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Report for Soil and Groundwater Sampling 16th Avenue & C Street Pipeline Rele Anchorage, Alaska ADEC RECKEY NO. 1989210101901, CS92.28

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Delivering smarter solutions

Prepared for
Signature Flight Support

December 28, 2000
A-8653

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REPORT FOR SOIL AND GROUNDWATER SAMPLING
16th AVENUE & C STREET PIPELINE RELEASE
ANCHORAGE, ALASKA
ADEC RECKEY NO. 1989210101901, CS92.28

INTRODUCTION

This report presents the results of Hart Crowser's assessment of soil and groundwater contamination at the 16th Avenue and C Street site in Anchorage, Alaska (Figure 1). The work was performed in accordance with our Alaska Department of Environmental Conservation (ADEC) approved work plan for the site. The release is not related to an underground storage tank (UST), however, the sampling procedures and laboratory analytical methods were performed in general accordance with Alaska UST regulations as provided in Title 18 of the Alaska Administrative Code, Chapter 75 (18 AAC 75) Guidance for Cleanup of Petroleum Contaminated Sites (September 2000). The work was performed to provide a "snapshot" of current soil and groundwater conditions at the site for comparison to ADEC cleanup regulations under 18 AAC 75.

Site History

A Jet-A fuel release occurred at this location on January 23, 1989 (Hart Crowser, 1989). At that time approximately 20 cubic yards of contaminated soil was excavated (Figure 2). Subsequent site investigation in 1989 indicated that the initial excavation action was successful in removing the majority of soil contamination at the site. However, floating product was determined to be present on the groundwater. Product recovery took place for several years from a recovery well installed at the site.

WORK PERFORMED

Prior to mobilization to the field, locations of buried utilities were coordinated and all applicable signage plans and right-of-way permits were acquired.

The recovery well was opened and the depth to water was measured (measurable floating product was not observed).

Five borings were then drilled at the locations shown on Figure 2. Soil borings were advanced by drill rig as follows:

- SB-1 was placed upgradient to assess conditions upgradient of the recovery well;
- SB-2 was placed next to the recovery well to assess "worst case" conditions;
- SB-3 and SB-5 were located downgradient from the recovery well to gather information on the downslope extent of contaminants; and
- SB-4 was placed to the west of the recovery well to assess the lateral extent of contaminants.

Soil samples were collected from 1.5 to 3.5 feet below ground surface (bgs) and at 3.5 to 5.5 feet bgs using split-spoon sampling techniques (Appendix A – Field Procedures). All soil samples were field screened and then submitted to CT&E Environmental Services, Inc. (CT&E), for analysis of benzene, toluene, ethylbenzene, xylenes (BTEX), gasoline-range organics (GRO), and diesel-range organics (DRO).

Upon completion of each hollow-stem auger soil boring, a temporary monitoring well casing was placed in the borehole so that a water sample could be collected. Groundwater samples were analyzed for BTEX, GRO, and DRO. The piping was then removed and the boring backfilled with drill cuttings.

In order to calculate Alternative Cleanup Levels (ACLs) using ADEC Method 3, five samples were collected from soils that did not appear contaminated for analysis of total organic carbon (TOC). From the hollow-stem auger borings, Samples 16-SB3-S1, 16-SB4-S1, 16-SB5-S1, and 16-SB5-S2 were submitted for TOC analysis. One hand-augered boring, 16-HB1, was advanced to 3 feet bgs and a TOC sample collected. A DRO sample from the hand-augered boring was also collected to verify that it did not contain significant levels of petroleum hydrocarbons that could bias TOC concentrations.

A groundwater sample was collected from the recovery well and submitted for analysis of BTEX, GRO, DRO, and polynuclear aromatic hydrocarbons (PAH). The well was sampled without purging. ? why not both unpurged and purged

Soil and groundwater were analyzed using the methods listed below.

Soil

- BTEX – EPA Method 8021B
- GRO – Alaska Method AK101
- DRO – Alaska Method AK102
- DRO A/A – Alaska Method AK102AA
- TOC – Method CTE SOP (soil combustion with IR detector)

Water

- BTEX – EPA Method 8021B
- GRO – Alaska Method AK101
- DRO – Alaska Method AK102
- PAH – EPA Method 8310

RESULTS

Soil and Groundwater Observations

Soils at the site generally consist of brown peat extending from near the surface to about 4 feet bgs. Soils beneath the peat layer were generally soft, gray clay/silt with varying amounts of fine sand. Specific soil types are presented in soil boring logs included in Appendix A (Figures A2 through A4).

Groundwater in the borings was encountered between 3.7 and 5.9 feet bgs. Depth to water in the recovery well was measured at 4.85 feet. There was no measurable product in the recovery well, but a slight hydrocarbon odor and a heavy sheen were noted.

Analytical Results

Soil

Petroleum Hydrocarbons

Benzene was detected above the ADEC cleanup limit of 0.02 mg/kg (18 AAC 75.341, Table B1 and B2, Under 40-inch Zone, Migration to groundwater criteria) in boring SB-1 through SB-4 (Table 1). Concentrations ranged from 0.115 mg/kg in SB-4 to 0.033 mg/kg in SB-3. All samples where benzene was detected were collected from the lower portion of each borehole within the smear zone. No benzene was detected in the samples from the upper portion of the soil column.

DRO above ADEC cleanup levels was detected in only two samples, SB-1, S-2 (461 mg/kg), located upgradient of the recovery well, and SB-2, S-1 (2,300 mg/kg), located adjacent to the recovery well.

TOC

TOC was detected in five of six samples submitted to the laboratory for analysis. TOC concentrations ranged from 47 percent (SB-3, S-1) to 0.71 percent (SB-5, S-2) with an average concentration of 19 percent. Sample SB-4, S-1 contained a DRO concentration over 200 mg/kg, and a hydrocarbon odor was noted (Figure A3). A hydrocarbon odor was also noted for sample SB-4, S-2. If these samples are not considered, the average TOC concentration is 17.5 percent.

Laboratory reports for all soil analyses performed by CT&E are provided in Appendix B.

Groundwater

Results of groundwater sampling are summarized in Table 2. In the sample collected from the recovery well (16-RW-WS-1), concentrations of benzene (0.025 mg/L) and DRO (46 mg/L) were detected above the ADEC cleanup level of (18 AAC 75.345, Table C). GRO at 1.63 mg/L was also in slightly in excess of the ADEC cleanup level of 1.3 mg/L. None of the PAH compounds were detected at concentrations above ADEC cleanup levels.

Groundwater impacts were observed in the samples collected from the temporary borings. Observed concentrations, especially for DRO, were unusually high. This is likely due to the sampling method, which provided a high proportion of soil particles in the samples collected.

Laboratory reports for groundwater analyses performed by CT&E are provided in Appendix B.

ALTERNATIVE CLEANUP LEVEL CALCULATION

ADEC Method 3 calculations for soil cleanup level (SCL) for migration to groundwater (Equation 11: Organic Contaminants – Soil-Water Partitioning Equation for Migration to Groundwater; ADEC, 1998) were performed using the average measured TOC (or foc) concentration of 17.5 percent to calculate ACLs for DRO and benzene in soil. As a conservative measure, the calculation for DRO was performed using DRO-aromatic chemical specific parameters. Calculations are presented in Table 3.

12,500 mg/kg max allowable

The calculated for SCL for DRO is 17,500 mg/kg. For benzene, the calculated concentration is 0.70 mg/kg.

CONCLUSIONS

Soil

Soil impacts appear to be generally limited. Except for the concentration of 2,300 mg/kg DRO detected next to the recovery well, it appears that observed concentrations might be related to groundwater transport. All DRO and benzene concentrations are below the calculated ADEC Method 3 cleanup levels. Further soil remediation should not be required.

what about continued impact to the Groundwater

Groundwater

Results from the recovery well suggest that groundwater in this area remains impacted, and concentrations have not yet degraded to the point of being below ADEC cleanup levels. Groundwater results from the temporary wells also suggest potential impacts both upgradient and downgradient of the recovery well. However, as discussed above, the observed concentrations (especially DRO) maybe higher than actual concentrations due to the high percentage of soil particles in the water samples.

RECOMMENDATIONS

The following recommendations are provided:

- Monitor the recovery well for the appearance of floating product on a monthly basis starting in January 2001to: 1) determine if floating hydrocarbons are still present; and 2) assess whether sufficient product may remain to warrant further product recovery.
- Two downgradient monitoring wells should be installed in spring 2001 in the approximate locations of 16-SB-4 and 16-SB-5 and sampled to provide more accurate groundwater quality information. Wells should be sampled for BTEX, GRO, and DRO.
- Boring SB-1 was apparently placed too close to the former excavation area to provide useful upgradient information. A monitoring well should be installed further north of this location in order to collect more accurate upgradient data.
- Existing wells (including the recovery well) should be surveyed to establish local groundwater flow characteristics.

LIMITATIONS

The work for this project was performed, and this report prepared, in accordance with generally accepted professional practices for the nature of the work completed in the same or similar localities at the time the work was performed. It is intended for the exclusive use of Signature Flight Support for specific application to the project site. This report is not meant to represent a legal opinion, and no other warranty, express or implied, is made.

Any questions regarding the field work or report, the presentation of the information, or the interpretation of the data are welcome and can be addressed to Nino Muniz at 276-7475.

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For. **HERMINIO R. MUNIZ**
Associate Hydrogeologist

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ADEC, 1998. *Guidance on Cleanup Standards Equations and Input Parameters.* September 16, 1998.

ADEC, 2000a. *18 AAC 75, Oil and Other Hazardous Substances Pollution Control.* Amended through August 27, 2000.

ADEC, 2000b. *Guidance for Cleanup of Petroleum Contaminated Sites.* September 2000.

