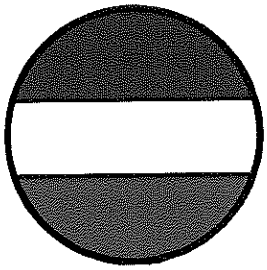
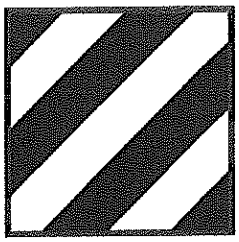


FORSCOM

Final Monitoring Well Installation Report



3d Inf Div (Mech)

Bulk Fuel Facility (HAA-09)
Facility Identification Number 9-025113
3rd Infantry Divison
Hunter Army Airfield, Georgia

May 2000

Prepared for:
ADVANCED INFRASTRUCTURE MANAGEMENT TECHNOLOGIES
Oak Ridge, Tennessee 37831-7606
Managed by
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
For the
U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-84OR21400

Prepared by:
Earth Tech, Inc.
800 Oak Ridge Turnpike, Suite C-100
Oak Ridge, Tennessee 37830

FINAL
MONITORING WELL INSTALLATION REPORT

BULK FUEL FACILITY (HAA-09)
FACILITY IDENTIFICATION NUMBER 9-025113
HUNTER ARMY AIRFIELD, GEORGIA

Submitted to:

Hunter Army Airfield

Submitted by:

ADVANCED INFRASTRUCTURE MANAGEMENT TECHNOLOGIES
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
Oak Ridge, TN 37831

For the:

U.S. DEPARTMENT OF ENERGY

Prepared by:

Earth Tech, Inc.
800 Oak Ridge Turnpike, Suite C-100
Oak Ridge, TN 37830

MAY 2000

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List of Acronyms

BSZ	Below Saturated Zone
BTEX	Benzene, Toluene, Ethylbenzene, And Xylene
CAP	Corrective Action Plan
DRO	Diesel Range Organic
GRO	Gasoline Range Organic
IDW	Investigation-Derived Waste
NTU	nephelometric turbidity unit
PAH	Polycyclic Aromatic Hydrocarbon
QA/QC	Quality Assurance/Quality Control
SAIC	Science Applications International
TPH	Total Petroleum Hydrocarbons
mg/l	milligrams per liter

1.0 INTRODUCTION

This report summarizes the results of the monitoring well installation activities performed at the Bulk Fuel Facility, Hunter Army Airfield, by Earth Tech, Inc.

A Corrective Action Plan (CAP) Part A is currently being conducted at the Bulk Fuel Facility by Science Applications International (SAIC). Additionally, the Bulk Fuel Facility is undergoing an upgrade and repair project conducted by Earth Tech, Inc. Six of the monitoring wells to be installed as part of the CAP-Part A investigation were inside the secondary containment being installed as part of the upgrade/repair; therefore, it was requested that Earth Tech install the six monitoring wells. Groundwater sampling of the monitoring wells will be performed as part of the CAP-Part B investigation under a separate contract.

2.0 SUMMARY OF INVESTIGATION ACTIVITIES

Six monitoring wells were installed at the Bulk Fuel Facility at Hunter Army Airfield to evaluate potential groundwater contamination at the site as part of the CAP-Part A investigation. The six monitoring wells were installed to depths ranging from 13.7 feet below ground surface (bgs) to 14.8 feet bgs at locations indicated on Figure 2-1.

