0.95 degrees Celsius (ºC) (MW-2) to 2.20 ºC (MW-4) and pH measurements ranged from 6.35 (MW-2) to 6.96 (MW-1). Temperature measurements are below the range generally associated with conditions consistent with natural attenuation. However, numerous published results suggest natural attenuation of petroleum hydrocarbons at low temperatures does occur (Filler, 2008).

DO concentrations indicate whether the subsurface is aerobic or anaerobic. DO concentrations in monitoring wells MW-2 and MW-4, (located outside the plume) ranged from 2.87 mg/L (MW-6) to 9.23 mg/L (MW-4). Due to a field calibration error, DO measurements for monitoring wells MW-1 (inside the plume), and MW-6 (outside the plume) are not available for the May 2009 event. ORP measurements ranged from 178.41 (MW-4) to 224.32 (MW-2). Generally, ORP measurements greater than zero millivolts (mV) and DO measurements greater than 1.0 mg/L are indicative of aerobic conditions. DO concentrations measured at the site monitoring wells MW-2 through MW-4 plume suggests aerobic conditions outside of the COC plume.

Methane and ferrous iron results are also indicative of an anaerobic environment in and around monitoring well MW-1. The methane concentration detected in well MW-1 was 1.02 mg/L and is indicative of localized methanogenic conditions. It also corresponds to the highest total COC concentration. Methane was not detected in the remaining monitoring wells. Ferrous iron was only detected in monitoring well MW-1 (2.0 mg/L). Methane concentrations above 0.5 mg/L and ferrous iron concentrations elevated above background concentrations are generally consistent with anaerobic natural attenuation of petroleum hydrocarbons.

The total alkalinity concentration in monitoring well MW-1 was 319.0 mg/L as calcium carbonate (mg/L as $CaCO_3$). Concentrations in the remaining monitoring wells ranged from 287 mg/L as $CaCO_3$ (MW-4) to 474 mg/L as $CaCO_3$ (MW-2).

Reported sulfate concentrations in the groundwater samples ranged from 11.0 mg/L (MW-1) to 75.3 (MW-4) in May 2009. Sulfate concentrations do not exhibit the same trend as that observed in 2008. This may be due to seasonal fluctuations in the groundwater related to the freeze/thaw cycle. Nitrate laboratory analytical and field measurements were non-detectable and inconclusive.

Due to the limited extent of the monitoring well network, it is difficult to assess groundwater flow and its potential contribution to natural attenuation. Boring logs from site assessment activities classify the dominant soil type in the saturated zone as silty sands which generally has a high hydraulic conductivity.

Laboratory Data Quality Assurance Summary

As required by ADEC (Technical Memorandum 06-002, dated August 20, 2008), ARCADIS completed a laboratory data review checklist for the TestAmerica report from the 2009 groundwater monitoring event. The laboratory report and the data

checklist are included as **Appendix B**. The electronic data deliverable (EDD) from TestAmerica is included on the enclosed CD. The following quality assurance (QA) summary describes six parameters related to the quality and usability of the data presented in this report.

1. Precision - Based on the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) relative percent differences, the data meet precision objectives with the exception of the duplicate samplePercent differences of methane reported in duplicate samples exceeded the acceptance limit.

2. Accuracy - The data meet accuracy objectives as indicated by the laboratory quality control samples, which were within method/laboratory limits.

3. Representativeness - The data appear to be representative of site conditions and are generally consistent with expected groundwater concentrations.

4 Comparability – The data are comparable with historical analytical results.

5 Completeness - The results appear to be valid and usable, and thus, the laboratory results have 100% completeness.

Conclusion

Groundwater elevations were consistent with historical measurements and the inferred flow direction at the site is south to southwest. The sample collected from monitoring well MW-1 contained GRO and benzene at concentrations exceeding their respective ADEC GCLs. The remaining COCs were detected below applicable criteria or they remained below laboratory detection limits. Groundwater samples were not collected from monitoring wells MW-3 and MW-5 due to the presence of ice in both wells.

Conditions outside of the COC plume indicate that the general subsurface conditions are aerobic. The available geochemical data suggest that general groundwater conditions near the site are nitrate depleted. The groundwater gradient at the site is relatively flat, which may limit the rate at which electron acceptors are supplied. High methane concentrations and the presence of ferrous iron in groundwater samples collected from inside the plume (MW-1) suggest methanogenic activity in this area.

Variations of geochemical parameter concentrations and trends measured between the 2008 and 2009 groundwater monitoring events highlight the seasonality of groundwater conditions at the site. It is likely that biological natural attenuation process are almost non-existent during the winter and early spring while they speed up and become relatively more significant to the plume attenuation later in the summer and early fall.

Recommendations

Additional COC and geochemical parameter sampling at the site is recommended for the year 2010 to better characterize seasonal and long-term concentration trends at the site. Future first-half semi-annual groundwater monitoring events should be conducted later in the summer when groundwater at the site is less likely to be frozen and natural attenuation processes are more observable.

References

Filler, D.M., I. Snape, and D.L. Barnes, editors. 2008. *Bioremediation of Petroleum Hydrocarbons in Cold Regions*. Cambridge University Press, Cambridge, Great Britain.

SAIC, 2008. *Site Assessment Report – Former Texaco Bulk Terminal No. 301726*. November 22, 2004. Science Applications International Corporation.

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Tables

TABLE 1
Groundwater Elevations and Analytical Results
Former Chevron Facility #301726
Lot 5A, Block 10, West Ramp
Fairbanks International Airport
Fairbanks, Alaska

Monitoring Well ID	Date Sampled	TOC (ft-amsl)	DTW (ft)	GWE (ft-amsl)	DRO[1] (µg/L)	RRO[2] (µg/L)	GRO[3] (µg/L)	BTEX[4]			
								Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
ADEC GCLs[5] (µg/L)					*1,500*	*1,100*	*2,200*	*5.0*	*1,000*	*700*	*10,000*
MW-1	08/19/04	426.84	6.37	420.47	33,400	<480	27,200	1,770	3,790	261	3,750
	03/30/05		10.09	416.75	436	<388	9,000	729	343	186	936
	09/19/05		8.12	418.72	8,660	<397	<2,500	153	150	<25	116
	09/11/08		8.63	418.21	12,000	<708	6,680	357	413	124	815
	05/10/09		**8.56**	**418.28**	**980**	**<420**	**3,960**	**28**	**75.7**	**72.7**	**392**
MW-2	08/19/04	426.73	6.29	420.44	-- [6]	-- [6]	<50.0	<0.200	<0.500	<0.500	<1.00
	03/30/05		9.98	416.75	4,040	427	<50.0	<0.500	<0.500	<0.500	<1.50
	09/19/05		8.02	418.71	<417	<417	<50.0	<0.500	<0.500	<0.500	<1.50
	09/11/08		8.52	418.21	<94.3	<708	<50.0	<0.200	<0.500	<0.500	<1.00
	9/11/08 [D]		--	--	<95.2	<714	<50.0	<0.200	<0.500	<0.500	<1.00
	05/10/09		**8.43**	**418.30**	**<403**	**<403**	<50.0	**0.333**	<0.500	<0.500	**<1.00**
MW-3	08/19/04	427.16	6.73	420.43	1,190	<480	89.4	0.774	<0.500	5.83	3.18
	03/30/05		10.42	416.74	<391	<391	181	0.979	<0.500	24.1	6.94
	09/19/05		8.47	418.69	6,730	2,120	<50.0	0.556	<0.500	1.73	<1.50
	09/11/08		8.96	418.20	12,000	<708	60.3	0.448	<0.500	0.653	1.96
	05/10/09	**Not Sampled - Ice in well**									
MW-4	08/19/04	427.02	6.59	420.43	<400	<480	<50.0	0.3	<0.500	<0.500	<1.00
	03/30/05		10.29	416.73	<385	<385	<50.0	<0.500	<0.500	<0.500	<1.50
	09/19/05		8.34	418.68	1,310	815	<50.0	<0.500	<0.500	<0.500	<1.50
	09/11/08		8.71	418.31	<94.3	<708	<50.0	<0.200	<0.500	<0.500	<1.00
	05/10/09		8.71	418.31	<403	<403	<50.0	<0.200	<0.500	<0.500	<1.00
	05/10/09 [D]		**8.71**	**418.31**	**<427**	**<427**	**<50.0**	**<0.200**	**<0.500**	**<0.500**	**<1.00**
MW-5	08/19/04	426.89	6.44	420.45	<400	<480	<50.0	<0.2	<0.500	<0.500	<1.00
	03/30/05		10.16	416.73	3,310	435	<50.0	<0.5	<0.500	<0.500	<1.50
	09/19/05		8.19	418.70	<431	782	<50.0	<0.5	<0.500	<0.500	<1.50
	09/11/08		8.70	418.19	150	<708	<50.0	<0.2	<0.500	<0.500	<1.00
	05/10/09	**Not Sampled - Ice in well**									
MW-6	08/19/04	426.82	6.36	420.46	<400	<480	<50.0	0.351	<0.500	<0.500	<1.00
	03/30/05		10.08	416.74	<388	<388	<50.0	<0.5	<0.500	<0.500	<1.50
	09/19/05		8.12	418.70	<403	<403	<50.0	<0.5	<0.500	<0.500	<1.50
	09/11/08		8.66	418.16	<100	<750	<50.0	<0.2	<0.500	<0.500	<1.0
	05/10/09		**8.55**	**418.27**	**<427**	**<427**	**<50.0**	**<0.200**	**<0.500**	**<0.500**	**<1.00**

Notes:
[1]: Diesel range organics (DRO) was analyzed by AK Method 102.
[2]: Residual range organics (RRO) was analyzed by AK Method 103.
[3]: Gasoline range organics (GRO) was analyzed by AK Method 101.
[4]: Benzene, toluene, ethylbenzene, and total xylenes (BTEX) were analyzed by EPA Method 8021B.
[5]: ADEC Groundwater Cleanup Levels (GCLs) per 18 AAC 75.345, Table C, Register 188, January 2009.
[6]: MW-2 was not analyzed for DRO or RRO because there was insufficient sample volume due to breakage during shipping.

ft = feet
ft-amsl = feet-above mean sea level
µg/L = micrograms per liter
"--" = Indicates analyte was not sampled or analyzed for or parameter was not measured.
Highlighted cell indicates concentration exceeds groundwater cleanup level
"<" = Indicates analyte not detected greater than laboratory reporting limit indicated.
[D] = Indicates sample is a duplicate
Data associated with current monitoring event in **bold**.
ADEC= Alaska Department of Environmental Conservation
TOC = Top of casing
DTW = Depth to water
GWE = Groundwater elevation

TABLE 2
Geochemical Parameter Monitoring Results
Former Chevron Facility #301726
Lot 5A, Block 10, West Ramp
Fairbanks International Airport
Fairbanks, Alaska

