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Earth and Environmental Technologies

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DEC 10 1999

DEPT. OF ENVIRONMENTAL CONSERVATION

A-8603-02

December 10, 1999

Mr. Dennis Harwood
State of Alaska
Department of Environmental Conservation
555 Cordova Street
Anchorage, Alaska 99501

Re: Eskimo Creek Site Assessment
King Salmon, Alaska
ADEC Contract ASPS No. 18201213
NTP No. 1820121312A

Dear Mr. Harwood:

This letter report presents the results of the site assessment conducted at Eskimo Creek in King Salmon, Alaska (Figure 1) for the Alaska Department of Environmental Conservation (ADEC). Work was performed in accordance with our Work Plan and Health and Safety Plan Addendum dated November 3, 1999.

The objectives of the work performed were as follows:

- Evaluate the soil and groundwater quality adjacent to and upgradient of the former underground storage tank (UST) at Eddie's Fireplace Inn (Eddie's).

WORK PERFORMED

On November 9, 1999, Hart Crowser personnel mobilized to King Salmon to conduct soil and





groundwater sampling in the vicinity of Eddie's. On November 9 and 10, 1999, two soil borings were drilled and soil samples collected. Monitoring wells (MW-5 and MW-6) were installed in each of the two borings. On November 10 and 11, 1999, the two monitoring wells were developed and sampled. Groundwater elevation data was recorded from two new monitoring wells and from two existing monitoring wells on November 10. Monitoring well MW-1 was not opened because a boulder had been moved on top of it. MW-4 could not be opened due to thick ice. A vertical survey was conducted for the new wells by the Hart Crowser personnel. Figure 2 presents the locations of all six monitoring wells. Appendix A provides a description of the field methods used for soil sampling, monitoring well construction, and water sampling.

LITHOLOGY AND GROUNDWATER OCCURRENCE

The lithologies of each borehole are presented on the borehole logs in Appendix A, Figures A-1 through A-3. The subsurface materials observed at MW-5 consisted sands with interbedded silt and clay. Gray silt was observed in the sample collected at 5 feet below the ground surface (bgs) and gray clay interbedded with sand was observed in the sample collected at 15 feet bgs. Between these finer materials was dark gray sand and sand. Soils cuttings at MW-5 were noticeably impacted by hydrocarbons. The hydrocarbon odor and vapor screening readings were less apparent at the 20 and 25-foot samples. Based on the moisture content of the sample collected at 15 feet bgs in MW-5 and because the sampler contained water when removed from the ground, the clay unit is thought to be holding perched water above it.

Subsurface materials observed at MW-6 consisted of interbedded silts and sands. Brown silt was observed in the sample collected at 10 feet bgs. Above and below this sample were brown silty sand and sands. Hydrocarbon odors were not observed at MW-6.

Groundwater was encountered at a depth of approximately 24 feet bgs at both MW-5 and MW-6. Hydrocarbon odors were only apparent at MW-5.

SAMPLE SELECTION

Soil samples were collected at 5-foot intervals, starting at 5 feet bgs. Samples selected for analyses were based upon field screening and visual observations.

Four samples from MW-5 were selected. Samples collected from 5, 10, and 15 feet bgs had elevated soil vapor readings and hydrocarbon odors. At 20 feet bgs, the organic vapor content and



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odor were less than those observed in the three previous samples. A duplicate soil sample was collected from this depth. The sample collected from 25 feet bgs was not analyzed because it was collected below the water table.

In Boring MW-6, soil samples collected from 10 and 20 feet bgs were selected for analyses. Hydrocarbon odors were not observed and organic vapor was not detected in the soil samples collected from MW-6.

FLOATING HYDROCARBON OCCURRENCE

Floating hydrocarbon was not observed in the two new monitoring wells (MW-5 and MW-6) or the existing monitoring wells which could be accessed (MW-2 and MW-3) during this field visit.

ANALYTICAL RESULTS

Soil samples were analyzed for diesel range organics (DRO) using ADEC Method AK 102, gasoline range organics (GRO) using ADEC Method AK 101 and benzene, toluene, ethylbenzene, and xylenes (BTEX) using a modification of U.S. Environmental Protection Agency (EPA) Method 8021. Soil sample analytical results are presented in Table 1, along with the ADEC most conservative soil cleanup levels (18 AAC 75.341, Tables B1 and B2) for the Under 40 Inches of Rainfall Zone.

Groundwater samples were analyzed for DRO using ADEC Method AK 102, for GRO using ADEC Method AK 101 and for BTEX using a modification of U.S. Environmental Protection Agency (EPA) Method 8021. Analytical results of groundwater samples are presented in Table 2, along with ADEC Table C Method 2 Groundwater Cleanup Levels (18 AAC 75.345, Table C). Laboratory reports are provided in Appendix B.

Soil Sample Analytical Results

DRO

DRO was detected in all four soil samples submitted from MW-5. DRO concentrations ranged from 380 to 9,200 milligrams per kilogram (mg/kg). The highest concentration was found in the sample collected from 15 feet bgs. The lowest concentration was found in the sample collected at 20 feet bgs. All samples from MW-5 exceeded the Under 40 Inches, Migration to Groundwater, Cleanup Level of 250 mg/kg.



DRO was not detected in the two soil samples submitted from MW-6.

GRO

GRO was detected in all four soil samples collected from MW-5 and ranged from 170 to 1,100 mg/kg. The analytical results of samples collected at 10 and 15 feet bgs were above the Under 40 Inches, Migration to Groundwater, Cleanup Level of 300 mg/kg. The highest GRO concentration was detected at 10 feet bgs.

GRO was not detected (<18 mg/kg) in the soil samples collected from MW-6.

BTEX

Benzene was detected above the Migration to Groundwater Cleanup Level of 0.02 mg/kg in each of the soil samples submitted from MW-5. Toluene and ethylbenzene were detected above the Migration to Groundwater, Cleanup Level in the 10 and 15-foot bgs soil samples from MW-5.

BTEX compounds were not detected in the samples from MW-6.

Groundwater Sample Analytical Results

DRO

DRO was detected in the groundwater sample collected from MW-5 at a concentration of 4.6 milligrams per liter (mg/L). The concentration exceeded the ADEC Groundwater Cleanup Level of 1.5 mg/L. DRO was not detected in the groundwater sample collected from MW-6.

GRO

GRO was detected in the groundwater sample collected from MW-5 at a concentration of 4.7 mg/L. The concentration exceeded the ADEC Groundwater Cleanup Level of 1.3 mg/L. GRO was not detected in the groundwater sample collected from MW-6.



BTEX

The benzene concentration exceeded the ADEC Groundwater Cleanup Level of 0.005 mg/L in MW-5 (0.046 mg/L), but not in MW-6 (<0.002 mg/L). The groundwater cleanup levels were not exceeded for toluene, ethylbenzene, or xylenes in the sample submitted from MW-5. The concentrations of all BTEX compounds were below the detection limits in the groundwater sample submitted from MW-6.

GROUNDWATER CONDITIONS

Figure 2 includes the inferred groundwater elevation contours for November 10, 1999. Based on the groundwater elevation information from MW-2, MW-3, MW-5, and MW-6, the inferred groundwater flow direction is to the west (toward Eskimo Creek), with a hydraulic gradient of approximately 0.01. This data is generally consistent with the June 1999 data, with the exception that the gradient was somewhat steeper during the November event (0.006 in June, 1999). Table A-1 presents the survey and elevation data.

SUMMARY AND DISCUSSION

The data indicate both DRO and GRO impacts to soil and groundwater at MW-5. Fuel impacts were not found at the upgradient well (MW-6). The November investigation results are summarized as follows:

- DRO soil concentrations at MW-5 exceeded the ADEC Table B Under 40 Inch Zone, Migration to Groundwater, Cleanup Level (250 mg/kg).
- DRO groundwater concentrations at MW-5 (4.6 mg/L) exceeded the ADEC Table C Cleanup Level (1.5 mg/L).
- Concentrations of GRO in soil samples collected from MW-5 exceeded the ADEC Table B Under 40 Inch Zone, Migration to Groundwater, Cleanup Level of 300 mg/kg.
- GRO was detected in groundwater samples collected from MW-5 (4.7 mg/L). The ADEC Table C, Method 2, Groundwater Cleanup Level is 1.3 mg/L.
- Benzene concentrations in collected soil samples from MW-5 exceeded the ADEC, Table B



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Under 40 Inch Zone, Migration to Groundwater, Cleanup Level (0.02 mg/kg). Toluene and ethylbenzene concentrations exceeded the cleanup levels of 5.4 and 5.5 mg/kg, respectively, in two samples from MW-5.

- The benzene groundwater concentration in MW-5 exceeded the ADEC Groundwater Cleanup Level (0.005 mg/L). Toluene, ethylbenzene, and xylenes were detected in MW-5 at concentrations below the cleanup levels.

The data suggest that the former heating oil UST at Eddie's is the source of the DRO, GRO and BTEX detected in soil and groundwater in the vicinity of the former UST (MW-5) and in groundwater downgradient of this area (MW-1 and MW-3). In addition, it is likely the source or a contributing source of the floating hydrocarbon encountered during the June 1999 investigation and seep at Eskimo Creek, downgradient of Eddie's. This is potentially due to an arctic-grade diesel release from the former UST.

The soil sample collected at 20 feet bgs from MW-5 had lower DRO and GRO concentrations than the two samples collected above this depth. It is possible that the free-phase product from the former UST release moved laterally at the clay layer observed at a depth of 15 feet bgs in MW-5, before reaching the groundwater table. This clay layer may be inter-connected with a silt layer observed at the same depth in MW-1, less than 50 feet away. This is supported by two observations:

- The sampler contained water when it was recovered after sampling at 15-foot bgs sample in MW-5.
- A hydrocarbon odor was observed in a sand situated on top of a silty layer located at a depth of 15 feet bgs at MW-1 during the June, 1999 investigation. This sand layer was wet, stained black, with a hydrocarbon odor. There were no other impacted soil zones in MW-1.

The majority of the petroleum release may have migrated downgradient on top of the clay and silt unit. This may explain why the concentration of DRO and GRO was less in the 20 foot sample than in the samples located at 10 and 15 feet bgs in MW-5

INFORMATION LIMITATIONS

Work for this project was performed, and this letter report prepared, in accordance with generally



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accepted professional practices for the nature and conditions of the work completed in the same and similar localities, at the time the work was performed. It is intended for the exclusive use of ADEC. This letter report is not meant to represent a legal opinion, and no other warranty, express or implied, is made.

We hope this information is sufficient for your needs at this time. If you have further questions, please feel free to contact us at 276-7475.

Sincerely,

HART CROWSER, INC.

LISA MASERJIAN

Senior Staff Hydrogeologist

THOMAS K. NOYES, P.E.