2.1 SAMPLING METHODOLOGIES

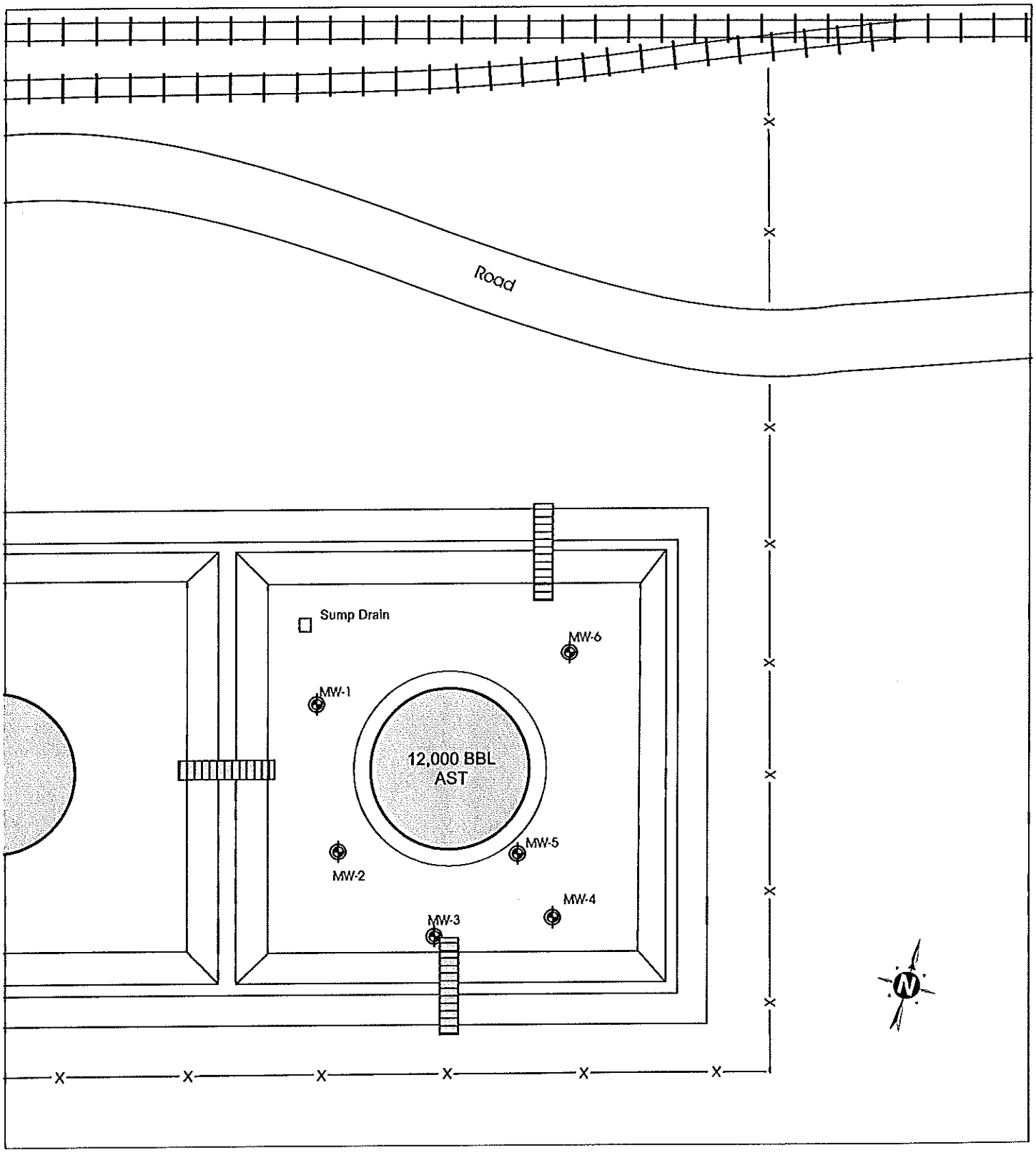
This section describes the monitoring well installation activities conducted at the Bulk Fuel Facility from January 10 to January 14, 2000. The sampling methodologies and types of testing for chemical characterization of the site are also described. The sampling strategy is shown in Table 2-1. All analyses were performed per Environmental Protection Agency SW-846.

Table 2-1.
Field Sampling Activities at the Bulk Fuel Facility

Matrix	Number of Samples	Analysis	Analytical Method
Soil	14	Benzene, Toluene, Ethylbenzene, Xylenes	SW-5035/8260B ENCORE™ Samplers
Soil	14	PAHs	8310
Soil	14	TPH-DRO	SW-846 8015/3550
Soil	14	TPH-GRO	SW-846 8015/5035

2.1.1 Soil Sampling at Monitoring Wells

The six monitoring wells were installed using six ½-inch diameter hollow-stem augers in conjunction with split-spoon samplers. All borings were continuously sampled with the split-spoon samplers, and the soil field-screened for contamination with a photoionization detector (PID). The two samples with the highest PID readings from each boring were submitted to the fixed-based laboratory for chemical analysis. Results of the chemical analysis are provided in Section 3.0. PID readings are presented in Table 2-2. Additionally, the soil borings were continuously logged and documented. The soils were generally fine sand with traces of silt and clay. The soils within the water-bearing zone were fine to very fine sands with traces of silt and were gray in color. The boring logs are provided in Appendix A.



EXPLANATION

MW-3 Groundwater Monitoring Well

—X—X— Fence

Railroad

0 20 40 Feet

Note: Monitoring well locations are approximate. Well survey has not been completed pending completion of wells.

