

# Alpine Satellite Development Plan (ASDP) 2010

## Water Quality Monitoring

SUBMITTED TO

  
Alaska

BY



November 2010

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120258-MBJ-RPT-001



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## ACRONYMS AND ABBREVIATIONS

ADEC	Alaska Department of Environmental Conservation
ASDP	Alpine Satellite Development Plan
CD	Colville Delta
CPAI	ConocoPhillips Alaska, Inc.
CRD	Colville River Delta
DO	Dissolved Oxygen
DRO	Diesel Range Organics
EPA	U.S. Environmental Protection Agency
FID	Flame Ionization Detector
GC	Gas Chromatography
GPS	Global Positioning System
GRO	Gasoline Range Organics
ICP-MS	Inductively Coupled Plasma-Mass Spectrometry
LOQ	Limit of Quantitation
MS	Mass Spectrometer
NAD83	North American Datum of 1983
NTU	Nephelometric Turbidity Units
PAH	Polynuclear Aromatic Hydrocarbons
RCRA	Resource Conservation and Recovery Act
RRO	Residual Range Organics
SIM	Selective Ion Monitoring
SGS	SGS North America, Inc.
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
VOC	Volatile Organic Compound

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## 1.0 INTRODUCTION

During the winter of 1998/1999, ConocoPhillips Alaska, Inc. (CPAI) initiated construction of the Alpine Facility (CD1 and CD2) in the Colville River Delta (CRD). Alpine operations expanded with implementation of the Alpine Satellite Development Plan (ASDP) during the 2004/2005 winter season. Construction included placement of gravel facilities for two new satellite drill sites, CD3 and CD4. The CD3 pad development included an airstrip and pad/airstrip access road, apron, and taxiway. The CD4 pad development included an access road running parallel to the existing Alpine Sales Pipeline, connecting to the CD2 access road.

Beginning in 2007, three lakes near CD3 and CD4 facilities have been monitored annually to comply with North Slope Borough Ordinance Serial No. 75-6-46, Stipulation IV.2.4.3(h). The three sampling lakes are M9313 near CD3, and L9323 and L9324 located north and south of CD4, respectively. The 2010 monitoring marks the fourth continuous year of annual water quality monitoring. An overview of the three study lakes relative to Alpine facilities is presented in Figure 1.1

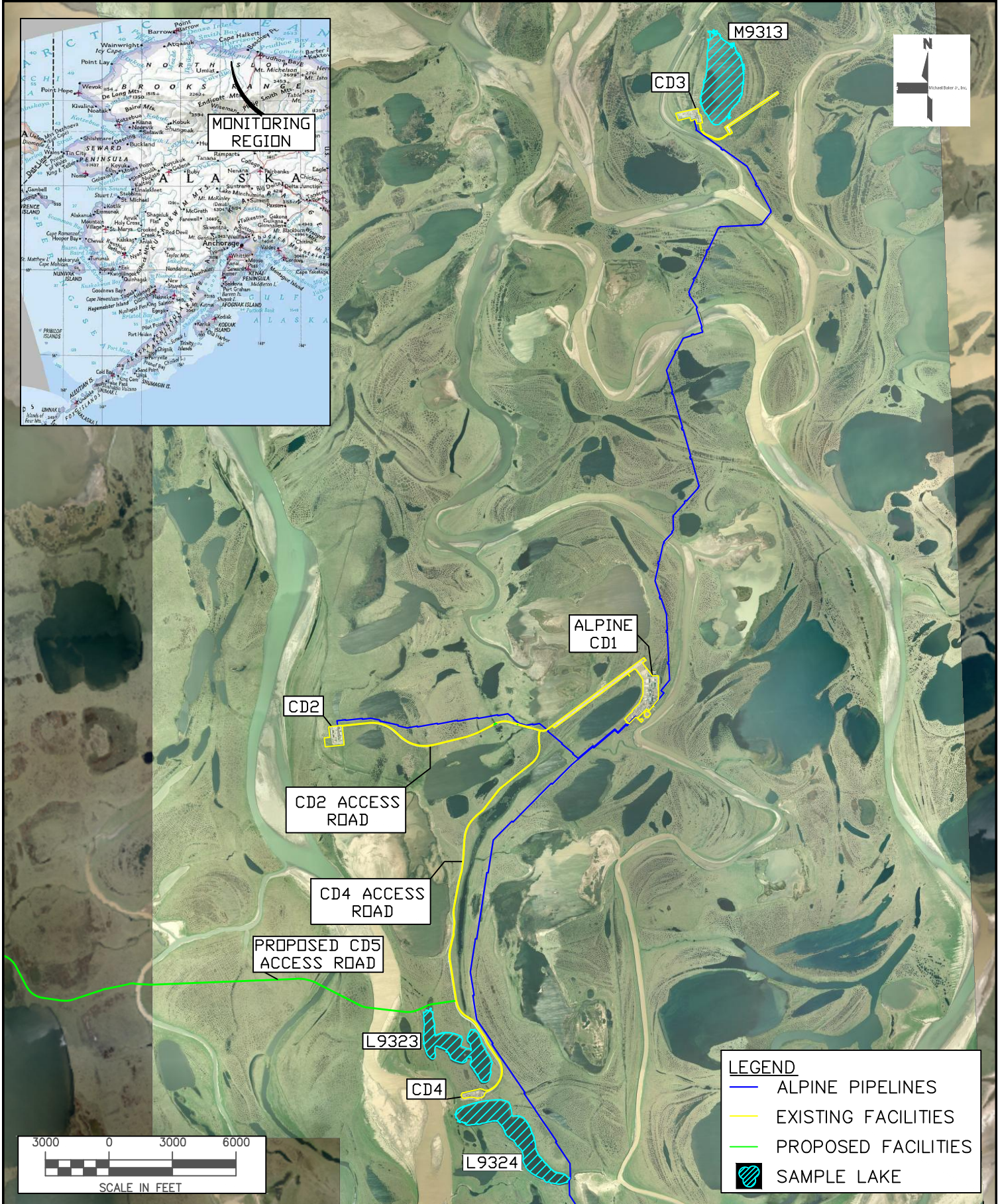
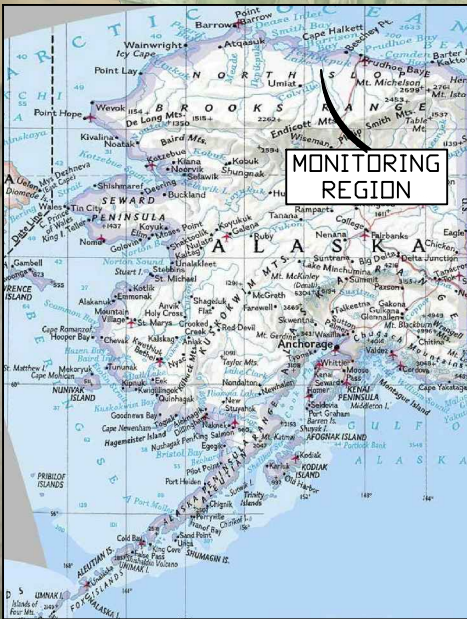
The water quality monitoring program for the lakes included in situ field sampling of temperature, dissolved oxygen (DO), salinity, conductivity/specific conductance, and turbidity. Additional water samples were collected for laboratory analysis of dissolved hydrocarbons--diesel range organics (DRO), residual range organics (RRO) and Resource Conservation and Recovery Act (RCRA) 8 metals. The laboratory analyses were chosen to identify and monitor the persistence of trace concentrations originally observed in 2007.

This report presents the field investigation procedures, sampling, and analytical methods as well as the resulting water quality data and analyses. Field sampling was performed on July 31, 2010. Laboratory analyses identified targeted constituent concentrations well below state and federal recommended water quality criteria and standards. Table 1.1 summarizes the field and laboratory sampling parameters for the three lakes included in the 2010 program.

**Table 1.1: Field and Laboratory Sampling Parameters**

Lake Designation	Field Sampling Parameters	Laboratory Analyses
M9313 L9323 L9324	Temperature Dissolved Oxygen Salinity Conductivity/Specific Conductance Turbidity	Diesel Range Organics (DRO) Residual Range Organics (RDO) Resource Conservation and Recovery Act 8 Metals (RCRA 8 Metals)





LEGEND	
	ALPINE PIPELINES
	EXISTING FACILITIES
	PROPOSED FACILITIES
	SAMPLE LAKE



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2010 OVERVIEW  
 ASDP WATER QUALITY  
 SAMPLING LOCATIONS

DATE: 10/20/2010	PROJECT: 120258
DRAWN: EJK	FILE: 2010 OVERVIEW.DWG
CHECKED: JMS	SCALE: AS SHOWN

FIGURE 1.1  
 (SHEET 1 OF 1)



## 2.0 METHODS

On July 31, 2010, Baker conducted field investigations at Lakes M9313, L9323, and L9324. Bristow Helicopters provided access to the three lakes. Each sampling location was identified and confirmed using a hand-held global positioning system (GPS) unit referenced to the North American Datum of 1983 (NAD83). Pre-defined locations were used for Lakes M9313, L9323, and L9324. Preference was given to the deepest part of each lake as identified using a hand-held sonar depth finder.

As in past years, in situ water quality data measurements and analytical sample collection were performed by a two-person Baker team; each in an inflatable kayak, with an attached support raft for transporting the sampling equipment (Photo 2.1). In situ water quality instruments were provided by TTT Environmental. Analytical sample bottles and storage coolers were provided by SGS North America, Inc. (SGS). Field aerial surveys were also conducted to identify possible inflow and outflow sources, and to determine if each lake was hydraulically connected to other nearby surface water sources.



Photo 2.1: Preparing inflatable kayaks and support equipment, Lake M9313. July 31, 2010.

Safety precautions were followed, as outlined in the North Slope Water Resources 2010 Health, Safety and Environmental Safety Plan (Baker 2010). Bristow Helicopters communicated travel plans to Alpine Security. Personnel were equipped with personal flotation devices (float-coats). Animal interaction was avoided during all field activities.

Field sampling methods were based on USGS (2006a), Ward and Harr (1990), and U.S. Army Corps of Engineers (USACE 1987) methods. It was assumed based on aerial observation each lake was hydraulically isolated with no apparent overland inflow or outflow. This was confirmed at each lake with an aerial survey of the perimeter of the lake. It was also assumed each lake was well-mixed and lacked significant stratification. Well-mixed conditions were confirmed with in situ measurements prior to analytic sample collection. Sample collection, storage, and transport for laboratory analysis methods were supplemented with instructions provided by SGS.

## 2.1 SAMPLE LOCATION SELECTION

For the purpose of this water quality study, it is assumed data collected at specific stations are representative of conditions throughout the water body. Thus, water samples collected at a single location are representative of the lake (Photo 2.2). Past in situ monitoring of North Slope lakes indicates hydraulically isolated lakes are well-mixed during open water conditions. The likelihood of homogeneous conditions, which are then verified with in situ measurements, supports the use of single point sampling.



Photo 2.2: Locating the deepest location using handheld sonar, Lake M9313. July 31, 2010.

Lake selection was initially based on maximum lake depth and relative proximity to gravel facilities. Lake bathymetry was used to select a single sampling location for Lake M9313 (Figure 2.1) and Lakes L9323 and L9324 (Figure 2.2). Field-specific locations were confirmed with field depth soundings, and locations recorded using a hand-held GPS.