Program Manager

LAM/tlm

Attachments: Table 1 Summary of Analytical Results for Soil Samples
Table 2 Summary of Analytical Results For Groundwater Samples
Collected on 11/10/99 and 11/11/99.
Figure 1 Project Setting and Vicinity Map
Figure 2 Site Map with Groundwater Elevation Contour Lines
Appendix A Field Methods
Appendix B Laboratory Reports

cc: Jim Frechione, ADEC

TABLE 1- SUMMARY OF ANALYTICAL DATA FOR SOIL SAMPLES
 ESKIMO CREEK SITE ASSESSMENT, KING SALMON, ALASKA

ANALYTE	MW-5-1 (4-5 feet bgs)		MW-5-2 (9-10 feet bgs)		MW-5-3 (14-15 feet bgs)		MW-5-4 (19-20 feet bgs)		MW-5-6 (2) (19-20 feet bgs)		MW-6-2 (9-10 feet bgs)		MW-6-4 (20-21 feet bgs)		Under 40 Inches, Most Restrictive Cleanup Level (mg/Kg)(1)	
	500	170	4,700	1,100	9,200	900	570	190	380	180	12	4.3	11	18	250 (MTG)	300 (MTG)
DRO (AK102) in mg/kg	500	170	4,700	1,100	9,200	900	570	190	380	180	12	4.3	11	18	250 (MTG)	300 (MTG)
GRO (AK 101) in mg/kg	500	170	4,700	1,100	9,200	900	570	190	380	180	12	4.3	11	18	250 (MTG)	300 (MTG)
BTEX (AK 101) in mg/kg	500	170	4,700	1,100	9,200	900	570	190	380	180	12	4.3	11	18	250 (MTG)	300 (MTG)
Benzene	0.079		1.2		2		0.096		0.084		0.017	U	0.072	U	0.02 (MTG)	
Toluene	0.410		6.7		9.6		0.52		0.38		0.022	U	0.09	U	5.4 (MTG)	
Ethylbenzene	4.300		27		22		5.1		3.9		0.022	U	0.09	U	5.5 (MTG)	
Xylenes	5.300		62		56		5.7		4.4		0.022	U	0.09	U	78 (MTG)	

Notes:

U = Not detected at concentration shown.

(1) 18 AAC75, Tables B1 and B2. Method Two. Bolded concentration exceed cleanup level.

(2) Duplicate of MW-5-4

MTG - Migration to Groundwater

TABLE 2- SUMMARY OF ANALYTICAL DATA FOR GROUNDWATER SAMPLES
 COLLECTED ON 11/10/99 AND 11/11/99
 ESKIMO CREEK SITE ASSESSMENT

ANALYTE	MW-5	MW-6	Trip Blank	ADEC Groundwater Cleanup Level in mg/L ⁽¹⁾
<i>DRO (AK 102) in mg/L</i>	4.6	0.27 U	NA	1.5
<i>GRO (AK101) in mg/L</i>	4.700	0.100 U	0.100 U	1.3
<i>BTEX (8021M) in mg/L</i>				
Benzene	0.046	0.002 U	0.002 U	0.005
Toluene	0.012	0.002 U	0.002 U	1
Ethylbenzene	0.110	0.002 U	0.002 U	0.7
Xylenes	0.150	0.002 U	0.002 U	10

Notes:

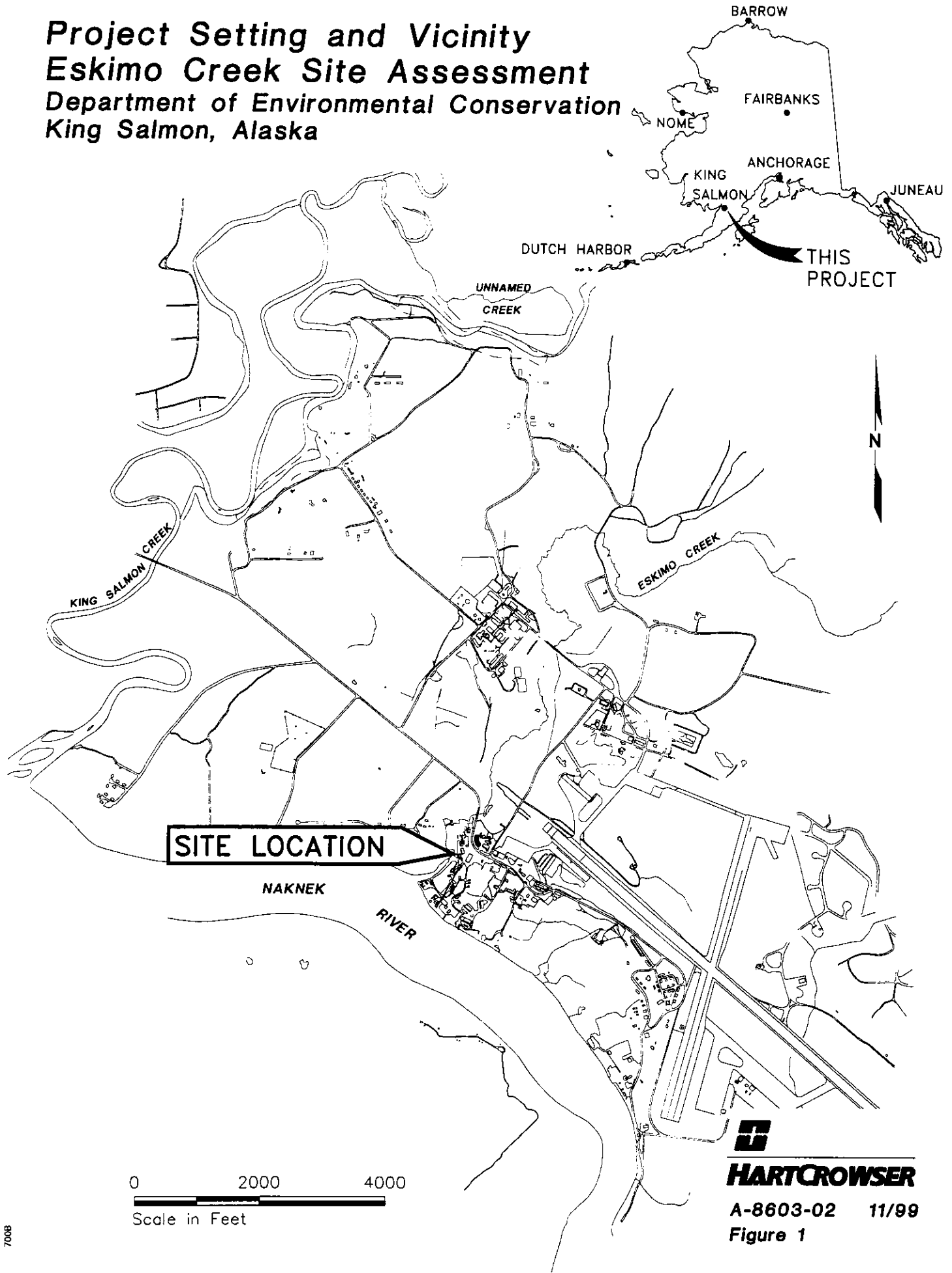
U = Not detected at concentration shown.

{1} 18 AAC 75, Table C. Bolded concentration exceed cleanup level.


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Analytical_Nov_99.xls

Project Setting and Vicinity Eskimo Creek Site Assessment Department of Environmental Conservation King Salmon, Alaska






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Figure 1

Site Map with Groundwater Elevation Contour Lines
Eskimo Creek Site Assessment
 Department of Environmental Conservation
 King Salmon, Alaska



LEGEND

-  JUNE 1999 MONITORING WELL
-  NOVEMBER 1999 MONITORING WELL
- AST ABOVEGROUND STORAGE TANK
-  GROUNDWATER ELEVATION CONTOUR LINE IN FEET ABOVE MEAN SEA LEVEL

Scale: 1 Inch = 55 Feet

Source: Aerial photograph provided by Aeromap U.S. Dated 10/2/97


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 Figure 2

**APPENDIX A
FIELD METHODS
ESKIMO CREEK SITE ASSESSMENT**

All field work conducted for this project was performed in accordance with the work plan dated November 3, 1999 and the 18 AAC 78, *Underground Storage Tanks* regulations.

Soil Sampling

Monitoring Well Locations. Soil samples collected at the two monitoring wells were obtained using hollow-stem auger soil boring techniques. A 3-3/8-inch inside diameter (i.d.) hollow-stem auger was used to advance the borings. Samples were collected employing a 2.5-inch i.d. split-spoon sampler at a five foot interval, starting at the surface and ending at the depth of the groundwater table. Groundwater was encountered at approximately 24 to 25 feet below ground surface (bgs). A 340-pound hydraulic hammer, free-falling 30 inches, was used to drive the split-spoon sampler 18 inches ahead of the auger into undisturbed soil. Blow counts were used to assess the relative density or consistency of the soils. Figures A-2 and A-3 are the borehole logs, which provide the soil descriptions and well construction details.

Soil samples recovered from the split-spoon sampler were field classified and placed in sample containers for laboratory analysis. Immediately after opening the split-spoon sampler, GRO/BTEX samples for laboratory analysis were placed in pre-weighed sample jars and field preserved with methanol in accordance with AK 101 procedures. Samples for analysis of DRO were collected next. A sample for field screening with an OVM photoionization detector (PID) was taken after all laboratory samples were collected. All laboratory samples were labeled and placed in a cooler with crushed ice for holding until transport to the laboratory under chain-of-custody procedures. A methanol trip blank accompanied each cooler containing BTEX and GRO samples.

One duplicate soil sample was collected at MW-5, Sample SS-4 (20 - 21 feet). The duplicate sample was submitted to the laboratory for analysis of BTEX, GRO, and DRO.

During drilling, no lubricants or greases were used on drilling tools or downhole equipment. Drill rig fueling and maintenance activities were conducted in an area away from the soil boring locations.

Field Screening

Soil samples were placed in 1-quart self-sealing plastic bags and screened in the field for concentrations of volatile organics using a PID equipped with a 10.0 eV lamp. Samples were allowed to equilibrate to the ambient temperature inside the field vehicle (approximately 65° F) for a minimum of 15 minutes prior to screening. The headspace vapors within the sample bag were then measured.

Monitoring Well Installation

After each monitoring well boring had been advanced approximately 5 feet below the groundwater table, a monitoring well was installed. A 10-foot section of 2-inch diameter well screen with 0.010-inch slots was placed at the bottom of the borehole. Screened sections were connected to the surface by a riser of flush-threaded, blank PVC pipe. A sand pack filter of No. 8-12 silica sand was placed in the annulus around the pre-packed screen section. Above the sand pack the borehole was backfilled with bentonite chips and hydrated in place to within 2 feet of the ground surface. Monitoring wells were then provided with a flush-mounted monument box, and sealed into place using concrete. Figures A-1 through A-3 provide a graphic description of the well construction details for each monitoring well.