Monitoring Well Locations
Bulk Fuel Facility (HAA-09)
Facility Identification
Number 9-025113
Hunter Army Airfield,
Georgia

Figure 2-1

Table 2-2.
Field Screening Results (ppm)

	PID Screening intervals (depth bgs)			
	0-2	2-4	4-6	6-8
MW-01	527.0	24.0	BSZ	BSZ
MW-02	13.1	5.0	2.6	BSZ
MW-03	11.6	43.4	0.5	BSZ
MW-04	2.4	2.6	0.0	0.0
MW-05	1.8	6.4	BSZ	BSZ
MW-06	8.7	3.8	1.0	BSZ

BSZ- Below Saturated Zone

Decontamination of sampling equipment was accomplished in accordance with procedures specified in the Earth Tech Standard Operating Procedures. These procedures included washing with water and phosphate free detergent, and rinsing alternately with water and isopropyl alcohol. Equipment was allowed to air dry before reuse. All equipment was decontaminated prior to the first sampling event, and then between each sampling event. The equipment was decontaminated before shipment off-site.

A total of 14 soil samples, including Quality Assurance/Quality Control (QA/QC) samples, were collected during the course of this investigation. Sample numbers, corresponding QA/QC samples, and the sample depths are provided in Table 2-3.

Table 2-3.
Sample Locations

	Depth (ft bgs)	Sample ID Number	QA/QC Sample Number
MW-01	0-2	MW-01-01	MW-01-03 (Duplicate)
MW-01	2-4	MW-01-02	MW-01 ER
MW-02	0-2	MW-02-01	
MW-02	2-4	MW-02-02	MW-02-02 MS/MSD
MW-03	0-2	MW-03-01	
MW-03	2-4	MW-03-02	MW-03-03 (Duplicate)
MW-04	0-2	MW-04-01	
MW-04	2-4	MW-04-02	
MW-05	0-2	MW-05-01	
MW-05	2-4	MW-05-02	MW-05-02 ER
MW-06	0-2	MW-06-01	
MW-06	2-4	MW-06-02	

ER- Equipment Rinsate
MS/MSD – Matrix Spike/Matrix Spike Duplicate

2.1.2 Monitoring Well Installation and Development

All monitoring wells were installed per the specifications (Table 2-4). Due to the high groundwater elevations, bentonite seal thicknesses were reduced to allow for a 1-foot grout seal at the ground surface. Surface completions were not installed during the investigation so that the secondary containment system around the storage tank could be attached to the riser pipe of the monitoring wells. Monitoring well construction logs are provided in Appendix B.

Table 2-4.
Well Construction Summary Table

	Total Depth, ft	Diameter, inches	Screen Interval, ft	Sand Interval, ft	Bentonite Seal Interval, ft	Grout Interval, ft
MW-01	14.6	2	4.6-14.6	2.6-14.6	1.0-2.6	0-1
MW-02	13.94	2	3.94-13.94	1.94-13.94	0-0.94	0-0.94
MW-03	14.4	2	4.4-14.4	2.4-14.4	1.0-2.4	0-1
MW-04	14.6	2	4.6-14.6	2.6-14.6	1.0-2.6	0-1
MW-05	14.8	2	4.8-14.8	2.8-14.8	1.0-2.8	0-1
MW-06	13.7	2	3.7-13.7	1.7-13.7	1.0-1.7	0-1

Monitoring wells were developed using the surge and pump method. Between 6.6 and 36 gallons of groundwater were removed from each well. Water temperature, pH, conductivity, dissolved oxygen, and turbidity measurements were recorded for each of the monitoring wells (Table 2-5). All monitoring wells reached equilibrium and had a turbidity of 10 NTU or less at the completion of the well development. There is a possibility that there will be fine sands within the monitoring wells at a later date due to ongoing construction activities in the area. Well development logs are provided in Appendix C.

Table 2-5.
Well Development Summary Table

	Temperature	pH	Conductivity	Dissolved Oxygen	Turbidity	Gallons Purged
MW-01	17.9	7.57	0.634	1.69	10	17
MW-02	19.8	7.57	0.359	2.12	10	36
MW-03	18.9	7.55	0.301	1.05	10	9
MW-04	19.1	7.73	0.252	2.70	10	9
MW-05	15.6	7.61	0.129	1.85	10	6.6
MW-06	19.1	7.56	0.118	2.03	10	17

Temperature = degrees C
Conductivity = umhos/cm
Dissolved oxygen = mg/l
Turbidity = NTU

2.1.3 Monitoring Well Sampling

Monitoring wells were not sampled at the time of completion.

2.1.4 Investigation-Derived Waste Management

All Investigation-Derived Waste (IDW) was drummed and labeled at the time of generation. The drums were then transported to the PDO Yard to await disposition. Earth Tech personnel transported the soil cuttings to the bio-treatment cell located at HAAF for disposal. Purge water and decontamination water were drummed at the site pending receipt of analytical data for determination of proper disposal.