## 2.2 ON-SITE WATER QUALITY PARAMETERS

In situ water quality was measured at two-foot intervals throughout the water column. A tabulation of meter equipment used and associated parameters is presented in Table 2.1.

Table 2.1: On-Site Water Quality Parameters

Meter	Parameter	Units
YSI 650 MDS	Temperature	°C
	Dissolved Oxygen	mg/L
	Dissolved Oxygen	%
	Salinity	ppt
	Conductivity	µS/cm
	Specific Conductance	µS/cm
	Turbidity	NTU

### 2.2.1 INSTRUMENT CALIBRATION

The primary and backup meters, both YSI 650 MDS handheld units with YSI 6920V2 Sondes sensors, were calibrated according to the manufacturer's specifications. Prior to sampling, a calibration check of the dissolved oxygen sensor was performed using tap water, as directed by the manufacturer. An optical or Light Dissolved Oxygen (LDO) sensor was used for the dissolved oxygen sampling. Meters would have been recalibrated as per manufacturer's instructions if readings were incorrect. Prior to each field sampling event, the meter was thoroughly rinsed with native water.





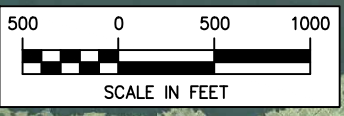
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ULAMNIGIAQ  
CHANNEL

M9313

N70°25'18.9"  
W150°53'58.2"

CD3



SCALE IN FEET

✘ WATER QUALITY  
SAMPLING POINT

LAKE M9313  
ASDP WATER QUALITY  
SAMPLING LOCATIONS  
FIGURE 2.1  
(SHEET 1 OF 1)

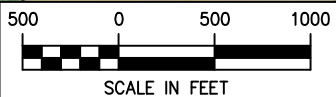
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Alaska, Inc.

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 WATER QUALITY SAMPLING POINT

LAKES L9323 & L9324  
ASDP WATER QUALITY  
SAMPLING LOCATIONS  
FIGURE 2.2  
(SHEET 1 OF 1)

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## 2.3 LABORATORY SAMPLE COLLECTION AND ANALYSIS

### 2.3.1 SAMPLE COLLECTION

In situ sampling was performed to confirm well-mixed water quality constituents within the water column at each sample location prior to laboratory sample collection. Neither oxycline (notable change in oxygen values with depth) nor thermocline (notable change in temperature values with depth) was apparent at any of the sampling sites (as demonstrated in Table 3.1). Therefore, a representative single point sample at mid-depth was collected at each location. In the event of lake stratification, multiple samples would have been collected throughout the water column and combined for laboratory analysis. Samples were collected using a 500 mL stainless steel bomb sampler. The bomb sampler was given a thorough native-water rinse at each lake prior to sampling.

Sample bottles provided by SGS were stored in the provided cooler before, during, and after sample collection to maintain adequate storage temperatures. Field samples were transported to SGS within 53 hours of collection. The procedures for transport and transfer are described in Appendix A as part of the SGS analysis report.

### 2.3.2 ANALYTICAL ANALYSIS

#### 2.3.2.1 ADEC AK102 – DIESEL RANGE ORGANICS (DRO)

The ADEC AK102 method for DRO, developed by the Alaska Department of Environmental Conservation (ADEC), is based on a solvent extraction, gas chromatography (GC) procedure for the detection of semi-volatile petroleum products such as diesels. Other nonpetroleum compounds of similar characteristics may be detected with this method. Samples spiked with a surrogate (o-Terphenyl) are extracted with methylene chloride. The GC is temperature programmed to facilitate separation of organic compounds detected by a flame ionization detector (FID). Quantification is based on FID response compared to a diesel calibration standard.

#### 2.3.2.2 ADEC AK103 – RESIDUAL RANGE ORGANICS (RRO)

This method, developed by ADEC, was originally designed to measure lubricating or motor oils and other heavy petroleum products in soils. The ADEC *Underground Storage Tanks Procedures Manual* (ADEC 2002) identifies the method as adequate for determining such compounds in solution. The method is an extension of ADEC AK102, employing solvent extractions and gas chromatographs (GC) to identify heavier residual range organics (RRO). Quantification is based on FID response compared to a residuals calibration standard.



### 2.3.2.3 SW6020 – RCRA TRACE METALS

This method, developed by the EPA Office of Solid Waste, employs inductively coupled plasma-mass spectrometry (ICP-MS) to determine trace elements, including metals, in solution. Elements tested include arsenic, barium, cadmium, chromium, lead, selenium, and silver. This method measures ions produced by a radio frequency inductively coupled plasma. High temperatures are used to produce ions, which are then entrained in a plasma gas and extracted. The ions are separated on the basis of their mass-to-charge ratio by a mass spectrometer (MS).

### 2.3.2.4 SW7470A/E245.1 – MERCURY IN LIQUID WASTE

This EPA method employs a cold-vapor atomic adsorption procedure approved for determining mercury concentration in liquid wastes. Aqueous samples are digested with sulfuric acid, nitric acid, potassium permanganate, and potassium persulfate. The organo-mercury compounds are oxidized to the mercuric ion. Once samples have cooled, the excess permanganate is chemically reduced, as is the elemental mercury, which is immediately measured by a cold-vapor atomic absorption spectrophotometer or equivalent instrument.

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## 3.0 RESULTS

### 3.1 FIELD CONDITIONS JULY 31, 2010

On July 31, the temperature ranged from 55°F to 60°F. The weather was cloudy and calm in the morning transitioning to slightly breezy and very breezy in the afternoon.

#### 3.1.1 LAKE L9323

Located near CD4, Lake L9323 (Figure 2.2) is a moderately sized lake with grassy banks and some reeds on the periphery. No hydraulic connectivity with the Nigliq Channel was apparent at the time of sampling (Photo 3.1 and Photo 3.2). No odor or oily sheen was observed on the lake; however, an oily sheen was observed in small isolated ponded pockets in the vicinity of the southwestern bank (Photo 3.3). It is worthwhile to note an oily sheen can come from natural sources. As an example, some bacteria grow and decompose, leaving an oily-appearing residue (USGS 2006b).

Sampling was conducted at the site between 2:50 p.m. and 3:40 p.m. As sampling was conducted, it was very breezy, and the water was choppy and well-mixed.



Photo 3.1: Lake L9323, CD4 in foreground, Nigliq Channel in background, looking northwest.  
July 31, 2010.





Photo 3.2: Lake L9323 in foreground, CD4 and Lake L9324 in background. July 31, 2010.



Photo 3.3: Isolated ponded pocket of water with oily sheen, vicinity of Lake L9323. July 31, 2010.

### 3.1.2 LAKE L9324

Also located near CD4, Lake L9324 (Figure 2.2) is a moderately sized lake with grassy banks and willows (Photo 3.2, Photo 3.4 through Photo 3.6). Some large bluffs surround the lake. At the time of sampling, there was no apparent hydraulic connectivity with any other water body. No odor or oily sheen was observed on the lake.

Sampling was conducted at the site between 4:00 p.m. and 5:30 p.m. The breeze began to pick up during sampling and white caps were observed on the lake surface.



Photo 3.4: Lake L9324, Sagoonang Channel in background, looking east. July 31, 2010.



Photo 3.5: Lake L9324 with CD4 on left side, looking southeast. July 31, 2010.



Photo 3.6: Lake L9324 with CD 4 on right side, looking southwest. July 31, 2010

### 3.1.3 LAKE M9313

Lake M9313 is located near CD3 (Figure 2.1). It is a large lake with low grassy banks (Photo 3.7 and Photo 3.8). No hydraulic connectivity was observed at the time of sampling. Neither odor nor oily sheen was observed on the lake. Several jumping fish and loons were observed on the lake during the sampling event. A slight oily sheen was noted in marshy water adjacent to the west bank. Sampling was conducted between 10:00 a.m. and 11:30 a.m.



Photo 3.7: Lake M9313, CD3 runway in foreground, looking northwest. July 31, 2010.





Photo 3.8: Lake L9313, CD3 facilities on right side, looking southeast. July 31, 2010.

## 3.2 ON-SITE WATER QUALITY RESULTS

The measured water quality results from the July 31, 2010, sampling event are tabulated in Table 3.1. The 2009 on-site results are presented in Appendix B. Values are discussed below.

### 3.2.1 SPECIFIC CONDUCTANCE

Conductivity is determined by measuring resistance, and reflects water's ionic activity and content. Conductivity for the three lakes was directly measured and values are tabulated in Table 3.1. Since resistance drops as temperature increases, conductivity in a water body change with changes in water temperature. To adequately compare different water sources, measured conductivity is corrected to a standard temperature of 25°C using the field-measured water temperature and a standard temperature correction coefficient. This yields specific conductance, which can then be compared to values from other water sources. Specific conductance was used as the basis of discussion.

Specific conductance varied little within the water column, but was notably different between lakes. The average specific conductance in M9313 was 733 $\mu$ S/cm (down 7% from 790 $\mu$ S/cm in 2009). Average specific conductance was 110 $\mu$ S/cm in L9323 (a 2% decrease from the 112 $\mu$ S/cm measured in 2009). Average specific conductance in L9324 was unchanged from 2009 at 66 $\mu$ S/cm. Overall values were consistent with those observed in August of 2009.

Table 3.1: On-Site Water Quality Results, July 31, 2010

Lake Location Time	Depth (ft)	Turbidity NTU	Depth (ft)	Temp (°C)	Conductivity ( $\mu$ S/cm)	Specific Conductance ( $\mu$ S/cm)	DO (mg/L)	DO (Percent Saturation)	Salinity (ppt)
<b>L9323</b> N70°17'45.9" W150°59'17.9" 2:50 p.m.	18.0	2.8	Surface	-	-	-	-	-	-
			1.0	15.3	89	110	10.34	103.2	0.05
			3.0	15.3	89	110	10.33	103.1	0.05
			5.0	15.3	89	110	10.32	103.0	0.05
			7.0	15.3	89	110	10.32	103.0	0.05
			9.0	15.3	89	110	10.31	103.0	0.05
			11.0	15.3	89	110	10.30	102.8	0.05
			13.0	15.3	89	110	10.30	102.8	0.05
			15.0	15.3	89	110	10.29	102.7	0.05
			17.0	15.3	89	110	10.28	102.6	0.05
<b>L9324</b> N70°17'24.7" W150°58'58.6" 4:00 p.m.	8.2	3.1	Surface	-	-	-	-	-	-
			1.0	15.9	54	66	10.10	102.2	0.03
			3.0	15.9	54	66	10.11	102.2	0.03
			5.0	15.9	54	66	10.12	102.3	0.03
			7.0	15.9	54	66	10.13	102.4	0.03
			7.5	15.9	54	66	10.13	102.3	0.03
<b>M9313</b> N70°25'18.9" W150°53'58.2" 10:00 a.m.	25.5	2.9	Surface	-	-	-	-	-	-
			1.0	14.1	577	733	10.32	100.5	0.36
			3.0	14.1	577	733	10.30	100.4	0.36
			5.0	14.1	577	733	10.27	100.1	0.36
			7.0	14.1	577	734	10.25	99.9	0.36
			9.0	14.1	576	733	10.21	99.5	0.36
			11.0	14.0	574	733	10.14	98.6	0.36
			13.0	13.9	573	733	10.12	98.1	0.36
			15.0	13.8	572	734	10.08	97.6	0.36
			17.0	13.7	571	734	9.99	96.5	0.36
			19.0	13.6	570	734	9.90	95.4	0.36
			21.0	13.6	569	733	9.84	94.8	0.36
			23.0	13.5	569	734	9.69	93.1	0.36
			25.0	13.5	569	735	9.58	92.1	0.36

Notes:  
(1) Sample depth is measured from the water surface.  
(2) Turbidity, temperature, conductivity, dissolved oxygen, and salinity were measured using a YSI 6920V2-M meter.  
(3) Turbidity is presented as an average of the sampled values in the water column.  
(4) Specific conductance (referenced to 25°C) was obtained using a conversion coefficient of 0.0196 based on empirical data.