Monitoring Well ID	Date Sampled	Temperature (°C)[1]	pH[1]	DO (mg/L)[1]	ORP (mV)[1]	Total Alkalinity (mg/L as $CaCO_3$)[2]	Sulfate (mg/L)[3]	Nitrate as nitrogen (mg/L)[3]	Methane (mg/L)[4]	Ferrous Iron by Field Measurement (mg/L)[5]	Nitrate by Field Measurement (mg/L)[5]
MW-1	05/10/09	1.57	6.96	--[6]	-106.25	319	13.0	<0.200	1.02	2.0	0.0
MW-2	05/10/09	0.95	6.35	2.87	224.32	474	11.0	<0.200	<0.00120	0.0	0.0
MW-3	05/10/09	Not Sampled - Ice in well									
MW-4	05/10/09	2.20	6.84	9.23	178.41	287	75.3	<0.200	<0.00120	0.0	0.0
MW-5	05/10/09	Not Sampled - Ice in well									
MW-6	05/10/09	1.44	6.83	--[6]	209.22	354	19.4	<0.200	<0.651	0.0	0.0

[1]: Temperature, pH, DO and ORP were measured using an In-Situ® 9000 and flow cell
[2]: Total Alkalinity analyzed using EPA method 310.1
[3]: Sulfate and nitrate analyzed by EPA method 300.0
[4]: Methane analyzed by method RSK 175
[5]: Ferrous iron and nitrate field measurement analyzed using colorimetric field kits
[6]: Parameter not measured due to field calibration error
°C = Degrees Celsius
DO = Dissolved oxygen
mg/L = milligrams per liter
ORP = Oxidation-reduction potential
mV = millivolts
$CaCO_3$ = Calcium carbonate
"<" = Indicates analyte not detected greater than laboratory reporting limit indicated
EPA = Environmental Protection Agency
[D] = Indicates sample is a duplicate
"--" = Not measured

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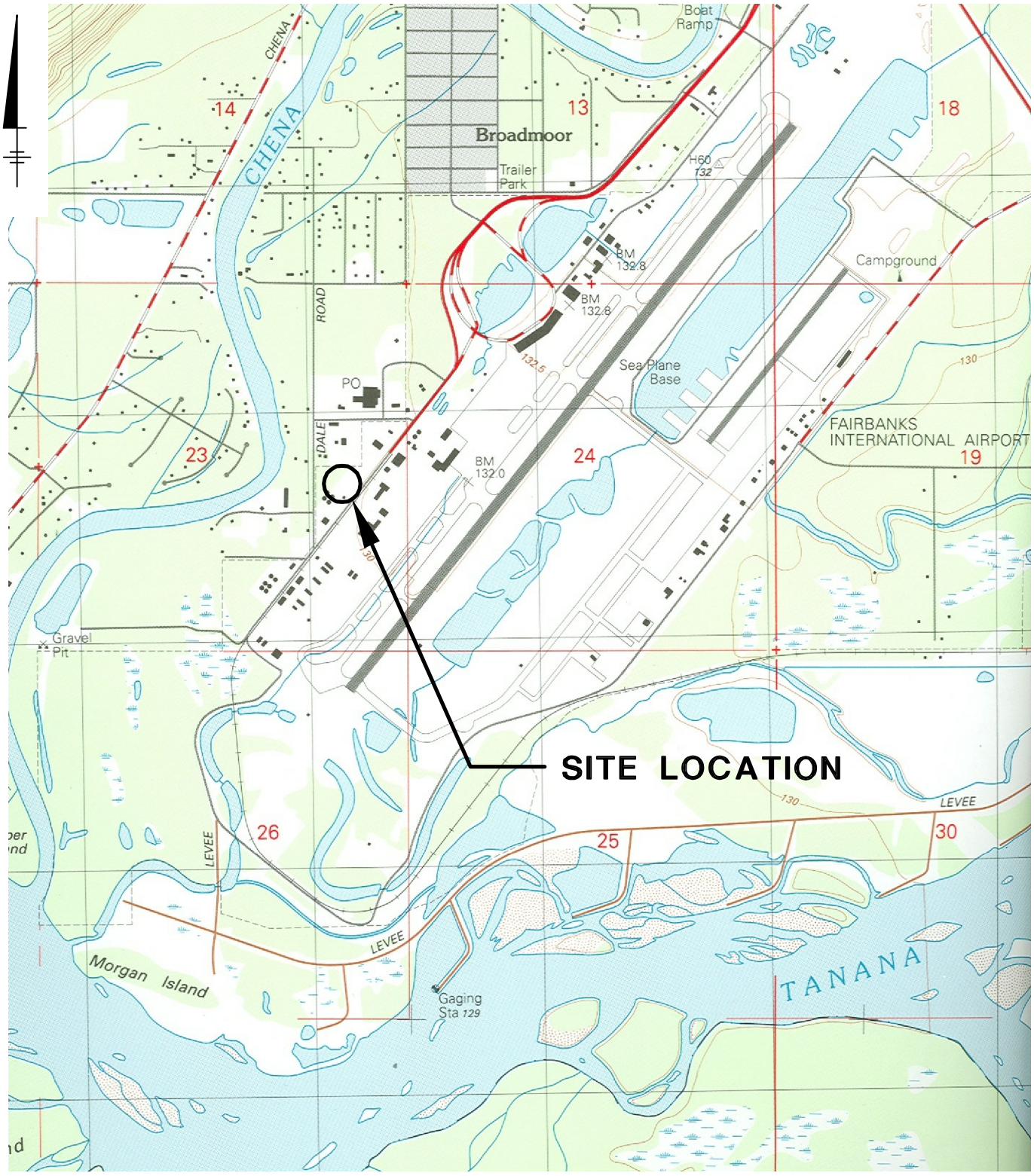
Figures



SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE: FAIRBANKS (D-2) SW, AK., 1992, FAIRBANKS NORTH STAR BOROUGH, SECTION: 24, TOWNSHIP: 1S, RANGE: 2W

0 2000' 4000'

APPROXIMATE GRAPHIC SCALE

CHEVRON FACILITY NO. 301726
FAIRBANKS INT. AIRPORT, FAIRBANKS, ALASKA
FIRST SEMIANNUAL 2009
GROUNDWATER MONITORING REPORT

SITE LOCATION MAP

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FIGURE
1

CITY: (TAMPA, FL), SYRACUSE, NY GROUP: ENVCAD DB: (J. RICHARDS), P. LISTER R. BASSETT PM/TM: R. ANDRESEN TR: D. BERUBE LYR: ON=*;OFF=REF
G:\ENVCAD\SYRACUSE\ACTIVE\B004626900010000\1\DWG\B004626900N01.dwg LAYOUT: 1SAVED: 8/4/2009 10:45 AM ACADVER: 17.0S (LMS TECH) PAGESETUP: ---PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 8/4/2009 10:46 AM BY: BASSETT, RICHARD
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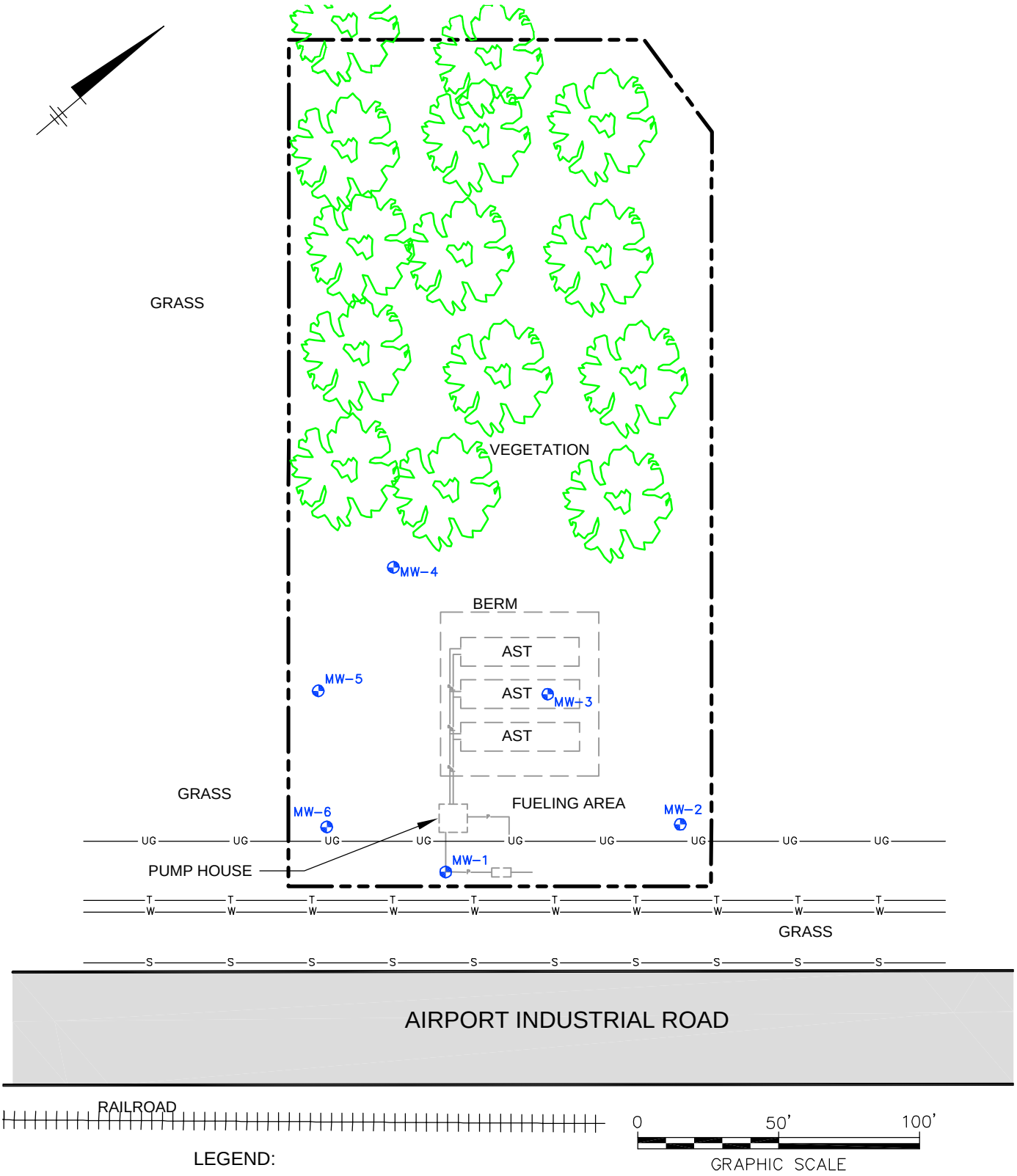

SOURCE: Base map digitized from "SAIC", Date 10/19/05, Scale 1"=30'

CHEVRON FACILITY NO. 301726
FAIRBANKS INT. AIRPORT, FAIRBANKS, ALASKA
FIRST SEMIANNUAL 2009
GROUNDWATER MONITORING REPORT