2.2 DATA QUALITY ASSESSMENT

Through appropriate data verification, validation, and review, analytical information has been identified as estimated and rejected where appropriate. None of the data were rejected. All data have been appropriately identified and qualified. Elevated detection limits were reported for TPH-DRO because the laboratory failed to perform the required low level extraction.

3.0 DATA SUMMARY

This section summarizes the results of the chemical laboratory analyses of the soil samples collected at Tank 7009, Bulk Fuel Facility (HAA-09), Facility Identification Number 9-025113, Hunter Army Airfield. The data were validated and have been appropriately qualified. Complete analytical results for the chemical data are included in Appendix D of this report.

3.1 SOIL SAMPLES

Six monitoring wells were installed around Tank 7009. A total of 12 soil samples were collected from the six monitoring well locations. Samples were collected at each monitoring well location at a depth of 0- to 2-ft bgs and at 2- to 4-ft bgs. Samples were analyzed for, polycyclic aromatic hydrocarbon (PAH) compounds, benzene, toluene, ethylbenzene, xylenes (BTEX), and total petroleum hydrocarbons (TPH) (GRO and DRO). Table 3-1 presents a summary of analytes detected in the soil samples collected from the six monitoring well locations.

3.1.1 Surface Soil (0 to 2 feet bgs)

Polycyclic Aromatic Hydrocarbon Compounds – Various PAHs were detected in the surface soil in low concentrations in all monitoring wells with the exception of MW-06, which had no detections of PAHs. The highest concentrations of PAH compounds were detected in MW-01, which had seven PAH compounds in concentrations ranging from 0.086 mg/kg of anthracene to 0.970 mg/kg of fluoranthene.

Pyrene was detected in the surface soil in MW-01 (0.550 mg/kg) and MW-05 (.092 mg/kg). Phenanthrene was detected in MW-01 (0.490 mg/kg) and MW-03 (.0089 mg/kg). Indeno(1,2,3-cd)pyrene was detected in MW-02 (.0082 mg/kg) and MW-03 (.030 mg/kg). Fluorene was detected in MW-01 (0.180 mg/kg). Fluoranthene was detected in MW-01 (0.970 mg/kg) and MW-05 (.040 mg/kg). Chrysene was detected in MW-01 (0.085 mg/kg). Benzo(k) fluoranthene was detected in MW-04 (0.096 mg/kg). Benzo(g,h,i)perylene was detected in MW-02 (0.017 mg/kg) and MW-05 (0.023 mg/kg). Benzo(b)fluoranthene was detected in MW-04 (0.025 mg/kg). Benzo(a) pyrene was detected in MW-03 (0.020 mg/kg). Benzo(a) anthracene was detected in MW-01 (0.740 mg/kg). Anthracene was detected in MW-01 (0.086 mg/kg).

Benzene, Toluene, Ethylbenzene, and Xylenes – Concentrations of BTEX were noted in the surface soil in all monitoring well locations with the exception of MW-06, which had no detections of BTEX. The

Table 3-1. Summary of Analytes Detected in Soil Samples at the Bulk Fuel Facility (HAA-09), Facility Identification Number 9-025113 (Page 1 of 2)

Compound		MW-01-01	MW-01-02	MW-01-03 [2]	MW-02-01	MW-02-02	MW-03-01	MW-03-02
Sample Collection Date	Soil Threshold Levels [1]	1/11/00	1/11/00	1/11/00	1/11/00	1/11/00	1/11/00	1/11/00
Depth, ft	(mg/kg)	0 to 2	2 to 4	0 to 2	0 to 2	2 to 4	0 to 2	2 to 4
8310- PAH (mg/kg)								
Pyrene	NA	0.55 J	1.8 J	0.42 J				
Phenanthrene	NA	0.49 J	1.5 J	0.31 J			0.009	
Naphthalene	NA		0.3 J					
Indeno(1,2,3-cd)pyrene	0.66				0.008		0.03	
Fluorene	NA	0.18 J	0.62 J	0.13 J				
Fluoranthene	NA	0.97 J	3 J	0.66 J				
Chrysene	0.66		0.32 J	0.085 J				
Benzo(k)fluoranthene	1.6		0.052 J					
Benzo(g,h,i)perylene	NA				0.017			
Benzo(b)fluoranthene	0.82		0.04 J					
Benzo(a)pyrene	0.66						0.02 J	
Benzo(a)anthracene	NA	0.74 J	2 J					
Anthracene	NA	0.086 J	0.29 J	0.06 J				
8270B-BTEX (mg/kg)								
o-Xylene	20				0.002 J			
m,p-Xylene	20				0.008		17	3.5
Ethylbenzene	0.37	0.009		0.024 J	0.016		4.5	0.18
Benzene	0.005						0.002 J	0.002 J
8015 GRO/DRO (mg/kg)								
Gasoline		440 J		380 J	72 J	70 J	1100 J	100 J
Diesel (C12-C24)		530 J	1300 J	230				

[1] Georgia UST Regulation 391-3-15, Table A, Column 1, <500 feet to withdrawal point.