Monitoring Well Development

Monitoring wells were developed after installation. The water level was measured in each well before development. Wells were bailed until ten casing volumes had been removed. Purge water was drummed and stored on-site for disposal. Free-phase hydrocarbons were not found at the time of development.

Monitoring Well Sampling

After development of each monitoring well, samples were collected using single-use disposable Teflon bailers. Samples for analysis of volatile analytes were collected first, followed by samples for non-volatile analytes.

Immediately after collection, the samples were labeled and placed in a cooler with crushed ice until delivery to the laboratory under chain-of-custody procedures. A trip blank accompanied each cooler containing BTEX and GRO samples.

Survey

After the new monitoring wells were installed, the vertical measuring point elevations were established by Hart Crowser personnel. The vertical elevations were established by measuring the difference between an existing monitoring well (MW-3) to each of the new wells using a standard surveyors level. Table A-1 presents the measuring point elevations and calculated groundwater elevations for the monitoring wells.

Sample Numbering System

Soil samples were first labeled using the monitoring well boring number. Samples collected from the surface were designated SS-1 with consecutive samples designated SS-2 (5 feet bgs), and SS-3 (10 feet bgs). For example, the 5-foot sample from boring MW-5 was MW-5/SS-2. All sample labels included the date, the time of sampling, and the sampler's initials.

The duplicate sample was collected at the 20-foot depth from monitoring well boring MW-5 and was named MW-5/SS-6, with a time of 5 minutes later than MW-5/SS-4 (the project sample).

Groundwater samples were labeled with the name of the monitoring well and included the date, the time of sampling, and the sampler's initials.

Field Documentation Procedures

The Hart Crowser field representative maintained a record of field activities in a logbook. All field log book entries were dated and signed. Activities and observations noted in the log book included weather, drilling observations, development amounts, PID readings, etc.

Decontamination Procedures

Drilling equipment was cleaned with a pressure wash steam cleaner prior to mobilization to the site each day. The driller supplied sufficient auger so that decontamination of augers on-site was not necessary.

The sampling equipment, consisting of sampling spoons, the split-spoon samplers, and the well sounder, were cleaned prior to and between sampling/measurement attempts. Decontamination consisted of using an

anionic detergent wash (Alconox) followed by two potable water rinses and a deionized water rinse.

Investigation-derived Wastes

Investigation-derived wastes (IDW) are wastes generated during field investigations. The IDW produced from the well installations and development consisted of the following waste streams:

- Auger cuttings;
- Water used in the decontamination process and from well development and purging; and
- Personal protective equipment (PPE) and general debris.

Auger Cuttings

Auger cuttings from MW-5, which contained hydrocarbon odors and high vapor screening results, were placed in a Supersac and labeled. A Supersac was used, as opposed to a drum because the drilling company's shipment of drums did not arrive in time for the investigation. The Supersac was placed at the south end of the Eddie's building per the manager's approval.

Soil cutting from MW-6 did not contain noticeable hydrocarbon odors and had vapor screening results. These cuttings were spread on the ground behind Eddie's per the manager's approval.

Decontamination/Development/Purge Water

Water generated from decontamination, and during well development and purging was placed into one drum. The drum was placed at the south end of the Eddie's building per the manager's approval.

Personal Protective Equipment (PPE) and Debris

PPE and debris were placed in plastic bags and taped shut and disposed in the Eddie's on-site dumpster.

**Table A-1- OBSERVED GROUNDWATER ELEVATIONS, NOVEMBER 10, 1999,
ESKIMO CREEK SITE ASSESSMENT, KING SALMON, AK**

Well Number	Measuring Point Elevation (Feet AMSL)	Depth to Water	November 10, 1999 Groundwater Elevation (Feet)
MW-1 ⁽¹⁾	24.82	NM	
MW-2 ⁽¹⁾	23.80	21.71	2.09
MW-3 ⁽¹⁾	24.22	23.43	0.79
MW-4 ⁽¹⁾	26.61	NM	
MW-5 ⁽²⁾	25.17	23.61	1.56
MW-6 ⁽²⁾	26.32	24.55	1.77

Notes:

- {1} Measuring point elevations established by registered professional land surveyor.
AMSL -Above Mean Sea Level
- {2} Measuring point elevation established by conducting vertical survey from MW-3.
- NM - Not measured

Key to Exploration Logs and Well Construction

Sample Description

Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:

Density/consistency, moisture, color, minor constituents, MAJOR CONSTITUENT, additional remarks.

Density/Consistency

Soil density/consistency in borings is related primarily to the Standard Penetration Resistance.

Soil density/consistency in test pits is estimated based on visual observation and is presented parenthetically on the test pit logs.

SAND or GRAVEL	Standard Penetration Resistance (N) in Blows/Foot	SILT or CLAY	Consistency	Standard Penetration Resistance (N) in Blows/Foot	Approximate Shear Strength in TSF
Very loose	0 - 4	Very soft		0 - 2	<0.125
Loose	4 - 10	Soft		2 - 4	0.125 - 0.25
Medium dense	10 - 30	Medium stiff		4 - 8	0.25 - 0.5
Dense	30 - 50	Stiff		8 - 15	0.5 - 1.0
Very dense	>50	Very stiff		15 - 30	1.0 - 2.0
		Hard		>30	>2.0

Moisture

Dry	Little perceptible moisture
Damp	Some perceptible moisture, probably below optimum
Moist	Probably near optimum moisture content
Wet	Much perceptible moisture, probably above optimum

Minor Constituents

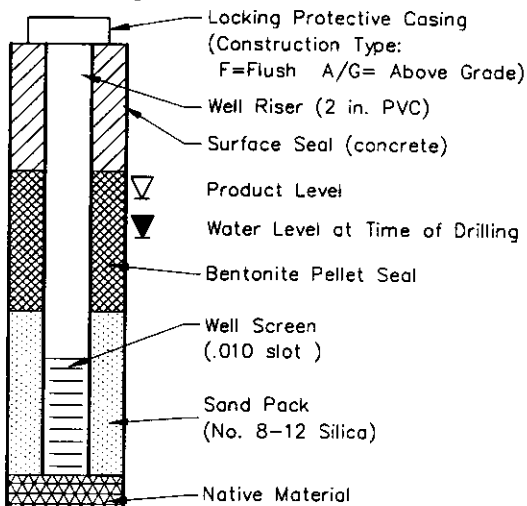
Minor Constituents	Estimated Percentage
Not identified in description	0 - 5
Slightly (clayey, silty, etc.)	5 - 12
Clayey, silty, sandy, gravelly	12 - 30
Very (clayey, silty, etc.)	30 - 50

Legends

Sampling Test Symbols

BORING SAMPLES	TEST PIT SAMPLES
Split Spoon	Grab (Jar)
Shelby Tube	Bag
Cuttings	Shelby Tube
Core Run	Bucket Sample
* No Sample Recovery	
P Tube Pushed, Not Driven	

Monitoring Well Construction



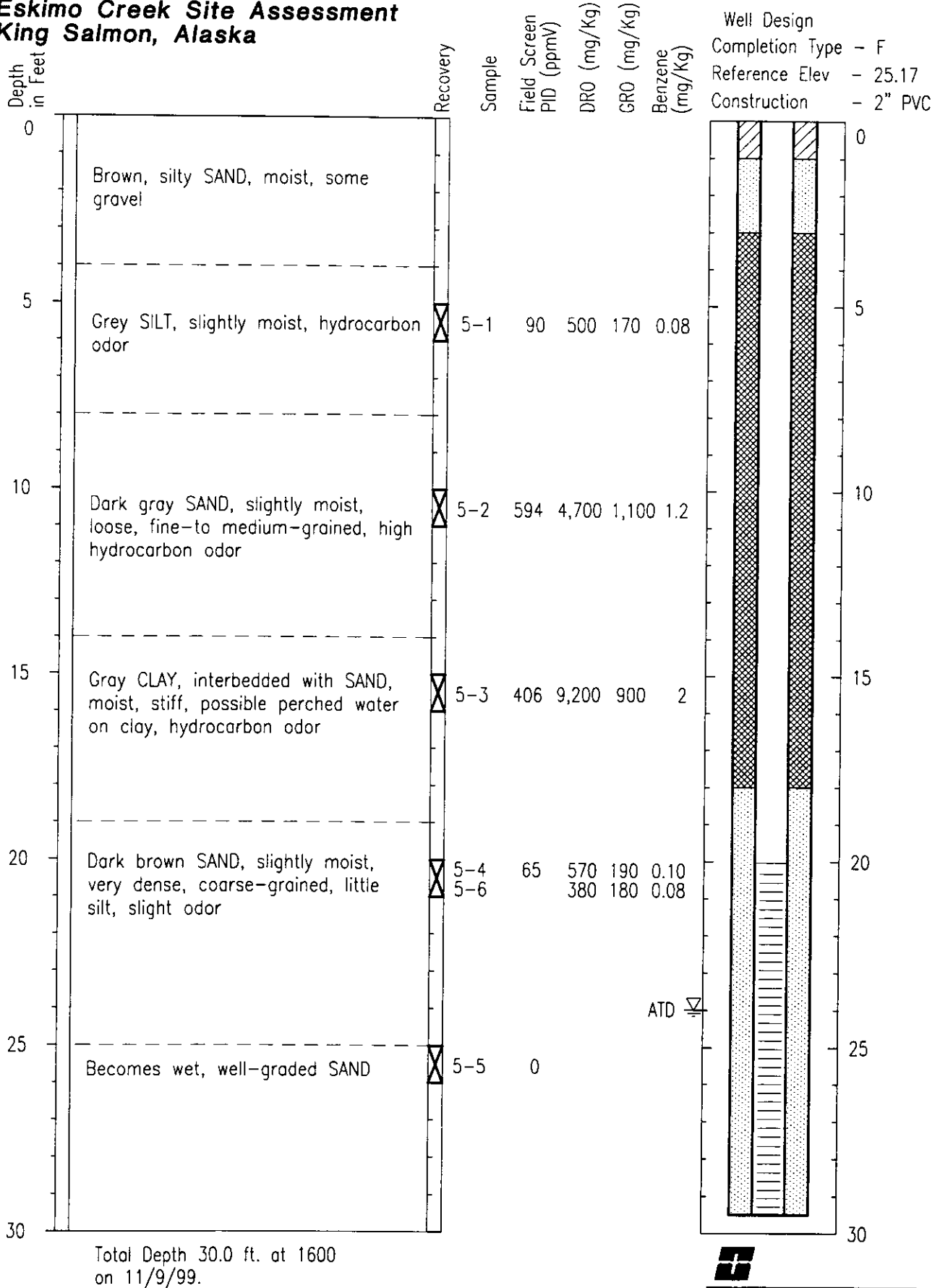
Geological Descriptions

MAJOR DIVISIONS	GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)	GW	WELL - GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)	GP	POORLY - GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	CLEAN SAND (LITTLE OR NO FINES)	SW	WELL - GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SP	POORLY - GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	SM	SILTY SANDS, SAND - SILT MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTY WITH SLIGHT PLASTICITY
		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		OL	ORGANIC SILTY AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
		CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
HIGHLY ORGANIC SOILS		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
		PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

- Notes: 1. Elevations are shown in feet above mean sea level.
2. Northing and Easting coordinates are in feet and are based on the Alaska State Plane coordinate system.