SITE PLAN

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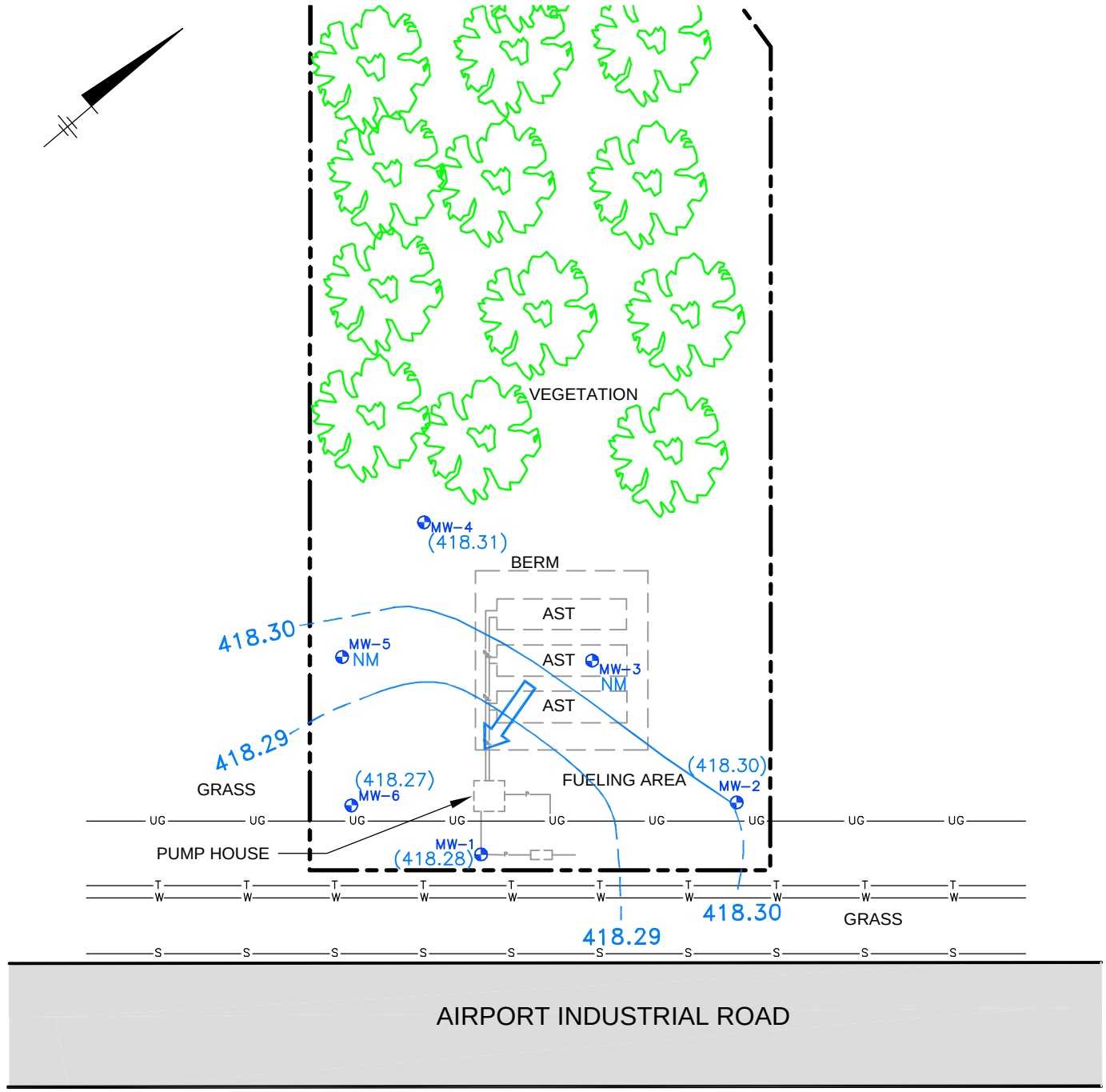
FIGURE
2

CITY:TAMPA DIV/GROUP:85 DB:JAR R. BASSETT LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIVE\B0046269\0001\00001\DWG\B0046269B01.dwg LAYOUT: 2SAVED: 7/27/2009 2:38 PM ACADVER: 17.0S (LMS TECH) PAGESETUP: ---PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 8/4/2009 10:48 AM BY: BASSETT, RICHARD
XREFS: IMAGES: PROJECTNAME: ---



LEGEND:

- MONITORING WELL
- BOUNDARY LINE
- PRODUCT PIPING
- TELEPHONE LINE
- WATER LINE
- 18" CULVERT
- 6" FUEL PIPELINE
- 418.29 — WATER-TABLE ELEVATION CONTOUR DASHED WHERE INFERRED CONTOUR INTERVAL = 0.01 FEET
- (418.28) — WATER-TABLE ELEVATION (FEET AMSL)
- APPARENT DIRECTION OF GROUNDWATER FLOW

SOURCE: Base map digitized from "SAIC", Date 10/19/05, Scale 1"=30'

NOTE:

NM = NOT MEASURED DUE TO OBSTRUCTION IN WELL CASING.

0 50' 100'

GRAPHIC SCALE

CHEVRON FACILITY NO. 301726
FAIRBANKS INT. AIRPORT, FAIRBANKS, ALASKA
FIRST SEMIANNUAL 2009
GROUNDWATER MONITORING REPORT

GROUNDWATER ELEVATION CONTOUR MAP - MAY 6, 2009

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FIGURE
3

CITY: (TAMPA) SYRACUSE, NY GROUP: ENVCAD DB: (J. RICHARDS), P. LISTER R. BASSETT PM/TM: R. ANDRESEN TR: D. BERUBE LYR: ON=*;OFF=REF, (FRZ)
G:\ENVCAD\SYRACUSE\ACTIVE\B0046269\0001\0000\1\DWG\B0046269W01.dwg LAYOUT: 3SAVED: 8/4/2009 10:50 AM ACADVER: 17.0S (LMS TECH) PAGESETUP: ####PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 8/4/2009 10:50 AM BY: BASSETT, RICHARD
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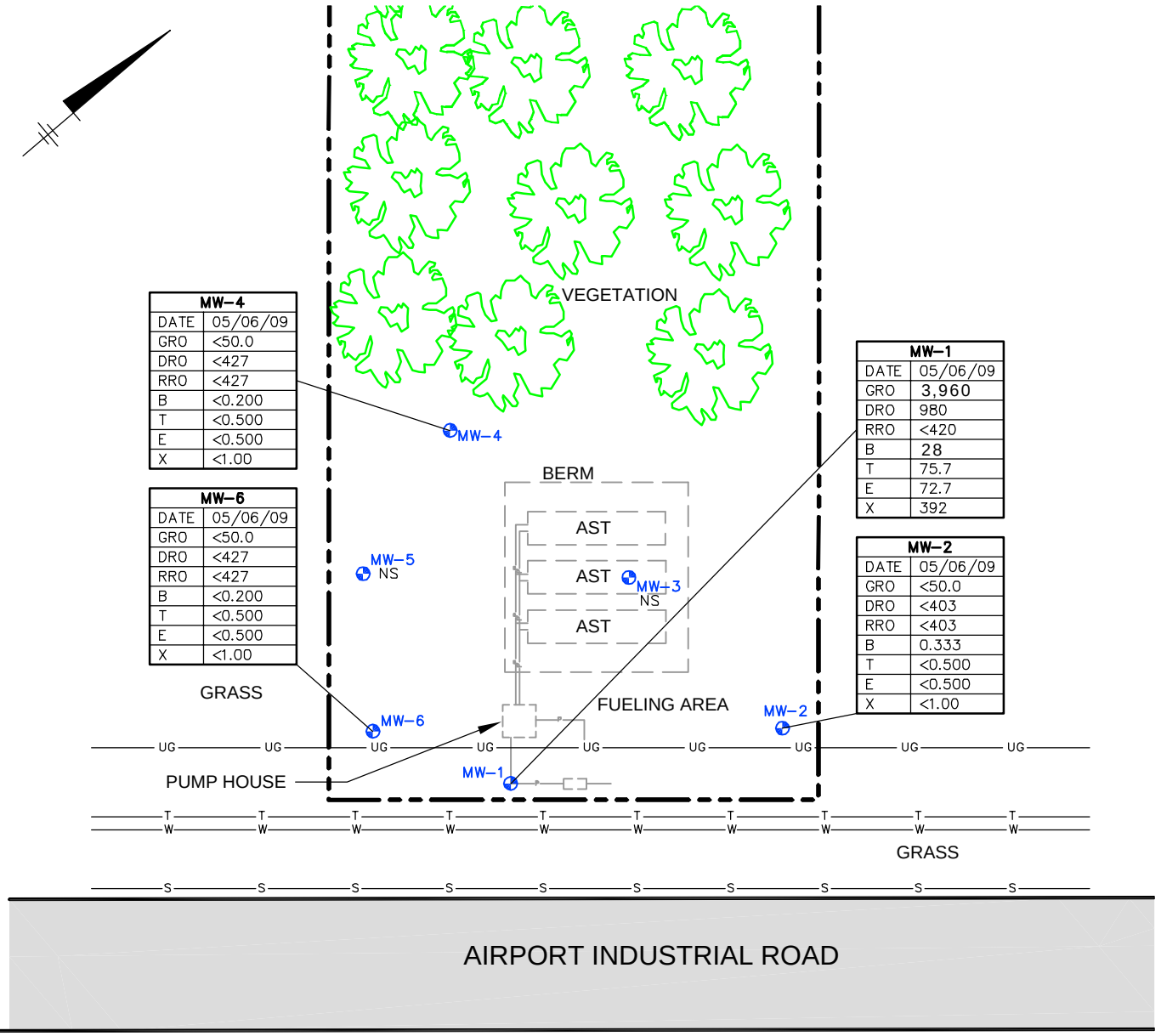

MW-4	
DATE	05/06/09
GRO	<50.0
DRO	<427
RRO	<427
B	<0.200
T	<0.500
E	<0.500
X	<1.00

MW-6	
DATE	05/06/09
GRO	<50.0
DRO	<427
RRO	<427
B	<0.200
T	<0.500
E	<0.500
X	<1.00

MW-1	
DATE	05/06/09
GRO	3,960
DRO	980
RRO	<420
B	28
T	75.7
E	72.7
X	392

MW-2	
DATE	05/06/09
GRO	<50.0
DRO	<403
RRO	<403
B	0.333
T	<0.500
E	<0.500
X	<1.00

LEGEND:

- MONITORING WELL
- BOUNDARY LINE

- P — PRODUCT PIPING
- T — TELEPHONE LINE
- W — WATER LINE
- S — 18" CULVERT
- UG — 6" FUEL PIPELINE

SAMPLE LOCATION		
DATE	SAMPLE DATE	ADEC GCL ug/L
GRO	GASOLINE RANGE ORGANICS	2,200
DRO	DIESEL RANGE ORGANICS	1,500
RRO	RESIDUAL RANGE ORGANICS	1,100
B	BENZENE	5.0
T	TOLUENE	1,000
E	ETHLYENE	700
X	TOTAL XYLENES	10,000

0 50' 100'

GRAPHIC SCALE

NOTES:

1. RESULTS REPORTED IN MICROGRAMS PER LITER (µg/L).
2. BOLD INDICATES CONCENTRATION EXCEEDS RESPECTIVE GROUNDWATER CLEANUP LEVEL.
3. ADEC = ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION.
4. NS = NOT SAMPLED

SOURCE: Base map digitized from "SAIC", Date 10/19/05, Scale 1"=30'

CHEVRON FACILITY NO. 301726
FAIRBANKS INT. AIRPORT, FAIRBANKS, ALASKA
FIRST SEMIANNUAL 2009
GROUNDWATER MONITORING REPORT