[2] Dup of MW-01-01

[3] Dup of MW-03-02

NA = Not Applicable. The health-based threshold level exceeds the expected soil concentration under free product condition.

J - value is estimated

Table 3-1. Summary of Analytes Detected in Soil Samples at the Bulk Fuel Facility (HAA-09), Facility Identification Number 9-025113 (Page 2 of 2)

Compound		MW-03-03 [3]	MW-04-01	MW-04-02	MW-05-01	MW-05-02	MW-06-01	MW-06-02
Sample Collection Date	Soil Threshold Levels [1]	1/11/00	1/11/00	1/11/00	1/11/00	1/11/00	1/11/00	1/11/00
Depth, ft	(mg/kg)	2 to 4	0 to 2	2 to 4	0 to 2	2 to 4	0 to 4	2 to 4
8310- PAH (mg/kg)								
Pyrene	NA				0.092 J			
Phenanthrene	NA							
Naphthalene	NA							
Indeno(1,2,3-cd)pyrene	0.66							
Fluorene	NA							
Fluoranthene	NA				0.04			
Chrysene	0.66							
Benzo(k)fluoranthene	1.6		0.096 J			0.24		
Benzo(g,h,i)perylene	NA				0.023 J			
Benzo(b)fluoranthene	0.82		0.025	0.024				
Benzo(a)pyrene	0.66							
Benzo(a)anthracene	NA							
Anthracene	NA							
8270B-BTEX (mg/kg)								
o-Xylene	20							
m,p-Xylene	20	0.81	0.001 J		0.002 J			
Ethylbenzene	0.37	0.076						
Benzene	0.005	0.001 J						
8015 GRO/DRO (mg/kg)								
Gasoline		130 J	20	30	8.80	12		
Diesel (C12-C24)					390			

[1] Georgia UST Regulation 391-3-15, Table A, Column 1, <500 feet to withdrawal point.

[2] Dup of MW-01-01

[3] Dup of MW-03-02

NA = Not Applicable. The health-based threshold level exceeds the expected soil concentration under free product condition.

J - value is estimated

highest detections of BTEX occurred in MW-03 with concentrations of m,p-xylene, ethylbenzene, and benzene at 17 mg/kg, 4.5 mg/kg, and 0.002 mg/kg, respectively.

Low concentrations of m,p-xylene were detected in MW-02 (0.008 mg/kg), MW-04 (0.001 mg/kg), and MW-05 (0.002 mg/kg). Ethylbenzene was detected in low concentrations in MW-01 (0.009 mg/kg) and MW-02 (0.016 mg/kg). Benzene was detected only in MW-03 at 0.002 mg/kg.

TPH – GRO/DRO – Total petroleum hydrocarbons were detected in the surface soil in all monitoring well locations with the exception of MW-06. The highest concentrations of TPH-GRO occurred in MW-03 (1100 mg/kg). TPH-GRO concentrations in the remaining wells ranged from 8.8 mg/kg (MW-05) to 440 mg/kg (MW-01). TPH-DRO was detected in MW-01 (530 mg/kg) and MW-05 (390 mg/kg).

3.1.2 Subsurface Soil (>2 feet bgs)

Polycyclic Aromatic Hydrocarbon Compounds – PAHs were detected in the subsurface soil in MW-01, MW-04, and MW-05. Pyrene, phenanathrene, fluoranthene, and benzo(a)anthracene were detected in MW-01 at elevated concentrations of 1.8 mg/kg, 1.5 mg/kg, 3 mg/kg, and 2 mg/kg, respectively. Lower concentrations of other PAHs were also present in concentrations ranging from 0.04 mg/kg to 0.620 mg/kg. Benzo(b)fluoranthene was detected in MW-04 at 0.024 mg/kg while benzo(k)fluoranthene was detected in MW-05 at 0.24 mg/kg.

Benzene, Toluene, Ethylbenzene, and Xylenes – BTEX compounds were detected in MW-03 only. M,p-xylene, ethylbenzene, and benzene were detected in concentrations of 3.5 mg/kg, 0.180 mg/kg, and 0.002 mg/kg, respectively.

TPH – GRO/DRO – Total petroleum hydrocarbons (GRO or DRO) were detected in the subsurface soil in all monitoring wells with the exception of MW-06. TPH-GRO was detected in MW-02, MW-03, MW-04, and MW-05 at concentrations of 70 mg/kg, 100 mg/kg, 30 mg/kg, and 12 mg/kg, respectively. TPH-DRO was detected in MW-01 at a concentration of 1300 mg/kg.