Hart Crowser, 1989. *Butler Aviation P.O.L. Pipeline Site Assessment, 19th Avenue and "C" Street, 16th Avenue and "C" Street, Anchorage, Alaska.* October 1998

Table 1 - Soil Analytical Results
16th Avenue and C Street Pipeline Release
Anchorage, Alaska

Boring	Sample Number	Depth (Feet bgs)	Alaska Method AK 101 GRO (mg/kg)	EPA Method 8021B Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-Benzene (mg/kg)	Total Xylenes (mg/kg)	Alaska Method AK 102 DRO (mg/kg)	Method CTE-SOP TOC (mg/kg)
SB-1	S-1	1.5 - 3.5	8.5 U	0.042 U	0.170 U	0.170 U	0.340 U	200	N/A
	S-2	3.5 - 5.5	87	**0.045**	0.091 U	1.590	1.88	**461**	N/A
SB-2	S-1	1.5 - 3.5	86	0.0326 U	0.130 U	0.140	1.44	**2,300**	N/A
	S-2	3.5 - 5.5	27	**0.096**	0.096	0.821	0.935	40	N/A
SB-3	S-1	1.5 - 3.5	8.4 U	0.0419 U	0.168 U	0.168 U	0.336 U	19	465,700
	S-2	3.5 - 5.5	15	**0.033**	0.058 U	0.368	0.328	119	N/A
SB-4	S-1	1.5 - 3.5	12 U	0.062 U	0.247 U	0.247 U	0.494 U	224	236,800
	S-2	3.5 - 5.5	24	**0.115**	0.094	0.758	1.58	135	12,750
SB-5	S-1	1.5 - 3.5	5.5 U	0.0273 U	0.109 U	0.109 U	0.218 U	179	158,000
	S-2	3.5 - 5.5	2.6 U	0.0129 U	0.052 U	0.052 U	0.103 U	28	7,171
HB-1	S-1	2.5 - 3.0	N/A	N/A	N/A	N/A	N/A	68	66,930
Duplicate	S-2	2.5 - 3.0	N/A	N/A	N/A	N/A	N/A	68	N/A
Trip Blank			2.5 U	0.013 U	0.051 U	0.051 U	0.101 U	N/A	N/A
ADEC Cleanup Level (1)			***300***	***0.02***	***5.4***	***5.5***	***78***	***250***	—

0.022 0.7 0.13 1.5

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16thlabres.xls:soil

Notes:
(1) 18 AAC 75.341, Table B1 and B2, Under 40-inch Zone, Migration to Groundwater. Bolded results in excess of cleanup level.
bgs - Below Ground Surface
DRO - Diesel-Range Organics
GRO - Gasoline Range Organics
mg/kg - Milligrams per Kilogram
N/A - Not Analyzed
ppmV - Parts per Million, Volumetric
PID - Photoionization detector
TOC - Total Organic Carbon
U - Below detection limit at concentration listed.

Table 2 - Groundwater Analytical Results
16th Avenue and C Street Pipeline Release
Anchorage, Alaska

Sample Number	Alaska Method AK 101 GRO (mg/L)	EPA Method 8021B				Alaska Method AK 102 DRO (mg/L)	EPA Method 8270C-SIMS {2} PAH				
		Benzene (mg/L)	Toluene (mg/L)	Ethyl-Benzene (mg/L)	Total Xylenes (mg/L)		Fluorene (mg/L)	Phenanathrene (mg/L)	Fluoranthrene (mg/L)	Pyrene (mg/L)	Naphthalene (mg/L)
16-SB1-WS-1	**66.8**	**0.018**	0.046	0.607	1.56	**1,150**	N/A	N/A	N/A	N/A	N/A
16-SB2-WS-1	**2.14**	**0.009**	0.0023	0.058	0.084	**417**	N/A	N/A	N/A	N/A	N/A
16-SB3-WS-1	**12.5**	**0.018**	0.020 U	0.358	0.895	**1,320**	N/A	N/A	N/A	N/A	N/A
16-SB4-WS-1	**162**	**0.109**	0.378	**1.70**	2.46	**363**	N/A	N/A	N/A	N/A	N/A
16-SB5-WS-1	0.1 U	0.003	0.002 U	0.002 U	0.004 U	**10.7**	N/A	N/A	N/A	N/A	N/A
Duplicate	1.1 U	0.003	0.002 U	0.002 U	0.004 U	**5.8**	N/A	N/A	N/A	N/A	N/A
16-RW-WS-1	**1.63**	**0.025**	0.003	0.144	0.083	**46**	0.0035	0.0009	0.0001	0.0001	0.0046
Duplicate	N/A	N/A	N/A	N/A	N/A	N/A	0.0026	0.0007	0.0001	0.0001	0.0017
Trip Blank	2.6 U	0.0005 U	0.0020 U	0.0020 U	0.0040 U	N/A	N/A	N/A	N/A	N/A	N/A
ADEC Cleanup Level {1}	***1.3***	***0.005***	***1***	***0.7***	***10***	***1.5***	***1.46*** 0.290	***NL*** 0.190	***1.46*** 0.260	***1.1*** 0.120	***1.46*** 0.017

0.0046

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16thlabre.xls:g-water

Notes:
{1} 18 AAC 75.345, Table C. Bolded results in excess of cleanup level.
{2} All other analytes elow detection limit
DRO - Diesel-Range Organics
GRO - Gasoline Range Organics
mg/L - Milligrams per Liter
N/A - Not Analyzed
NL - Not Listed
PAH - Polynuclear Aromatic Hydrocarbons
U - Below detection limit at concentration listed.

Site Vicinity Map
16th Avenue and C Street Pipeline Release Site
Anchorage, Alaska

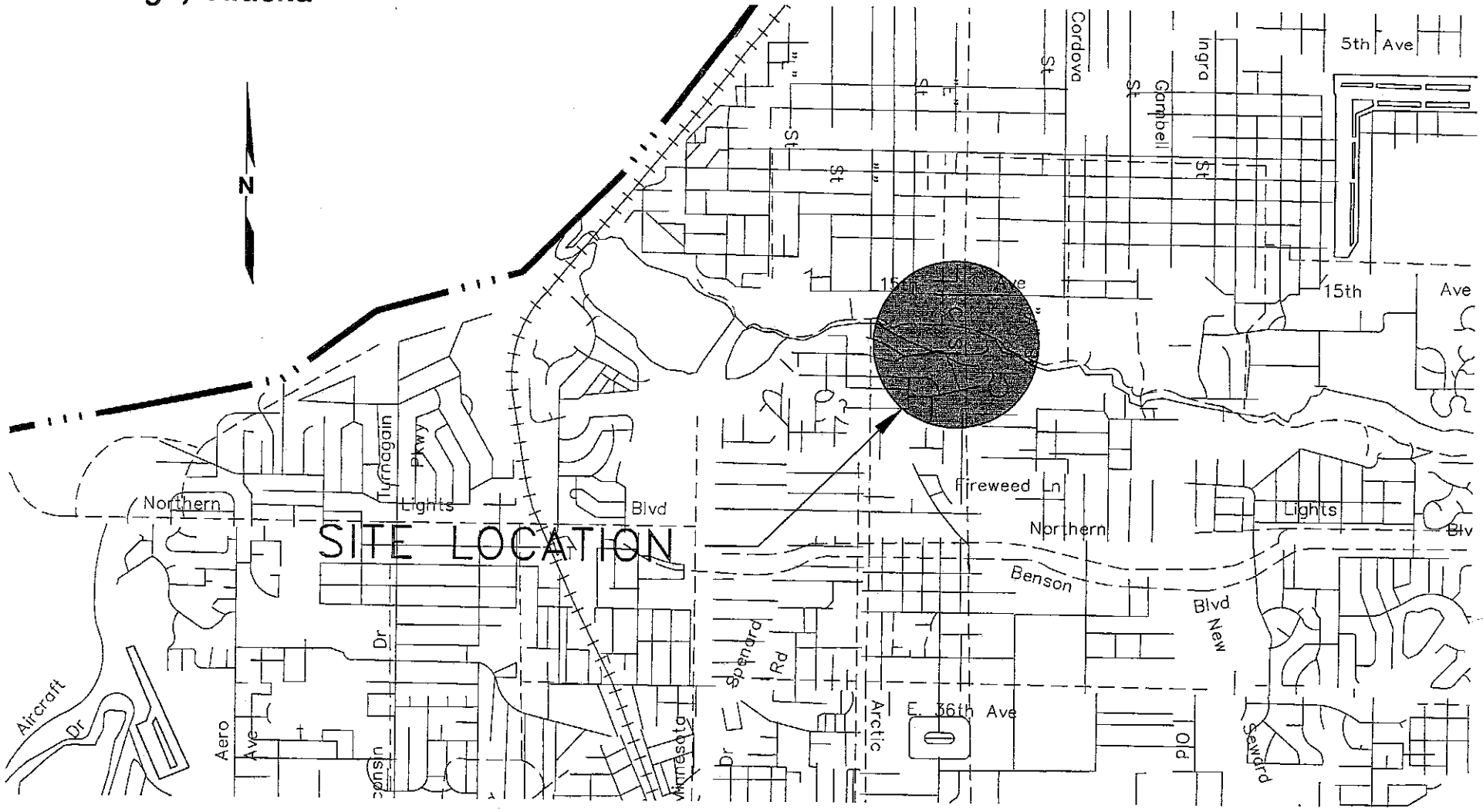

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Figure 1

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Boring Locations
16th Avenue and C Street Pipeline Release Site
Anchorage, Alaska