GROUNDWATER ANALYTICAL RESULTS MAY 6, 2009

ARCADIS

FIGURE
4

CITY: (TAMPA) SYRACUSE, NY GROUP: ENVCAD DB: (J. RICHARDS), A.Schilling R. BASSETT PM/TM: R. ANDRESEN TR: D. BERUBE LYR: ON=*;OFF=REF; (FRZ)
G:\ENVCAD\SYRACUSE\ACTIVITY\B004626900010000\1\DWG\B004626900C02.dwg LAYOUT: 4SAVED: 8/4/2009 11:16 AM ACADVER: 17.0S (LMS TECH) PAGESETUP: ####PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 8/4/2009 11:22 AM BY: BASSETT, RICHARD
XREFS: IMAGES: PROJECTNAME: ---

ARCADIS

Appendix A

Low-Flow Sampling Field Data Sheets

ARCADIS

Troll 9000 Low-Flow System
05/10/09 ISI Low-Flow Log

Project Information:		**Pump Information:**	
Operator Name	DB	Pump Model/Type	peri
Company Name	ARCADIS	Tubing Type	teflon
Project Name	FIA Texico	Tubing Diameter	0.17 [in]
Site Name	301726	Tubing Length	11 [ft]
		Pump placement from TOC	1 [ft]

Well Information:		**Pumping information:**	
Well Id	MW-1	Final pumping rate	180 [mL/min]
Well diameter	2 [in]	Flowcell volume	649.1 [mL]
Well total depth	14 [ft]	Calculated Sample Rate	217 [sec]
Depth to top of screen	0 [ft]	Sample rate	180 [sec]
Screen length	0 [in]	Stabilized drawdown	0.1 [in]
Depth to Water	8.56 [ft]		

Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.1 +/-10 %	+/-0.03 +/-3 %	+/-0.1 +/-10 %	+/-0.1 +/-10 %	+/-0.1 +/-10 %
Last 5 Readings	10:05:30	1.60	6.89	413.18	12.66	-2.50	-93.04
	10:08:31	1.58	6.91	413.83	16.91	-2.50	-96.98
	10:11:32	1.58	6.93	413.04	20.32	-2.50	-100.69
	10:14:33	1.60	6.95	412.59	21.28	-2.50	-103.64
	10:17:35	1.57	6.96	412.64	22.17	-2.50	-106.25
Variance in last 3 readings	10:11:32	0.00	0.02	-0.80	3.41	0.00	-3.72
	10:14:33	0.02	0.02	-0.45	0.96	0.00	-2.95
	10:17:35	-0.03	0.01	0.05	0.90	0.00	-2.61

Notes: sample MW-61 @10:25/Fe 2.0/Nitrate 0.0

ARCADIS

Troll 9000 Low-Flow System
05/10/09 ISI Low-Flow Log

Project Information:		**Pump Information:**	
Operator Name	DR	Pump Model/Type	peri
Company Name	ARCADIS	Tubing Type	teflon
Project Name	FIA Texaco	Tubing Diameter	0.17 [in]
Site Name	301726	Tubing Length	11 [ft]
		Pump placement from TOC	1 [ft]

Well Information:		**Pumping information:**	
Well Id	MW-2	Final pumping rate	175 [mL/min]
Well diameter	2 [in]	Flowcell volume	649.1 [mL]
Well total depth	12.6 [ft]	Calculated Sample Rate	223 [sec]
Depth to top of screen	0 [ft]	Sample rate	210 [sec]
Screen length	0 [in]	Stabilized drawdown	0 [in]
Depth to Water	8.6 [ft]		

Low-Flow Sampling Stabilization Summary

	Time	Temp [F]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-10 +/-10 %	+/-3 +/-3 %	+/-10 +/-10 %	+/-10 +/-10 %	+/-10 +/-10 %
Last 5 Readings	8:56:18	33.94	6.35	531.34	3.81	2.96	230.71
	8:59:55	33.85	6.35	530.08	5.56	2.95	228.52
	9:03:34	33.78	6.35	529.35	2.92	2.91	226.60
	9:07:11	33.75	6.35	528.36	3.20	2.89	225.14
	9:10:48	33.72	6.35	527.70	2.61	2.87	224.32
Variance in last 3 readings	9:03:34	-0.07	0.00	-0.73	-2.64	-0.04	-1.93
	9:07:11	-0.04	0.00	-0.99	0.28	-0.03	-1.46
	9:10:48	-0.03	0.00	-0.66	-0.60	-0.02	-0.82

Notes: sample @ 910

ARCADIS

Troll 9000 Low-Flow System
05/10/09 ISI Low-Flow Log

Project Information:		**Pump Information:**	
Operator Name	DR	Pump Model/Type	peri
Company Name	ARCADIS	Tubing Type	teflon
Project Name	FIA Texaco	Tubing Diameter	0.17 [in]
Site Name	301726	Tubing Length	11 [ft]
		Pump placement from TOC	1 [ft]

Well Information:		**Pumping information:**	
Well Id	MW-4	Final pumping rate	175 [mL/min]
Well diameter	2 [in]	Flowcell volume	649.1 [mL]
Well total depth	14.6 [ft]	Calculated Sample Rate	223 [sec]
Depth to top of screen	0 [ft]	Sample rate	210 [sec]
Screen length	0 [in]	Stabilized drawdown	0.1 [in]
Depth to Water	8.7 [ft]		

Low-Flow Sampling Stabilization Summary

	Time	Temp [F]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-10 +/-10 %	+/-3 +/-3 %	+/-10 +/-10 %	+/-10 +/-10 %	+/-10 +/-10 %
Last 5 Readings	10:09:46	35.98	6.87	408.26	5.31	9.52	181.79
	10:13:24	35.99	6.86	402.84	3.83	9.47	180.25
	10:17:02	35.94	6.86	400.45	3.40	9.38	179.44
	10:20:40	35.96	6.85	396.80	5.15	9.29	178.97
	10:24:17	35.96	6.84	399.11	2.95	9.23	178.41
Variance in last 3 readings	10:17:02	-0.04	-0.01	-2.39	-0.44	-0.09	-0.81
	10:20:40	0.01	-0.01	-3.65	1.75	-0.09	-0.47
	10:24:17	0.00	-0.01	2.31	-2.20	-0.06	-0.56

Notes: sample @ 1030
fe=0

ARCADIS

Troll 9000 Low-Flow System
05/10/09 ISI Low-Flow Log

Project Information:		**Pump Information:**	
Operator Name	DB	Pump Model/Type	peri
Company Name	ARCADIS	Tubing Type	teflon
Project Name	FIA Texico	Tubing Diameter	0.17 [in]
Site Name	301726	Tubing Length	10 [ft]
		Pump placement from TOC	1 [ft]

Well Information:		**Pumping information:**	
Well Id	MW-6	Final pumping rate	175 [mL/min]
Well diameter	2 [in]	Flowcell volume	644.63 [mL]
Well total depth	14.33 [ft]	Calculated Sample Rate	222 [sec]
Depth to top of screen	0 [ft]	Sample rate	180 [sec]
Screen length	0 [in]	Stabilized drawdown	0.1 [in]
Depth to Water	8.55 [ft]		

Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.1 +/-10 %	+/-0.03 +/-3 %	+/-0.1 +/-10 %	+/-0.1 +/-10 %	+/-0.1 +/-10 %
Last 5 Readings	8:57:03	1.43	6.80	382.68	1.96	-2.50	227.94
	9:00:05	1.44	6.81	385.44	3.66	-2.50	223.58
	9:03:05	1.43	6.82	386.88	20.24	-2.50	218.92
	9:06:06	1.45	6.82	388.59	40.85	-2.50	214.13
	9:09:08	1.44	6.83	389.38	58.03	-2.50	209.22
Variance in last 3 readings	9:03:05	-0.01	0.01	1.44	16.58	0.00	-4.66
	9:06:06	0.02	0.00	1.71	20.61	0.00	-4.79
	9:09:08	-0.02	0.01	0.80	17.19	0.00	-4.92

Notes: sample MW-6 @ 9:20/Fe 0.0/Nitrate 0.0

ARCADIS

Appendix B

Laboratory Analytical Reports, Chain-of-Custody Documentation and ADEC Laboratory Checklists

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210
CS Approval Number: UST-067

May 27, 2009

Greg Montgomery
Arcadis, Geraghty, & Miller - Seattle
2300 Eastlake Avenue East, Suite 200
Seattle, WA/USA 98102

RE: 301726

Enclosed are the results of analyses for samples received by the laboratory on 05/13/09 10:00. The following list is a summary of the Work Orders contained in this report, generated on 05/27/09 16:03.

If you have any questions concerning this report, please feel free to contact me.

Work Order	Project	ProjectNumber
BSE0126	301726	[none]

TestAmerica Seattle

Curtis D. Armstrong, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report shall not be reproduced except in full, without the written approval of the laboratory.

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210
CS Approval Number: UST-067

Arcadis, Geraghty, & Miller - Seattle	Project Name:	**301726**	
2300 Eastlake Avenue East, Suite 200	Project Number:	[none]	Report Created:
Seattle, WA/USA 98102	Project Manager:	Greg Montgomery	05/27/09 16:03

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Trip Blank	BSE0126-01	Water	05/10/09 17:00	05/13/09 10:00
Dup-1	BSE0126-02	Water	05/10/09 17:00	05/13/09 10:00
MW-1	BSE0126-03	Water	05/10/09 10:25	05/13/09 10:00
MW-2	BSE0126-04	Water	05/10/09 09:10	05/13/09 10:00
MW-4	BSE0126-05	Water	05/10/09 10:30	05/13/09 10:00
MW-6	BSE0126-06	Water	05/10/09 09:20	05/13/09 10:00

TestAmerica Seattle

Curtis D. Armstrong, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210
CS Approval Number: UST-067

Arcadis, Geraghty, & Miller - Seattle	Project Name: **301726**	
2300 Eastlake Avenue East, Suite 200	Project Number: [none]	Report Created:
Seattle, WA/USA 98102	Project Manager: Greg Montgomery	05/27/09 16:03