APPENDIX A

BORING LOGS

The Earth Technology Corporation

Borehole Log

Project Name: HAAF Bulk Fuel		Project Number:	
Borehole Location: Bulk Fuel Storage Area	Borehole No. MW-1	Sheet 1 of	
Drilling Agency: Alliance Environmental	Driller: Richard Mooney		
Drilling Equipment: Mobile B-59	Date Started: 1/11/00	Total Depth (feet):	
Drilling Method: HSA/SS	Date Finished: 1/11/00	Depth to Bedrock (feet): N/A	
Drilling Fluid: N/A	Number of Samples: 2	Depth to Water (feet): 4'	
Completion Information:	Borehole Diameter (in): 6½"	Elevation and Datum:	
	Logged by: K.E. Owens		
	Checked by:	Date:	

Depth (feet)	Sample: Number	Sample: Interval	Sample: Blow Count	Sample: Recovery	Sample: Time	Field Analysis: FID (ppm) S/B*	Field Analysis: PID (ppm) S/B*	LOG: Graphic	LOG: USCS or Rock Type	Lithologic Description	Remarks
0	1	0-2	4 4 3 6	12			527.0			FINE SAND, SILT, BROWN 7.5YR 5/3 DAMP	
	2	2-4	6 8 13 12	24			24.0			FINE SAND, TRACE SILT, LT. GRAY 7.5YR N7 WET	WATER STOP SS, AUGER TO 14'
5											
10											
15											
20											
25											
30											

Key: * S/B = Sample reading / background reading; NA = not analyzed

Form F-S

The Earth Technology Corporation

Borehole Log

Project Name: HAAF BULK FUEL			Project Number:
Borehole Location: BULK FUEL STORAGE AREA		Borehole No. MW-2	Sheet 1 of
Drilling Agency: ALLIANCE ENVIRONMENTAL		Driller: RICHARD MOONEY	
Drilling Equipment: Mobile B-59		Date Started: 1/11/00	Total Depth (feet):
Drilling Method: HSA/SS		Date Finished: 1/11/00	Depth to Bedrock (feet): N/A
Drilling Fluid: N/A		Number of Samples: 2	Depth to Water (feet): 4
Completion Information:		Borehole Diameter (in): 6½"	Elevation and Datum:
		Logged by: K.E. OWENS	
		Checked by:	Date:

Depth (feet)	Sample: Number	Sample: Interval	Sample: Blow Count	Sample: Recovery	Sample: Time	Field Analysis: FID (ppm) S/B*	Field Analysis: PID (ppm) S/B*	LOG: Graphic	LOG: USCS or Rock Type	Lithologic Description	Remarks
0	1	0-2	3 4 2	8"			3.1			V. FINE SAND, SILTY, DK. BROWN 7.5YR 3/2 WET	BOREHOLE TO POOR
	2	2-4	6 7 5	24			5.0			V. FINE SAND, SILTY, PINKISH GRAY 7.5YR 6/7 WET	
5			3 3 4	18"			2.6			V. FINE SAND, SILTY, GRAY 7.5YR 5/2 WET	WATER STOP SS, AUGER TO 14'
10											
15											
20											
25											
30											

Form F

Key • S/B = Sample reading / background reading; NA = not analyzed

The Earth Technology Corporation

Borehole Log

Project Name: HAAF BULK FUEL		Project Number:	
Borehole Location: BULK FUEL STORAGE AREA		Borehole No. MW-3	Sheet 1 of 1
Drilling Agency: ALLIANCE ENVIRONMENTAL		Driller: RICHARD MOONEY	
Drilling Equipment: Mobile B-59		Date Started: 1/11/00	Total Depth (feet):
Drilling Method: HSA/SS		Date Finished: 1/11/00	Depth to Bedrock (feet): N/A
Drilling Fluid: N/A		Number of Samples: 2	Depth to Water (feet): 6'
Completion Information:		Borehole Diameter (in): 6½"	Elevation and Datum:
		Logged by: K.E. OWENS	
		Checked by:	Date:

Depth (feet)	Sample: Number	Sample: Interval	Sample: Blow Count	Sample: Recovery	Sample: Time	Field Analysis: FID (ppm) S/B*	Field Analysis: PID (ppm) S/B*	LOG: Graphic	LOG: USCS or Rock Type	Lithologic Description	Remarks
0	1	0-2	4 4 5	8"			11.6			SICHT SAND, SOME GRAVEL, V. DARK GRAY 7.5YR N3 MOIST	
										7.5	
	2	2-4	3 5 5	2"			43.4			FINE SAND, SILTY, LT GRAY 7.5YR N7 DAMP	
5			3 5 5	12"			0.5			FINE SAND, SOME SILT, GRAY 7.5YR N6 WET	WATER STOP SS, AUGER TO 14'
10											TD 14'
15											
20											
25											
30											