### 3.2.2 DISSOLVED OXYGEN (DO) AND WATER TEMPERATURE

As seen in past years, DO concentration varied little between lakes and between sampling years. For 2010, the average DO was measured at 10.05 milligrams per liter (mg/L) in Lake M9313, 10.31 mg/L in Lake L9323, and 10.12 mg/L in Lake L9324.

A 100% saturation level is based on standard temperature and pressure conditions. The percent-saturation (%-saturation) at each CD3 and CD4 lake was 97.4% (M9313), 102.9% (L9323), and 102.3% (L9324). Variation from standard values can result in DO concentrations greater than 100%. No significant oxycline was apparent within the sampled water columns, although oxygen dropped with depth in the deepest lake, M9313.

No significant thermocline was apparent within the sampled water columns. Temperatures in all three lakes ranged from 13.5°C in M9313 to 15.9°C in L9324. The coolest temperatures were noted in the deepest lake, M9313.

### 3.2.3 SALINITY

Salinity remained fairly consistent with depth and between sampling years. The greatest concentration was measured in M9313 at 0.36 parts per thousand (ppt). This compares with a similar concentration of 0.39 ppt in 2009, and is likely due to the close proximity of the lake to the coast. Lakes L9323 and L9324 had concentrations less than or equal to 0.05 ppt.

### 3.2.4 TURBIDITY

Turbidity was variable between lakes and monitoring years. Turbidity was sampled at the same increments as other in situ water quality parameters; however, it is presented as an average of the sampled values in the water column. Reported values increased approximately 290% from 0.98 NTU in 2009 to 2.8 NTU in 2010 at L9323. At L9324, turbidity increased nearly 210% from 1.5 NTU in 2009 to 3.1 NTU in 2010. At M9313, turbidity increased approximately 350% from a 2009 value of 0.83 NTU to 2.9 NTU in 2010.

## 3.3 LABORATORY FINDINGS

Water quality samples for ex situ laboratory analyses were taken at mid-depth in each water column. Results from ex situ laboratory analyses are tabulated in Table 3.2 through Table 3.4. Analytical results provided by SGS are presented in Appendix A. Values are summarized and compared for the three lakes below.

With the exception of barium and chromium, the targeted compounds and metals were non-detectable (ND) in the sampled lakes. Barium was detected in all lakes, at levels consistent with the 2009 laboratory values. The greatest measured concentration of barium was 212 µg/L; well below the water quality standard of 2 mg/L identified by the EPA (EPA 2006) and adopted in the *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances* (ADEC 2008). Barium concentrations remained relatively unchanged



in Lake M9313, decreasing from 232 to 212 mg/L. Barium decreased slightly from 55.2 µg/L to 52.6 µg/L in Lake L9323, and decreased from 43.4 to 39.2 µg/L in Lake L9324.

Chromium was detected in Lake M9313 at a concentration of 5.03 µg/L. This value is well below limits identified in the *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances* of 100 µg/L. Chromium was not detected in Lakes L9323 and L9324 in 2010. Chromium was previously detected in Lake L9324 in 2007 at a concentration of 13 µg/L. Chromium was not detected in any of the three sample lakes in either 2008 or 2009.

**Table 3.2: Lake L9323 Laboratory Results (2010)**

Lab Sample Number	Test Method	Analysis	Concentration	Units	LOQ	Lower Limit	Upper Limit
1103801002A	SW7470A/E245.1	Mercury	ND	µg/L	0.200	-	-
1103801002B	ADEC AK103-RRO	Residual Range Organics <i>n-Triacontane-d62</i>	ND 82.6	mg/L %	0.510	- 50	- 150
1103801002B	ADEC AK102-DRO	Diesel Range Organics <i>5a Androstane</i>	ND 88.2	mg/L %	0.816	- 50	- 150
1103801002A	SW6010B-ICP-RCRA	Arsenic	ND	µg/L	5.00	-	-
		Barium	52.6	µg/L	3.00	-	-
		Cadmium	ND	µg/L	2.00	-	-
		Chromium	ND	µg/L	4.00	-	-
		Lead	ND	µg/L	1.00	-	-
		Selenium	ND	µg/L	5.00	-	-
		Silver	ND	µg/L	2.00	-	-
Notes: (1) LOQ: Limit of Quantitation (2) Surrogates values are italicized.							

**Table 3.3: Lake L9324 Laboratory Results (2010)**

Lab Sample Number	Test Method	Analysis	Concentration	Units	LOQ	Lower Limit	Upper Limit
1103801003A	SW7470A/E245.1	Mercury	ND	µg/L	0.200	-	-
1103801003B	ADEC AK103-RRO	Residual Range Organics <i>n-Triacontane-d62</i>	ND 90.9	mg/L %	0.532	- 50	- 150
1103801003B	ADEC AK102-DRO	Diesel Range Organics <i>5a Androstane</i>	ND 97	mg/L %	0.851	- 50	- 150
1103801003A	SW6010B-ICP-RCRA	Arsenic	ND	µg/L	5.00	-	-
		Barium	39.2	µg/L	3.00	-	-
		Cadmium	ND	µg/L	2.00	-	-
		Chromium	ND	µg/L	4.00	-	-
		Lead	ND	µg/L	1.00	-	-
		Selenium	ND	µg/L	5.00	-	-
		Silver	ND	µg/L	2.00	-	-
Notes: (1) LOQ: Limit of Quantitation (2) Surrogates are italicized							

Table 3.4: Lake M9313 Laboratory Results (2010)

Lab Sample Number	Test Method	Analysis	Concentration	Units	LOQ	Lower Limit	Upper Limit
1103801001A	SW7470A/E245.1	Mercury	ND	µg/L	0.200	-	-
1103801001B	ADEC AK103-RRO	Residual Range Organics <i>n-Triacontane-d62</i>	ND <i>88.2</i>	mg/L %	0.532	- <i>50</i>	- <i>150</i>
1103801001B	ADEC AK102-DRO	Diesel Range Organics <i>5a Androstane</i>	ND <i>91.4</i>	mg/L %	0.851	- <i>50</i>	- <i>150</i>
1103801001A	SW6020	Arsenic	ND	µg/L	5.00	-	-
		Barium	212	µg/L	3.00	-	-
		Cadmium	ND	µg/L	2.00	-	-
		Chromium	5.03	µg/L	4.00	-	-
		Lead	ND	µg/L	1.00	-	-
		Selenium	ND	µg/L	5.00	-	-
		Silver	ND	µg/L	2.00	-	-
Notes: (1) LOQ: Limit of Quantitation (2) <i>Surrogates and their values are italicized</i>							

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## 4.0 DISCUSSION

Overall, in situ water quality parameters varied little with depth and time for the three lakes evaluated.

When compared with previous monitoring years, turbidity was observed to be higher in 2010. Generally speaking, aquatic organisms are not affected by turbidity less than 10 NTU. The maximum turbidity observed in 2010 was 3.1 NTU, which is well below the 10 NTU value. Turbidity is a measure of the concentration of total suspended solids (TSS) in a water body. The greatest source of turbidity in the open water zone of most lakes is typically phytoplankton or algae. Algal turbidity varies seasonally and with depth in a complex manner in response to natural physical, chemical, and biological changes in a lake and cannot be directly linked to development activities.

A surrogate, as shown in italics in the tables, is a known quantity of a compound that the laboratory injects into the sample prior to the analysis. The amount of the surrogate recovered during the analysis has to fall within a certain percentage to meet Quality Control (QC) goals. The surrogates analyzed for all lakes fell within the QC limits.

Laboratory analysis of lake water samples yielded no evidence of targeted contaminants at any lake, except for barium in all lakes and chromium in Lake M9313. Barium in all three of the sample lakes had concentrations well below federal and state water quality standards. Barium concentrations in all three lakes were consistent with levels detected in past years. The concentration of barium decreased from 2009 in the three sampled lakes. Lake M9313 had the highest barium concentration at 212 $\mu\text{g}/\text{L}$ ; an 8.6% decrease from the 2009 reported concentration. Barium levels at Lakes L9323 and L9324 were 52.6 $\mu\text{g}/\text{L}$  and 39.2 $\mu\text{g}/\text{L}$  respectively. Barium is not uncommon in arctic waters at concentrations similar to those measured at the three lakes (Guay and Falkner 1998).

Chromium was detected in Lake M9313 at a concentration of 5.03 $\mu\text{g}/\text{L}$ , which is substantially lower than limits identified in the *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances* of 100  $\mu\text{g}/\text{L}$ . Chromium was not detected in M9313 in 2009. In 2008, the Limit of Quantitation (LOQ) would not have been able to detect chromium at concentrations below 10  $\mu\text{g}/\text{L}$ .

The results of these analyses suggest the gravel access roads and pads for CD3 and CD4 have no measureable effect on the water quality of adjacent lakes.

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## 5.0 REFERENCES

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# Appendix A

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**SGS North America Inc.**  
**Alaska Division**  
**Level II Laboratory Data Report**

Project: ASDPWQ  
Client: Michael Baker Jr., Inc.  
SGS Work Order: 1103801

Released by:

**Contents (Bookmarked in PDF):**

Cover Page  
Case Narrative  
Sample Results Forms  
Quality Control Summary Forms  
Chain of Custody/Sample Receipt Forms  
Attachments (if applicable)





Case Narrative

Client MBAKERJ Michael Baker Jr., Inc.  
Workorder 1103801 ASDPWQ

Printed Date/Time 8/12/2010 8:15

Sample ID Client Sample ID

---

Refer to the sample receipt form for information on sample condition.

---

- 978031 \* LCS LCS for HBN 632480 [XXX/23239]**  
AK103 - LCS recovery for RRO is outside QC criteria (biased high). Samples are non-detected for this analyte . See the LCSD for accuracy.
- 979467 \* MSD 07282010-1FL...(1104924001MSD)**  
7470A - Mercury- MSD recovery for mercury was outside of acceptance criteria (biased low). Post digestion spike was unsuccessful. Sample result was determined by MSA.
- 979468 \* BND 07282010-1FL...(1104924001BND)**  
7470A - Mercury- MSD recovery for mercury was outside of acceptance criteria (biased low). Post digestion spike was unsuccessful. Sample result was determined by MSA.

\* QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Julie Shewman  
Michael Baker Jr., Inc.  
1400 West Benson Blvd, Ste 200  
Anchorage, AK 99503

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**Work Order:** 1103801  
ASDPWQ

**Client:** Michael Baker Jr., Inc.

**Report Date:** August 12, 2010

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Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. If you have any questions regarding this report, or if we can be of any other assistance, please contact your SGS Project Manager at 907-562-2343. All work is provided under SGS general terms and conditions ([http://www.sgs.com/terms\\_and\\_conditions.htm](http://www.sgs.com/terms_and_conditions.htm)), unless other written agreements have been accepted by both parties.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and AK100001 for NELAP (RCRA methods: 1020A, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035B, 6010B, 6020, 7470A, 7471B, 8021B, 8081B, 8082A, 8260B, 8270D, 8270D-SIM, 9040B, 9045C, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, the National Environmental Laboratory Accreditation Program and other regulatory authorities. The following descriptors or qualifiers may be found in your report:

- \* The analyte has exceeded allowable regulatory or control limits.
- ! Surrogate out of control limits.
- B Indicates the analyte is found in a blank associated with the sample.
- CCV Continuing Calibration Verification
- CL Control Limit
- D The analyte concentration is the result of a dilution.
- DF Dilution Factor
- DL Detection Limit (i.e., maximum method detection limit)
- E The analyte result is above the calibrated range.
- F Indicates value that is greater than or equal to the DL
- GT Greater Than
- ICV Initial Calibration Verification
- J The quantitation is an estimation.
- JL The analyte was positively identified, but the quantitation is a low estimation.
- LCS(D) Laboratory Control Spike (Duplicate)
- LOD Limit of Detection (i.e., 2xDL)
- LOQ Limit of Quantitation (i.e., reporting or practical quantitation limit)
- LT Less Than
- M A matrix effect was present.
- MB Method Blank
- MS(D) Matrix Spike (Duplicate)
- ND Indicates the analyte is not detected.
- Q QC parameter out of acceptance range.
- R Rejected
- RPD Relative Percent Difference
- U Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content.  
All DRO/RRO analyses are integrated per SOP.



### Detectable Results Summary

Print Date: 8/12/2010 8:15 am

Client Sample ID: **M9313**  
SGS Ref. #: 1103801001  
**Metals by ICP/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Barium	212	ug/L
Chromium	5.03	ug/L

Client Sample ID: **L9323**  
SGS Ref. #: 1103801002  
**Metals by ICP/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Barium	52.6	ug/L

Client Sample ID: **L9324**  
SGS Ref. #: 1103801003  
**Metals by ICP/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Barium	39.2	ug/L



**SGS Ref.#** 1103801001  
**Client Name** Michael Baker Jr., Inc.  
**Project Name/#** ASDPWQ  
**Client Sample ID** M9313  
**Matrix** Water (Surface, Eff., Ground)

**Printed Date/Time** 08/12/2010 8:15  
**Collected Date/Time** 07/31/2010 10:15  
**Received Date/Time** 08/02/2010 15:12  
**Technical Director** Stephen C. Ede

Sample Remarks:

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
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**Metals Department**

Mercury	0.200 U	0.200	ug/L	SW7470A/E245.1	A		08/06/10	08/09/10	KAR
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**Metals by ICP/MS**

Arsenic	5.00 U	5.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC
Barium	212	3.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC
Cadmium	2.00 U	2.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC
Chromium	5.03	4.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC
Lead	1.00 U	1.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC
Selenium	5.00 U	5.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC
Silver	2.00 U	2.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC

**Semivolatile Organic Fuels Department**

Diesel Range Organics	0.851 U	0.851	mg/L	AK102	B		08/03/10	08/04/10	HM
Residual Range Organics	0.532 U	0.532	mg/L	AK103	B		08/03/10	08/04/10	HM

**Surrogates**

5a Androstane <surr>	91.4		%	AK102	B	50-150	08/03/10	08/04/10	HM
n-Triacontane-d62 <surr>	88.2		%	AK103	B	50-150	08/03/10	08/04/10	HM





**SGS Ref.#** 1103801002  
**Client Name** Michael Baker Jr., Inc.  
**Project Name/#** ASDPWQ  
**Client Sample ID** L9323  
**Matrix** Water (Surface, Eff., Ground)

**Printed Date/Time** 08/12/2010 8:15  
**Collected Date/Time** 07/31/2010 15:00  
**Received Date/Time** 08/02/2010 15:12  
**Technical Director** Stephen C. Ede

Sample Remarks:

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Metals Department</u></b>									
Mercury	0.200 U	0.200	ug/L	SW7470A/E245.1	A		08/06/10	08/09/10	KAR
<b><u>Metals by ICP/MS</u></b>									
Arsenic	5.00 U	5.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC
Barium	52.6	3.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC
Cadmium	2.00 U	2.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC
Chromium	4.00 U	4.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC
Lead	1.00 U	1.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC
Selenium	5.00 U	5.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC
Silver	2.00 U	2.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	0.816 U	0.816	mg/L	AK102	B		08/03/10	08/04/10	HM
Residual Range Organics	0.510 U	0.510	mg/L	AK103	B		08/03/10	08/04/10	HM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	88.2		%	AK102	B	50-150	08/03/10	08/04/10	HM
n-Triacontane-d62 <surr>	82.6		%	AK103	B	50-150	08/03/10	08/04/10	HM



**SGS Ref.#** 1103801003  
**Client Name** Michael Baker Jr., Inc.  
**Project Name/#** ASDPWQ  
**Client Sample ID** L9324  
**Matrix** Water (Surface, Eff., Ground)

**Printed Date/Time** 08/12/2010 8:15  
**Collected Date/Time** 07/31/2010 16:00  
**Received Date/Time** 08/02/2010 15:12  
**Technical Director** Stephen C. Ede

Sample Remarks:

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
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**Metals Department**

Mercury	0.200 U	0.200	ug/L	SW7470A/E245.1	A		08/06/10	08/09/10	KAR
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**Metals by ICP/MS**

Arsenic	5.00 U	5.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC
Barium	39.2	3.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC
Cadmium	2.00 U	2.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC
Chromium	4.00 U	4.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC
Lead	1.00 U	1.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC
Selenium	5.00 U	5.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC
Silver	2.00 U	2.00	ug/L	SW6020	A		08/10/10	08/11/10	KDC

**Semivolatile Organic Fuels Department**

Diesel Range Organics	0.851 U	0.851	mg/L	AK102	B		08/03/10	08/04/10	HM
Residual Range Organics	0.532 U	0.532	mg/L	AK103	B		08/03/10	08/04/10	HM

**Surrogates**

5a Androstane <surr>	97		%	AK102	B	50-150	08/03/10	08/04/10	HM
n-Triacontane-d62 <surr>	90.9		%	AK103	B	50-150	08/03/10	08/04/10	HM



SGS Ref.# 978030 Method Blank  
Client Name Michael Baker Jr., Inc.  
Project Name/# ASDPWQ  
Matrix Water (Surface, Eff., Ground)

Printed Date/Time 08/12/2010 8:15  
Prep Batch XXX23239  
Method SW3520C  
Date 08/03/2010

QC results affect the following production samples:  
1103801001, 1103801002, 1103801003

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
<b>Semivolatile Organic Fuels Department</b>					
Diesel Range Organics	0.500 U	0.800	0.250	mg/L	08/06/10
<b>Surrogates</b>					
5a Androstane <surr>	88.3	60-120		%	08/06/10
Batch	XFC9397				
Method	AK102				
Instrument	HP 7890A	FID SV E R			
Residual Range Organics	0.300 U	0.500	0.150	mg/L	08/06/10
<b>Surrogates</b>					
n-Triacontane-d62 <surr>	84.9	60-120		%	08/06/10
Batch	XFC9397				
Method	AK103				
Instrument	HP 7890A	FID SV E R			



SGS Ref.# 979464 Method Blank  
Client Name Michael Baker Jr., Inc.  
Project Name/# ASDPWQ  
Matrix Water (Surface, Eff., Ground)

Printed Date/Time 08/12/2010 8:15  
Prep Batch MXX23335  
Method METHOD  
Date 08/06/2010

QC results affect the following production samples:  
1103801001, 1103801002, 1103801003

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
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**Metals Department**

Mercury	0.124 U	0.200	0.0620	ug/L	08/09/10
Batch	MCV4601				
Method	SW7470A/E245.1				
Instrument	PSA Millennium mercury AA				





SGS Ref.# 979488 Method Blank  
Client Name Michael Baker Jr., Inc.  
Project Name/# ASDPWQ  
Matrix Water (Surface, Eff., Ground)

Printed Date/Time 08/12/2010 8:15  
Prep Batch MXX23335  
Method METHOD  
Date 08/06/2010

QC results affect the following production samples:  
1103801001, 1103801002, 1103801003

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
-----------	---------	--------	----	-------	---------------

Metals Department

Mercury	0.124 U	0.200	0.0620	ug/L	08/09/10
Batch	MCV4601				
Method	SW7470A/E245.1				
Instrument	PSA Millennium mercury AA				



SGS Ref.# 979898 Method Blank  
Client Name Michael Baker Jr., Inc.  
Project Name/# ASDPWQ  
Matrix Water (Surface, Eff., Ground)

Printed Date/Time 08/12/2010 8:15  
Prep Batch MXX23344  
Method SW3010A  
Date 08/10/2010

QC results affect the following production samples:  
1103801001, 1103801002, 1103801003

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
<b>Metals by ICP/MS</b>					
Arsenic	3.00 U	5.00	1.50	ug/L	08/11/10
Barium	1.88 U	3.00	0.940	ug/L	08/11/10
Cadmium	1.20 U	2.00	0.600	ug/L	08/11/10
Chromium	2.40 U	4.00	1.20	ug/L	08/11/10
Lead	0.620 U	1.00	0.310	ug/L	08/11/10
Selenium	3.00 U	5.00	1.50	ug/L	08/11/10
Silver	1.24 U	2.00	0.620	ug/L	08/11/10
Batch	MMS6595				
Method	SW6020				
Instrument	Perkin Elmer Sciex ICP-MS P3				



**SGS Ref.#** 978031 Lab Control Sample  
 978032 Lab Control Sample Duplicate  
**Client Name** Michael Baker Jr., Inc.  
**Project Name/#** ASDPWQ  
**Matrix** Water (Surface, Eff., Ground)

**Printed Date/Time** 08/12/2010 8:15  
**Prep Batch** XXX23239  
**Method** SW3520C  
**Date** 08/03/2010

QC results affect the following production samples:  
 1103801001, 1103801002, 1103801003

Parameter	QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
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**Semivolatile Organic Fuels Department**

Diesel Range Organics	LCS	4.74	95	( 75-125 )			5 mg/L	08/06/2010
	LCSD	4.65	93		2	(< 20 )	5 mg/L	08/06/2010

**Surrogates**

5a Androstane <surr>	LCS		94	( 60-120 )				08/06/2010
	LCSD		92		2			08/06/2010

**Batch** XFC9397  
**Method** AK102  
**Instrument** HP 7890A FID SV E R

Residual Range Organics	LCS	4.93	99	( 60-120 )			5 mg/L	08/06/2010
	LCSD	4.70	94		5	(< 20 )	5 mg/L	08/06/2010

**Surrogates**

n-Triacontane-d62 <surr>	LCS		86	( 60-120 )				08/06/2010
	LCSD		82		5			08/06/2010

**Batch** XFC9397  
**Method** AK103  
**Instrument** HP 7890A FID SV E R



SGS Ref.# 979465 Lab Control Sample

Printed Date/Time 08/12/2010 8:15  
Prep Batch MXX23335  
Method METHOD  
Date 08/06/2010

Client Name Michael Baker Jr., Inc.