Boring Log and Well Construction Data MW-5

Eskimo Creek Site Assessment
King Salmon, Alaska



1. Soil descriptions are interpretative and actual changes may be gradual.
2. Solid contact lines indicate an observed contact. Dashed lines indicate an inferred contact.
3. Water level is for date indicated and may vary with time of year. (ATD-At Time of Drilling)
4. Refer to Figure A-1 for key to exploration logs.



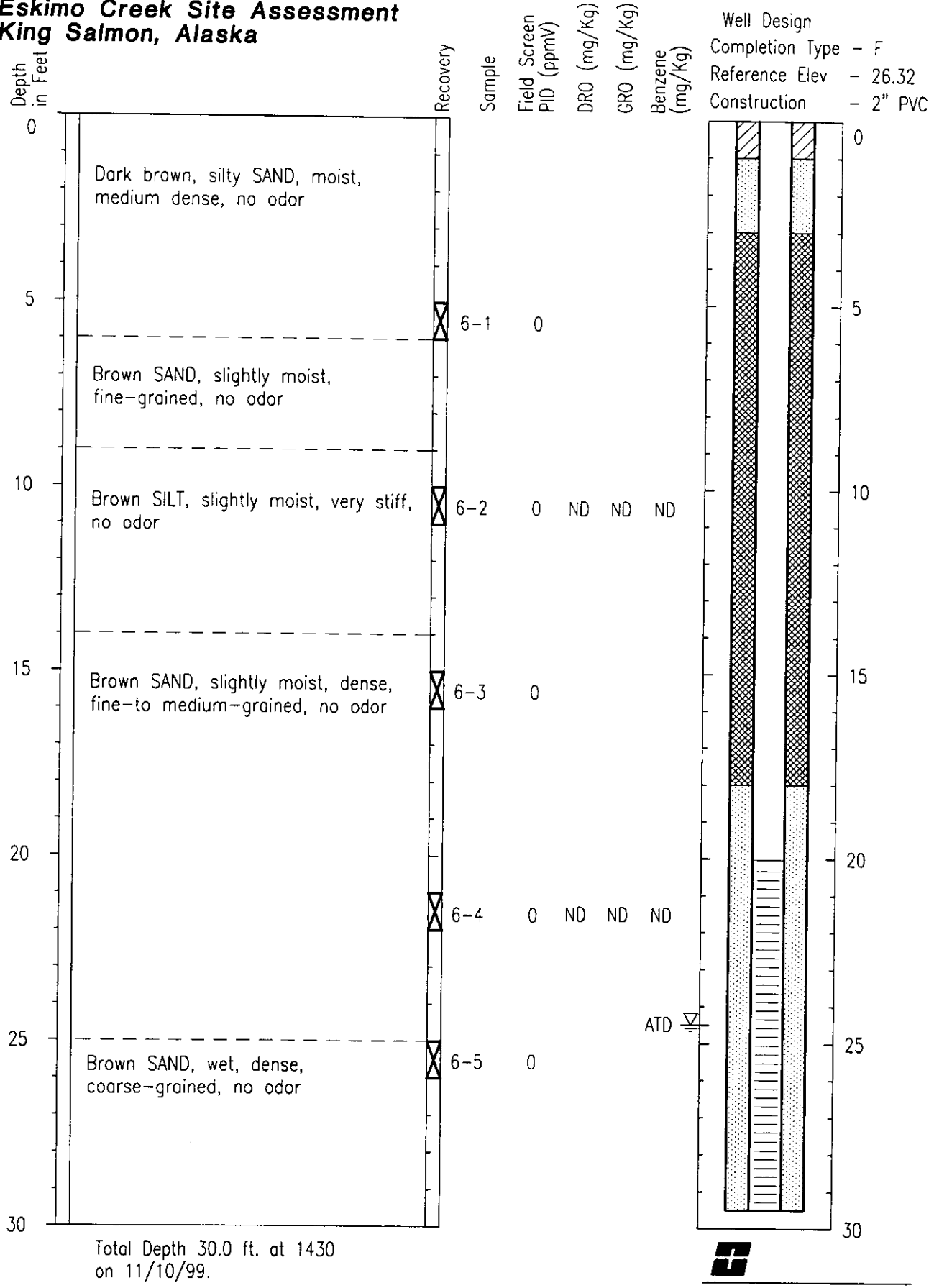
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FIGURE A-2

Boring Log and Well Construction Data MW-6

Eskimo Creek Site Assessment
King Salmon, Alaska



Total Depth 30.0 ft. at 1430 on 11/10/99.

1. Soil descriptions are interpretative and actual changes may be gradual.
2. Solid contact lines indicate an observed contact. Dashed lines indicate an inferred contact.
3. Water level is for date indicated and may vary with time of year. (ATD-At Time of Drilling)
4. Refer to Figure A-1 for key to exploration logs.

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FIGURE A-3



MultiChem
ANALYTICAL SERVICES

November 30, 1999

MAS I.D. # 911011

Hart Crowser, Inc.
2550 Denali Street
Suite 705
Anchorage, AK 99503

RECEIVED
DEC 2 1999
HART-CROWSER, INC.

Attn: Lisa Maserjian

Project Name: Eskimo Creek

Project Number: 8603-02


Dear Ms. Maserjian:

On November 11, 1999, MultiChem Analytical Services of Alaska received fourteen samples for analysis in conjunction with the above listed project. The requested analyses were performed using EPA or equivalent methods. The reports of analyses are enclosed. Below is an outline of the laboratories that participated in this project.

MAS-AK Analysis Performed: GRO/BETX (AK 101/8021), DRO (AK 102)

Please do not hesitate to contact us at (907) 248-8273, if you have any questions or comments.

Sincerely,
MultiChem Analytical Services, LLC


Susan M. Snyder
Laboratory Manager

Sample ID. Cross Reference Sheet

Client: Hart Crowser, Inc.
Project #: 8603-02
Project Name: Eskimo Creek

MAS I.D.: 911011

MAS ID #	Client Description	MAS ID #	Client Description
911011 1	MW-5-1		
911011 2	MW-5-2		
911011 3	MW-5-3		
911011 4	MW-5-4		
911011 6	MW-5-6		
911011 7	MW-5		
911011 8	MW-6-2		
911011 10	MW-6-4		
911011 12	METHANOL BLANK		
911011 13	MW-6		
911011 14	TRIP BLANK		

MAS STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of the report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Sample Custody Record

Samples Shipped to: **MAS**

JOB NUMBER 8603-02 LAB NUMBER _____
 PROJECT NAME Esikmo Creek
 HART CROWSER CONTACT Lisa Maserjian

SAMPLED BY: Lisa Maserjian

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX
01	MW-5-1	5'	11-9-99	1415	SOIL
02	MW-5-2	10'	11-9-99	1425	
03	MW-5-3	15'	11-9-99	1500	
04	MW-5-4	20'	11-9-99	1510	
05	MW-5-5	25'	11-9-99	1530	
06	MW-5-6	20'	11-9-99	1515	SOIL
07	MW-5	20'	11-10-99	1030	WATER
08	MW-6-2	10'	11-10-99	1300	SOIL
09	MW-6-3	15'	11-10-99	1330	SOIL
10	MW-6-4	20'	11-10-99	1345	SOIL
11	MW-6-5	25'	11-10-99	1405	SOIL

RELINQUISHED BY	DATE	RECEIVED BY	DATE
<i>Lisa Maserjian</i>	11-8-99	<i>M. Masera</i>	11/2/99
Lisa Maserjian		M. Masera	
Hart Crowser	0835	MAS	8:35am

REQUESTED ANALYSES	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
DR0 AK102 Gro/BTEX AK101		
	2	OVM = 90 ppm
	2	OVM = 594 ppm
	2	OVM = 406 ppm
	2	OVM = 65 ppm
	2	OVM = 0 ppm
	2	OVM = 65 ppm
	4	
	2	OVM = 0 ppm
	2	OVM = 0 ppm
	2	OVM = 0 ppm
	2	OVM = 0 ppm

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS:
 * Labels attached by Matrix indicating slight leak during shipment JSA

COOLER NO.: 111A

STORAGE LOCATION: _____

TURNAROUND TIME:
 24 HOURS 1 WEEK
 48 HOURS STANDARD
 72 HOURS OTHER _____

Accession # 911011
HARTCROWSER

Hart Crowser, Inc.
 2550 Denali Street, Suite 705
 Anchorage, AK 99503-2737
 Phone: 907-276-7475 FAX: 907-276-2104

Sample Custody Record

Samples Shipped to: MAS

JOB NUMBER 8603-02 LAB NUMBER _____

PROJECT NAME Eskimo Creek

HART CROWSER CONTACT Lisa Maserjian

SAMPLED BY: Lisa Maserjian

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX
X12	METHONAL BLANK		11/11/99		soil
13	MW-6		11-11-99	1000	WATER
14	TRIP BLANK		11/11/99		Water

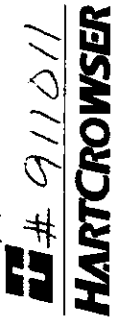
REQUESTED ANALYSES		NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
DR0 AK102	60/6TEX AK101		
		1	
		7	Note: 1 extra
		2	1 hr and 2 extra voas
			in case of breakage

RELINQUISHED BY	DATE	RECEIVED BY	DATE
<u>Lisa Maserjian</u> SIGNATURE Lisa Maserjian PRINT NAME Hart Crowser COMPANY	11-18-99 TIME 0835	<u>M. Jones</u> SIGNATURE M. Jones PRINT NAME M A S COMPANY	11/12/99 TIME 8:35am

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS:	STORAGE LOCATION:
Added date + matrix to BOD + added * MEDH leakage of rom being shipped on side left	
COOLER NO: 1111A	
See Lab Work Order No. _____ for Other Contract Requirements	