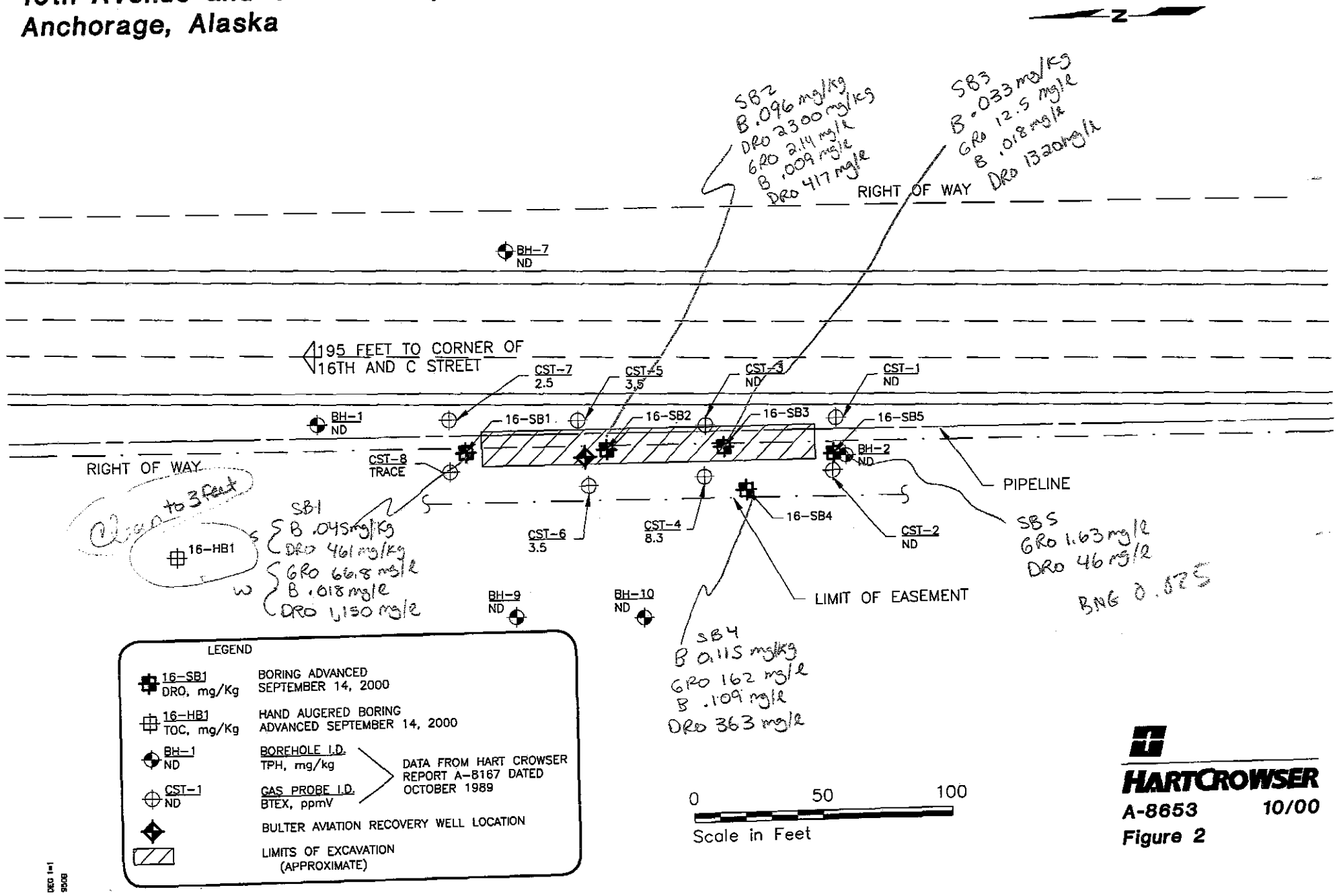

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Figure 2

APPENDIX A
FIELD PROCEDURES

APPENDIX A
FIELD PROCEDURES

This appendix documents the methods used by Hart Crowser to conduct the field investigation. Field procedures used to install monitoring wells, collect soil samples, develop monitoring wells, collect surface water and groundwater samples, and measure water quality parameters are described. The discussion is organized under the following headings:

- Soil Sampling;
- Temporary Monitoring Well Construction;
- Groundwater Sampling; and
- Decontamination Methods.

Soil Sampling

This section describes how soil borings were advanced and soil samples were collected using hollow-stem auger drilling and hand-auger equipment. Methods used for collecting analytical samples are presented along with general procedures for subsurface explorations.

Five soil borings were drilled using hollow-stem auger methods to a depth of 8 feet below ground surface (bgs). One soil boring was advanced using hand auger methods. Sampling stopped when the soil became saturated, except for the hand auger boring completed at 3.5 feet bgs. Five boreholes were completed as temporary monitoring wells.

Hollow-Stem Auger Sampling Methods.

Soil samples were collected for analytical laboratory analysis using hollow-stem auger soil boring techniques. A 3.375-inch inside-diameter (i.d.) hollow-stem auger was used to drill into the soils. Samples were collected at 2.5 feet and 4.5 feet bgs employing a 2.5-inch i.d. split-spoon sampler. Blow counts were used to assess the relative density or consistency of the earth materials. Soil samples recovered from the split-spoon sampler were field classified; and placed in sample containers for laboratory analysis.

Hand Auger Sampling Methods.

A 6-inch-diameter hand auger was manually driven into the soil. After soils were field classified, samples were collected and immediately placed into sample containers. Hand auger boreholes were backfilled with the borehole cuttings.

All soils were visually classified in general accordance with American Society of Testing and Materials (ASTM) Method D 2488 (Figure A-1). A log of the soils encountered, pertinent observations regarding drilling conditions, and the presence/absence of hydrocarbon staining or odor were recorded on boring logs (Figures A2 through A5).

Soil descriptions included moisture, color, major and minor constituents, and the presence of non-soil debris.

Collection of Soil Samples for Chemical Analysis

Samples submitted for chemical laboratory analyses were collected by first opening and removing any disturbed soils in the upper portion of the split-spoon or hand auger. This was immediately followed by collection of soils for benzene, toluene, ethylbenzene, and xylenes (BTEX) analysis.

Samples representative of the whole split-spoon or hand auger were collected with minimum disturbance to the soil, using a disposable sampling scoop. Efforts were made to remove large rocks and care was used to exclude soils that were in contact with the sampler wall. After collection of the BTEX sample, the remaining soil was collected for analysis of diesel-range organics (DRO). Samples were collected into factory-cleaned sample jars with tightly sealed Teflon-lined lids.

Sample jars were tightly packed with soil to minimize the loss of volatile compounds to the jar headspace. Immediately after collection, samples were placed in coolers containing either ice or an ice-substitute to maintain a holding temperature of 4°C (+/-2°C). They were then delivered to CT&E Environmental Services, Inc. (CT&E), under chain-of-custody procedures

Temporary Monitoring Well Construction

Installation of temporary 2-inch-diameter monitoring wells immediately followed completion of drilling. In all wells, a 5-foot length of 0.020-inch slot well screen was placed at the bottom of the borehole. The screened sections were connected to the surface by a riser of flush-threaded Schedule 40, PVC pipe.

After collection of groundwater samples, the piping was removed and the hole filed with drill cuttings.

Groundwater Sampling

Groundwater samples were collected from the temporary monitoring wells and the recovery well at the site. Samples were collected using disposable, single-use Teflon bailers. Wells were not purged prior to sampling. Sample containers for volatile constituents were filled first, followed by samples for less-volatile parameters. Immediately after collection the samples were placed into a cooler containing either ice or an ice-substitute to maintain a holding temperature of 4°C (+/-2°C). They were then delivered to CT&E CT&E under chain-of- custody procedures.

Decontamination Methods

This section describes the decontamination procedures used for sampling and drilling equipment.

Soil Sampling Equipment

Sampling equipment (including the split-spoon samplers) were decontaminated both before and between each sample collection event. Disposable gloves were worn and changed between sample locations.

Sampling equipment were decontaminated according to the following procedures:

- Equipment was scrubbed thoroughly with phosphate-free detergent (Alconox) and potable water using a brush to remove any particulate matter or surface film;
- Equipment was double rinsed with clear potable water; and
- Equipment was single-rinsed with clean distilled water.

Drilling Equipment

The drill rig, drill rods, and augers were thoroughly cleaned at a decontamination unit supplied by the drilling contractor. The equipment was steam cleaned with a pressure wash steam cleaner prior to being mobilized to the site. Sufficient auger was cleaned to allow for completion of all drilling during the day.

All drilling was conducted in an environmentally conscious manner. No petroleum-based hydrocarbon lubricants or grease were used on drilling tools or downhole equipment.

Drill rig and auxiliary equipment were checked by the Hart Crowser field representative for leakage of fuels, lubricants, or hydraulic oil, both prior to and periodically during operations. Drill rig fueling and maintenance was conducted in an area removed from soil and groundwater sampling locations.

Water Sampling Equipment

Disposable Teflon bailers were used between each new sample point for groundwater water. Disposable gloves were worn and changed between sample locations. Between sampling attempts, nylon rope, used for lowering the bailers, bailers, and gloves were disposed of as solid waste.

Key to Exploration Logs and Well Construction

Sample Descriptions

Classificaton of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture conditions, 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 are interpretative and actual changes may be gradual.
Water and product level observations are for the date indicated and may vary with time. (ATD – At time of drilling)

Density/Consistancy

Soil density/consistancy in borings is related primarily to the Standard Penetration Resistance. Soil density/consistancy in test pits is estimated based on visual observation and is presented parenthetically on the test pit logs.

SAND or GRAVEL Density:	Standard Penetration Resistance (N) in Blows/Foot
Very loose	0 – 4
Loose	4 – 10
Medium dense	10 – 30
Dense	30 – 50
Very dense	>50

SILT or CLAY Consistancy:	Standard Penetration Resistance (N) in Blows/Foot	Approximate Shear Strength in TSF
Very soft	0 – 2	<0.125
Soft	2 – 4	0.125 – 0.25
Medium stiff	4 – 8	0.25 – 0.5
Stiff	8 – 15	0.5 – 1.0
Very stiff	15 – 30	1.0 – 2.0
Hard	>30	>2.0

Moisture

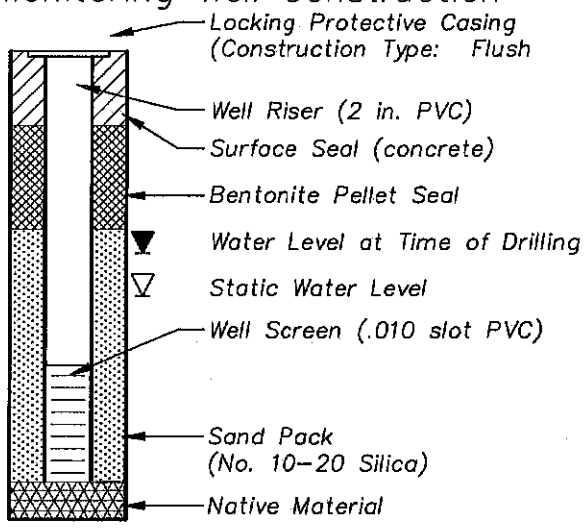
Dry	Little perceptable moisture
Damp	Some perceptable moisture, probably below optimum
Moist	Probably near optimum moisture content
Wet	Much perceptable moisture, probably above optimum

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

Monitoring Well Construction



Sampling Test Symbols

BORING SAMPLES		BORING SAMPLES		Test Pit Samples	
⊠	Split Spoon	‖	Core Run	⊠	Grab (jar)
⊠	Shelby Tube	⊼	No sample Recovery	⊠	Bag
▥	Cuttings	P	Tube pushed, Not driven	⊠	Shelby Tube

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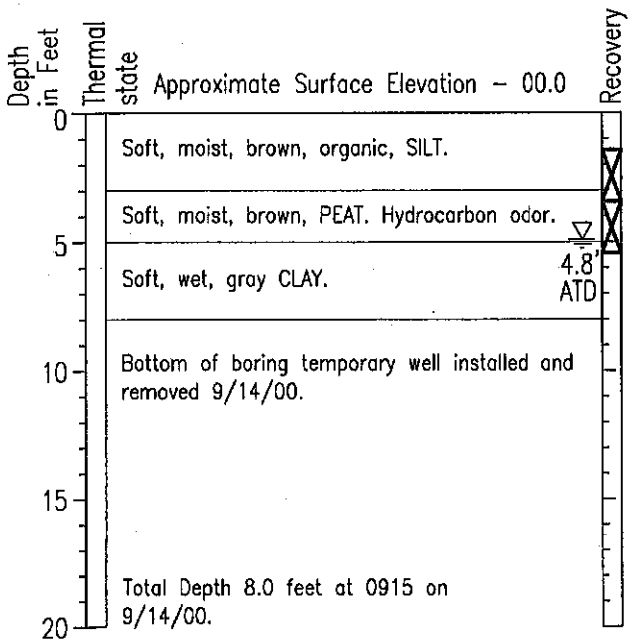
FIGURE A1