Project Name/# ASDPWQ

Matrix Water (Surface, Eff., Ground)

QC results affect the following production samples:

1103801001, 1103801002, 1103801003

Parameter	QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
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**Metals Department**

Mercury	LCS	3.77	94	( 85-115 )		4 ug/L	08/09/2010
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Batch MCV4601

Method SW7470A/E245.1

Instrument PSA Millennium mercury AA



SGS Ref.# 979489 Lab Control Sample

Printed Date/Time 08/12/2010 8:15  
Prep Batch MXX23335  
Method METHOD  
Date 08/06/2010

Client Name Michael Baker Jr., Inc.

Project Name/# ASDPWQ

Matrix Water (Surface, Eff., Ground)

QC results affect the following production samples:

1103801001, 1103801002, 1103801003

Parameter	QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
-----------	------------	-----------	-----------------	-----	------------	---------------	---------------

**Metals Department**

Mercury LCS 4.04 101 ( 85-115 ) 4 ug/L 08/09/2010

Batch MCV4601

Method SW7470A/E245.1

Instrument PSA Millennium mercury AA





**SGS Ref.#** 979899 Lab Control Sample  
**Client Name** Michael Baker Jr., Inc.  
**Project Name/#** ASDPWQ  
**Matrix** Water (Surface, Eff., Ground)

**Printed Date/Time** 08/12/2010 8:15  
**Prep Batch** MXX23344  
**Method** SW3010A  
**Date** 08/10/2010

QC results affect the following production samples:  
 1103801001, 1103801002, 1103801003

Parameter	QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
<b><u>Metals by ICP/MS</u></b>							
Arsenic	LCS	976	98	( 80-120 )		1000 ug/L	08/11/2010
Barium	LCS	950	95	( 80-120 )		1000 ug/L	08/11/2010
Cadmium	LCS	94.0	94	( 80-120 )		100 ug/L	08/11/2010
Chromium	LCS	375	94	( 80-120 )		400 ug/L	08/11/2010
Lead	LCS	1030	103	( 80-120 )		1000 ug/L	08/11/2010
Selenium	LCS	968	97	( 80-120 )		1000 ug/L	08/11/2010
Silver	LCS	99.2	99	( 80-120 )		100 ug/L	08/11/2010

**Batch** MMS6595  
**Method** SW6020  
**Instrument** Perkin Elmer Sciex ICP-MS P3



SGS Ref.# 979466 Matrix Spike  
979467 Matrix Spike Duplicate

Printed Date/Time 08/12/2010 8:15  
Prep Batch MXX23335  
Method Digestion Mercury (W)  
Date 08/06/2010

Original 1104924001  
Matrix Solid/Soil (Wet Weight)

QC results affect the following production samples:

1103801001, 1103801002, 1103801003

Parameter	Qualifiers	Original Result	QC Result	Pet Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
-----------	------------	-----------------	-----------	-----------	---------------	-----	------------	---------------	---------------

**Metals Department**

Mercury	MS (2.00) U	135	88 (85-115)					154 ug/L	08/09/2010
	MSD	127	82*			7 (< 15)		154 ug/L	08/09/2010

Batch MCV4601  
Method SW7470A/E245.1  
Instrument PSA Millennium mercury AA



SGS Ref.# 979468 Bench Spike DIGESTED

Printed Date/Time 08/12/2010 8:15  
Prep Batch MXX23335  
Method Digestion Mercury (W)  
Date 08/06/2010

Original 1104924001  
Matrix Solid/Soil (Wet Weight)

QC results affect the following production samples:

1103801001, 1103801002, 1103801003

Parameter	Qualifiers	Original Result	QC Result	Pet Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
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**Metals Department**

Mercury BND (2.00) U 197 127\* (85-115) 154 ug/L 08/09/2010

Batch MCV4601  
Method SW7470A/E245.1  
Instrument PSA Millennium mercury AA



SGS Ref.# 979475 Matrix Spike

Printed Date/Time 08/12/2010 8:15  
Prep Batch MXX23335  
Method Digestion Mercury (W)  
Date 08/06/2010

Original 1103850001  
Matrix Water (Surface, Eff., Ground)

QC results affect the following production samples:  
1103801001, 1103801002, 1103801003

Parameter	Qualifiers	Original Result	QC Result	Pet Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
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**Metals Department**

Mercury MS (0.200) U 6.89 86 (85-115) 8.00 ug/L 08/09/2010

Batch MCV4601  
Method SW7470A/E245.1  
Instrument PSA Millennium mercury AA



SGS Ref.# 979900 Matrix Spike  
 979901 Matrix Spike Duplicate

Printed Date/Time 08/12/2010 8:15  
 Prep Batch MXX23344  
 Method 3010 H2O Digest for Metals ICI  
 Date 08/10/2010

Original 1103779004  
 Matrix Water (Surface, Eff., Ground)

QC results affect the following production samples:  
 1103801001, 1103801002, 1103801003

Parameter	Qualifiers	Original Result	QC Result	Pet Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
<b>Metals by ICP/MS</b>									
Arsenic	MS	(5.00) U	1050	105	(80-120)			1000	ug/L 08/11/2010
	MSD		1040	104		0	(< 15)	1000	ug/L 08/11/2010
Barium	MS	14.8	1010	99	(80-120)			1000	ug/L 08/11/2010
	MSD		1010	100		1	(< 15)	1000	ug/L 08/11/2010
Cadmium	MS	(2.00) U	94.2	94	(80-120)			100	ug/L 08/11/2010
	MSD		100	100		6	(< 15)	100	ug/L 08/11/2010
Chromium	MS	(4.00) U	395	99	(80-120)			400	ug/L 08/11/2010
	MSD		403	101		2	(< 15)	400	ug/L 08/11/2010
Lead	MS	(1.00) U	1150	115	(80-120)			1000	ug/L 08/11/2010
	MSD		1060	106		9	(< 15)	1000	ug/L 08/11/2010
Selenium	MS	(5.00) U	1030	103	(80-120)			1000	ug/L 08/11/2010
	MSD		1020	102		1	(< 15)	1000	ug/L 08/11/2010
Silver	MS	(2.00) U	99.6	100	(80-120)			100	ug/L 08/11/2010
	MSD		106	106		7	(< 15)	100	ug/L 08/11/2010

Batch MMS6595  
 Method SW6020  
 Instrument Perkin Elmer Sciex ICP-MS P3







## SAMPLE RECEIPT FORM

Review Criteria:	Condition:	Comments/Action Taken:
Were custody seals intact? Note # & location, if applicable. COC accompanied samples?	Yes <input checked="" type="radio"/> No <input type="radio"/> N/A <input type="radio"/>	
Temperature blank compliant* (i.e., 0-6°C after correction factor)? * Note: Exemption permitted for chilled samples collected less than 8 hours ago. Cooler ID: <u>  V  </u> @ <u>  6.5  </u> w/ Therm.ID: <u>  100  </u> Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Note: If non-compliant, use form FS-0029 to document affected samples/analyses. If samples are received <u>without</u> a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "COOLER TEMP" will be noted to the right. In cases where neither a temp blank <u>nor</u> cooler temp can be obtained, note "ambient" or "chilled." If temperature(s) <0°C, were all sample containers ice free?	Yes <input type="radio"/> No <input checked="" type="radio"/> N/A <input type="radio"/>	Client is aware of high temp and wants to proceed
Delivery method (specify all that apply): USPS Alert Courier Road Runner AK Air Lynden Carlile ERA PenAir FedEx UPS NAC Other:	Note airbill/tracking #  See Attached  or N/A	
→ For samples received with payment, note amount (\$) and cash / check / CC (circle one). → For samples received in FBKS, ANCH staff will verify all criteria are reviewed.		SRF Initiated by: <input checked="" type="radio"/> N/A <input checked="" type="radio"/>
Do samples match COC* (i.e., sample IDs, dates/times collected)? * Note: Exemption permitted if collection times differ by less than an hour; in which case, the times on the COC will be used.	Yes <input checked="" type="radio"/> No <input type="radio"/> N/A <input type="radio"/>	
Are analyses requested unambiguous?	Yes <input checked="" type="radio"/> No <input type="radio"/> N/A <input type="radio"/>	
Were samples in good condition (no leaks/cracks/breakage)? Packing material used (specify all that apply): <u>  Bubble Wrap  </u> Separate plastic bags Vermiculite Other:	Yes <input checked="" type="radio"/> No <input type="radio"/> N/A <input type="radio"/>	
Were all VOA vials free of headspace (i.e., bubbles ≤6 mm)? Were all soil VOAs field extracted with MeOH+BFB? Were the bottles provided by SGS? (Note apparent exceptions.)	Yes <input type="radio"/> No <input checked="" type="radio"/> N/A <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A <input type="radio"/>	
Were proper containers (type/mass/volume/preservative*) used? * Note: Exemption permitted for waters to be analyzed for metals. Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes <input checked="" type="radio"/> No <input type="radio"/> N/A <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A <input type="radio"/>	
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was pH verified and compliant? If pH was adjusted, were bottles flagged (i.e., stickers)? Refer to attached bottle sheet (form F066) for documentation.	Yes <input checked="" type="radio"/> No <input type="radio"/> N/A <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A <input type="radio"/>	
For RUSH or SHORT HOLD TIME samples, were the COC & this SRF flagged, bottles flagged (e.g., stickers) and lab notified?	Yes <input type="radio"/> No <input checked="" type="radio"/> N/A <input type="radio"/>	
For client requested, site-specific QC (e.g., MS/MSD/DUP), were bottles flagged (e.g., stickers) and numbered accordingly?	Yes <input type="radio"/> No <input checked="" type="radio"/> N/A <input type="radio"/>	
For special handling (e.g., "MI" or foreign soils, lab filter, limited volume, Ref Lab), were bottles/paperwork flagged (e.g., sticker)?	Yes <input type="radio"/> No <input checked="" type="radio"/> N/A <input type="radio"/>	
Was the WO# recorded in Front Counter/Sample Receiving log? For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?	Yes <input checked="" type="radio"/> No <input type="radio"/> N/A <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A <input type="radio"/>	SRF Completed by: <u>  LMB  </u> Bottle Sheet by: <u>  LMB  </u> PM = _____ N/A
Was PEER REVIEW of sample numbering completed (i.e., compare WO# on containers to COC, container ID on containers to COC, unique lab ID on each container?)	Yes <input checked="" type="radio"/> No <input type="radio"/> N/A <input type="radio"/>	Peer Reviewed by: <u>  [Signature]  </u> Metrics: <u>  1745  </u>
Additional notes (if applicable):		

WO# (7 digits)	Sample #		Container ID		Matrix	QC	Preservative (CHECKED)	TEST GROUP	Notes: ANOMALIES - e.g., preservative added or SPECIAL HANDLING - e.g., Multi-Incremental (MI), Field Filter (FF), Lab Filter (LF), use "same jar as" (SJA) for QC, 2xMeOH, bubbles, etc.
	Sample #	Sample #	Container ID	Container ID					
SAMPLE ID					TYPE	CONTAINERS	ANALYSIS	Type comments below:	
1103801	001	003	A	A	1 Water		HNO3 (pH <2)	W_Metals_Total/Diss.	
1103801	001	003	B	C	1 Water		HCl (pH <2)	W_DRO_1L	

1103801



# Appendix B

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# Laboratory Analysis Report

200 W. Potter Drive  
Anchorage, AK 99518-1605  
Tel: (907) 562-2343  
Fax: (907) 561-5301  
Web: <http://www.us.sgs.com>

Julie Shewman  
Michael Baker Jr., Inc.  
1400 West Benson Blvd, Ste 200  
Anchorage, AK 99503

<b>Work Order:</b>	1094060	
	ASDP WQ	<b>Released by:</b>
<b>Client:</b>	Michael Baker Jr., Inc.	
<b>Report Date:</b>	August 26, 2009	

Enclosed are the analytical results associated with the above workorder.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintained by SGS. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request.