TOTAL NUMBER OF CONTAINERS	
SAMPLE RECEIPT INFORMATION	
CUSTODY SEALS: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
GOOD CONDITION: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	
TEMPERATURE: _____	3.7°C
SHIPMENT METHOD: <input checked="" type="checkbox"/> HAND <input type="checkbox"/> COURIER <input type="checkbox"/> OVERNIGHT	
TURNAROUND TIME:	
<input type="checkbox"/> 24 HOURS	<input type="checkbox"/> 1 WEEK
<input type="checkbox"/> 48 HOURS	<input checked="" type="checkbox"/> STANDARD
<input type="checkbox"/> 72 HOURS	<input type="checkbox"/> OTHER

Hart Crowser, Inc.
2550 Denali Street, Suite 705
Anchorage, AK 99503-2737
Phone: 907-276-7475 FAX: 907-276-2104



RECEPTION # 911011

PAGE 2 OF 2

SAMPLE LOG-IN CHECKLIST

ACCESSION #: 911011 SUBCONTRACT WORK? YES / NO
 CLIENT NAME: Hart Cruiser TO LAB (circle): MAS-R / OTHER: ---
 LOGGED-IN BY (print): Lorraine Andela (sign): L Andela
 Date received: 11/12/99 Client's Cooler # (if any): 1111A
 Is the project for: ACOE? YES / NO NAVY? YES / NO

- | | | | |
|---|----------------------------|------------|-----------|
| 1. Did cooler arrive with shipping document? | <u>(Hand delivery)</u> N/A | YES | <u>NO</u> |
| 2. Are Custody seals present on cooler? YES / <u>NO</u> How many? _____ Where? _____ | | | |
| Seal date: _____ Seal name: _____ Intact? | <u>N/A</u> | YES | <u>NO</u> |
| 3. Are Custody seals present on sample containers? | | YES | <u>NO</u> |
| If "YES", intact? <u>TRIP BLANKS - YES</u> | <u>N/A</u> | YES | <u>NO</u> |
| 4. Is the Chain of Custody (C-O-C) sealed in plastic bag? YES / <u>NO</u> Taped to cooler lid? | | YES | <u>NO</u> |
| 5. Is the C-O-C complete? * Relinquished by client: YES / <u>NO</u> Analyses marked off: | | <u>YES</u> | <u>NO</u> |
| * C-O-C or other: representative documents, letters, and/or shipping memos. Signed/received by lab: | | <u>YES</u> | <u>NO</u> |
| 6. Is the C-O-C in agreement with samples received? | | | |
| Sample ID's: <u>YES</u> / NO Matrix: <u>Salt Water</u> | | <u>YES</u> | <u>NO</u> |
| Date sampled: <u>YES</u> / NO # Containers: <u>34</u> | | <u>YES</u> | <u>NO</u> |
| 7. Has the main logbook been filled out properly? | | <u>YES</u> | <u>NO</u> |
| 8. If samples are RUSH has notice been given? | <u>N/A</u> | YES | <u>NO</u> |
| 9. Is proper preservation indicated on label(s)? <u>Lab labels</u> | N/A | <u>YES</u> | <u>NO</u> |
| 10. Did pH check verify preservative indicated? (Volatiles) N/A | | YES | <u>NO</u> |
| 11. Is there sufficient sample volume for analyses? | | <u>YES</u> | <u>NO</u> |
| 12. Are samples in proper containers? (see reference chart) | | <u>YES</u> | <u>NO</u> |
| 13. Are all samples within holding times for requested analysis? | | <u>YES</u> | <u>NO</u> |
| 14. Are all sample containers intact? (i.e. not broken, leaking...) | <u>HA</u> | <u>YES</u> | <u>NO</u> |
| 15. Are samples individually bagged? <u>Bubble Bag</u> | | <u>YES</u> | <u>NO</u> |
| 16. Are all volatile samples headspace-free (< pea-size for waters)? | <u>N/A</u> | <u>YES</u> | <u>NO</u> |
| 17. Shipping container (circle one): <u>Cooler</u> / Box / Other: | | | |
| 18. Type of packing material used (circle one): <u>Bubble Wrap</u> / Styrofoam Peanuts / Vermiculite / None | | | |
| 19. Refrigerant (circle one): <u>Gel Ice</u> / Loose Ice / Other: _____ / None | | | |
| 20. Was refrigerant frozen upon receipt? | | <u>YES</u> | <u>NO</u> |
| 21. Cooler temperature(s): #1: <u>3.7 °C</u> #2: _____ °C | | | |

Sample tagging check for QC: YES / NO
 Sample ID's issued in order of appearance on C-O-C: YES / NO
 Tags placed in appropriate areas of sample containers: YES / NO

Initials of reviewer: LS
 Describe any "NO" items from checklist above: Item #14 - Methanol blank leakage due to shipping on side. Item #6 - Added date + matrix to both salt water trip blanks on CDC. L Andela
Item #14 - labels on Vials smudged on # 2, 4+5, indicating meth leakage during shipping

Was client contacted: YES / NO / N/A Date: _____ Name of person contacted: shipping #14
 Describe client instructions or actions taken: _____

Airport of
Departure

Subject to Conditions of
Contract on the Back of
the Airbill

INSURANCE
AVAILABLE

339
027

339 0563 8592

0563 8592

Alaska Airlines

P.O. BOX 68906
SEATTLE, WASHINGTON 98168
1-800-225-2752

NOT NEGOTIABLE
AIR WAYBILL
(AIR CONSIGNMENT NOTE)

Copies 1, 2 and 3 of this Air Waybill are originals and have the same validity.

It is agreed that the goods described herein are accepted for carriage in apparent good order and condition (except as noted) and SUBJECT TO THE CONDITIONS OF CONTRACT ON THE REVERSE HEREOF. THE SHIPPER'S ATTENTION IS DRAWN TO THE NOTICE CONCERNING CARRIER'S LIMITATION OF LIABILITY AND SHIPPER'S SECURITY NOTIFICATION. Cargo items tendered for air transportation are subject to aviation security controls by air carriers and when appropriate, other government regulations. Copies of all relevant shipping documents showing the cargo's consignee, consignor, description, and other relevant data will be retained on file until the cargo completes its air transportation.

DOMESTIC ONLY

PRIORITY **ECONOMY**
TO EXPEDITE MOVEMENT, SHIPMENT MAY BE DIVERTED TO MOTOR OR OTHER CARRIER UNLESS SHIPPER GIVES OTHER INSTRUCTIONS HEREON.

ALSO NOTIFY NAME AND ADDRESS (OPTIONAL ACCOUNTING INFORMATION)

*Kenn Air call @ 400
called @ 10:25 077 To 339
confirmed @ 10:50 w/Kit B
DANKING SUPE OK TO SUBSTITUTE*

SHIPPER'S NAME AND ADDRESS
MULTICHEM

SHIPPER'S ACCOUNT NUMBER
27442238040

2000 W. INTL AIRPORT RD

ANCHORAGE, AK 99502

CONSIGNEE'S NAME AND ADDRESS
HART CROWSER

ATTN: LISA MAGERSTAN
HOLD FOR PICK-UP

KING SALMON AK

ISSUING CARRIER'S AGENT NAME AND CITY

**243.2905 KIT PENAIR
AK AIR-NORMA**

AGENTS IATA CODE

ACCOUNT NO.

AIRPORT OF DEPARTURE (ADDR OF FIRST CARRIER) AND REQUESTED ROUTING

ANCHORAGE

ROUTING AND DESTINATION

TO BY FIRST CARRIER TO BY TO BY

CURRENCY CHGS WT/VAL OTHER DECLARED VALUE FOR CARRIAGE DECLARE VALUE FOR CUSTOMS
CODE PPD COLL PPD COLL

AIRPORT OF DESTINATION

KING SALMON

FOR CARRIER USE ONLY

FLIGHT/DATE FLIGHT/DATE

AMOUNT OF INSURANCE

INSURANCE - If shipper requests insurance in accordance with conditions on reverse hereof, indicate amount to be insured in figures in box marked amount of insurance. INITIALS

HANDLING INFORMATION These commodities licensed by US for ultimate destination. Diversion contrary to US law is prohibited.

HOLD FOR PICK-UP ON 11/11/99 AM *Kit/KS
1430/10 Nov 99*

NO. OF PIECES RCP	GROSS WEIGHT	KG LBS	RATE CLASS COMMODITY ITEM NO.	CHARGEABLE WEIGHT	RATE CHARGE	TOTAL	NATURE AND QUANTITY OF GOODS (INCL. DIMENSIONS OR VOLUME)
1	22						DANGEROUS GOODS AS PER ATTACHED SHIPPER'S DECLARATION

PREPAID A 53.00	WEIGHT CHARGE	COLLECT	P-UP ZONE	PICKUP CHARGES	ORIGIN ADVANCE CHARGES	DESCRIPTION OF ORIGIN ADVANCE
VALUATION CHARGE			DEL ZONE	DELIVERY CHARGES	DEST. ADVANCE CHARGE	DESCRIPTION OF DEST. ADVANCE
TAX D 3.31				OTHER CHARGES AND DESCRIPTION F RA 25.00	ITEMS PREPAID	ITEMS COLLECT

TOTAL OTHER CHARGES DUE AGENT

TOTAL OTHER CHARGES DUE CARRIER
25.00

PRINTED NAME: **LORRAINE ANDELA**
SIGNATURE OF SHIPPER OR HIS AGENT AND APPLICABLE BOXES BELOW

TOTAL PREPAID: **81.31**
TOTAL COLLECT

CURRENCY CONVERSION RATES
TOTAL COLLECT IN DESTINATION CURRENCY

FOR CARRIERS USE ONLY AT DESTINATION
CHARGES AT DESTINATION
TOTAL COLLECT CHARGES

339 027 0563 8592

SUMMARY REPORT of ANALYSIS

Client: Hart Crowser, Inc.

Lab Accession: 911011

Date Received: 11/12/99

Soil Units: mg/Kg

Water GRO/BETX Units: µg/L

Water DRO Units: mg/L

Project Name: Eskimo Creek

Project Number: 8603-02

Project Manager: Lisa Maserjian

Reviewed By: BME

Client Sample	Lab Accession #	Date Collected	% Moisture	Conc. Benzene	Conc. Toluene	Conc. Ethyl-Benzene	Conc. Total Xylene	Conc. GRO as Gasoline	Conc DRO as Diesel
MW-5-1	911011 -1	11/9/99	13	0.079	0.41	4.3	5.3	170	500
MW-5-2	911011 -2	11/9/99	7.0	1.2	6.7	27	62	1100	4700
MW-5-3	911011 -3	11/9/99	21	2.0	9.6	22	56	900	9200
MW-5-4	911011 -4	11/9/99	6.4	0.096	0.52	5.1	5.7	190	570
MW-5-6	911011 -6	11/9/99	5.8	0.084	0.38	3.9	4.4	180	380
MW-5	911011 -7	11/10/99	N/A	46	12	110	150	4700	4.6
MW-6-2	911011 -8	11/10/99	18	<0.017	<0.022	<0.022	<0.022	<4.3	<12
MW-6-4	911011 -10	11/10/99	5.0	<0.072	<0.090	<0.090	<0.090	<18	<11
METHANOL BLANK	911011 -12	11/9/99	N/A	<0.020	<0.025	<0.025	<0.025	<5.0	
MW-6	911011 -13	11/11/99	N/A	<2.0	<2.0	<2.0	<2.0	<100	<0.27
TRIP BLANK	911011 -14	11/10/99	N/A	<2.0	<2.0	<2.0	<2.0	<100	

Methods:
 BETX = 8021M
 GRO = AK 101
 DRO = AK 102
 RRO = AK 103

MultiChem Analytical Services, Alaska.