Gasoline Hydrocarbons (n-Hexane to <n-Decane) and BTEX by AK101/EPA 8021B

TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Analyst	Notes
BSE0126-01 (Trip Blank)		**Water**				**Sampled: 05/10/09 17:00**					
Gasoline Range Hydrocarbons	AK 101	ND	-----	50.0	ug/l	1x	9E14004	05/14/09 07:13	05/14/09 18:52	VM	
Benzene	"	ND	-----	0.200	"	"	"	"	"	VM	
Toluene	"	ND	-----	0.500	"	"	"	"	"	VM	
Ethylbenzene	"	ND	-----	0.500	"	"	"	"	"	VM	
Xylenes (total)	"	ND	-----	1.00	"	"	"	"	"	VM	
Surrogate(s): 4-BFB (FID)			*84.8%*		*50 - 150 %*	"			"		
4-BFB (PID)			*95.6%*		*80 - 130 %*	"			"		
BSE0126-02 (Dup-1)		**Water**				**Sampled: 05/10/09 17:00**					
Gasoline Range Hydrocarbons	AK 101	ND	-----	50.0	ug/l	1x	9E14004	05/14/09 07:13	05/15/09 05:40	VM	
Benzene	"	ND	-----	0.200	"	"	"	"	"	VM	
Toluene	"	ND	-----	0.500	"	"	"	"	"	VM	
Ethylbenzene	"	ND	-----	0.500	"	"	"	"	"	VM	
Xylenes (total)	"	ND	-----	1.00	"	"	"	"	"	VM	
Surrogate(s): 4-BFB (FID)			*84.6%*		*50 - 150 %*	"			"		
4-BFB (PID)			*95.8%*		*80 - 130 %*	"			"		
BSE0126-03 (MW-1)		**Water**				**Sampled: 05/10/09 10:25**					
Gasoline Range Hydrocarbons	AK 101	**3960**	-----	500	ug/l	10x	9E14004	05/14/09 07:13	05/15/09 05:08	VM	
Benzene	"	**28.0**	-----	2.00	"	"	"	"	"	VM	
Toluene	"	**75.7**	-----	5.00	"	"	"	"	"	VM	
Ethylbenzene	"	**72.7**	-----	5.00	"	"	"	"	"	VM	
Xylenes (total)	"	**392**	-----	10.0	"	"	"	"	"	VM	
Surrogate(s): 4-BFB (FID)			*89.8%*		*50 - 150 %*	*1x*			"		
4-BFB (PID)			*95.6%*		*80 - 130 %*	"			"		
BSE0126-04 (MW-2)		**Water**				**Sampled: 05/10/09 09:10**					
Gasoline Range Hydrocarbons	AK 101	ND	-----	50.0	ug/l	1x	9E14004	05/14/09 07:13	05/15/09 03:31	VM	
Benzene	"	**0.333**	-----	0.200	"	"	"	"	"	VM	
Toluene	"	ND	-----	0.500	"	"	"	"	"	VM	
Ethylbenzene	"	ND	-----	0.500	"	"	"	"	"	VM	
Surrogate(s): 4-BFB (FID)			*82.7%*		*50 - 150 %*	"			"		
4-BFB (PID)			*95.7%*		*80 - 130 %*	"			"		

TestAmerica Seattle

Curtis D. Armstrong, Project Manager

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THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210
CS Approval Number: UST-067

Arcadis, Geraghty, & Miller - Seattle	Project Name:	**301726**	
2300 Eastlake Avenue East, Suite 200	Project Number:	[none]	Report Created:
Seattle, WA/USA 98102	Project Manager:	Greg Montgomery	05/27/09 16:03

Gasoline Hydrocarbons (n-Hexane to <n-Decane) and BTEX by AK101/EPA 8021B

TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Analyst	Notes
BSE0126-04RE1 (MW-2)		**Water**				**Sampled: 05/10/09 09:10**					
Xylenes (total)	AK 101	ND	-----	1.00	ug/l	1x	9E15022	05/15/09 11:45	05/15/09 19:42	VM	
Surrogate(s): 4-BFB (PID)			*96.1%*		*80 - 130 %*	"			"		
BSE0126-05 (MW-4)		**Water**				**Sampled: 05/10/09 10:30**					
Gasoline Range Hydrocarbons	AK 101	ND	-----	50.0	ug/l	1x	9E14004	05/14/09 07:13	05/15/09 04:03	VM	
Benzene	"	ND	-----	0.200	"	"	"	"	"	VM	
Toluene	"	ND	-----	0.500	"	"	"	"	"	VM	
Ethylbenzene	"	ND	-----	0.500	"	"	"	"	"	VM	
Xylenes (total)	"	ND	-----	1.00	"	"	"	"	"	VM	
Surrogate(s): 4-BFB (FID)			*85.6%*		*50 - 150 %*	"			"		
4-BFB (PID)			*94.3%*		*80 - 130 %*	"			"		
BSE0126-06 (MW-6)		**Water**				**Sampled: 05/10/09 09:20**					
Gasoline Range Hydrocarbons	AK 101	ND	-----	50.0	ug/l	1x	9E14004	05/14/09 07:13	05/15/09 04:35	VM	
Benzene	"	ND	-----	0.200	"	"	"	"	"	VM	
Toluene	"	ND	-----	0.500	"	"	"	"	"	VM	
Ethylbenzene	"	ND	-----	0.500	"	"	"	"	"	VM	
Xylenes (total)	"	ND	-----	1.00	"	"	"	"	"	VM	
Surrogate(s): 4-BFB (FID)			*83.2%*		*50 - 150 %*	"			"		
4-BFB (PID)			*94.1%*		*80 - 130 %*	"			"		

TestAmerica Seattle

Curtis D. Armstrong, Project Manager

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TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210
CS Approval Number: UST-067

Arcadis, Geraghty, & Miller - Seattle	Project Name:	**301726**	
2300 Eastlake Avenue East, Suite 200	Project Number:	[none]	Report Created:
Seattle, WA/USA 98102	Project Manager:	Greg Montgomery	05/27/09 16:03

Conventional Chemistry Parameters by APHA/EPA Methods

TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Analyst	Notes
BSE0126-03 (MW-1)			**Water**			**Sampled: 05/10/09 10:25**					
Total Alkalinity	EPA 310.1	**319**	-----	5.00	mg/L as CaCO3	1x	9E19059	05/19/09 20:21	05/19/09 22:15	PT	
BSE0126-04 (MW-2)			**Water**			**Sampled: 05/10/09 09:10**					
Total Alkalinity	EPA 310.1	**474**	-----	5.00	mg/L as CaCO3	1x	9E19059	05/19/09 20:21	05/19/09 22:15	PT	
BSE0126-05 (MW-4)			**Water**			**Sampled: 05/10/09 10:30**					
Total Alkalinity	EPA 310.1	**287**	-----	5.00	mg/L as CaCO3	1x	9E19059	05/19/09 20:21	05/19/09 22:15	PT	
BSE0126-06 (MW-6)			**Water**			**Sampled: 05/10/09 09:20**					
Total Alkalinity	EPA 310.1	**354**	-----	5.00	mg/L as CaCO3	1x	9E19059	05/19/09 20:21	05/19/09 22:15	PT	

TestAmerica Seattle

Curtis D. Armstrong, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210
CS Approval Number: UST-067

Arcadis, Geraghty, & Miller - Seattle	Project Name: **301726**	
2300 Eastlake Avenue East, Suite 200	Project Number: [none]	Report Created:
Seattle, WA/USA 98102	Project Manager: Greg Montgomery	05/27/09 16:03

Anions by EPA Method 300.0

TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Analyst	Notes
BSE0126-03 (MW-1)			**Water**			**Sampled: 05/10/09 10:25**					
Nitrate-Nitrogen	EPA 300.0	ND	-----	0.200	mg/l as N	1x	9E13034	05/13/09 11:00	05/13/09 15:59	LSB	**H3**
Sulfate	"	**13.0**	-----	0.400	mg/l	"	"	"	"	LSB	
BSE0126-04 (MW-2)			**Water**			**Sampled: 05/10/09 09:10**					
Nitrate-Nitrogen	EPA 300.0	ND	-----	0.200	mg/l as N	1x	9E13034	05/13/09 11:00	05/13/09 16:15	LSB	**H3**
Sulfate	"	**11.0**	-----	0.400	mg/l	"	"	"	"	LSB	
BSE0126-05 (MW-4)			**Water**			**Sampled: 05/10/09 10:30**					
Nitrate-Nitrogen	EPA 300.0	ND	-----	0.200	mg/l as N	1x	9E13034	05/13/09 11:00	05/13/09 16:30	LSB	**H3**
Sulfate	"	**75.3**	-----	4.00	mg/l	10x	"	"	05/15/09 12:43	LSB	
BSE0126-06 (MW-6)			**Water**			**Sampled: 05/10/09 09:20**					
Nitrate-Nitrogen	EPA 300.0	ND	-----	0.200	mg/l as N	1x	9E13034	05/13/09 11:00	05/13/09 16:46	LSB	**H3**
Sulfate	"	**19.4**	-----	0.400	mg/l	"	"	"	"	LSB	

TestAmerica Seattle

Curtis D. Armstrong, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210
CS Approval Number: UST-067

Arcadis, Geraghty, & Miller - Seattle	Project Name: **301726**	
2300 Eastlake Avenue East, Suite 200	Project Number: [none]	Report Created:
Seattle, WA/USA 98102	Project Manager: Greg Montgomery	05/27/09 16:03

Diesel Range Organics (C10-C25) and Residual Range Organics (C25-C36) per AK102/RRO

TestAmerica Anchorage

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Analyst	Notes
BSE0126-02 (Dup-1)		**Water**					**Sampled: 05/10/09 17:00**				
Diesel Range Organics	AK102/103	ND	-----	0.427	mg/l	1x	9050037	05/19/09 09:59	05/20/09 19:58	JN	
Residual Range Organics	"	ND	-----	0.427	"	"	"	"	"	JN	
Surrogate(s): 1-Chlorooctadecane			*71.5%*		*50 - 150 %*	"			"		
Triacontane			*66.8%*		*50 - 150 %*	"			"		
BSE0126-03 (MW-1)		**Water**					**Sampled: 05/10/09 10:25**				
Diesel Range Organics	AK102/103	**0.980**	-----	0.420	mg/l	1x	9050037	05/19/09 09:59	05/20/09 19:58	JN	
Residual Range Organics	"	ND	-----	0.420	"	"	"	"	"	JN	
Surrogate(s): 1-Chlorooctadecane			*69.8%*		*50 - 150 %*	"			"		
Triacontane			*64.7%*		*50 - 150 %*	"			"		
BSE0126-04 (MW-2)		**Water**					**Sampled: 05/10/09 09:10**				
Diesel Range Organics	AK102/103	ND	-----	0.403	mg/l	1x	9050037	05/19/09 09:59	05/20/09 20:31	JN	
Residual Range Organics	"	ND	-----	0.403	"	"	"	"	"	JN	
Surrogate(s): 1-Chlorooctadecane			*70.9%*		*50 - 150 %*	"			"		
Triacontane			*66.4%*		*50 - 150 %*	"			"		
BSE0126-05 (MW-4)		**Water**					**Sampled: 05/10/09 10:30**				
Diesel Range Organics	AK102/103	ND	-----	0.403	mg/l	1x	9050037	05/19/09 09:59	05/20/09 20:31	JN	
Residual Range Organics	"	ND	-----	0.403	"	"	"	"	"	JN	
Surrogate(s): 1-Chlorooctadecane			*75.2%*		*50 - 150 %*	"			"		
Triacontane			*68.8%*		*50 - 150 %*	"			"		
BSE0126-06 (MW-6)		**Water**					**Sampled: 05/10/09 09:20**				
Diesel Range Organics	AK102/103	ND	-----	0.427	mg/l	1x	9050037	05/19/09 09:59	05/20/09 21:36	JN	
Residual Range Organics	"	ND	-----	0.427	"	"	"	"	"	JN	
Surrogate(s): 1-Chlorooctadecane			*69.8%*		*50 - 150 %*	"			"		
Triacontane			*65.3%*		*50 - 150 %*	"			"		

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CS Approval Number: UST-067

Arcadis, Geraghty, & Miller - Seattle	Project Name:	**301726**	
2300 Eastlake Avenue East, Suite 200	Project Number:	[none]	Report Created:
Seattle, WA/USA 98102	Project Manager:	Greg Montgomery	05/27/09 16:03