The laboratory certification numbers are AK971-05 (DW), UST-005 (CS) and AK00971 (Micro) for ADEC and AK100001 for NELAP (RCRA methods: 1020A, 1311, 6010B, 7470A, 7471A, 9040B, 9045C, 9056, 9060, 9065, 8015B, 8021B, 8081A/8082, 8260B, 8270C).

Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP, the National Environmental Laboratory Accreditation Program and, when applicable, other regulatory authorities.

If you have any questions regarding this report or if we can be of any other assistance, please contact your SGS Project Manager at 907-562-2343. All work is being provided under SGS general terms and conditions ([http://www.sgs.com/terms\\_and\\_conditions.htm](http://www.sgs.com/terms_and_conditions.htm)) unless other written agreements have been accepted by both parties.

- PQL Practical Quantitation Limit (reporting limit).
- U Indicates the analyte was analyzed for but not detected.
- F Indicates value that is greater than or equal to the MDL.
- J The quantitation is an estimation.
- ND Indicates the analyte is not detected.
- B Indicates the analyte is found in a blank associated with the sample.
- \* The analyte has exceeded allowable regulatory or control limits.
- GT Greater Than
- D The analyte concentration is the result of a dilution.
- LT Less Than
- ! Surrogate out of control limits.
- Q QC parameter out of acceptance range.
- M A matrix effect was present.
- JL The analyte was positively identified, but the quantitation is a low estimation.
- E The analyte result is above the calibrated range.
- R Rejected

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content.



SGS Ref.# 1094060001  
Client Name Michael Baker Jr., Inc.  
Project Name/# ASDP WQ  
Client Sample ID L9323  
Matrix Water (Surface, Eff., Ground)

Printed Date/Time 08/26/2009 7:38  
Collected Date/Time 08/04/2009 16:45  
Received Date/Time 08/07/2009 13:45  
Technical Director Stephen C. Ede

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Metals Department</u></b>									
Mercury	ND	0.200	ug/L	SW7470A/E245.1	A		08/19/09	08/19/09	KAR
<b><u>Metals by ICP/MS</u></b>									
Arsenic	ND	5.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
Barium	55.2	3.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
Cadmium	ND	2.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
Chromium	ND	4.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
Lead	ND	1.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
Selenium	ND	2.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
Silver	ND	2.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	ND	870	ug/L	AK102	B		08/10/09	08/10/09	KDC
Residual Range Organics	ND	543	ug/L	AK103	B		08/10/09	08/10/09	KDC
<b><u>Surrogates</u></b>									
5a Androstane <surr>	69.9		%	AK102	B	50-150	08/10/09	08/10/09	KDC
n-Triacontane-d62 <surr>	77.2		%	AK103	B	50-150	08/10/09	08/10/09	KDC



SGS Ref.# 1094060002  
Client Name Michael Baker Jr., Inc.  
Project Name/# ASDP WQ  
Client Sample ID L9324  
Matrix Water (Surface, Eff., Ground)

Printed Date/Time 08/26/2009 7:38  
Collected Date/Time 08/04/2009 18:10  
Received Date/Time 08/07/2009 13:45  
Technical Director Stephen C. Ede

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Metals Department</u></b>									
Mercury	ND	0.200	ug/L	SW7470A/E245.1	A		08/19/09	08/19/09	KAR
<b><u>Metals by ICP/MS</u></b>									
Arsenic	ND	5.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
Barium	43.4	3.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
Cadmium	ND	2.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
Chromium	ND	4.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
Lead	ND	1.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
Selenium	ND	2.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
Silver	ND	2.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	ND	879	ug/L	AK102	B		08/10/09	08/10/09	KDC
Residual Range Organics	ND	549	ug/L	AK103	B		08/10/09	08/10/09	KDC
<b><u>Surrogates</u></b>									
5a Androstane <surr>	71.4		%	AK102	B	50-150	08/10/09	08/10/09	KDC
n-Triacontane-d62 <surr>	78		%	AK103	B	50-150	08/10/09	08/10/09	KDC



**SGS Ref.#** 1094060003  
**Client Name** Michael Baker Jr., Inc.  
**Project Name/#** ASDP WQ  
**Client Sample ID** M9313  
**Matrix** Water (Surface, Eff., Ground)

**Printed Date/Time** 08/26/2009 7:38  
**Collected Date/Time** 08/05/2009 10:40  
**Received Date/Time** 08/07/2009 13:45  
**Technical Director** Stephen C. Ede

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Metals Department</u></b>									
Mercury	ND	0.200	ug/L	SW7470A/E245.1	A		08/19/09	08/19/09	KAR
<b><u>Metals by ICP/MS</u></b>									
Arsenic	ND	5.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
Barium	232	3.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
Cadmium	ND	2.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
Chromium	ND	4.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
Lead	ND	1.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
Selenium	ND	2.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
Silver	ND	2.00	ug/L	SW6020	A		08/13/09	08/19/09	NRB
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	ND	870	ug/L	AK102	B		08/10/09	08/10/09	KDC
Residual Range Organics	ND	543	ug/L	AK103	B		08/10/09	08/10/09	KDC
<b><u>Surrogates</u></b>									
5a Androstane <surr>	77.4		%	AK102	B	50-150	08/10/09	08/10/09	KDC
n-Triacontane-d62 <surr>	90.8		%	AK103	B	50-150	08/10/09	08/10/09	KDC



**SGS Ref.#** 1094060004  
**Client Name** Michael Baker Jr., Inc.  
**Project Name/#** ASDP WQ  
**Client Sample ID** L9341  
**Matrix** Water (Surface, Eff., Ground)

**Printed Date/Time** 08/26/2009 7:38  
**Collected Date/Time** 08/04/2009 13:00  
**Received Date/Time** 08/07/2009 13:45  
**Technical Director** Stephen C. Ede

Sample Remarks:

1664 TPH - Due to lab error the sample was analyzed at a temperature in excess of 6 degrees celcius. The acid preservation would have prevented significant degradation but the results may be biased low.

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Metals Department</u></b>									
Mercury	ND	0.200	ug/L	SW7470A/E245.1	G		08/19/09	08/19/09	KAR
<b><u>Metals by ICP/MS</u></b>									
Arsenic	ND	5.00	ug/L	SW6020	G		08/13/09	08/19/09	NRB
Barium	85.8	3.00	ug/L	SW6020	G		08/13/09	08/19/09	NRB
Cadmium	ND	2.00	ug/L	SW6020	G		08/13/09	08/19/09	NRB
Chromium	ND	4.00	ug/L	SW6020	G		08/13/09	08/19/09	NRB
Lead	ND	1.00	ug/L	SW6020	G		08/13/09	08/19/09	NRB
Selenium	ND	2.00	ug/L	SW6020	G		08/13/09	08/19/09	NRB
Silver	ND	2.00	ug/L	SW6020	G		08/13/09	08/19/09	NRB
<b><u>Waters Department</u></b>									
TPH Silica Gel HEM	ND	4.30	mg/L	EPA 1664A	L		08/20/09	08/20/09	RTS
<b><u>Volatile Fuels Department</u></b>									
Gasoline Range Organics	ND	100	ug/L	AK101	D		08/13/09	08/13/09	KPW
<b><u>Surrogates</u></b>									
4-Bromofluorobenzene <surr>	123		%	AK101	D	50-150	08/13/09	08/13/09	KPW
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	ND	860	ug/L	AK102	J		08/10/09	08/10/09	KDC
Residual Range Organics	ND	538	ug/L	AK103	J		08/10/09	08/10/09	KDC



**SGS Ref.#** 1094060004  
**Client Name** Michael Baker Jr., Inc.  
**Project Name/#** ASDP WQ  
**Client Sample ID** L9341  
**Matrix** Water (Surface, Eff., Ground)

**Printed Date/Time** 08/26/2009 7:38  
**Collected Date/Time** 08/04/2009 13:00  
**Received Date/Time** 08/07/2009 13:45  
**Technical Director** Stephen C. Ede

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
<b>Surrogates</b>									
5a Androstane <surrogate>	73.4		%	AK102	J	50-150	08/10/09	08/10/09	KDC
n-Triacontane-d62 <surrogate>	81		%	AK103	J	50-150	08/10/09	08/10/09	KDC
<b><u>Volatile Gas Chromatography/Mass Spectroscopy</u></b>									
Benzene	ND	0.400	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Toluene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Ethylbenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
n-Butylbenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Carbon disulfide	ND	2.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
1,4-Dichlorobenzene	ND	0.500	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
1,2-Dichloroethane	ND	0.500	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
1,3,5-Trimethylbenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
4-Chlorotoluene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Chlorobenzene	ND	0.500	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
4-Methyl-2-pentanone (MIBK)	ND	10.0	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
cis-1,2-Dichloroethene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
4-Isopropyltoluene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
cis-1,3-Dichloropropene	ND	0.500	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
n-Propylbenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Styrene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Dibromomethane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
trans-1,3-Dichloropropene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
1,2,4-Trichlorobenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
1,1,2,2-Tetrachloroethane	ND	0.500	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
1,2-Dibromo-3-chloropropane	ND	2.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Methyl-t-butyl ether	ND	5.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Tetrachloroethene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Dibromochloromethane	ND	0.500	ug/L	SW8260B	B		08/13/09	08/14/09	SCL





**SGS Ref.#** 1094060004  
**Client Name** Michael Baker Jr., Inc.  
**Project Name/#** ASDP WQ  
**Client Sample ID** L9341  
**Matrix** Water (Surface, Eff., Ground)

**Printed Date/Time** 08/26/2009 7:38  
**Collected Date/Time** 08/04/2009 13:00  
**Received Date/Time** 08/07/2009 13:45  
**Technical Director** Stephen C. Ede

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Volatile Gas Chromatography/Mass Spectroscopy</u></b>									
1,3-Dichloropropane	ND	0.400	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
1,2-Dibromoethane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Carbon tetrachloride	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
1,1,1,2-Tetrachloroethane	ND	0.500	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Chloroform	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Bromobenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
1,2,3-Trichloropropane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Chloromethane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Bromomethane	ND	3.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Bromochloromethane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Vinyl chloride	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Dichlorodifluoromethane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Chloroethane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
sec-Butylbenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Bromodichloromethane	ND	0.500	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
1,1-Dichloroethene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
2-Butanone (MEK)	ND	10.0	ug/L	SW8260B	C		08/14/09	08/15/09	SCL
Methylene chloride	ND	5.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Trichlorofluoromethane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
P & M -Xylene	ND	2.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Naphthalene	ND	2.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
o-Xylene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Bromoform	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Xylenes (total)	ND	2.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
1,2,4-Trimethylbenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
tert-Butylbenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
1,1,1-Trichloroethane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
1,1-Dichloroethane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
2-Chlorotoluene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Trichloroethene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL



**SGS Ref.#** 1094060004  
**Client Name** Michael Baker Jr., Inc.  
**Project Name/#** ASDP WQ  
**Client Sample ID** L9341  
**Matrix** Water (Surface, Eff., Ground)

**Printed Date/Time** 08/26/2009 7:38  
**Collected Date/Time** 08/04/2009 13:00  
**Received Date/Time** 08/07/2009 13:45  
**Technical Director** Stephen C. Ede