GC-Fuels QC Evaluation Summary

Date: 11/18/99

Client:	Hart Crowser, Inc.	Dates Extracted:	11/09/99
Method:	AK 101/8021M		11/10/99
Criteria:	ADEC		11/15/99
MAS-Alaska #:	911011	Dates Analyzed:	11/12/99
Client Project:	Eskimo Creek		11/15/99
Matrix:	Water Soil		11/16/99
Number of Samples:	11		

QC Parameter	Method Criteria Acceptance	Comments/Actions
Holding Times	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Extraction Dates	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Analysis Dates	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Continuing Calibration	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Method Blanks	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
QC Spike Samples	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
MS/MSD	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Calculations	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Surrogate Recoveries	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> Fail	Bromofluorobenzene surrogate was not recovered in samples 911011-2, -3, and -4 due to sample dilution. Data are flagged 'I'. Chlorofluorobenzene was above acceptance limits in samples -1, -2, -3, -4, and -6 due to matrix interferences. Data are flagged 'F'.
Retention Times	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	

Hydrocarbon Match: Samples 911011-8, -10, -12, -13, and -14 were below method reporting limits for all compounds. Remaining samples contained all BTEX compounds and GRO. Sample chromatography indicates the presence of gasoline and diesel fuels.

Laboratory QA:

Data meets guidelines established within the SOP for the MAS-Alaska Data Reporting Level 3, and State of Alaska Standard Quality Assurance Program Plan, 18AAC78 Underground Storage Tanks, as amended through December 1998.

Data Reviewed by: *E. J. Cannon* Approved by: *Snyder*

MAS I.D. # 911011

BETX - GASOLINE RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: N/A
PROJECT #	: 8603-02	DATE RECEIVED	: N/A
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
METHOD	: GRO/BETX (AK101/8021M)	DILUTION FACTOR	: 1

COMPOUNDS RESULTS

BENZENE	<2.0
ETHYLBENZENE	<2.0
TOLUENE	<2.0
TOTAL XYLENES	<2.0
FUEL HYDROCARBONS	<100
HYDROCARBON RANGE	C6 - C10
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY

LIMITS

BROMOFLUOROBENZENE	93	72-119
1-CHLOROOCCTANE	97	70-126
CHLOROFLUOROBENZENE	104	60-120

Analyst EL Date 11/18/99
Reviewer SS Date 11/18/99

MAS I.D. # 911011-7

BETX - GASOLINE RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: 11/10/99
PROJECT #	: 8603-02	DATE RECEIVED	: 11/12/99
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-5	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
METHOD	: GRO/BETX (AK101/8021M)	DILUTION FACTOR	: 5

COMPOUNDS	RESULTS
BENZENE	46
ETHYLBENZENE	110
TOLUENE	12
TOTAL XYLENES	150
FUEL HYDROCARBONS	4700
HYDROCARBON RANGE	C6 - C10
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	88	72-119
1-CHLOROOCCTANE	95	70-126
CHLOROFLUOROBENZENE	112	60-120

Analyst *[Signature]* Date 11/18/99
 Reviewer *[Signature]* Date 11/18/99

MAS I.D. # 911011-13

BETX - GASOLINE RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: 11/11/99
PROJECT #	: 8603-02	DATE RECEIVED	: 11/12/99
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-6	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
METHOD	: GRO/BETX (AK101/8021M)	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<2.0
ETHYLBENZENE	<2.0
TOLUENE	<2.0
TOTAL XYLENES	<2.0
FUEL HYDROCARBONS	<100
HYDROCARBON RANGE	C6 - C10
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	84	72-119
1-CHLOROOCCTANE	84	70-126
CHLOROFLUOROBENZENE	95	60-120

Analyst E.A. Date 11/15/99
Reviewer SS Date 11/18/99

MAS I.D. # 911011-14

BETX - GASOLINE RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: 11/10/99
PROJECT #	: 8603-02	DATE RECEIVED	: 11/12/99
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: N/A
CLIENT I.D.	: TRIP BLANK	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
METHOD	: GRO/BETX (AK101/8021M)	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<2.0
ETHYLBENZENE	<2.0
TOLUENE	<2.0
TOTAL XYLENES	<2.0
FUEL HYDROCARBONS	<100
HYDROCARBON RANGE	C6 - C10
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE	PERCENT RECOVERY	LIMITS
BROMOFLUOROBENZENE	83	72-119
1-CHLOROOCCTANE	83	70-126
CHLOROFLUOROBENZENE	95	60-120

Analyst *[Signature]* Date 11/18/99
 Reviewer *[Signature]* Date 11/18/99

MAS I.D. # 911011

BETX - GASOLINE RANGE ORGANICS
QUALITY CONTROL DATA

CLIENT	: HART CROWSER, INC.	SAMPLE I.D. #	: BLANK
PROJECT #	: 8603-02	DATE EXTRACTED	: N/A
PROJECT NAME	: ESKIMO CREEK	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: GRO/BETX (AK101/8021M)		

COMPOUNDS	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
BENZENE	<2.00	26.1	27.5	105	28.5	109	4
ETHYLBENZENE	<2.00	35.6	37.4	105	39.1	110	4
TOLUENE	<2.00	159	145	91	149	94	3
TOTAL XYLENES	<2.00	187	181	97	185	99	2
GASOLINE	<100	2200	2230	101	2280	104	2

CONTROL LIMITS

	% REC.	RPD
BENZENE	75 - 126	20
ETHYLBENZENE	77 - 128	20
TOLUENE	78 - 116	20
TOTAL XYLENES	74 - 120	20
GASOLINE	80 - 115	20

SURROGATE RECOVERIES

	SPIKE	DUP. SPIKE	LIMITS
BROMOFLUOROBENZENE	90	90	72 - 119
1-CHLOROOCCTANE	99	98	70 - 126
CHLOROFLUOROBENZENE	109	108	60 - 120

Analyst *[Signature]* Date 11/30/99
Reviewer *[Signature]* Date 11/30/99

MAS I.D. # 911011

MultiChem
ANALYTICAL SERVICES

BETX - GASOLINE RANGE ORGANICS
QUALITY CONTROL DATA

CLIENT : HART CROWSER, INC.
PROJECT # : 8603-02
PROJECT NAME : ESKIMO CREEK
SAMPLE MATRIX : WATER
EPA METHOD : GRO/BETX (AK101/8021M)

SAMPLE I.D. # : 821886-1
DATE EXTRACTED : N/A
DATE ANALYZED : 11/12/99
UNITS : ug/L

COMPOUNDS	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
BENZENE	<2.00	26.1	27.7	106	28.8	110	4
ETHYLBENZENE	<2.00	35.6	38.4	108	38.2	107	1
TOLUENE	<2.00	159	144	91	149	94	3
TOTAL XYLENES	<2.00	187	178	95	183	98	3
GASOLINE	<100	2200	2180	99	2270	103	4

CONTROL LIMITS

	% REC.	RPD
BENZENE	78 - 133	20
ETHYLBENZENE	70 - 137	20
TOLUENE	74 - 117	20
TOTAL XYLENES	70 - 122	20
GASOLINE	83 - 114	20

SURROGATE RECOVERIES

	SPIKE	DUP. SPIKE	LIMITS
BROMOFLUOROBENZENE	91	92	72 - 119
1-CHLOROOCCTANE	96	98	70 - 126
CHLOROFLUOROBENZENE	106	109	60 - 120

Analyst J.L. Date 11/30/99
Reviewer SS Date 11/30/99

MAS I.D. # 911011

BETX - GASOLINE RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: N/A
PROJECT #	: 8603-02	DATE RECEIVED	: N/A
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: 11/15/99
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/15/99
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: GRO/BETX (AK101/8021M)	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT		%MOISTURE	: .0

COMPOUNDS	RESULTS
BENZENE	<0.020
ETHYLBENZENE	<0.025
TOLUENE	<0.025
TOTAL XYLENES	<0.025
FUEL HYDROCARBONS	<5.0
HYDROCARBON RANGE	C6 - C10
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	88	63-119
1-CHLOROOCCTANE	92	60-120
CHLOROFLUOROBENZENE	103	60-120

Analyst *[Signature]* Date 11/18/99
 Reviewer *[Signature]* Date 11/18/99

MAS I.D. # 911011-1

BETX - GASOLINE RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: 11/09/99
PROJECT #	: 8603-02	DATE RECEIVED	: 11/12/99
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: 11/09/99
CLIENT I.D.	: MW-5-1	DATE ANALYZED	: 11/15/99
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: GRO/BETX (AK101/8021M)	DILUTION FACTOR	: 5
RESULTS ARE CORRECTED FOR MOISTURE CONTENT		%MOISTURE	: 13.0

COMPOUNDS	RESULTS
BENZENE	0.079
ETHYLBENZENE	4.3
TOLUENE	0.41
TOTAL XYLENES	5.3
FUEL HYDROCARBONS	170
HYDROCARBON RANGE	C6 - C10
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	107	63-119
1-CHLOROOCCTANE	99	60-120
CHLOROFLUOROBENZENE	125 F	60-120

F = Out of limits due to matrix interference.

Analyst [Signature] Date 11/18/99
Reviewer [Signature] Date 11/18/99

MAS I.D. # 911011-2

BETX - GASOLINE RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: 11/09/99
PROJECT #	: 8603-02	DATE RECEIVED	: 11/12/99
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: 11/09/99
CLIENT I.D.	: MW-5-2	DATE ANALYZED	: 11/15/99
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: GRO/BETX (AK101/8021M)	DILUTION FACTOR	: 10
RESULTS ARE CORRECTED FOR MOISTURE CONTENT		%MOISTURE	: 7.0

COMPOUNDS	RESULTS
BENZENE	1.2
ETHYLBENZENE	27
TOLUENE	6.7
TOTAL XYLENES	62
FUEL HYDROCARBONS	1100
HYDROCARBON RANGE	C6 - C10
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY

LIMITS

BROMOFLUOROBENZENE	I	63-119
1-CHLOROOCCTANE	98	60-120
CHLOROFLUOROBENZENE	160 F	60-120

F = Out of limits due to matrix interference.
 I = Surrogate out of limits due to sample dilution.