Hydrocarbons by GC/FID Headspace

TestAmerica Anchorage

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Analyst	Notes
BSE0126-03 (MW-1)			**Water**				**Sampled: 05/10/09 10:25**				
Methane	GC/FID	**1020**	-----	1.20	ug/l	1x	9050042	05/20/09 11:15	05/20/09 15:24	DS	
BSE0126-04 (MW-2)			**Water**				**Sampled: 05/10/09 09:10**				
Methane	GC/FID	ND	-----	1.20	ug/l	1x	9050042	05/20/09 11:15	05/20/09 15:29	DS	
BSE0126-05 (MW-4)			**Water**				**Sampled: 05/10/09 10:30**				
Methane	GC/FID	ND	-----	1.20	ug/l	1x	9050042	05/20/09 11:15	05/20/09 15:33	DS	
BSE0126-06 (MW-6)			**Water**				**Sampled: 05/10/09 09:20**				
Methane	GC/FID	**651**	-----	1.20	ug/l	1x	9050042	05/20/09 11:15	05/20/09 15:36	DS	

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Arcadis, Geraghty, & Miller - Seattle	Project Name: **301726**	
2300 Eastlake Avenue East, Suite 200	Project Number: [none]	Report Created:
Seattle, WA/USA 98102	Project Manager: Greg Montgomery	05/27/09 16:03

Gasoline Hydrocarbons (n-Hexane to <n-Decane) and BTEX by AK101/EPA 8021B - Laboratory Quality Control Results

TestAmerica Seattle

QC Batch: 9E14004 **Water Preparation Method: EPA 5030B (P/T)**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (9E14004-BLK1)							**Extracted: 05/14/09 07:13**							
Gasoline Range Hydrocarbons	AK 101	ND	---	50.0	ug/l	1x	--	--	--	--	--	--	05/14/09 11:18	
Benzene	"	ND	---	0.200	"	"	--	--	--	--	--	--	"	
Toluene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Ethylbenzene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Xylenes (total)	"	ND	---	1.00	"	"	--	--	--	--	--	--	"	
Surrogate(s): 4-BFB (FID)		*Recovery: 84.4%*			*Limits: 50-150%*	"							*05/14/09 11:18*	
4-BFB (PID)		*94.3%*			*80-130%*	"							"	
LCS (9E14004-BS1)							**Extracted: 05/14/09 07:13**							
Gasoline Range Hydrocarbons	AK 101	1170	---	50.0	ug/l	1x	--	1000	117%	(60-120)	--	--	05/14/09 11:50	
Surrogate(s): 4-BFB (FID)		*Recovery: 96.8%*			*Limits: 60-120%*	"							*05/14/09 11:50*	
LCS (9E14004-BS2)							**Extracted: 05/14/09 07:13**							
Benzene	AK 101	28.2	---	0.200	ug/l	1x	--	30.0	94.1%	(80-125)	--	--	05/14/09 12:55	
Toluene	"	28.4	---	0.500	"	"	--	"	94.6%	(80-120)	--	--	"	
Ethylbenzene	"	29.4	---	0.500	"	"	--	"	98.0%	(80-125)	--	--	"	
Xylenes (total)	"	87.3	---	1.00	"	"	--	90.0	97.0%	(75-120)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 93.5%*			*Limits: 80-130%*	"							*05/14/09 12:55*	
LCS Dup (9E14004-BSD1)							**Extracted: 05/14/09 07:13**							
Gasoline Range Hydrocarbons	AK 101	1190	---	50.0	ug/l	1x	--	1000	119%	(60-120)	1.76%	(20)	05/14/09 12:22	
Surrogate(s): 4-BFB (FID)		*Recovery: 97.1%*			*Limits: 60-120%*	"							*05/14/09 12:22*	
LCS Dup (9E14004-BSD2)							**Extracted: 05/14/09 07:13**							
Benzene	AK 101	29.0	---	0.200	ug/l	1x	--	30.0	96.8%	(80-125)	2.80%	(20)	05/14/09 13:27	
Toluene	"	29.0	---	0.500	"	"	--	"	96.6%	(80-120)	2.06%	"	"	
Ethylbenzene	"	30.2	---	0.500	"	"	--	"	101%	(80-125)	2.76%	"	"	
Xylenes (total)	"	89.7	---	1.00	"	"	--	90.0	99.6%	(75-120)	2.65%	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 95.3%*			*Limits: 80-130%*	"							*05/14/09 13:27*	
Duplicate (9E14004-DUP1)							**QC Source: BSE0124-01**						**Extracted: 05/14/09 07:13**	
Gasoline Range Hydrocarbons	AK 101	ND	---	50.0	ug/l	1x	ND	--	--	--	NR	(20)	05/14/09 14:32	
Benzene	"	ND	---	0.200	"	"	ND	--	--	--	NR	(25)	"	
Toluene	"	ND	---	0.500	"	"	ND	--	--	--	NR	"	"	
Ethylbenzene	"	ND	---	0.500	"	"	ND	--	--	--	NR	"	"	
Xylenes (total)	"	ND	---	1.00	"	"	ND	--	--	--	NR	"	"	
Surrogate(s): 4-BFB (FID)		*Recovery: 86.4%*			*Limits: 50-150%*	"							*05/14/09 14:32*	
4-BFB (PID)		*97.5%*			*80-130%*	"							"	

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CS Approval Number: UST-067

Arcadis, Geraghty, & Miller - Seattle	Project Name: **301726**	
2300 Eastlake Avenue East, Suite 200	Project Number: [none]	Report Created:
Seattle, WA/USA 98102	Project Manager: Greg Montgomery	05/27/09 16:03

Gasoline Hydrocarbons (n-Hexane to <n-Decane) and BTEX by AK101/EPA 8021B - Laboratory Quality Control Results

TestAmerica Seattle

QC Batch: 9E14004 **Water Preparation Method: EPA 5030B (P/T)**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Duplicate (9E14004-DUP2)				**QC Source: BSE0124-04**					**Extracted: 05/14/09 07:13**					
Gasoline Range Hydrocarbons	AK 101	112	---	50.0	ug/l	1x	117	--	--	--	3.57%	(20)	05/14/09 19:57	
Benzene	"	1.35	---	0.200	"	"	1.34	--	--	--	1.19%	(25)	"	
Toluene	"	ND	---	0.500	"	"	ND	--	--	--	2.96%	"	"	
Ethylbenzene	"	0.711	---	0.500	"	"	0.748	--	--	--	5.07%	"	"	
Xylenes (total)	"	2.14	---	1.00	"	"	2.23	--	--	--	4.17%	"	"	
Surrogate(s): 4-BFB (FID)		*Recovery: 92.1%*			*Limits: 50-150%*	"							*05/14/09 19:57*	
4-BFB (PID)		*100%*			*80-130%*	"							"	
Matrix Spike (9E14004-MS1)				**QC Source: BSE0124-01**					**Extracted: 05/14/09 07:13**					
Gasoline Range Hydrocarbons	AK 101	1190	---	50.0	ug/l	1x	ND	1000	119%	(60-130)	--	--	05/14/09 15:37	
Surrogate(s): 4-BFB (FID)		*Recovery: 94.6%*			*Limits: 50-150%*	"							*05/14/09 15:37*	
Matrix Spike (9E14004-MS2)				**QC Source: BSE0124-02**					**Extracted: 05/14/09 07:13**					
Benzene	AK 101	31.6	---	0.200	ug/l	1x	0.486	30.0	104%	(60-135)	--	--	05/14/09 22:40	
Toluene	"	32.2	---	0.500	"	"	0.146	"	107%	(65-135)	--	--	"	
Ethylbenzene	"	33.7	---	0.500	"	"	ND	"	112%	"	--	--	"	
Xylenes (total)	"	99.0	---	1.00	"	"	0.510	90.0	109%	(65-130)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 98.2%*			*Limits: 80-130%*	"							*05/14/09 22:40*	
Matrix Spike Dup (9E14004-MSD1)				**QC Source: BSE0124-01**					**Extracted: 05/14/09 07:13**					
Gasoline Range Hydrocarbons	AK 101	1170	---	50.0	ug/l	1x	ND	1000	117%	(60-130)	1.53%	(20)	05/14/09 16:10	
Surrogate(s): 4-BFB (FID)		*Recovery: 95.3%*			*Limits: 50-150%*	"							*05/14/09 16:10*	
Matrix Spike Dup (9E14004-MSD2)				**QC Source: BSE0124-02**					**Extracted: 05/14/09 07:13**					
Benzene	AK 101	30.4	---	0.200	ug/l	1x	0.486	30.0	99.6%	(60-135)	4.00%	(25)	05/14/09 23:12	
Toluene	"	30.6	---	0.500	"	"	0.146	"	101%	(65-135)	5.09%	"	"	
Ethylbenzene	"	32.1	---	0.500	"	"	ND	"	107%	"	5.08%	"	"	
Xylenes (total)	"	94.0	---	1.00	"	"	0.510	90.0	104%	(65-130)	5.18%	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 95.1%*			*Limits: 80-130%*	"							*05/14/09 23:12*	

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CS Approval Number: UST-067

Arcadis, Geraghty, & Miller - Seattle	Project Name: **301726**	
2300 Eastlake Avenue East, Suite 200	Project Number: [none]	Report Created:
Seattle, WA/USA 98102	Project Manager: Greg Montgomery	05/27/09 16:03

Gasoline Hydrocarbons (n-Hexane to <n-Decane) and BTEX by AK101/EPA 8021B - Laboratory Quality Control Results