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Volatile Gas Chromatography/Mass Spectroscopy</u></b>									
trans-1,2-Dichloroethene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
1,2-Dichlorobenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
2,2-Dichloropropane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Hexachlorobutadiene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
Isopropylbenzene (Cumene)	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
2-Hexanone	ND	10.0	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
1,2-Dichloropropane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
1,1-Dichloropropene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
1,1,2-Trichloroethane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
1,3-Dichlorobenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
1,2,3-Trichlorobenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/14/09	SCL
<b><u>Surrogates</u></b>									
1,2-Dichloroethane-D4 <surr>	107		%	SW8260B	B	73-120	08/13/09	08/14/09	SCL
Toluene-d8 <surr>	98.4		%	SW8260B	B	80-120	08/13/09	08/14/09	SCL
4-Bromofluorobenzene <surr>	101		%	SW8260B	B	76-120	08/13/09	08/14/09	SCL
<b><u>Polynuclear Aromatics GC/MS</u></b>									
Acenaphthylene	ND	0.0543	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Acenaphthene	ND	0.0543	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Fluorene	ND	0.0543	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Phenanthrene	ND	0.0543	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Anthracene	ND	0.0543	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Fluoranthene	ND	0.0543	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Pyrene	ND	0.0543	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Benzo(a)Anthracene	ND	0.0543	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Chrysene	ND	0.0543	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Benzo[b]Fluoranthene	ND	0.0543	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Benzo[k]fluoranthene	ND	0.0543	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Benzo[a]pyrene	ND	0.0543	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH



SGS Ref.# 1094060004  
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Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b>Polynuclear Aromatics GC/MS</b>									
Indeno[1,2,3-c,d] pyrene	ND	0.0543	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Dibenzo[a,h]anthracene	ND	0.0543	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Benzo[g,h,i]perylene	ND	0.0543	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Naphthalene	ND	0.109	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
1-Methylnaphthalene	ND	0.0543	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
2-Methylnaphthalene	ND	0.0543	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
<b>Surrogates</b>									
Terphenyl-d14 <surr>	74.7		%	8270D SIMS	H	50-135	08/08/09	08/17/09	JDH



**SGS Ref.#** 1094060005  
**Client Name** Michael Baker Jr., Inc.  
**Project Name/#** ASDP WQ  
**Client Sample ID** M03S3  
**Matrix** Water (Surface, Eff., Ground)

**Printed Date/Time** 08/26/2009 7:38  
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**Technical Director** Stephen C. Ede

**Sample Remarks:**

8260B - 1,2-dichloroethane-d4 (surrogate) recovery does not meet QC criteria (biased high). All target analytes associated with this surrogate were not detected above the POL.  
 1664 TPH - Due to lab error the sample was analyzed at a temperature in excess of 6 degrees celcius. The acid preservation would have prevented significant degradation but the results may be biased low.

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Metals Department</u></b>									
Mercury	ND	0.200	ug/L	SW7470A/E245.1	G		08/19/09	08/19/09	KAR
<b><u>Metals by ICP/MS</u></b>									
Arsenic	ND	5.00	ug/L	SW6020	G		08/13/09	08/19/09	NRB
Barium	166	3.00	ug/L	SW6020	G		08/13/09	08/19/09	NRB
Cadmium	ND	2.00	ug/L	SW6020	G		08/13/09	08/19/09	NRB
Chromium	ND	4.00	ug/L	SW6020	G		08/13/09	08/19/09	NRB
Lead	ND	1.00	ug/L	SW6020	G		08/13/09	08/19/09	NRB
Selenium	ND	2.00	ug/L	SW6020	G		08/13/09	08/19/09	NRB
Silver	ND	2.00	ug/L	SW6020	G		08/13/09	08/19/09	NRB
<b><u>Waters Department</u></b>									
TPH Silica Gel HEM	ND	4.28	mg/L	EPA 1664A	L		08/20/09	08/20/09	RTS
<b><u>Volatile Fuels Department</u></b>									
Gasoline Range Organics	ND	100	ug/L	AK101	D		08/13/09	08/13/09	KPW
<b><u>Surrogates</u></b>									
4-Bromofluorobenzene <surr>	128		%	AK101	D	50-150	08/13/09	08/13/09	KPW
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	ND	879	ug/L	AK102	J		08/10/09	08/10/09	KDC



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<b><u>Semivolatile Organic Fuels Department</u></b>									
Residual Range Organics	ND	549	ug/L	AK103	J		08/10/09	08/10/09	KDC
<b>Surrogates</b>									
5a Androstane <surr>	74.2		%	AK102	J	50-150	08/10/09	08/10/09	KDC
n-Triacontane-d62 <surr>	82.8		%	AK103	J	50-150	08/10/09	08/10/09	KDC
<b><u>Volatile Gas Chromatography/Mass Spectroscopy</u></b>									
Benzene	ND	0.400	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Toluene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Ethylbenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
n-Butylbenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Carbon disulfide	ND	2.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
1,4-Dichlorobenzene	ND	0.500	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
1,2-Dichloroethane	ND	0.500	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
1,3,5-Trimethylbenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
4-Chlorotoluene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Chlorobenzene	ND	0.500	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
4-Methyl-2-pentanone (MIBK)	ND	10.0	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
cis-1,2-Dichloroethene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
4-Isopropyltoluene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
cis-1,3-Dichloropropene	ND	0.500	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
n-Propylbenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Styrene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Dibromomethane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
trans-1,3-Dichloropropene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
1,2,4-Trichlorobenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
1,1,2,2-Tetrachloroethane	ND	0.500	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
1,2-Dibromo-3-chloropropane	ND	2.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Methyl-t-butyl ether	ND	5.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Tetrachloroethene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL



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**Technical Director** Stephen C. Ede

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Volatile Gas Chromatography/Mass Spectroscopy</u></b>									
Dibromochloromethane	ND	0.500	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
1,3-Dichloropropane	ND	0.400	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
1,2-Dibromoethane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Carbon tetrachloride	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
1,1,1,2-Tetrachloroethane	ND	0.500	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Chloroform	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Bromobenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
1,2,3-Trichloropropane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Chloromethane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Bromomethane	ND	3.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Bromochloromethane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Vinyl chloride	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Dichlorodifluoromethane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Chloroethane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
sec-Butylbenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Bromodichloromethane	ND	0.500	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
1,1-Dichloroethene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
2-Butanone (MEK)	ND	10.0	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Methylene chloride	ND	5.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Trichlorofluoromethane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
P & M -Xylene	ND	2.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Naphthalene	ND	2.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
o-Xylene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Bromoform	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Xylenes (total)	ND	2.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
1,2,4-Trimethylbenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
tert-Butylbenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
1,1,1-Trichloroethane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
1,1-Dichloroethane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
2-Chlorotoluene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL





**SGS Ref.#** 1094060005  
**Client Name** Michael Baker Jr., Inc.  
**Project Name/#** ASDP WQ  
**Client Sample ID** M03S3  
**Matrix** Water (Surface, Eff., Ground)

**Printed Date/Time** 08/26/2009 7:38  
**Collected Date/Time** 08/04/2009 10:55  
**Received Date/Time** 08/07/2009 13:45  
**Technical Director** Stephen C. Ede

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Volatile Gas Chromatography/Mass Spectroscopy</u></b>									
Trichloroethene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
trans-1,2-Dichloroethene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
1,2-Dichlorobenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
2,2-Dichloropropane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Hexachlorobutadiene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
Isopropylbenzene (Cumene)	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
2-Hexanone	ND	10.0	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
1,2-Dichloropropane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
1,1-Dichloropropene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
1,1,2-Trichloroethane	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
1,3-Dichlorobenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
1,2,3-Trichlorobenzene	ND	1.00	ug/L	SW8260B	B		08/13/09	08/13/09	SCL
<b><u>Surrogates</u></b>									
1,2-Dichloroethane-D4 <surr>	121	!	%	SW8260B	B	73-120	08/13/09	08/13/09	SCL
Toluene-d8 <surr>	100		%	SW8260B	B	80-120	08/13/09	08/13/09	SCL
4-Bromofluorobenzene <surr>	104		%	SW8260B	B	76-120	08/13/09	08/13/09	SCL
<b><u>Polynuclear Aromatics GC/MS</u></b>									
Acenaphthylene	ND	0.0538	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Acenaphthene	ND	0.0538	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Fluorene	ND	0.0538	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Phenanthrene	ND	0.0538	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Anthracene	ND	0.0538	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Fluoranthene	ND	0.0538	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Pyrene	ND	0.0538	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Benzo(a)Anthracene	ND	0.0538	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Chrysene	ND	0.0538	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Benzo[b]Fluoranthene	ND	0.0538	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Benzo[k]fluoranthene	ND	0.0538	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH



**SGS Ref.#** 1094060005  
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Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Polynuclear Aromatics GC/MS</u></b>									
Benzo[a]pyrene	ND	0.0538	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Indeno[1,2,3-c,d] pyrene	ND	0.0538	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Dibenzo[a,h]anthracene	ND	0.0538	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Benzo[g,h,i]perylene	ND	0.0538	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
Naphthalene	ND	0.108	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
1-Methylnaphthalene	ND	0.0538	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
2-Methylnaphthalene	ND	0.0538	ug/L	8270D SIMS	H		08/08/09	08/17/09	JDH
<b>Surrogates</b>									
Terphenyl-d14 <surr>	77.3		%	8270D SIMS	H	50-135	08/08/09	08/17/09	JDH



SGS Ref.# 1094060006  
Client Name Michael Baker Jr., Inc.  
Project Name/# ASDP WQ  
Client Sample ID Trip Blank  
Matrix Water (Surface, Eff., Ground)

Printed Date/Time 08/26/2009 7:38  
Collected Date/Time 08/04/2009 0:00  
Received Date/Time 08/07/2009 13:45  
Technical Director Stephen C. Ede

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Volatile Fuels Department</u></b>									
Gasoline Range Organics	ND	100	ug/L	AK101	B		08/12/09	08/12/09	KPW
<b>Surrogates</b>									
4-Bromofluorobenzene <surr>	123		%	AK101	B	50-150	08/12/09	08/12/09	KPW
<b><u>Volatile Gas Chromatography/Mass Spectroscopy</u></b>									
Benzene	ND	0.400	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Toluene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Ethylbenzene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
n-Butylbenzene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Carbon disulfide	ND	2.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
1,4-Dichlorobenzene	ND	0.500	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
1,2-Dichloroethane	ND	0.500	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
1,3,5-Trimethylbenzene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
4-Chlorotoluene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Chlorobenzene	ND	0.500	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
4-Methyl-2-pentanone (MIBK)	ND	10.0	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
cis-1,2-Dichloroethene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
4-Isopropyltoluene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
cis-1,3-Dichloropropene	ND	0.500	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
n-Propylbenzene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Styrene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Dibromomethane	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
trans-1,3-Dichloropropene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
1,2,4-Trichlorobenzene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
1,1,2,2-Tetrachloroethane	ND	0.500	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
1,2-Dibromo-3-chloropropane	ND	2.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL



**SGS Ref.#** 1094060006  
**Client Name** Michael Baker Jr., Inc.  
**Project Name/#** ASDP WQ  
**Client Sample ID** Trip Blank  
**Matrix** Water (Surface, Eff., Ground)

**Printed Date/Time** 08/26/2009 7:38  
**Collected Date/Time** 08/04/2009 0:00  
**Received Date/Time** 08/07/2009 13:45  
**Technical Director** Stephen C. Ede