Analyst ZLF Date 11/15/99
 Reviewer ES Date 11/13/99

MAS I.D. # 911011-3

BETX - GASOLINE RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: 11/09/99
PROJECT #	: 8603-02	DATE RECEIVED	: 11/12/99
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: 11/09/99
CLIENT I.D.	: MW-5-3	DATE ANALYZED	: 11/15/99
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: GRO/BETX (AK101/8021M)	DILUTION FACTOR	: 10
RESULTS ARE CORRECTED FOR MOISTURE CONTENT		%MOISTURE	: 21.0

COMPOUNDS	RESULTS
BENZENE	2.0
ETHYLBENZENE	22
TOLUENE	9.6
TOTAL XYLENES	56
FUEL HYDROCARBONS	900
HYDROCARBON RANGE	C6 - C10
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	I	63-119
1-CHLOROOCCTANE	97	60-120
CHLOROFLUOROBENZENE	144 F	60-120

F = Out of limits due to matrix interference.
I = Surrogate out of limits due to sample dilution.

Analyst Zef Date 11/15/99
Reviewer EB Date 11/15/99

MAS I.D. # 911011-4

BETX - GASOLINE RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: 11/09/99
PROJECT #	: 8603-02	DATE RECEIVED	: 11/12/99
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: 11/09/99
CLIENT I.D.	: MW-5-4	DATE ANALYZED	: 11/15/99
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: GRO/BETX (AK101/8021M)	DILUTION FACTOR	: 5
RESULTS ARE CORRECTED FOR MOISTURE CONTENT		%MOISTURE	: 6.4

COMPOUNDS RESULTS

BENZENE	0.096
ETHYLBENZENE	5.1
TOLUENE	0.52
TOTAL XYLENES	5.7
FUEL HYDROCARBONS	190
HYDROCARBON RANGE	C6 - C10
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY LIMITS

BROMOFLUOROBENZENE	I	63-119
1-CHLOROOCCTANE	94	60-120
CHLOROFLUOROBENZENE	131 F	60-120

F = Out of limits due to matrix interference.
I = Surrogate out of limits due to sample dilution.

Analyst Z.F. Date 11/15/99
Reviewer SS Date 11/15/99

MAS I.D. # 911011-6

BETX - GASOLINE RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: 11/09/99
PROJECT #	: 8603-02	DATE RECEIVED	: 11/12/99
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: 11/09/99
CLIENT I.D.	: MW-5-6	DATE ANALYZED	: 11/16/99
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: GRO/BETX (AK101/8021M)	DILUTION FACTOR	: 5
RESULTS ARE CORRECTED FOR MOISTURE CONTENT		%MOISTURE	: 5.8

COMPOUNDS	RESULTS
BENZENE	0.084
ETHYLBENZENE	3.9
TOLUENE	0.38
TOTAL XYLENES	4.4
FUEL HYDROCARBONS	180
HYDROCARBON RANGE	C6 - C10
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	100	63-119
1-CHLOROOCCTANE	108	60-120
CHLOROFLUOROBENZENE	130 F	50-120

F = Out of limits due to matrix interference.

Analyst J. J. Date 11/18/99
 Reviewer SS Date 11/18/99

MAS I.D. # 911011-8

BETX - GASOLINE RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: 11/10/99
PROJECT #	: 8603-02	DATE RECEIVED	: 11/12/99
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: 11/10/99
CLIENT I.D.	: MW-6-2	DATE ANALYZED	: 11/16/99
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: GRO/BETX (AK101/8021M)	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT		%MOISTURE	: 18.0

COMPOUNDS	RESULTS
BENZENE	<0.017
ETHYLBENZENE	<0.022
TOLUENE	<0.022
TOTAL XYLENES	<0.022
FUEL HYDROCARBONS	<4.3
HYDROCARBON RANGE	C6 - C10
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	68	63-119
1-CHLOROOCCTANE	80	60-120
CHLOROFLUOROBENZENE	94	60-120

Analyst *[Signature]* Date 11/18/99
 Reviewer *[Signature]* Date 11/18/99

MAS I.D. # 911011-10

BETX - GASOLINE RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: 11/10/99
PROJECT #	: 8603-02	DATE RECEIVED	: 11/12/99
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: 11/10/99
CLIENT I.D.	: MW-6-4	DATE ANALYZED	: 11/16/99
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: GRO/BETX (AK101/8021M)	DILUTION FACTOR	: 5
RESULTS ARE CORRECTED FOR MOISTURE CONTENT		%MOISTURE	: 5.0

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COMPOUNDS	RESULTS
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BENZENE	<0.072
ETHYLBENZENE	<0.090
TOLUENE	<0.090
TOTAL XYLENES	<0.090

FUEL HYDROCARBONS	<18
HYDROCARBON RANGE	C6 - C10
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY	LIMITS
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BROMOFLUOROBENZENE	80	63-119
1-CHLOROOCCTANE	91	60-120
CHLOROFLUOROBENZENE	99	60-120

Analyst E.L. Date 11/18/99
 Reviewer SS Date 11/18/99

MAS I.D. # 911011-12

MultiChem
ANALYTICAL SERVICES

BETX - GASOLINE RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: 11/09/99
PROJECT #	: 8603-02	DATE RECEIVED	: 11/12/99
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: 11/09/99
CLIENT I.D.	: METHANOL BLANK	DATE ANALYZED	: 11/16/99
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: GRO/BETX (AK101/8021M)	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT		%MOISTURE	: .0

COMPOUNDS	RESULTS
BENZENE	<0.020
ETHYLBENZENE	<0.025
TOLUENE	<0.025
TOTAL XYLENES	<0.025
FUEL HYDROCARBONS	<5.0
HYDROCARBON RANGE	C6 - C10
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY

LIMITS

BROMOFLUOROBENZENE	83	63-119
1-CHLOROOCCTANE	79	60-120
CHLOROFLUOROBENZENE	96	60-120

Analyst *S.J.* Date 11/30/99
Reviewer *BS* Date 11/30/99

MAS I.D. # 911011

MultiChem
ANALYTICAL SERVICES

BETX - GASOLINE RANGE ORGANICS
QUALITY CONTROL DATA

CLIENT : HART CROWSER, INC.
PROJECT # : 8603-02
PROJECT NAME : ESKIMO CREEK
SAMPLE MATRIX : SOIL
EPA METHOD : GRO/BETX (AK101/8021M)

SAMPLE I.D. # : BLANK
DATE EXTRACTED : 11/15/99
DATE ANALYZED : 11/15/99
UNITS : mg/Kg

COMPOUNDS	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
BENZENE	<0.0200	0.261	0.272	104	0.273	105	0
ETHYLBENZENE	<0.0250	0.356	0.381	107	0.376	106	1
TOLUENE	<0.0250	1.59	1.40	88	1.40	88	0
TOTAL XYLENES	<0.0250	1.87	1.74	93	1.76	94	1
GASOLINE	<5.00	22.0	20.9	95	21.0	95	0

CONTROL LIMITS

	% REC.	RPD
BENZENE	73 - 123	20
ETHYLBENZENE	73 - 122	20
TOLUENE	80 - 102	20
TOTAL XYLENES	80 - 103	20
GASOLINE	79 - 107	20

SURROGATE RECOVERIES

	SPIKE	DUP. SPIKE	LIMITS
BROMOFLUOROBENZENE	88	87	63 - 119
1-CHLOROOCCTANE	93	94	60 - 120
CHLOROFLUOROBENZENE	107	107	60 - 120

Analyst SA Date 11/15/99
Reviewer SS Date 11/18/99

MultiChem Analytical Services, Alaska.

GC-Fuels QC Evaluation Summary

Date: 11/24/99

Client:	Hart Crowser, Inc.	Dates Extracted:	11/16/99
Method:	AK 102		11/17/99
Criteria:	ADEC		
MAS-Alaska #:	911011	Dates Analyzed:	11/17/99
Client Project:	Eskimo Creek		11/19/99
Matrix:	Water Soil		11/20/99
Number of Samples:	8		11/23/99

QC Parameter	Method Criteria Acceptance	Comments/Actions
Holding Times	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Extraction Dates	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Analysis Dates	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Continuing Calibration	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Method Blanks	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
QC Spike Samples	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
MS/MSD	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> Fail	DRO spike recovery in the MS was below acceptance limits. Some of the extract was lost during the preparation process. Insufficient sample volume remained to reextract the MS. Data are flagged 'H'.
Calculations	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Surrogate Recoveries	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> Fail	o-Terphenyl recovery was below limits in the MS. See MS/MSD, above, for explanation. Data are flagged 'H'.
Retention Times	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	

Hydrocarbon Match: Samples 911011-8, -10, and -13 were below method reporting limits. Chromatographs of remaining samples resembled diesel fuels.

Laboratory QA:

Data meets guidelines established within the SOP for the MAS-Alaska Data Reporting Level 3, and State of Alaska Standard Quality Assurance Program Plan, 18AAC78 Underground Storage Tanks, as amended through December 1998.

Data Reviewed by: *E. LeBaron* Approved by: *[Signature]*

MAS I.D. # 911011

DIESEL RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: N/A
PROJECT #	: 8603-02	DATE RECEIVED	: N/A
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: 11/16/99
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/17/99
SAMPLE MATRIX	: WATER	UNITS	: mg/L
METHOD	: AK102	DILUTION FACTOR	: 1

COMPOUNDS

RESULTS

FUEL HYDROCARBONS	<0.25
HYDROCARBON RANGE	C10 - C25
HYDROCARBON QUANTITATION USING	DIESEL

SURROGATE PERCENT RECOVERY

LIMITS

O-TERPHENYL	92	70-116
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Analyst *[Signature]* Date 11/24/99
Reviewer *[Signature]* Date 11/24/99

MAS I.D. # 911011-7

DIESEL RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: 11/10/99
PROJECT #	: 8603-02	DATE RECEIVED	: 11/12/99
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: 11/17/99
CLIENT I.D.	: MW-5	DATE ANALYZED	: 11/17/99
SAMPLE MATRIX	: WATER	UNITS	: mg/L
METHOD	: AK102	DILUTION FACTOR	: 1

COMPOUNDS

RESULTS

FUEL HYDROCARBONS 4.6
HYDROCARBON RANGE C10 - C25
HYDROCARBON QUANTITATION USING DIESEL

SURROGATE PERCENT RECOVERY

LIMITS

O-TERPHENYL

97

70-116

Analyst *S.L.* Date 11/24/99
Reviewer *SS* Date 11/24/99

MAS I.D. # 911011-13

DIESEL RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: 11/11/99
PROJECT #	: 8603-02	DATE RECEIVED	: 11/12/99
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: 11/16/99
CLIENT I.D.	: MW-6	DATE ANALYZED	: 11/17/99
SAMPLE MATRIX	: WATER	UNITS	: mg/L
METHOD	: AK102	DILUTION FACTOR	: 1