DEG 1=1
9608

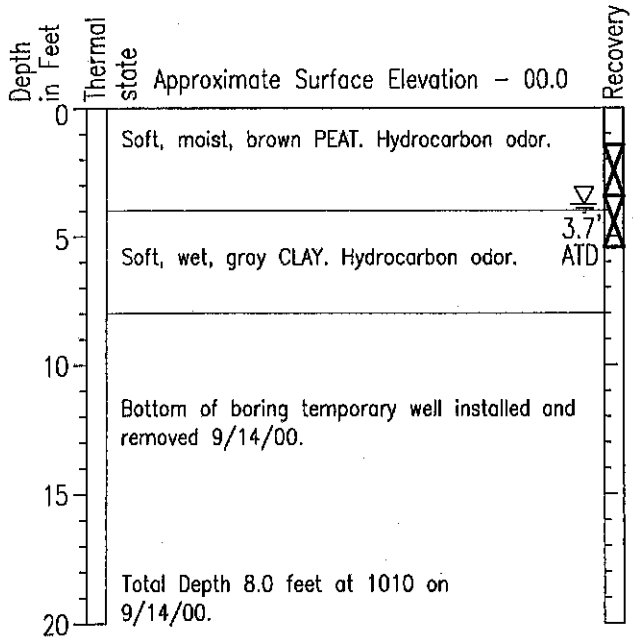
Boring Log 16-SB1



Sample	Benzene (mg/kg)	GRO (mg/kg)	DRO (mg/kg)
S1	U	U	200
S2	0.045	86.9	461

GW: GRO 66.8 mg/l
B .018 mg/l
DRO 1150 mg/l

Boring Log 16-SB2



Sample	Benzene (mg/kg)	GRO (mg/kg)	DRO (mg/kg)
S1	U	86	2,300
S2	0.096	27	40

GW: GRO 2.14
B .009
DRO 417

1. Soil descriptions are interpretative and actual changes may be gradual.
2. Water level is for date indicated and may vary with time of year. (ATD–At Time of Drilling).
3. Refer to Figure A1 for key to exploration logs.
4. U – Below detection limit.

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FIGURE A2

DEB 1=1
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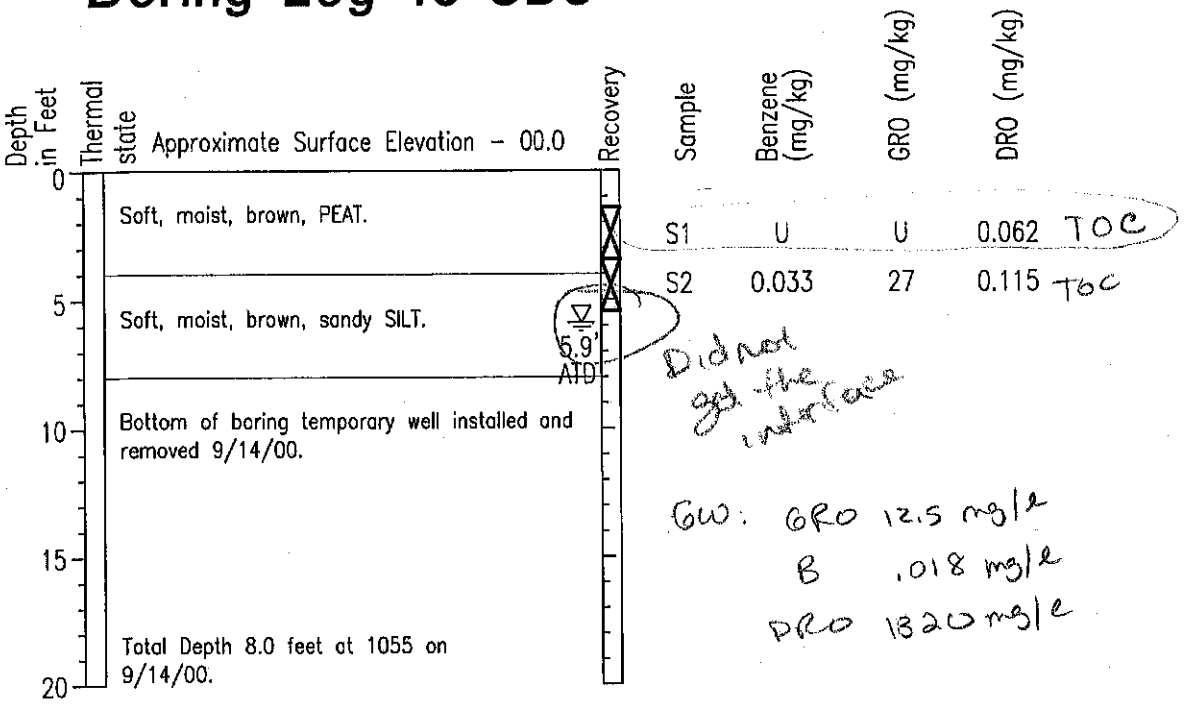
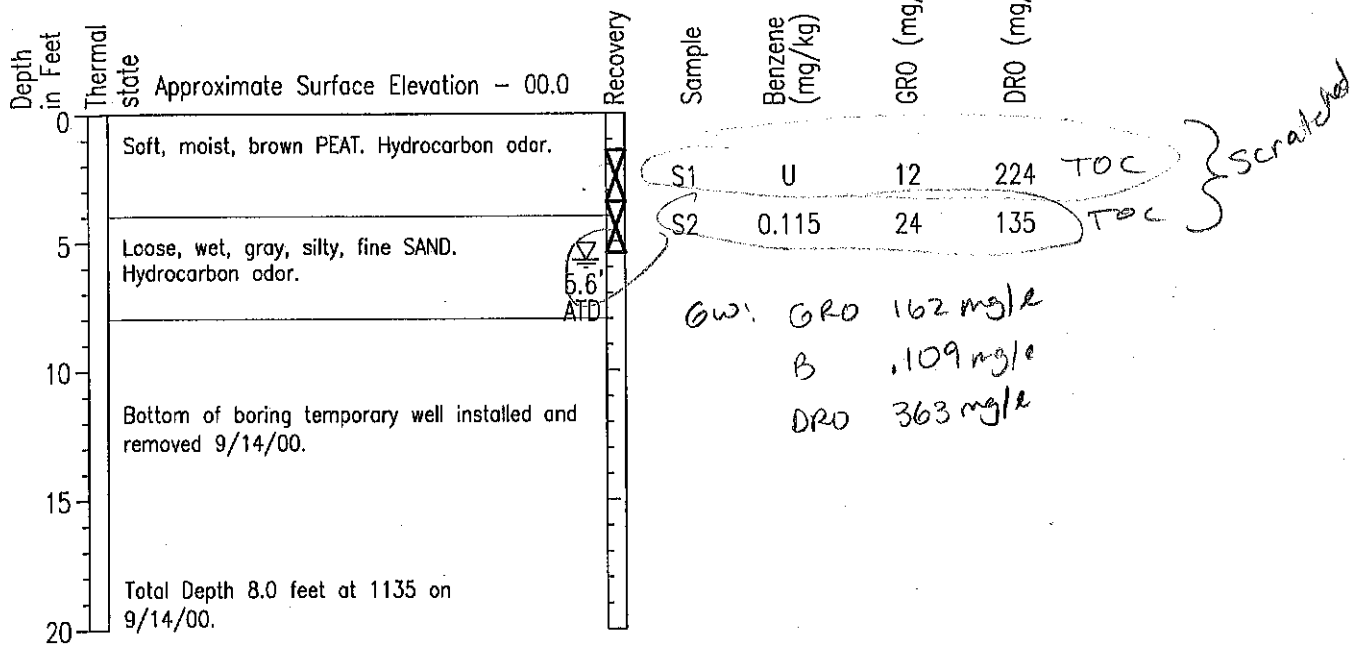
Boring Log 16-SB3



Boring Log 16-SB4



1. Soil descriptions are interpretative and actual changes may be gradual.
2. Water level is for date indicated and may vary with time of year. (ATD–At Time of Drilling).
3. Refer to Figure A1 for key to exploration logs.
4. U – Below detection limit.

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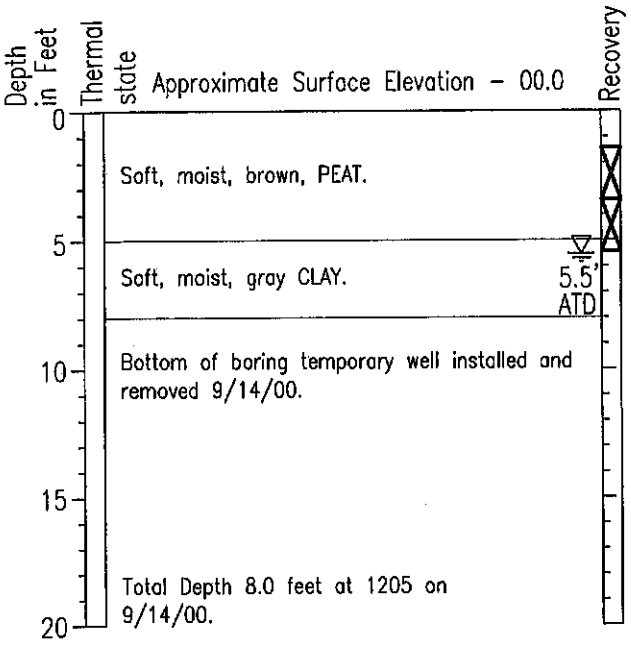
FIGURE A3

DEG 1=1 9608

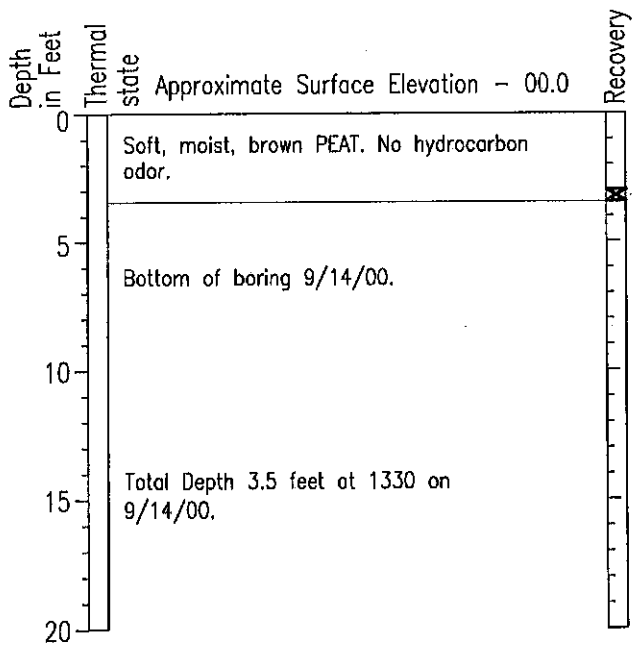
Boring Log 16-SB5



Sample	Benzene (mg/kg)	GRO (mg/kg)	DRO (mg/kg)
S1	U	U	179
S2	U	U	28

GW: DRO 10.7

Boring Log 16-HB1



Sample	Benzene (mg/kg)	GRO (mg/kg)	DRO (mg/kg)
S1	0	0	U TOC

water level 2'

1. Soil descriptions are interpretative and actual changes may be gradual.
2. Water level is for date indicated and may vary with time of year. (ATD–At Time of Drilling).
3. Refer to Figure A1 for key to exploration logs.
4. U – Below detection limit.