TestAmerica Seattle

QC Batch: 9E15022 **Water Preparation Method: EPA 5030B (P/T)**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (9E15022-BLK1)							**Extracted: 05/15/09 11:45**							
Gasoline Range Hydrocarbons	AK 101	ND	---	50.0	ug/l	1x	--	--	--	--	--	--	05/15/09 15:55	
Benzene	"	ND	---	0.200	"	"	--	--	--	--	--	--	"	
Toluene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Ethylbenzene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Xylenes (total)	"	ND	---	1.00	"	"	--	--	--	--	--	--	"	
Surrogate(s): 4-BFB (FID)		*Recovery: 86.1%*			*Limits: 50-150%*	"							*05/15/09 15:55*	
4-BFB (PID)		*94.9%*			*80-130%*	"							"	
LCS (9E15022-BS1)							**Extracted: 05/15/09 11:45**							
Gasoline Range Hydrocarbons	AK 101	1180	---	50.0	ug/l	1x	--	1000	118%	(60-120)	--	--	05/15/09 16:27	
Surrogate(s): 4-BFB (FID)		*Recovery: 96.8%*			*Limits: 60-120%*	"							*05/15/09 16:27*	
LCS (9E15022-BS2)							**Extracted: 05/15/09 11:45**							
Benzene	AK 101	28.6	---	0.200	ug/l	1x	--	30.0	95.2%	(80-125)	--	--	05/15/09 17:32	
Toluene	"	29.0	---	0.500	"	"	--	"	96.5%	(80-120)	--	--	"	
Ethylbenzene	"	29.9	---	0.500	"	"	--	"	99.8%	(80-125)	--	--	"	
Xylenes (total)	"	88.8	---	1.00	"	"	--	90.0	98.7%	(75-120)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 94.3%*			*Limits: 80-130%*	"							*05/15/09 17:32*	
LCS Dup (9E15022-BSD1)							**Extracted: 05/15/09 11:45**							
Gasoline Range Hydrocarbons	AK 101	1150	---	50.0	ug/l	1x	--	1000	115%	(60-120)	2.84%	(20)	05/15/09 17:00	
Surrogate(s): 4-BFB (FID)		*Recovery: 95.5%*			*Limits: 60-120%*	"							*05/15/09 17:00*	
LCS Dup (9E15022-BSD2)							**Extracted: 05/15/09 11:45**							
Benzene	AK 101	28.1	---	0.200	ug/l	1x	--	30.0	93.8%	(80-125)	1.44%	(20)	05/15/09 18:05	
Toluene	"	28.5	---	0.500	"	"	--	"	94.9%	(80-120)	1.63%	"	"	
Ethylbenzene	"	29.7	---	0.500	"	"	--	"	99.1%	(80-125)	0.684%	"	"	
Xylenes (total)	"	88.4	---	1.00	"	"	--	90.0	98.2%	(75-120)	0.477%	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 94.8%*			*Limits: 80-130%*	"							*05/15/09 18:05*	
Duplicate (9E15022-DUP1)							**QC Source: BSE0158-06**						**Extracted: 05/15/09 11:45**	
Gasoline Range Hydrocarbons	AK 101	ND	---	50.0	ug/l	1x	ND	--	--	--	NR	(20)	05/15/09 19:10	
Benzene	"	ND	---	0.200	"	"	ND	--	--	--	NR	(25)	"	
Toluene	"	ND	---	0.500	"	"	ND	--	--	--	NR	"	"	
Ethylbenzene	"	ND	---	0.500	"	"	ND	--	--	--	NR	"	"	
Xylenes (total)	"	ND	---	1.00	"	"	ND	--	--	--	NR	"	"	
Surrogate(s): 4-BFB (FID)		*Recovery: 85.9%*			*Limits: 50-150%*	"							*05/15/09 19:10*	
4-BFB (PID)		*95.3%*			*80-130%*	"							"	

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2300 Eastlake Avenue East, Suite 200	Project Number:	[none]	Report Created:
Seattle, WA/USA 98102	Project Manager:	Greg Montgomery	05/27/09 16:03

Gasoline Hydrocarbons (n-Hexane to <n-Decane) and BTEX by AK101/EPA 8021B - Laboratory Quality Control Results

TestAmerica Seattle

QC Batch: 9E15022 **Water Preparation Method: EPA 5030B (P/T)**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike (9E15022-MS1)				**QC Source: BSE0158-06**				**Extracted: 05/15/09 11:45**						
Gasoline Range Hydrocarbons	AK 101	1230	---	50.0	ug/l	1x	ND	1000	123%	(60-130)	--	--	05/15/09 20:15	
Surrogate(s): 4-BFB (FID)		*Recovery: 95.8%*			*Limits: 50-150%*	"							*05/15/09 20:15*	
Matrix Spike (9E15022-MS2)				**QC Source: BSE0158-06**				**Extracted: 05/15/09 11:45**						
Benzene	AK 101	30.9	---	0.200	ug/l	1x	0.151	30.0	103%	(60-135)	--	--	05/16/09 03:16	
Toluene	"	31.2	---	0.500	"	"	0.129	"	104%	(65-135)	--	--	"	
Ethylbenzene	"	32.4	---	0.500	"	"	0.125	"	108%	"	--	--	"	
Xylenes (total)	"	95.6	---	1.00	"	"	0.409	90.0	106%	(65-130)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 95.1%*			*Limits: 80-130%*	"							*05/16/09 03:16*	
Matrix Spike Dup (9E15022-MSD1)				**QC Source: BSE0158-06**				**Extracted: 05/15/09 11:45**						
Gasoline Range Hydrocarbons	AK 101	1200	---	50.0	ug/l	1x	ND	1000	120%	(60-130)	3.11%	(20)	05/15/09 20:47	
Surrogate(s): 4-BFB (FID)		*Recovery: 96.2%*			*Limits: 50-150%*	"							*05/15/09 20:47*	
Matrix Spike Dup (9E15022-MSD2)				**QC Source: BSE0158-06**				**Extracted: 05/15/09 11:45**						
Benzene	AK 101	31.0	---	0.200	ug/l	1x	0.151	30.0	103%	(60-135)	0.304%	(25)	05/16/09 03:49	
Toluene	"	31.5	---	0.500	"	"	0.129	"	105%	(65-135)	0.940%	"	"	
Ethylbenzene	"	32.8	---	0.500	"	"	0.125	"	109%	"	1.02%	"	"	
Xylenes (total)	"	96.7	---	1.00	"	"	0.409	90.0	107%	(65-130)	1.13%	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 96.2%*			*Limits: 80-130%*	"							*05/16/09 03:49*	

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Arcadis, Geraghty, & Miller - Seattle	Project Name:	**301726**	
2300 Eastlake Avenue East, Suite 200	Project Number:	[none]	Report Created:
Seattle, WA/USA 98102	Project Manager:	Greg Montgomery	05/27/09 16:03

Conventional Chemistry Parameters by APHA/EPA Methods - Laboratory Quality Control Results

TestAmerica Seattle

QC Batch: 9E19059 **Water Preparation Method: General Preparation**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (9E19059-BLK1)								**Extracted: 05/19/09 20:21**						
Total Alkalinity	EPA 310.1	ND	---	5.00	mg/L as CaCO3	1x	--	--	--	--	--	--	05/19/09 22:15	
LCS (9E19059-BS1)								**Extracted: 05/19/09 20:21**						
Total Alkalinity	EPA 310.1	51.3	---	5.00	mg/L as CaCO3	1x	--	50.0	103%	(90-110)	--	--	05/19/09 22:15	
Duplicate (9E19059-DUP1)							**QC Source: BSE0154-05**			**Extracted: 05/19/09 20:21**				
Total Alkalinity	EPA 310.1	391	---	5.00	mg/L as CaCO3	1x	385	--	--	--	1.55%	(20)	05/19/09 22:15	

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TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210
CS Approval Number: UST-067

Arcadis, Geraghty, & Miller - Seattle	Project Name:	**301726**	
2300 Eastlake Avenue East, Suite 200	Project Number:	[none]	Report Created:
Seattle, WA/USA 98102	Project Manager:	Greg Montgomery	05/27/09 16:03

Anions by EPA Method 300.0 - Laboratory Quality Control Results

TestAmerica Seattle

QC Batch: 9E13034 **Water Preparation Method: General Preparation**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (9E13034-BLK1)								**Extracted: 05/13/09 11:00**						
Nitrate-Nitrogen	EPA 300.0	ND	---	0.200	mg/l as N	1x	--	--	--	--	--	--	05/13/09 13:54	
Sulfate	"	ND	---	0.400	mg/l	"	--	--	--	--	--	--	"	
LCS (9E13034-BS1)								**Extracted: 05/13/09 11:00**						
Nitrate-Nitrogen	EPA 300.0	1.01	---	0.200	mg/l as N	1x	--	1.00	101%	(90-110)	--	--	05/13/09 14:09	
Sulfate	"	5.92	---	0.400	mg/l	"	--	6.00	98.7%	"	--	--	"	
Duplicate (9E13034-DUP1)						**QC Source: BSE0124-01**		**Extracted: 05/13/09 11:00**						
Sulfate	EPA 300.0	24.6	---	0.800	mg/l	2x	25.2	--	--	--	2.25%	(20)	05/15/09 12:12	
Nitrate-Nitrogen	"	1.58	---	0.200	mg/l as N	1x	1.57	--	--	--	0.635%	"	05/13/09 13:38	
Duplicate (9E13034-DUP2)						**QC Source: BSE0126-06**		**Extracted: 05/13/09 11:00**						
Sulfate	EPA 300.0	19.4	---	0.400	mg/l	1x	19.4	--	--	--	0.206%	(20)	05/13/09 17:17	
Nitrate-Nitrogen	"	ND	---	0.200	mg/l as N	"	ND	--	--	--	NR	"	"	
Matrix Spike (9E13034-MS1)						**QC Source: BSE0124-01**		**Extracted: 05/13/09 11:00**						
Sulfate	EPA 300.0	30.8	---	0.800	mg/l	2x	25.2	6.00	92.7%	(80-120)	--	--	05/15/09 12:27	
Nitrate-Nitrogen	"	2.45	---	0.200	mg/l as N	1x	1.57	1.00	88.0%	(60-120)	--	--	05/13/09 13:22	
Matrix Spike (9E13034-MS2)						**QC Source: BSE0126-06**		**Extracted: 05/13/09 11:00**						
Sulfate	EPA 300.0	25.4	---	0.800	mg/l	2x	19.4	6.00	101%	(80-120)	--	--	05/15/09 12:59	
Nitrate-Nitrogen	"	1.04	---	0.200	mg/l as N	1x	ND	1.00	104%	(60-120)	--	--	05/13/09 17:02	

TestAmerica Seattle

Curtis D. Armstrong, Project Manager

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2300 Eastlake Avenue East, Suite 200	Project Number: [none]	Report Created:
Seattle, WA/USA 98102	Project Manager: Greg Montgomery	05/27/09 16:03

Diesel Range Organics (C10-C25) and Residual Range Organics (C25-C36) per AK102/RRO - Laboratory Quality Control Results

TestAmerica Anchorage

QC Batch: 9050037 **Water Preparation Method: EPA 3510**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (9050037-BLK1)								**Extracted: 05/19/09 09:59**						
Diesel Range Organics	AK102/103	ND	---	0.500	mg/l	1x	--	--	--	--	--	--	05/20/09 15:37	
Residual Range Organics	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Surrogate(s): 1-Chlorooctadecane		*Recovery: 79.4%*			*Limits: 50-150%*	"							*05/20/09 15:37*	
Triacontane		*70.5%*			*50-150%*	"							"	
LCS (9050037-BS1)								**Extracted: 05/19/09 09:59**						
Diesel Range Organics	AK102/103	9.39	---	0.500	mg/l	1x	--	10.6	88.5%	(75-125)	--	--	05/20/09 16:10	
Residual Range Organics	"	8.66	---	0.500	"	"	--	10.2	84.9%	(60-120)	--	--	"	
Surrogate(s): 1-Chlorooctadecane		*Recovery: 81.9%*			*Limits: 60-120%*	"							*05/20/09 16:10*	
Triacontane		*69.8%*			*60-120%*	"							"	
LCS Dup (9050037-BSD1)								**Extracted: 05/19/09 09:59**						
Diesel Range Organics	AK102/103	10.2	---	0.500	mg/l	1x	--	10.6	96.3%	(75-125)	8.35%	(20)	05/20/09 16:42	
Residual Range Organics	"	9.19	---	0.500	"	"	--	10.2	90.1%	(60-120)	5.87%	"	"	
Surrogate(s): 1-Chlorooctadecane		*Recovery: 85.6%*			*Limits: 60-120%*	"							*05/20/09 16:42*	
Triacontane		*73.5%*			*60-120%*	"							"	
Duplicate (9050037-DUP1)					**QC Source: ASE0037-02**			**Extracted: 05/19/09 09:59**						
Diesel Range Organics	AK102/103	ND	---	0.450	mg/l	1x	ND	--	--	--	NR	(20)	05/20/09 15:37	
Residual Range Organics	"	ND	---	0.450	"	"	ND	--	--	--	NR	(50)	"	
Surrogate(s): 1-Chlorooctadecane		*Recovery: 75.7%*			*Limits: 50-150%*	"							*05/20/09 15:37*	
Triacontane		*69.1%*			*50-150%*	"							"	