COMPOUNDS

RESULTS

FUEL HYDROCARBONS <0.27
HYDROCARBON RANGE C10 - C25
HYDROCARBON QUANTITATION USING DIESEL

SURROGATE PERCENT RECOVERY

LIMITS

O-TERPHENYL

90

70-116

Analyst EL Date 11/24/99
Reviewer SS Date 11/24/99

MAS I.D. # 911011

DIESEL RANGE ORGANICS
QUALITY CONTROL DATA

CLIENT : HART CROWSER, INC.
PROJECT # : 8603-02
PROJECT NAME : ESKIMO CREEK
SAMPLE MATRIX : WATER
METHOD : AK102

SAMPLE I.D. # : BLANK
DATE EXTRACTED : 11/16/99
DATE ANALYZED : 11/17/99
UNITS : mg/L

COMPOUNDS	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
DIESEL	<0.250	2.50	2.19	88	2.23	89	2
CONTROL LIMITS				% REC.			RPD
DIESEL				77 - 113			20
SURROGATE RECOVERIES		SPIKE		DUP. SPIKE	LIMITS		
O-TERPHENYL		89		95		70 - 116	

Analyst Z.L. Date 11/24/99
Reviewer SS Date 11/24/99

MAS I.D. # 911011

DIESEL RANGE ORGANICS
QUALITY CONTROL DATA

CLIENT	: HART CROWSER, INC.	SAMPLE I.D. #	: 911011-13
PROJECT #	: 8603-02	DATE EXTRACTED	: 11/16/99
PROJECT NAME	: ESKIMO CREEK	DATE ANALYZED	: 11/17/99
SAMPLE MATRIX	: WATER	UNITS	: mg/L
METHOD	: AK102		

COMPOUNDS	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
DIESEL	<0.266	2.66	1.60	62H	2.37	91	39H
CONTROL LIMITS				% REC.			RPD
DIESEL				64 - 129			20
SURROGATE RECOVERIES		SPIKE		DUP. SPIKE		LIMITS	
O-TERPHENYL		60H		92		70 - 116	

H = Out of limits see case narrative.

Analyst EJ Date 11/24/99
Reviewer SS Date 11/24/99

MAS I.D. # 911011

DIESEL RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: N/A
PROJECT #	: 8603-02	DATE RECEIVED	: N/A
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: 11/17/99
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/19/99
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: AK102	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT		%MOISTURE	: .0

COMPOUNDS

RESULTS

FUEL HYDROCARBONS	<10
HYDROCARBON RANGE	C10 - C25
HYDROCARBON QUANTITATION USING	DIESEL

SURROGATE PERCENT RECOVERY

LIMITS

O-TERPHENYL	99	72-116
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Analyst *J.F.* Date 11/24/99
 Reviewer *MS* Date 11/24/99

MAS I.D. # 911011-1

DIESEL RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: 11/09/99
PROJECT #	: 8603-02	DATE RECEIVED	: 11/12/99
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: 11/17/99
CLIENT I.D.	: MW-5-1	DATE ANALYZED	: 11/20/99
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: AK102	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT		%MOISTURE	: 13.0

COMPOUNDS

RESULTS

FUEL HYDROCARBONS 500
HYDROCARBON RANGE C10 - C25
HYDROCARBON QUANTITATION USING DIESEL

SURROGATE PERCENT RECOVERY

LIMITS

O-TERPHENYL

94

72-116

Analyst *[Signature]* Date 11/24/99
Reviewer *[Signature]* Date 11/24/99

MAS I.D. # 911011-2

MultiChem
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DIESEL RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: 11/09/99
PROJECT #	: 8603-02	DATE RECEIVED	: 11/12/99
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: 11/17/99
CLIENT I.D.	: MW-5-2	DATE ANALYZED	: 11/23/99
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: AK102	DILUTION FACTOR	: 10
RESULTS ARE CORRECTED FOR MOISTURE CONTENT		%MOISTURE	: 7.0

COMPOUNDS

RESULTS

FUEL HYDROCARBONS 4700
HYDROCARBON RANGE C10 - C25
HYDROCARBON QUANTITATION USING DIESEL

SURROGATE PERCENT RECOVERY

LIMITS

O-TERPHENYL

102

72-116

Analyst Date 11/24/99
Reviewer Date 11/24/99

MAS I.D. # 911011-3

DIESEL RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: 11/09/99
PROJECT #	: 8603-02	DATE RECEIVED	: 11/12/99
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: 11/17/99
CLIENT I.D.	: MW-5-3	DATE ANALYZED	: 11/23/99
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: AK102	DILUTION FACTOR	: 10
RESULTS ARE CORRECTED FOR MOISTURE CONTENT		%MOISTURE	: 21.0

COMPOUNDS

RESULTS

FUEL HYDROCARBONS 9200
HYDROCARBON RANGE C10 - C25
HYDROCARBON QUANTITATION USING DIESEL

SURROGATE PERCENT RECOVERY

LIMITS

O-TERPHENYL

99

72-116

Analyst SL Date 11/24/99
Reviewer SS Date 11/24/99

MAS I.D. # 911011-4

DIESEL RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: 11/09/99
PROJECT #	: 8603-02	DATE RECEIVED	: 11/12/99
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: 11/17/99
CLIENT I.D.	: MW-5-4	DATE ANALYZED	: 11/20/99
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: AK102	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT		%MOISTURE	: 6.4

COMPOUNDS RESULTS

FUEL HYDROCARBONS	570
HYDROCARBON RANGE	C10 - C25
HYDROCARBON QUANTITATION USING	DIESEL

	SURROGATE PERCENT RECOVERY	LIMITS
O-TERPHENYL	97	72-116

Analyst *[Signature]* Date 11/24/99
Reviewer *[Signature]* Date 11/24/99

MAS I.D. # 911011-6

DIESEL RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: 11/09/99
PROJECT #	: 8603-02	DATE RECEIVED	: 11/12/99
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: 11/17/99
CLIENT I.D.	: MW-5-6	DATE ANALYZED	: 11/20/99
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: AK102	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT		%MOISTURE	: 5.8

COMPOUNDS

RESULTS

FUEL HYDROCARBONS 380
HYDROCARBON RANGE C10 - C25
HYDROCARBON QUANTITATION USING DIESEL

SURROGATE PERCENT RECOVERY

LIMITS

O-TERPHENYL

103

72-116

Analyst EL Date 11/24/99
Reviewer BS Date 1/24/99

MAS I.D. # 911011-8

MultiChem
ANALYTICAL SERVICES

DIESEL RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: 11/10/99
PROJECT #	: 8603-02	DATE RECEIVED	: 11/12/99
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: 11/17/99
CLIENT I.D.	: MW-6-2	DATE ANALYZED	: 11/20/99
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: AK102	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT		%MOISTURE	: 18.0

COMPOUNDS

RESULTS

FUEL HYDROCARBONS <12
HYDROCARBON RANGE C10 - C25
HYDROCARBON QUANTITATION USING DIESEL

SURROGATE PERCENT RECOVERY

LIMITS

O-TERPHENYL

91

72-116

Analyst *[Signature]* Date 11/24/99
Reviewer *[Signature]* Date 11/24/99

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Sample File : 99B02458.D

MAS I.D. # 911011-10

DIESEL RANGE ORGANICS
DATA SUMMARY

CLIENT	: HART CROWSER, INC.	DATE SAMPLED	: 11/10/99
PROJECT #	: 8603-02	DATE RECEIVED	: 11/12/99
PROJECT NAME	: ESKIMO CREEK	DATE EXTRACTED	: 11/17/99
CLIENT I.D.	: MW-6-4	DATE ANALYZED	: 11/20/99
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: AK102	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT		%MOISTURE	: 5.0

COMPOUNDS

RESULTS

FUEL HYDROCARBONS <11
HYDROCARBON RANGE C10 - C25
HYDROCARBON QUANTITATION USING DIESEL

SURROGATE PERCENT RECOVERY

LIMITS

O-TERPHENYL

93

72-116

Analyst *[Signature]* Date 11/24/99
Reviewer *[Signature]* Date 11/24/99

MAS I.D. # 911011

MultiChem
ANALYTICAL SERVICES

DIESEL RANGE ORGANICS
QUALITY CONTROL DATA

CLIENT : HART CROWSER, INC.
PROJECT # : 8603-02
PROJECT NAME : ESKIMO CREEK
SAMPLE MATRIX : SOIL
METHOD : AK102

SAMPLE I.D. # : BLANK
DATE EXTRACTED : 11/17/99
DATE ANALYZED : 11/19/99
UNITS : mg/Kg

COMPOUNDS	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
DIESEL	<10.0	100	99.3	99	103	103	4
CONTROL LIMITS				% REC.			RPD
DIESEL				76 - 131			20
SURROGATE RECOVERIES		SPIKE		DUP. SPIKE		LIMITS	
O-TERPHENYL		90		93		72 - 116	

Analyst EL Date 11/24/98
Reviewer ES Date 11/24/99

Page 1

Sample File : 99B02448
MS File : 99B02449
MSD File : 99B02450

MAS I.D. # 911011

MultiChem
ANALYTICAL SERVICES

DIESEL RANGE ORGANICS
QUALITY CONTROL DATA

CLIENT : HART CROWSER, INC.
PROJECT # : 8603-02
PROJECT NAME : ESKIMO CREEK
SAMPLE MATRIX : SOIL
METHOD : AK102

SAMPLE I.D. # : 911011-10
DATE EXTRACTED : 11/17/99
DATE ANALYZED : 11/20/99
UNITS : mg/Kg

COMPOUNDS	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
DIESEL	<10.5	105	108	103	106	101	2
CONTROL LIMITS				% REC.			RPD
DIESEL				52 - 144			20
SURROGATE RECOVERIES		SPIKE		DUP. SPIKE		LIMITS	
C-TERPHENYL		92		91		72 - 116	

Analyst *[Signature]* Date 11/24/99
Reviewer *[Signature]* Date

PERCENT MOISTURE RESULTS

MultiChem - Anchorage
Extraction Lab

Accession group: 911011

Date analyzed: 11/17/99

Report printed: 11/18/99

Filename: mois0135

Method: CLP ILM03.0

Accession Number	Percent Moisture	Flag
911011 - 1	13	
911011 - 2	7.0	
911011 - 3	21	
911011 - 4	6.4	
911011 - 6	5.8	
911011 - 8	18	
911011 - 10	5.0	

QC RESULTS

Accession Number	Sample Result	Duplicate Result	RPD	Flag
911012 - 1	2.8	2.6	7	