HARTCROWSER

A-8653 10/00

FIGURE A4

DEG 1=1
9608

APPENDIX B
LABORATORY ANALYSIS REPORT
CT&E ENVIRONMENTAL, INC

CT&E Environmental Services Inc.
Laboratory Division

Laboratory Analysis Report

200 W. Potter Drive
Anchorage, AK 99518-1605
Tel: (907) 562-2343
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Nino Muniz
Hart Crowser
2550 Denali St. Suite 705
Anchorage, AK 995032737

Work Order:	1005549
	A-8653 C St Assessment 16th
Client:	Signature Flight Support
Report Date:	October 10, 2000

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 maintaned by CT&E. A copy of our Quality Control Manual that outlines this program is available at your request.

Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth in our Quality Assurance Program Plan.

If you have any questions regarding this report or if we can be of any other assistance, please call your CT&E Project Manager at (907) 562-2343.

The following descriptors may be found on your report which will serve to further qualify the data.

U	Indicates the analyte was analyzed for but not detected.
J	Indicates an estimated value that falls below PQL, but is greater than the MDL.
B	Indicates the analyte is found in the blank associated with the sample.
*	The analyte has exceeded allowable limits.
GT	Greater Than
D	Secondary Dilution
LT	Less Than
!	Surrogate out of range

CT&E Environmental Services Inc.

CT&E Ref.#	1005549001	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 9:05
Client Sample ID	16-SB1-S-1	**Received Date/Time**	09/14/2000 16:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	Michael Riley

Sample Remarks:

DRO/RRO - Unknown hydrocarbon with several peaks.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	61.6		%	SM20 2540G			09/17/00	JCO
Volatile Fuels Department								
Gasoline Range Organics	8.48 U	8.48	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Benzene	0.0424 U	0.0424	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Toluene	0.170 U	0.170	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Ethylbenzene	0.170 U	0.170	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
P & M -Xylene	0.170 U	0.170	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
o-Xylene	0.170 U	0.170	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Surrogates								
1,4-Difluorobenzene <Surr>	85.5		%	AK101/8021B	60-120	09/14/00	09/22/00	MAH
4-Bromofluorobenzene <Surr>	61.2		%	AK101/8021B	50-150	09/14/00	09/22/00	MAH
Semivolatile Organic Fuels Department								
Diesel Range Organics	200	17.6	mg/Kg	AK102 DRO		09/18/00	09/24/00	MCM
Surrogates								
5a Androstane <surr>	102		%	AK102 DRO	50-150	09/18/00	09/24/00	MCM

CT&E Environmental Services Inc.

CT&E Ref.#	1005549002	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 9:18
Client Sample ID	16-SB1-S-2	**Received Date/Time**	09/14/2000 16:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	Michael Riley

Sample Remarks:

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Pattern consistent with weathered middle distillate.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	80.2		%	SM20 2540G			09/17/00	JCO
Volatile Fuels Department								
Gasoline Range Organics	86.9	4.54	mg/Kg	AK101/8021B		09/14/00	09/24/00	MAH
Benzene	0.0452	0.0227	mg/Kg	AK101/8021B		09/14/00	09/24/00	MAH
Toluene	0.0909 U	0.0909	mg/Kg	AK101/8021B		09/14/00	09/24/00	MAH
Ethylbenzene	1.59	0.0909	mg/Kg	AK101/8021B		09/14/00	09/24/00	MAH
P & M -Xylene	1.71	0.0909	mg/Kg	AK101/8021B		09/14/00	09/24/00	MAH
o-Xylene	0.165	0.0909	mg/Kg	AK101/8021B		09/14/00	09/24/00	MAH
Surrogates								
1,4-Difluorobenzene <Surr>	97.6		%	AK101/8021B	60-120	09/14/00	09/24/00	MAH
4-Bromofluorobenzene <Surr>	600 !		%	AK101/8021B	50-150	09/14/00	09/24/00	MAH
Semivolatile Organic Fuels Department								
Diesel Range Organics	461	13.0	mg/Kg	AK102 DRO		09/18/00	09/24/00	MCM
Surrogates								
5a Androstane <surr>	97.7		%	AK102 DRO	50-150	09/18/00	09/24/00	MCM

CT&E Environmental Services Inc.

CT&E Ref.#	1005549003	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 10:00
Client Sample ID	16-SB2-S-1	**Received Date/Time**	09/14/2000 16:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	Michael Riley

Sample Remarks:

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO - Pattern consistent with weathered middle distillate.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids									
Total Solids	80.3			%	SM20 2540G			09/17/00	JCO
Volatile Fuels Department									
Gasoline Range Organics	86.4		6.52	mg/Kg	AK101/8021B		09/14/00	09/24/00	MAH
Benzene	0.0326 U		0.0326	mg/Kg	AK101/8021B		09/14/00	09/24/00	MAH
Toluene	0.130 U		0.130	mg/Kg	AK101/8021B		09/14/00	09/24/00	MAH
Ethylbenzene	0.140		0.130	mg/Kg	AK101/8021B		09/14/00	09/24/00	MAH
P & M -Xylene	1.09		0.130	mg/Kg	AK101/8021B		09/14/00	09/24/00	MAH
o-Xylene	0.354		0.130	mg/Kg	AK101/8021B		09/14/00	09/24/00	MAH
Surrogates									
1,4-Difluorobenzene <Surr>	86.1			%	AK101/8021B	60-120	09/14/00	09/24/00	MAH
4-Bromofluorobenzene <Surr>	239	!		%	AK101/8021B	50-150	09/14/00	09/24/00	MAH
Semivolatile Organic Fuels Department									
Diesel Range Organics	2300		138	mg/Kg	AK102 DRO		09/18/00	09/26/00	MCM
Surrogates									
5a Androstane <surr>	127			%	AK102 DRO	50-150	09/18/00	09/26/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1005549004	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 10:05
Client Sample ID	16-SB2-S-2	**Received Date/Time**	09/14/2000 16:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	Michael Riley

Sample Remarks:

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Pattern consistent with weathered middle distillate.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids									
Total Solids	75.2			%	SM20 2540G			09/17/00	JCO
Volatile Fuels Department									
Gasoline Range Organics	27.1		4.55	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Benzene	0.0962		0.0228	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Toluene	0.0964		0.0911	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Ethylbenzene	0.821		0.0911	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
P & M -Xylene	0.935		0.0911	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
o-Xylene	0.0911 U		0.0911	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Surrogates									
1,4-Difluorobenzene <Surr>	93.6			%	AK101/8021B	60-120	09/14/00	09/22/00	MAH
4-Bromofluorobenzene <Surr>	209	!		%	AK101/8021B	50-150	09/14/00	09/22/00	MAH
Semivolatile Organic Fuels Department									
Diesel Range Organics	40.2		14.2	mg/Kg	AK102 DRO		09/18/00	09/24/00	MCM
Surrogates									
5a Androstane <surr>	99.7			%	AK102 DRO	50-150	09/18/00	09/24/00	MCM

CT&E Environmental Services Inc.

CT&E Ref.#	1005549005	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 10:45
Client Sample ID	16-SB3-S-1	**Received Date/Time**	09/14/2000 16:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	

Sample Remarks:

DRO/RRO - Pattern consistent with weathered middle distillate.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	82.6		%	SM20 2540G			09/17/00	JCO
Waters Department								
Total Organic Carbon	465700	9880	mg/Kg	TOC CTE SOP		10/04/00	10/04/00	SCL
Volatile Fuels Department								
Gasoline Range Organics	8.38 U	8.38	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Benzene	0.0419 U	0.0419	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Toluene	0.168 U	0.168	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Ethylbenzene	0.168 U	0.168	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
P & M -Xylene	0.168 U	0.168	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
o-Xylene	0.168 U	0.168	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Surrogates								
1,4-Difluorobenzene <Surr>	85.4		%	AK101/8021B	60-120	09/14/00	09/22/00	MAH
4-Bromofluorobenzene <Surr>	53		%	AK101/8021B	50-150	09/14/00	09/22/00	MAH
Semivolatile Organic Fuels Department								
Diesel Range Organics	19.0	11.5	mg/Kg	AK102 DRO		09/18/00	09/24/00	MCM
Surrogates								
5a Androstane <surr>	117		%	AK102 DRO	50-150	09/18/00	09/24/00	MCM

CT&E Environmental Services Inc.

CT&E Ref.#	1005549006	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 10:50
Client Sample ID	16-SB3-S-2	**Received Date/Time**	09/14/2000 16:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	Michael Riley

Sample Remarks:

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Unknown hydrocarbon with several peaks.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids									
Total Solids	85.5			%	SM20 2540G			09/17/00	JCO
Volatile Fuels Department									
Gasoline Range Organics	15.4		2.91	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Benzene	0.0329		0.0146	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Toluene	0.0583 U		0.0583	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Ethylbenzene	0.368		0.0583	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
P & M -Xylene	0.328		0.0583	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
o-Xylene	0.0583 U		0.0583	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Surrogates									
1,4-Difluorobenzene <Surr>	93			%	AK101/8021B	60-120	09/14/00	09/22/00	MAH
4-Bromofluorobenzene <Surr>	188	!		%	AK101/8021B	50-150	09/14/00	09/22/00	MAH
Semivolatile Organic Fuels Department									
Diesel Range Organics	119		12.1	mg/Kg	AK102 DRO		09/18/00	09/24/00	MCM
Surrogates									
5a Androstane <surr>	131			%	AK102 DRO	50-150	09/18/00	09/24/00	MCM

CT&E Environmental Services Inc.