TestAmerica Seattle

Curtis D. Armstrong, Project Manager

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Arcadis, Geraghty, & Miller - Seattle	Project Name:	**301726**	
2300 Eastlake Avenue East, Suite 200	Project Number:	[none]	Report Created:
Seattle, WA/USA 98102	Project Manager:	Greg Montgomery	05/27/09 16:03

Hydrocarbons by GC/FID Headspace - Laboratory Quality Control Results

TestAmerica Anchorage

QC Batch: 9050042 **Water Preparation Method: RSK 175**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (9050042-BLK1)								**Extracted: 05/20/09 11:15**						
Methane	GC/FID	ND	---	1.20	ug/l	1x	--	--	--	--	--	--	05/20/09 13:18	
LCS (9050042-BS1)								**Extracted: 05/20/09 11:15**						
Methane	GC/FID	52.1	---	1.20	ug/l	1x	--	56.3	92.6%	(85-115)	--	--	05/20/09 13:10	
LCS Dup (9050042-BSD1)								**Extracted: 05/20/09 11:15**						
Methane	GC/FID	54.5	---	1.20	ug/l	1x	--	56.3	96.7%	(85-115)	4.40%	(25)	05/20/09 13:13	
Duplicate (9050042-DUP1)					**QC Source: ASE0030-01**				**Extracted: 05/20/09 11:15**					
Methane	GC/FID	2.18	---	1.20	ug/l	1x	20.2	--	--	--	161%	(20)	05/20/09 13:25	R2

TestAmerica Seattle

Curtis D. Armstrong, Project Manager

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PH: (425) 420.9200 FAX: (425) 420.9210
CS Approval Number: UST-067

Arcadis, Geraghty, & Miller - Seattle	Project Name:	**301726**	
2300 Eastlake Avenue East, Suite 200	Project Number:	[none]	Report Created:
Seattle, WA/USA 98102	Project Manager:	Greg Montgomery	05/27/09 16:03

Notes and Definitions

Report Specific Notes:

H3 - Sample was received and analyzed past holding time.

R2 - The RPD exceeded the acceptance limit.

Laboratory Reporting Conventions:

DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.

ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).

NR/NA - Not Reported / Not Available

dry - Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.

wet - Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.

RPD - RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).

MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.

MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.

Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.

Reporting Limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.

Electronic Signature - Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy.* Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

TestAmerica Seattle

Curtis D. Armstrong, Project Manager

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11720 North Creek Pkwy N Suite 400, Bothell, WA 98011-8244 425-420-9200 FAX 420-9210
11922 E. First Ave, Spokane, WA 99206-5302 509-924-9200 FAX 924-9290
9405 SW Nimbus Ave,Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210

CHAIN OF CUSTODY REPORT

Work Order #: BSE0126

CLIENT: ARCADIS

REPORT TO: Greg Montgomery
ADDRESS: 2300 E Lake Ave E Suite 200
Seattle WA 98102
PHONE: 206 325 5254 FAX:

INVOICE TO: Greg Montgomery
2300 E Lake Ave E Suite 200
Seattle WA 98102

P.O. NUMBER: NWRTB-030915-2-1-Lab

PROJECT NAME: FIA Texaco
PROJECT NUMBER: 301726
SAMPLED BY: DMB/DR

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: 48 hold time Nitrates

* Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	PRESERVATIVE	BTEX 8021B	GRO AK101	DRO AK102	RRO AK103	Total Alkalinity 310.1	Methane 3015	Sulfate Nitrate 300.0	MATRIX (W, S, O)	# OF CONT.	LOCATION/ COMMENTS	TA WO ID
1	Trip Blank	5/10/09	H	X	X							2		
2	Dup-2	5/10/09	H	X	X	X	X				W	5		
3	MW-1	5/10/09 10:25	H	X	X	X	X	X	X	X	W	10		
4	MW-2	5/10/09 9:10	H	X	X	X	X	X	X	X	W	10		
5	MW-4	5/10/09 10:30	H	X	X	X	X	X	X	X	W	10		
6	MW-6	5/10/09 9:20	H	X	X	X	X	X	X	X	W	10		
7														
8														
9														
10														

RELEASED BY: PRINT NAME: Dawn Benbe FIRM: ARCADIS DATE: 5/11/09 TIME: 8:30

RECEIVED BY: PRINT NAME: Anastasia Gumulia FIRM: Anchorage DATE: 05/12/09 TIME: 10:35

RELEASED BY: PRINT NAME: FIRM: DATE: TIME:

RECEIVED BY: Colette Weaver PRINT NAME: Colette Weaver FIRM: TAL-Seattle DATE: 05-13-09 TIME: 1000

ADDITIONAL REMARKS:

TEMP: #1 : 1.4 #2 : 3.8 #3 : 3.9 1.5°C W/CS

PAGE OF

TAL-1000(0408)

TAT: _____ Paperwork to PM – Date:_____ Time:_____ Non-Conformances?

Page Time & Initials:_____ Circle (Y) or N

(If Y, see other side)

TEST AMERICA SAMPLE RECEIPT CHECKLIST

Received By: (applies to temp at receipt)
Date: 05.13.09
Time: 1000
Initials: CW

Logged-in By:
Date: 05.13
Time: 1154
Initials: CW

Unpacked/Labeled By:
Date: 5/14
Time: 13:15
Initials: CW

Cooler ID: 168,347,397

Work Order No. BSE0126
Client: _____
Project: _____

Container Type:
X Cooler
___ Box
___ None/Other _____

COC Seals:
X Ship Container ? Sign By
___ On Bottles 05-12-09 Date
___ None

Packing Material:
X Bubble Bags ___ Styrofoam
___ Foam Packs
X None/(Other) box & bubble wrap

Refrigerant:
X Gel Ice Pack _____
___ Loose Ice _____
___ None/Other _____

Soil Stir Bars/Encores:
Placed in freezer #46:
Y or N or (NA)
Initial/date/time_____

Received Via: Bill#:
X Fed Ex ___ Client
___ UPS ___ TA Courier
___ DHL ___ Mid Valley
___ Senvoy ___ TDP
___ GS ___ Other_____

Cooler Temperature (*IR*): ____°C Plastic Glass (Frozen filters, Tedlars and aqueous Metals exempt)
(circle one)
Temperature Blank? 1.5 °C or NA comments 1.1c, 0.7c Trip Blank? (Y) or N or NA

BP, OPLC,ARCO-Temperature monitoring every 15 minutes:
(initial/date/time):_____
Comments:_____

Sample Containers:		ID
Intact?	(Y) or N	_____
Provided by TA?	(Y) or N	_____
Correct Type?	(Y) or N CW 5/14	_____
#Containers match COC?	(Y) or (N)	_____
IDs/time/date match COC?	(Y) or N	_____
Hold Times in hold?	Y or (N) Nitrates	_____

		ID
Metals Preserved?	Y or N or (NA)	_____
Client QAPP Preserved?	Y or N or (NA)	_____
Adequate Volume? (for tests requested)	(Y) or N	_____
Water VOAs: Headspace?	(Y) or N or NA	03J (MW1)
Comments:		01A (MW-6), 01A (Trip Blank

PROJECT MANAGEMENT

Is the Chain of Custody complete? Y or N If N, circle the items that were incomplete

Comments,Problems_____

Total access set up? Y or N
Has client been contacted regarding non-conformances? Y or N If Y, ____/____ Date Time

PM Initials: _____ Date: _____ Time: _____

(rev 5, 03/04/09)

Laboratory Data Review Checklist

Completed by:	J. Russell Greisler
Title:	Scientist II
Date:	8/25/09
CS Report Name:	First Semi-annual Groundwater Monitoring Report and Geochemical Parameter Monitoring Results
Report Date:	8/25/09
Consultant Firm:	ARCADIS
Laboratory Name:	Test America
Laboratory Report Number:	BSE0126
ADEC File Number:	100.38.066
ADEC RecKey Number:	1992310119101

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   ◉ Yes ○ No Comments:

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   ○ Yes ○ No Comments:

   N/A

2. Chain of Custody (COC)

   a. COC information completed, signed, and dated (including released/received by)?

   ◉ Yes ○ No Comments:

   b. Correct analyses requested?

   ◉ Yes ○ No Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

☐ Yes ☒ No Comments:

1.5° Celsius

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

☒ Yes ☐ No Comments:

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

☐ Yes ☒ No Comments:

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 Comments:

N/A

e. Data quality or usability affected? Explain.

Comments:

N/A

4. Case Narrative

a. Present and understandable?

☒ Yes ☐ No Comments:

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

☐ Yes ☒ No Comments:

c. Were all corrective actions documented?

☐ Yes ☐ No Comments:

N/A

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

Comments:

N/A

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

☉ Yes ○ No Comments:

b. All applicable holding times met?

○ Yes ☉ No Comments:

The holding time for nitrate was not met.

c. All soils reported on a dry weight basis?

○ Yes ○ No Comments:

N/A

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

☉ Yes ○ No Comments:

e. Data quality or usability affected?

Comments:

N/A

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

☉ Yes ○ No Comments:

ii. All method blank results less than PQL?

☉ Yes ○ No Comments:

iii. If above PQL, what samples are affected?

Comments:

N/A

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

☐ Yes ☐ No Comments:

N/A

v. Data quality or usability affected? Explain.

Comments:

N/A

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 Comments:

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

☑ Yes ☐ No Comments:

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 Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

☑ Yes ☐ No Comments:

RPD for methane exceeded acceptance limit.

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

Comments:

Samples are not expected to be affected.

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

☐ Yes ☐ No Comments:

N/A

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

Comments:

N/A

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

☉ Yes ○ No 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 Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

○ Yes ○ No Comments:

N/A

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

Comments:

N/A

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): <u>Water and Soil</u>

i. One trip blank reported per matrix, analysis and cooler?

☉ Yes ○ No Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

☉ Yes ○ No Comments:

iii. All results less than PQL?

☉ Yes ○ No Comments:

iv. If above PQL, what samples are affected?

Comments:

N/A

v. Data quality or usability affected? Explain.

Comments:

N/A

e. Field Duplicate

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

◉ Yes ○ No Comments:

ii. Submitted blind to lab?

◉ Yes ○ No Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

◉ Yes ○ No Comments:

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

Comments:

N/A

f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below.)

☐ Yes ☐ No ☒ Not Applicable

i. All results less than PQL?

☐ Yes ☐ No Comments:

N/A

ii. If above PQL, what samples are affected?

Comments:

N/A

iii. Data quality or usability affected? Explain.

Comments:

N/A

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

a. Defined and appropriate?

☐ Yes ☐ No Comments:

N/A