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Volatile Gas Chromatography/Mass Spectroscopy</u></b>									
Methyl-t-butyl ether	ND	5.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Tetrachloroethene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Dibromochloromethane	ND	0.500	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
1,3-Dichloropropane	ND	0.400	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
1,2-Dibromoethane	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Carbon tetrachloride	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
1,1,1,2-Tetrachloroethane	ND	0.500	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Chloroform	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Bromobenzene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
1,2,3-Trichloropropane	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Chloromethane	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Bromomethane	ND	3.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Bromochloromethane	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Vinyl chloride	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Dichlorodifluoromethane	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Chloroethane	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
sec-Butylbenzene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Bromodichloromethane	ND	0.500	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
1,1-Dichloroethene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
2-Butanone (MEK)	ND	10.0	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Methylene chloride	ND	5.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Trichlorofluoromethane	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
P & M -Xylene	ND	2.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Naphthalene	ND	2.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
o-Xylene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Bromoform	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Xylenes (total)	ND	2.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
1,2,4-Trimethylbenzene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
tert-Butylbenzene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
1,1,1-Trichloroethane	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL



**SGS Ref.#** 1094060006  
**Client Name** Michael Baker Jr., Inc.  
**Project Name/#** ASDP WQ  
**Client Sample ID** Trip Blank  
**Matrix** Water (Surface, Eff., Ground)

**Printed Date/Time** 08/26/2009 7:38  
**Collected Date/Time** 08/04/2009 0:00  
**Received Date/Time** 08/07/2009 13:45  
**Technical Director** Stephen C. Ede

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b>Volatile Gas Chromatography/Mass Spectroscopy</b>									
1,1-Dichloroethane	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
2-Chlorotoluene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Trichloroethene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
trans-1,2-Dichloroethene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
1,2-Dichlorobenzene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
2,2-Dichloropropane	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Hexachlorobutadiene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
Isopropylbenzene (Cumene)	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
2-Hexanone	ND	10.0	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
1,2-Dichloropropane	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
1,1-Dichloropropene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
1,1,2-Trichloroethane	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
1,3-Dichlorobenzene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
1,2,3-Trichlorobenzene	ND	1.00	ug/L	SW8260B	A		08/11/09	08/12/09	SCL
<b>Surrogates</b>									
1,2-Dichloroethane-D4 <surr>	120		%	SW8260B	A	73-120	08/11/09	08/12/09	SCL
Toluene-d8 <surr>	102		%	SW8260B	A	80-120	08/11/09	08/12/09	SCL
4-Bromofluorobenzene <surr>	104		%	SW8260B	A	76-120	08/11/09	08/12/09	SCL



# SGS Environmental Services Inc. CHAIN OF CUSTODY RECORD

1094060

anyland  
ew York  
hio



SGS Reference #: \_\_\_\_\_ page 1 of 1

**1** CLIENT: **MICHAEL BAKER JR**  
 CONTACT: **JULIE SHEWMAN** PHONE NO: \_\_\_\_\_  
 PROJECT: **ASDP WQ** SITE/PWSID#: \_\_\_\_\_  
 REPORTS TO: **JULIE SHEWMAN** EMAIL: **jshewman@mbakercorp.com**  
 INVOICE TO: **JULIE SHEWMAN** QUOTE #: \_\_\_\_\_  
 P.O. #: \_\_\_\_\_

**2**

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX/ MATRIX CODE
L9323	① A-C	8/4/09	1645	
L9324	② A	8/4/09	1800	
M9313	③ A	8/5/09	1040	
L9341	④ <del>ASDP</del> I.G.U. 5, M	8/4/09	1300	
M0353	⑤ G-I	8/4/09	1055	

**3**

# CONTAINERS	SAMPLE TYPE	Preservatives Used	Analysis Required	REMARKS/LOC ID
	PRO AK102	K		
	PRO AK103	K		
	RORA-8 SW 6020/1470	X		
	SW 8260B	X		
	VOC AK101	X		
	TPH SW 8260B	X		
	EPA 1664	X		
	PAH SW 8270D SIMS	X		

**4**

Special Deliverable Requirements:  
**please list all RORA & metals**

DOD Project? YES NO  
Cooler ID \_\_\_\_\_

Requested Turnaround Time and/or Special Instructions:

Samples Received Cold? YES NO  
Cooler TB  
Temperature °C: **# 7** 6.8

Chain of Custody Seal: (Circle)  
INTACT  BROKEN  ABSENT

**5**

Collected/Relinquished By: (1) **J Shewman** Date **8/7/09** Time **8:35am** Received By: \_\_\_\_\_  
 Relinquished By: (2) \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_ Received By: \_\_\_\_\_  
 Relinquished By: (3) \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_ Received By: \_\_\_\_\_  
 Relinquished By: (4) \_\_\_\_\_ Date **8/7/09** Time **1345** Received For Laboratory By: \_\_\_\_\_



SGS Environmental Services Inc. CHAIN OF CUSTODY RECORD

1094060



wide Maryland New York Ohio

gs.com

1 CLIENT: MICHAEL BAKER JR  
 CONTACT: JULIE SHEWMAN PHONE NO:  
 PROJECT: ASDP WQ SITE/PWSID#:  
 REPORTS TO: JULIE SHEWMAN EMAIL: jshewman@mbakercorp.com  
 INVOICE TO: JULIE SHEWMAN QUOTE #:  
 P.O. #:

SGS Reference #:

# CONTAINERS	SAMPLE TYPE C= COMP G= GRAB MI= Multi Incremental	Preservatives Used	Analysts Required	DOD Project?		Special Deliverable Requirements:	REMARKS/LOC ID
				YES	NO		
③	DRD AK102	'X	'X	3X	3X	SW 8270DSIMS	
	PRO AK103	'X	'X	3X	3X	TPH SW 8260B	
	PCA-8 SW6020/7470	'X	'X	3X	3X	TPH SW 8270DSIMS	
	GRO AK101	'X	'X	3X	3X	TPH SW 8270DSIMS	
	VOC SW 8260B	'X	'X	3X	3X	TPH SW 8270DSIMS	
	TPH SW 8260B	'X	'X	3X	3X	TPH SW 8270DSIMS	
	TPH SW 8270DSIMS	'X	'X	3X	3X	TPH SW 8270DSIMS	

2

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX/MATRIX CODE
⑤ A-F, J-M	MD353	8/4/09	11:00	
⑥ A-F, K	L9341	8/4/09	13:00	
③ B/C	M9313	8/5/09	10:40	
② B/C	L9324	8/4/09	18:00	

5

Collected/Relinquished By: (1) JULIE SHEWMAN  
 Date: 8/17/09 Time: 8:25am  
 Received By: [Signature]  
 Relinquished By: (2)  
 Date: Time:  
 Received By:  
 Relinquished By: (3)  
 Date: Time:  
 Received By:  
 Relinquished By: (4)  
 Date: 8/17/09 Time: 1345  
 Received By: [Signature]

4

DOD Project? YES NO  
 Cooler ID  
 Special Deliverable Requirements: please list all PCBs & metals  
 Requested Turnaround Time and/or Special Instructions:

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT  
 Samples Received Cold? YES NO  
 Cooler TB  
 Temperature °C: #7 6.7





SAMPLE RECEIPT FORM

SGS WO#:

Yes No NA

- Are samples **RUSH**, priority or w/in 72 hrs of **hold time**?
- If yes, have you done e-mail **ALERT** notification?
- Are samples *within 24 hrs.* of **hold time** or **due date**?
- If yes, have you also *spoken with supervisor*?
- Archiving bottles: Are lids marked w/ red "X"?
- Were samples collected with proper preservative?
- Any problems (ID, cond'n, HT, etc)? Explain:**

TAT (circle one): Standard -or- Rush

Received Date: 8-7-09

Received Time: 1345

Cooler ID	Temperature	Measured w/ (Therm/IR ID#)
<u>1</u>	<u>6.8</u> °C	<u>#7</u>
<u>2</u>	<u>6.7</u> °C	<u>#7</u>
	°C	
	°C	

Note: Temperature readings include thermometer correction factors

Delivery method (circle all that apply):

- Client / Alert Courier / Lynden / SGS
- UPS / FedEx / USPS / DHL / Carlisle
- AkAir Goldstreak / NAC / ERA / PenAir
- Other: \_\_\_\_\_

Additional Sample Remarks: (✓ if applicable)

- Extra Sample Volume?
- Limited Sample Volume?
- Multi-Incremental Samples?
- Lab-filtered for dissolved \_\_\_\_\_
- Ref Lab required for \_\_\_\_\_
- Foreign Soil?

- If this is for PWS, provide PWSID: \_\_\_\_\_
- Payment received: \$ \_\_\_\_\_ by Check or Credit Card
- Will courier charges apply?
- Data package required? (Level: 1 / 2 / 3 / 4)
- Notes: \_\_\_\_\_
- Is this a DoD project? (USACE, Navy, AFCEE)

This section must be filled out for DoD projects (USACE, Navy, AFCEE):

Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	Is received temperature $\leq 6^{\circ}\text{C}$ ?
<input type="checkbox"/>	<input type="checkbox"/>	Were containers ice-free? Notify PM immediately of any ice in samples. If some cooler temperatures are non-compliant, see form FS-0029 (attached) for samples/analyses affected.
<input type="checkbox"/>	<input type="checkbox"/>	Was there an airbill? (If 'yes,' see attached.)
<input type="checkbox"/>	<input type="checkbox"/>	Was cooler sealed with custody seals & were they intact? # / where: _____
<input type="checkbox"/>	<input type="checkbox"/>	Was there a COC with cooler?
<input type="checkbox"/>	<input type="checkbox"/>	Was COC sealed in plastic bag & taped inside lid of cooler?
<input type="checkbox"/>	<input type="checkbox"/>	Was the COC filled out properly? Did labels correspond?
<input type="checkbox"/>	<input type="checkbox"/>	Did the COC indicate USACE / Navy / AFCEE project?
<input type="checkbox"/>	<input type="checkbox"/>	Samples were packed to prevent breakage with (circle one): Bubble Wrap / Vermiculite / Other (specify): _____
<input type="checkbox"/>	<input type="checkbox"/>	Were all samples sealed in separate plastic bags?
<input type="checkbox"/>	<input type="checkbox"/>	Were all VOCs free of headspace and/or MeOH preserved?
<input type="checkbox"/>	<input type="checkbox"/>	Were correct container / sample sizes submitted?
<input type="checkbox"/>	<input type="checkbox"/>	Was the PM notified of arrival so they can send Sample Receipt Acknowledgement to client?

This section must be completed if problems are noted.

Was client notified of problems? Yes / No \_\_\_\_\_

By (SGS PM): \_\_\_\_\_

Individual contacted: \_\_\_\_\_

Via: Phone / Fax / E-mail (circle one): \_\_\_\_\_

Date/Time: \_\_\_\_\_

Reason for contact: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Change Order Required? Yes / No \_\_\_\_\_

Notes: \_\_\_\_\_

Completed by (sign): [Signature] (print): JAMES DOUGHTY

Login proof: Self-check completed [Signature] Peer-reviewer's Initials JJR









Michael Baker Jr., Inc.  
1400 W. Benson Suite 200  
Anchorage, AK 99503  
907-273-1600

Alpine Satellite Development Plan (ASDP)  
2010 Water Quality Monitoring

120258-MBJ-RPT-001  
November 2010