CT&E Ref.#	1005549007	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 11:20
Client Sample ID	16-SB4-S-1	**Received Date/Time**	09/14/2000 16:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	

Sample Remarks:

DRO/RRO - Unknown hydrocarbon with several peaks.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	70.3		%	SM20 2540G			09/17/00	JCO
Waters Department								
Total Organic Carbon	236800	47400	mg/Kg	TOC CTE SOP		10/04/00	10/04/00	SCL
Volatile Fuels Department								
Gasoline Range Organics	12.3 U	12.3	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Benzene	0.0617 U	0.0617	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Toluene	0.247 U	0.247	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Ethylbenzene	0.247 U	0.247	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
P & M -Xylene	0.247 U	0.247	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
o-Xylene	0.247 U	0.247	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Surrogates								
1,4-Difluorobenzene <Surr>	85.1		%	AK101/8021B	60-120	09/14/00	09/22/00	MAH
4-Bromofluorobenzene <Surr>	62.5		%	AK101/8021B	50-150	09/14/00	09/22/00	MAH
Semivolatile Organic Fuels Department								
Diesel Range Organics	224	14.2	mg/Kg	AK102 DRO		09/18/00	09/24/00	MCM
Surrogates								
5a Androstane <surr>	143		%	AK102 DRO	50-150	09/18/00	09/24/00	MCM

CT&E Environmental Services Inc.

CT&E Ref.#	1005549008	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 11:30
Client Sample ID	16-SB4-S-2	**Received Date/Time**	09/14/2000 16:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	Michael Riley

Sample Remarks:

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Pattern consistent with weathered middle distillate.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids									
Total Solids	86.2			%	SM20 2540G			09/17/00	JCO
Waters Department									
Total Organic Carbon	12570		4990	mg/Kg	TOC CTE SOP		10/04/00	10/04/00	SCL
Volatile Fuels Department									
Gasoline Range Organics	23.9		2.60	mg/Kg	AK101/8021B		09/14/00	09/24/00	MAH
Benzene	0.115		0.0130	mg/Kg	AK101/8021B		09/14/00	09/24/00	MAH
Toluene	0.0936		0.0521	mg/Kg	AK101/8021B		09/14/00	09/24/00	MAH
Ethylbenzene	0.758		0.0521	mg/Kg	AK101/8021B		09/14/00	09/24/00	MAH
P & M -Xylene	1.28		0.0521	mg/Kg	AK101/8021B		09/14/00	09/24/00	MAH
o-Xylene	0.297		0.0521	mg/Kg	AK101/8021B		09/14/00	09/24/00	MAH
Surrogates									
1,4-Difluorobenzene <Surr>	93.9			%	AK101/8021B	60-120	09/14/00	09/24/00	MAH
4-Bromofluorobenzene <Surr>	256	!		%	AK101/8021B	50-150	09/14/00	09/24/00	MAH
Semivolatile Organic Fuels Department									
Diesel Range Organics	135		12.3	mg/Kg	AK102 DRO		09/18/00	09/24/00	MCM
Surrogates									
5a Androstane <surr>	130			%	AK102 DRO	50-150	09/18/00	09/24/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1005549009	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 11:50
Client Sample ID	16-SB5-S-1	**Received Date/Time**	09/14/2000 16:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	Michael Riley

Sample Remarks:

DRO - Unknown hydrocarbon with several peaks.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	89.7		%	SM20 2540G			09/17/00	JCO
Waters Department								
Total Organic Carbon	158000	27900	mg/Kg	TOC CTE SOP		10/04/00	10/04/00	SCL
Volatile Fuels Department								
Gasoline Range Organics	5.45 U	5.45	mg/Kg	AK101/8021B		09/14/00	09/25/00	MAH
Benzene	0.0273 U	0.0273	mg/Kg	AK101/8021B		09/14/00	09/25/00	MAH
Toluene	0.109 U	0.109	mg/Kg	AK101/8021B		09/14/00	09/25/00	MAH
Ethylbenzene	0.109 U	0.109	mg/Kg	AK101/8021B		09/14/00	09/25/00	MAH
P & M -Xylene	0.109 U	0.109	mg/Kg	AK101/8021B		09/14/00	09/25/00	MAH
o-Xylene	0.109 U	0.109	mg/Kg	AK101/8021B		09/14/00	09/25/00	MAH
Surrogates								
1,4-Difluorobenzene <Surr>	88.6		%	AK101/8021B	60-120	09/14/00	09/25/00	MAH
4-Bromofluorobenzene <Surr>	75.2		%	AK101/8021B	50-150	09/14/00	09/25/00	MAH
Semivolatile Organic Fuels Department								
Diesel Range Organics	179	24.7	mg/Kg	AK102 DRO		09/26/00	10/01/00	MCM
Surrogates								
5a Androstane <surr>	119		%	AK102 DRO	50-150	09/26/00	10/01/00	MCM

CT&E Environmental Services Inc.

CT&E Ref.#	1005549010	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/24/2000 13:21
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 12:00
Client Sample ID	16-SB5-S2	**Received Date/Time**	09/14/2000 16:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	Michael Riley

Sample Remarks:

DRO/RRO - Unknown hydrocarbon with several peaks.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	83.7		%	SM20 2540G			09/17/00	JCO
Waters Department								
Total Organic Carbon	7171	1990	mg/Kg	TOC CTE SOP		10/20/00	10/20/00	SCL
Volatile Fuels Department								
Gasoline Range Organics	2.58 U	2.58	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Benzene	0.0129 U	0.0129	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Toluene	0.0517 U	0.0517	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Ethylbenzene	0.0517 U	0.0517	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
P & M -Xylene	0.0517 U	0.0517	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
o-Xylene	0.0517 U	0.0517	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Surrogates								
1,4-Difluorobenzene <Surr>	85.7		%	AK101/8021B	60-120	09/14/00	09/22/00	MAH
4-Bromofluorobenzene <Surr>	62.3		%	AK101/8021B	50-150	09/14/00	09/22/00	MAH
Semivolatile Organic Fuels Department								
Diesel Range Organics	27.5	12.6	mg/Kg	AK102 DRO		09/18/00	09/24/00	MC
Surrogates								
5a Androstane <surr>	111		%	AK102 DRO	50-150	09/18/00	09/24/00	MC

CT&E Environmental Services Inc.

CT&E Ref.#	1005549011	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 13:26
Client Sample ID	16-HB-1-S1	**Received Date/Time**	09/14/2000 16:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	Michael Riley

Sample Remarks:

DRO/RRO - Unknown hydrocarbon with several peaks.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	86.0		%	SM20 2540G			09/17/00	JCO
Waters Department								
Total Organic Carbon	66930	9690	mg/Kg	TOC CTE SOP		10/04/00	10/04/00	SCL
Semivolatile Organic Fuels Department								
Diesel Range Organics	68.4	12.3	mg/Kg	AK102 DRO		09/18/00	09/24/00	MCM
Surrogates								
5a Androstane <surr>	104		%	AK102 DRO	50-150	09/18/00	09/24/00	MCM

CT&E Environmental Services Inc.

CT&E Ref.#	1005549012	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 13:26
Client Sample ID	16-HB-1-S2	**Received Date/Time**	09/14/2000 16:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	Michael Riley

Sample Remarks:

DRO/RRO - Unknown hydrocarbon with several peaks.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	83.6		%	SM20 2540G			09/17/00	JCO
Semivolatile Organic Fuels Department								
Diesel Range Organics	67.8	12.8	mg/Kg	AK102 DRO		09/18/00	09/24/00	MCM
Surrogates								
5a Androstane <surr>	148		%	AK102 DRO	50-150	09/18/00	09/24/00	MCM

CT&E Environmental Services Inc.

CT&E Ref.#	1005549013	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 9:45
Client Sample ID	16-SB1-WS-1	**Received Date/Time**	09/14/2000 16:30
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	

Sample Remarks:

GRO/BTEX - Surrogate recovery does not meet QC goals due to sample dilution. Results are not affected.
DRO - Surrogate does not meet QC goals due to matrix interference. Results are not affected.
DRO - Pattern consistent with weathered middle distillate.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Gasoline Range Organics	66.8		1.80	mg/L	AK101/8021B		09/24/00	09/26/00	MAH
Benzene	0.0183		0.0100	mg/L	AK101/8021B		09/24/00	09/26/00	MAH
Ethylbenzene	0.607		0.0400	mg/L	AK101/8021B		09/24/00	09/26/00	MAH
P & M -Xylene	1.40		0.0400	mg/L	AK101/8021B		09/24/00	09/26/00	MAH
o-Xylene	0.157		0.0400	mg/L	AK101/8021B		09/24/00	09/26/00	MAH
Toluene	0.0462		0.0400	mg/L	AK101/8021B		09/24/00	09/26/00	MAH
Surrogates									
1,4-Difluorobenzene <Surr>	19.5	!		%	AK101/8021B	60-120	09/24/00	09/26/00	MAH
4-Bromofluorobenzene <Surr>	15100	!		%	AK101/8021B	50-150	09/24/00	09/26/00	MAH
Semivolatile Organic Fuels Department									
Diesel Range Organics	1150		16.7	mg/L	AK102 DRO		09/20/00	09/29/00	MCM
Surrogates									
5a Androstane <surr>	173	!		%	AK102 DRO	50-150	09/20/00	09/29/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1005549014	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 10:25
Client Sample ID	16-SB2-WS-1	**Received Date/Time**	09/14/2000 16:30
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	Stephen C. Ede
Ordered By		**Released By**	Michael Riley

Sample Remarks:

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO - Pattern consistent with weathered middle distillate.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Gasoline Range Organics	2.14		0.0900	mg/L	AK101/8021B		09/24/00	09/28/00	MAH
Benzene	0.00924		0.000500	mg/L	AK101/8021B		09/24/00	09/28/00	MAH
Ethylbenzene	0.0579		0.00200	mg/L	AK101/8021B		09/24/00	09/28/00	MAH
P & M -Xylene	0.0678		0.00200	mg/L	AK101/8021B		09/24/00	09/28/00	MAH
o-Xylene	0.0158		0.00200	mg/L	AK101/8021B		09/24/00	09/28/00	MAH
Toluene	0.00233		0.00200	mg/L	AK101/8021B		09/24/00	09/28/00	MAH
Surrogates									
1,4-Difluorobenzene <Surr>	96.4			%	AK101/8021B	60-120	09/24/00	09/28/00	MAH
4-Bromofluorobenzene <Surr>	499	!		%	AK101/8021B	50-150	09/24/00	09/28/00	MAH
Semivolatile Organic Fuels Department									
Diesel Range Organics	417		16.7	mg/L	AK102 DRO		09/20/00	09/29/00	MCM
Surrogates									
5a Androstane <surr>	109			%	AK102 DRO	50-150	09/20/00	09/29/00	MCM

CT&E Environmental Services Inc.

CT&E Ref.#	1005549015	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 11:15
Client Sample ID	16-SB3-WS-1	**Received Date/Time**	09/14/2000 16:30
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	Michael Riley

Sample Remarks:

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO - Surrogate does not meet QC goals due to matrix interference. Results are not affected.
DRO - Pattern consistent with weathered middle distillate.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Gasoline Range Organics	12.5		0.900	mg/L	AK101/8021B		09/24/00	09/24/00	MAH
Benzene	0.0182		0.00500	mg/L	AK101/8021B		09/24/00	09/24/00	MAH
Ethylbenzene	0.358		0.0200	mg/L	AK101/8021B		09/24/00	09/24/00	MAH
P & M -Xylene	0.659		0.0200	mg/L	AK101/8021B		09/24/00	09/24/00	MAH
o-Xylene	0.236		0.0200	mg/L	AK101/8021B		09/24/00	09/24/00	MAH
Toluene	0.0200 U		0.0200	mg/L	AK101/8021B		09/24/00	09/24/00	MAH
Surrogates									
1,4-Difluorobenzene <Surr>	109			%	AK101/8021B	60-120	09/24/00	09/24/00	MAH
4-Bromofluorobenzene <Surr>	2530	!		%	AK101/8021B	50-150	09/24/00	09/24/00	MAH
Semivolatile Organic Fuels Department									
Diesel Range Organics	1320		16.7	mg/L	AK102 DRO		09/20/00	09/29/00	MCM
Surrogates									
5a Androstane <surr>	231	!		%	AK102 DRO	50-150	09/20/00	09/29/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1005549016	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 11:45
Client Sample ID	16-SB4-WS-1	**Received Date/Time**	09/14/2000 16:30
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	

Sample Remarks:

GRO/BTEX - Surrogate recovery does not meet QC goals due to sample dilution. Results are not affected.
DRO - Pattern consistent with weathered middle distillate.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Gasoline Range Organics	162		9.00	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
Benzene	0.109		0.0500	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
Ethylbenzene	1.70		0.200	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
P & M -Xylene	5.11		0.200	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
o-Xylene	2.08		0.200	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
Toluene	0.378		0.200	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
Surrogates									
1,4-Difluorobenzene <Surr>	0	!		%	AK101/8021B	60-120	09/23/00	09/23/00	MAH
4-Bromofluorobenzene <Surr>	37500	!		%	AK101/8021B	50-150	09/23/00	09/23/00	MAH
Semivolatile Organic Fuels Department									
Diesel Range Organics	363		16.0	mg/L	AK102 DRO		09/20/00	09/29/00	MCM
Surrogates									
5a Androstane <surr>	64			%	AK102 DRO	50-150	09/20/00	09/29/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1005549017	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 12:10
Client Sample ID	16-SB5-WS-1	**Received Date/Time**	09/14/2000 16:30
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	Stephen C. Ede
Ordered By		**Released By**	Michael Riley

Sample Remarks:

DRO - Unknown hydrocarbon with several peaks.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department								
Gasoline Range Organics	0.0900 U	0.0900	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
Benzene	0.00257	0.000500	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
Ethylbenzene	0.00200 U	0.00200	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
P & M -Xylene	0.00200 U	0.00200	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
o-Xylene	0.00200 U	0.00200	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
Toluene	0.00200 U	0.00200	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
Surrogates								
1,4-Difluorobenzene <Surr>	83.6		%	AK101/8021B	60-120	09/23/00	09/23/00	MAH
4-Bromofluorobenzene <Surr>	82		%	AK101/8021B	50-150	09/23/00	09/23/00	MAH
Semivolatile Organic Fuels Department								
Diesel Range Organics	10.7	3.57	mg/L	AK102 DRO		09/20/00	09/28/00	MCM
Surrogates								
5a Androstane <surr>	74.9		%	AK102 DRO	50-150	09/20/00	09/28/00	MCM

CT&E Environment Services Inc.

CT&E Ref.#	1005549018	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 12:15
Client Sample ID	16-SB5-WS-2	**Received Date/Time**	09/14/2000 16:30
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	Michael Riley

Sample Remarks:

DRO - Unknown hydrocarbon with several peaks.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department								
Gasoline Range Organics	0.0900 U	0.0900	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
Benzene	0.00254	0.000500	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
Ethylbenzene	0.00200 U	0.00200	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
P & M -Xylene	0.00200 U	0.00200	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
o-Xylene	0.00200 U	0.00200	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
Toluene	0.00200 U	0.00200	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
Surrogates								
1,4-Difluorobenzene <Surr>	83.3		%	AK101/8021B	60-120	09/23/00	09/23/00	MAH
4-Bromofluorobenzene <Surr>	84		%	AK101/8021B	50-150	09/23/00	09/23/00	MAH
Semivolatile Organic Fuels Department								
Diesel Range Organics	5.81	3.49	mg/L	AK102 DRO		09/20/00	09/28/00	MCM
Surrogates								
5a Androstane <surr>	92.3		%	AK102 DRO	50-150	09/20/00	09/28/00	MCM

CT&E Environment[illegible]ervices Inc.

CT&E Ref.#	1005549019	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 12:55
Client Sample ID	16-RW-WS-1	**Received Date/Time**	09/14/2000 16:30
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	Michael Riley

Sample Remarks:

PAHSIM - Recovery for surrogate #1 and #2 are outside qc goals in the 1x dilution due to hydrocarbon interference. See dilution for recovery of these surrogates.
GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO - Surrogate does not meet QC goals due to matrix interference. Results are not affected.
DRO - Pattern consistent with weathered middle distillate.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Gasoline Range Organics	1.63		0.0900	mg/L	AK101/8021B		09/23/00	09/25/00	MAH
Benzene	0.0251		0.000500	mg/L	AK101/8021B		09/23/00	09/25/00	MAH
Ethylbenzene	0.114		0.00200	mg/L	AK101/8021B		09/23/00	09/25/00	MAH
P & M -Xylene	0.197		0.00200	mg/L	AK101/8021B		09/23/00	09/25/00	MAH
o-Xylene	0.0809		0.00200	mg/L	AK101/8021B		09/23/00	09/25/00	MAH
Toluene	0.00252		0.00200	mg/L	AK101/8021B		09/23/00	09/25/00	MAH
Surrogates									
1,4-Difluorobenzene <Surr>	94			%	AK101/8021B	60-120	09/23/00	09/25/00	MAH
4-Bromofluorobenzene <Surr>	215	!		%	AK101/8021B	50-150	09/23/00	09/25/00	MAH
Semivolatile Organic Fuels Department									
Diesel Range Organics	46.4		1.61	mg/L	AK102 DRO		09/20/00	09/28/00	MCM
Surrogates									
5a Androstane <surr>	350	!		%	AK102 DRO	50-150	09/20/00	09/28/00	MCM
Semivolatile Organic GC/MS									
Acenaphthylene	0.562 U		0.562	ug/L	PAH SIM		09/20/00	09/23/00	KWM
Acenaphthene	0.562 U		0.562	ug/L	PAH SIM		09/20/00	09/23/00	KWM
Fluorene	3.48		0.562	ug/L	PAH SIM		09/20/00	09/23/00	KWM
Phenanthrene	0.869		0.0562	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Anthracene	0.0562 U		0.0562	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Fluoranthene	0.0818		0.0562	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Pyrene	0.0827		0.0562	ug/L	PAH SIM		09/20/00	09/24/00	KWM

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CT&E Environmental Services Inc.

CT&E Ref.#	1005549019	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 12:55
Client Sample ID	16-RW-WS-1	**Received Date/Time**	09/14/2000 16:30
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**
Ordered By			

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Semivolatile Organic GC/MS								
Benzo(a)Anthracene	0.0562 U 0.12	0.0562	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Chrysene	0.0562 U	0.0562	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Benzo[b]Fluoranthene	0.0562 U	0.0562	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Benzo[k]fluoranthene	0.0562 U	0.0562	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Benzo[a]pyrene 0.034	0.0562 U	0.0562	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Indeno[1,2,3-c,d] pyrene	0.0562 U	0.0562	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Dibenzo[a,h]anthracene	0.0562 U	0.0562	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Benzo[g,h,i]perylene 0.036	0.0562 U	0.0562	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Naphthalene	4.60	0.562	ug/L	PAH SIM		09/20/00	09/23/00	KWM
Surrogates								
Naphthalene-d8 <surr/IS>	72.2		%	PAH SIM	14-125	09/20/00	09/23/00	KWM
Acenaphthene-d10 <surr/IS>	94.4		%	PAH SIM	23-125	09/20/00	09/23/00	KWM
Chrysene-d12 <surr/IS>	72.6		%	PAH SIM	43-125	09/20/00	09/24/00	KWM

CT&E Environmental Services Inc.

CT&E Ref.#	1005549020	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 13:05
Client Sample ID	16-RW-SWS-2	**Received Date/Time**	09/14/2000 16:30
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Semivolatile Organic GC/MS								
Acenaphthylene	0.538 U	0.538	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Acenaphthene	0.538 U	0.538	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Fluorene	2.59	0.538	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Phenanthrene	0.683	0.0538	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Anthracene	0.0538 U	0.0538	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Fluoranthene	0.0589	0.0538	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Pyrene	0.0618	0.0538	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Benzo(a)Anthracene	0.0538 U	0.0538	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Chrysene	0.0538 U	0.0538	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Benzo[b]Fluoranthene	0.0538 U	0.0538	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Benzo[k]fluoranthene	0.0538 U	0.0538	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Benzo[a]pyrene	0.0538 U	0.0538	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Indeno[1,2,3-c,d] pyrene	0.0538 U	0.0538	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Dibenzo[a,h]anthracene	0.0538 U	0.0538	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Benzo[g,h,i]perylene	0.0538 U	0.0538	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Naphthalene	1.71	0.538	ug/L	PAH SIM		09/20/00	09/24/00	KWM
Surrogates								
Naphthalene-d8 <surr/IS>	74.8		%	PAH SIM	14-125	09/20/00	09/24/00	KWM
Acenaphthene-d10 <surr/IS>	93.4		%	PAH SIM	23-125	09/20/00	09/24/00	KWM
Chrysene-d12 <surr/IS>	74.6		%	PAH SIM	43-125	09/20/00	09/24/00	KWM

CT&E Environmental Services Inc.

CT&E Ref.#	1005549021	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 0:00
Client Sample ID	Trip Blank	**Received Date/Time**	09/14/2000 16:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	100		%	SM20 2540G			09/17/00	JCO
Volatile Fuels Department								
Gasoline Range Organics	2.53 U	2.53	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Benzene	0.0126 U	0.0126	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Toluene	0.0506 U	0.0506	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Ethylbenzene	0.0506 U	0.0506	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
P & M -Xylene	0.0506 U	0.0506	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
o-Xylene	0.0506 U	0.0506	mg/Kg	AK101/8021B		09/14/00	09/22/00	MAH
Surrogates								
1,4-Difluorobenzene <Surr>	90.1		%	AK101/8021B	60-120	09/14/00	09/22/00	MAH
4-Bromofluorobenzene <Surr>	86.5		%	AK101/8021B	50-150	09/14/00	09/22/00	MAH

CT&E Environmental Services Inc.

CT&E Ref.#	1005549022	**Client PO#**	
Client Name	Signature Flight Support	**Printed Date/Time**	10/10/2000 11:34
Project Name/#	A-8653 C St Assessment 16th	**Collected Date/Time**	09/14/2000 0:00
Client Sample ID	Trip Blank	**Received Date/Time**	09/14/2000 16:30
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	Stephen C. Ede
Ordered By		**Released By**	Michael Riley

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department								
Gasoline Range Organics	0.0900 U	0.0900	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
Benzene	0.000500 U	0.000500	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
Ethylbenzene	0.00200 U	0.00200	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
P & M -Xylene	0.00200 U	0.00200	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
o-Xylene	0.00200 U	0.00200	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
Toluene	0.00200 U	0.00200	mg/L	AK101/8021B		09/23/00	09/23/00	MAH
Surrogates								
1,4-Difluorobenzene <Surr>	86.3		%	AK101/8021B	60-120	09/23/00	09/23/00	MAH
4-Bromofluorobenzene <Surr>	81.4		%	AK101/8021B	50-150	09/23/00	09/23/00	MAH

Sample Custody Record

Samples Shipped to: _____

HARTCROWSER

1005549

JOB NUMBER A-8653 LAB NUMBER _____

PROJECT NAME C St. Assessment (16th)

HART CROWSER CONTACT Rick Giroux

Bill Signature Flight 6 pm Nine / 9/14 1700

SAMPLED BY: RG & Brandie Theisen

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	BTEX/GRO (AK101)	DRO (AK102)	TDC	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
1	16-SB1-S-1		9/14/00	0905	SOIL	X	X			
2	16-SB1-S-2			0918		X	X			
3	16-SB2-S-1			1000		X	X			
4	16-SB2-S-2			1005		X	X			
5	16-SB3-S-1			1045		X	X	X		
6	16-SB3-S-2			1050		X	X			
7	16-SB4-S-1			1120		X	X	X		
8	16-SB4-S-2			1130		X	X			
9	16-SB5-S-1			1150		X	X	X		
10	16-SB5-S-2			1200		X	X	X		
11	16-HB-1-S1			1326			X	X		
12	16-HB-1-S2			1326			X			

REQUESTED ANALYSES

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	9/14/00	SIGNATURE	
Brandie Theisen	TIME	Erik Thiemann	TIME
PRINT NAME Hart-Crowser	1630	PRINT NAME CT & E	
COMPANY		COMPANY	
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE		SIGNATURE	
	TIME		TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT/HANDILING OR STORAGE REQUIREMENTS:

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐ YES ☐ NO ☐ N/A
GOOD CONDITION ☐ YES ☐ NO
TEMPERATURE: _____
SHIPMENT METHOD: ☐ HAND ☐ COURIER ☐ OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

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

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1005549

Sample Custody Record

HARTCROWSER Ph.

Samples Shipped to: _____

JOB NUMBER A-8653 LAB NUMBER _____

PROJECT NAME C Street Assessment

HART CROWSER CONTACT Rick Girouard

SAMPLED BY: RG / BT Bill Signature Flight / Nino 9/14 1700 hrs

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	REQUESTED ANALYSES: DRO (AK 102)	GRO/BTEX (AK101)	PAH - 8310	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
13	16-SB1-WS-1		9/14/00	945	H_2O	X	X			
14	16-SB2-WS-1			1025		X	X			
15	16-SB3-WS-1			1115		X	X			
16	16-SB4-WS-1			1145		X	X			
17	16-SB5-WS-1			1210		X	X			
18	16-SB5-WS-2			1215		X	X			
19	16-RW-WS-1			1255		X	X	X		
20	16-RW-WS-2			1305				X		

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE: Brandie Thiessen	9/14/00 TIME	SIGNATURE: Ora Freeman	9/14/00 TIME
PRINT NAME: Hart Crowser	1630	PRINT NAME: C & E	16:30
COMPANY		COMPANY	
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS:

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐ YES ☐ NO ☐ N/A
GOOD CONDITION ☐ YES ☐ NO
TEMPERATURE: _____
SHIPMENT METHOD: ☐ HAND ☐ COURIER ☐ OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____
for Other Contract Requirements

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

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CT&E Environmental Services Inc.

SAMPLE RECEIPT FORM

CT&E WO#: 1005549

Yes	No		
	✓	Are samples **RUSH**, priority, or *within 72 hrs* of **hold time**?	
		If yes, have you done *e-mail notification*?	
	✓	Are samples *within 24 hrs* of **hold time** or **due date**?	
		If yes, have you *spoken with* Supervisor?	
		Are there any **problems** (e.g., ids, analyses)?	
	✓	Were samples preserved correctly and pH verified?	HCl was added to DRO jars of #3, 13, 17, 18
		Has Project Manager been notified of problems?	
	✓	Is this an ACOE/AFCEE/ADEC project?	
	✓	Will a **data package** be required?	
		If this is for PWS, provide **PWSID**.	
		Is there a **quote** for this project?	
	✓	Will **courier** charges apply?	

Completed by (sign): _____ (print): Eva Nielsen

***** The following *must* be completed for *all* ACOE & AFCEE projects: *****

Yes	No		Notes:
		Is cooler temperature 4 ± C?	
		thermometer used:	
		Was there an airbill, etc? note #:	
		Was cooler sealed with custody seals?	
		#/where?	
		Were seals intact upon arrival?	
		Was there a COC with cooler?	
		Was the COC filled out properly?	
		Did the COC indicate ACOE/AFCEE project?	
		Did the COC and samples correspond?	
		Were samples screened with Geiger counter?	
		Were all samples packed to prevent breakage?	
		packing material:	
		Were all samples unbroken and clearly labelled?	
		Were all samples sealed in separate plastic bags?	
		Were all bottles for volatiles free of headspace?	
		Were correct container/sample sizes submitted?	
		Was client notified of problems? (specify below)	

Individual contacted: _____

Date & Time: _____ Phone/Fax #: _____

Due Date: 9/25/00

Received Date/Time: 9/19 - 16:30

Cooler Temperature: 5.1 - 5.9 °C

Sample Condition: (Good) / Poor

Matrix of each Sample:

2	" "	1-12
1	" "	13-20
	" "	
	" "	
2/1	Trip Blank	21/22
	MS/MSD	

Additional Sample Remarks:

_____ AK101s/_____ 8260s field pres'd?

_____ Field-filtered for dissolved_____?

_____ Lab-filter for dissolved_____?

_____ Ref Lab required?

Notes:

Difference in labelling was discussed w/ Nino. Samples 1, 3, 5, 6

# of each Container Received:

4	950 ml amber	unpres'd
14	950 ml amber	w/ HCl
	500 ml amber	w/ H2SO4
	1L cubies	unpres'd
	1L cubies	w/ HNO3
	1L cubies	w/ H2SO4
	1L cubies	w/ NaOH + ZnAc
	120 ml coli	bottles
	60 ml	Nalg
12	8 oz amber	unpres'd
5	4 oz amber	unpres'd
16	4 oz w/ septa	w/ MeOH
16	40 ml vials	w/ HCl
	Other (specify)	
	Other (specify)	

#/Log In Proofed by: _____

Form Number: F004r2
Printed: 7/12/99

APPENDIX C
ADEC METHOD 3 CALCULATIONS

Table C1 - Method 3 Calculation for DRO-Aromatic
16th & "C" Street Site

Soil Cleanup Level (mg/kg) = C_w { ($K_{oc}F_{oc}$) + ((Θ_w +Θ_aH')/ρ_b) } {1}

		Default	Measured
Dilution Factor (DF)		3.3	
C_w = 1.5 (10 + DF) =	20.0 (mg/L)		
K_{oc} (L/kg)		5010 (Table C-3)	
f_{oc}			0.175
Θ_w (L_{water}/L_{soil})		0.3	
Θ_a(L_{air}/L_{soil})		0.13	
H'		0.0302 (Table C-3)	
ρ_b		1.5	
SCL (mg/kg) = 20.0 (mg/L) {(5010 (L/kg)*.18) + ((.03 + (0.13)(0.0302)/1.5) } =			1.75E+04

Note: {1} 18 AAC 75 Guidance on Cleanup Standards, Equations and Input Parameters, Equation 11.

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16-method3.xls:dro-ar

Table C2 - Method 3 Calculation for Benzene
16th & "C" Street Site

Soil Cleanup Level (mg/kg) = C_w [($K_{oc}F_{oc}$) + ((Θ_w +Θ_aH')/ρ_b)] {1}

		Default	Measured
Dilution Factor (DF)		3.3	
C_w = 0.005 (10 + DF) =	0.067 (mg/L)		
K_{oc} (L/kg)		58.9 (Table C-2)	
f_{oc}			0.175
Θ_w (L_{water}/L_{soil})		0.3	
Θ_a(L_{air}/L_{soil})		0.13	
H'		0.228 (Table C-2)	
ρ_b		1.5	
SCL (mg/kg) = 0.07 (mg/L) {(5.37E6 (L/kg)*.18) + ((.03 + (0.13)(75.9)/1.5) } =			7.00E-01

Note: {1} 18 AAC 75 Guidance on Cleanup Standards, Equations and Input Parameters, Equation 11.

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16-method3.xls:benzene