Key: * S/B = Sample reading / background reading; NA = not analyzed

Form F-S

The Earth Technology Corporation

Borehole Log

Project Name: HAAF BULK FUEL		Project Number:
Borehole Location: BULK FUEL STORAGE AREA	Borehole No. MW-4	Sheet 1 of 1
Drilling Agency: ALLIANCE ENVIRONMENTAL	Driller: RICHARD MOONEY	
Drilling Equipment: Mobile B-59	Date Started: 1/11/00	Total Depth (feet): 14
Drilling Method: HSA/SS	Date Finished: 1/11/00	Depth to Bedrock (feet): N/A
Drilling Fluid N/A	Number of Samples: 2	Depth to Water (feet): 6' BGS
Completion Information:	Borehole Diameter (in): 6 1/2"	Elevation and Datum:
	Logged by: K. E. OWENS	
	Checked by:	Date:

Depth (feet)	Sample: Number	Sample: Interval	Sample: Blow Count	Sample: Recovery	Sample: Time	Field Analysis: FID (ppm) S/B*	Field Analysis: PID (ppm) S/B*	LOG: Graphic	LOG: USCS or Rock Type	Lithologic Description	Remarks
0	1	0-2	2 2 3 3	12"			2.4			FINE SAND, SILT, DK. REDDISH BROWN, DAMP, 5YR 3/4	
	2	2-4	7 7 12 12	18"			7.6			SILTY CLAY, DK REDDISH BROWN 5YR 3/4 MOIST	
5				12"			0.0			SANDY CLAY, SOME SILT, CLAY 5YR 6/1 DAMP	WATER
				14"			0.0			FINE SAND, SOME SILT, GRAY 5YR 5/1 WET	STOP SS, AUGER TO 14'
10											TD 14'
15											
20											
25											
30											

Key * S/B = Sample reading / background reading; NA = not analyzed

Form F-

The Earth Technology Corporation

Borehole Log

Project Name: HAAF BULK FUEL	Project Number:
Borehole Location: BULK FUEL STORAGE AREA	Borehole No. MW-5 / Sheet 1 of 1
Drilling Agency: ALLIANCE ENVIRONMENTAL	Driller: RICHARD MOONEY
Drilling Equipment: Mobile B-57	Date Started: 1/11/00 / Total Depth (feet):
Drilling Method: HSA/SS	Date Finished: 1/11/00 / Depth to Bedrock (feet): N/A
Drilling Fluid N/A	Number of Samples: 2 / Depth to Water (feet): 4'
Completion Information:	Borehole Diameter (in): 6½" / Elevation and Datum:
	Logged by: K.E. OWENS
	Checked by: / Date:

Depth (feet)	Sample Number	Sample Interval	Sample Blow Count	Sample Recovery	Sample Time	Field Analysis FID (ppm) S/B*	Field Analysis PID (ppm) S/B*	LOG Graphic	LOG USCS or Rock Type	Lithologic Description	Remarks
0	1	0-2	3-4-4	18"			1.8			FINE SAND, SOME SILT, LT. GRAY 5YR7/1 DAMP	
	2	2-4	2-3-3	20"			2.4			FINE SAND, SOME SILT, LT. GRAY 5YR7/1 WET	WATER STOP SS, AUGER TO 14'
5											
10											TD 14'
15											
20											
25											
30											

Key * S/B = Sample reading / background reading; NA = not analyzed

Form F-5

The Earth Technology Corporation

Borehole Log

Project Name: HAAF BULK FUEL		Project Number:	
Borehole Location: BULK FUEL STORAGE AREA		Borehole No. MW-6	Sheet 1 of
Drilling Agency: ALLIANCE ENVIRONMENTAL		Driller: RICHARD MOONEY	
Drilling Equipment: Mobile B-59		Date Started: 1/11/00	Total Depth (feet):
Drilling Method: HSA/SS		Date Finished: 1/11/00	Depth to Bedrock (feet): N/A
Drilling Fluid: N/A		Number of Samples: 2	Depth to Water (feet): 6
Completion Information:		Borehole Diameter (in): 6½"	Elevation and Datum:
		Logged by: K.E. OWENS	
		Checked by:	Date:

Depth (feet)	Sample: Number	Sample: Interval	Sample: Blow Count	Sample: Recovery	Sample: Time	Field Analysis: FID (ppm) S/B*	Field Analysis: PID (ppm) S/B*	LOG: Graphic	LOG: USCS or Rock Type	Lithologic Description	Remarks
0	1	0-2	3 4 3	12			8.7			V. FINE SAND, SILT, BROWN 7.5YR 4/3 DAMP	
	2	2-4	8 11 13 14	24			3.8			V. FINE SAND, SILT, DK BROWN 7.5YR 4/12 DAMP	
5			3 4 5 8	14			1.0			FINE SAND, TRACE SILT, PINKISH GRAY 7.5YR N7 WET	WATER STOPPED AUGER TO 14'
10											TD 14'
15											
20											
25											
30											

Key * S/B = Sample reading / background reading; NA = not analyzed

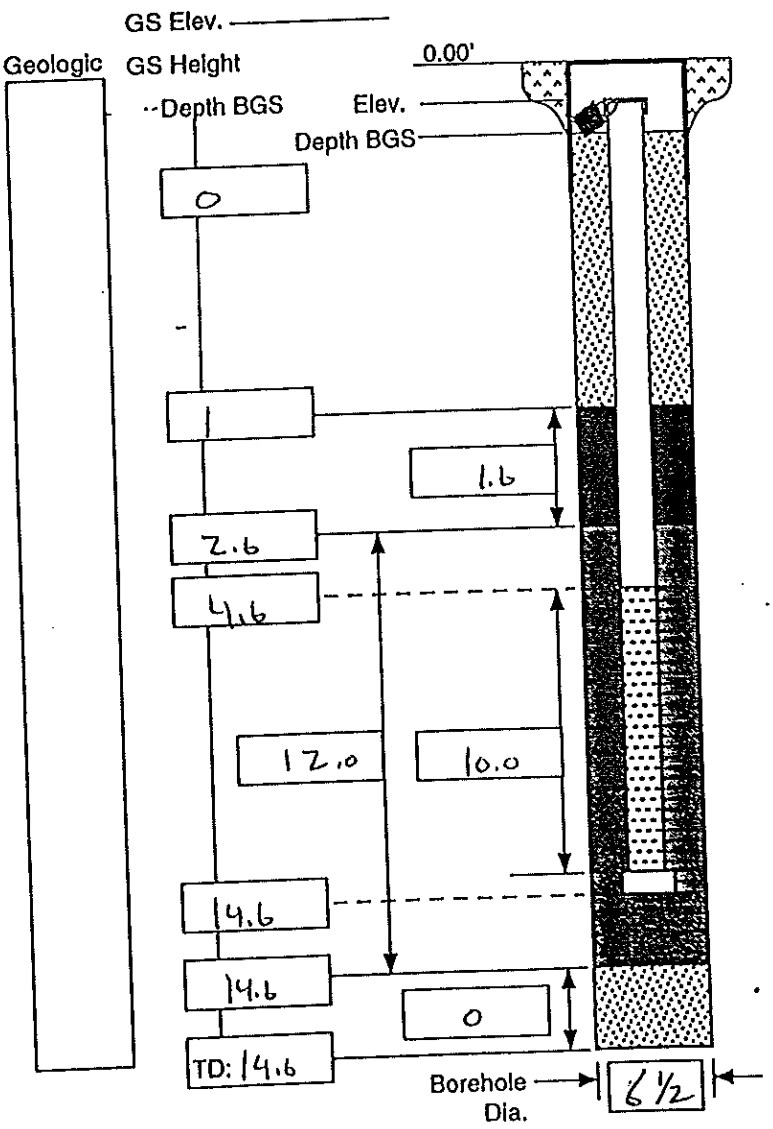
Form F.

APPENDIX B

MONITORING WELL CONSTRUCTION LOGS

Monitoring Well Construction Log - Flush Mount

Project Name: HAAF Bulk Fuel	Project Number: 34872-95.22	Date: 1/11/00
Well Location: Bulk Fuel	Well ID: MW-01	Sheet 1 of 1
Driller: Richard Mooney	Borehole Diameter (in): 6½"	Total Depth (ft): 14.6
Drilling Agency: Alliance Environmental	Date Started: 1/11/00	Depth to Water (ft): 3.4
Drilling Equipment: Mobile B-59	Date Finished: 1/12/00	Elevation and Datum:
Drilling Method: SS/HSA	Logged by: K.E. Owens	Checked by:
Drilling Fluid: N/A	Number of Samples: 2	Date:



PROTECTIVE CSG
Material / Type:
Diameter:
Depth BGS: Weep Hole (Y / N)

GUARD POSTS (Y / N)
No.: Type:

SURFACE PAD
Composition and Size:

RISER PIPE
Type: PVC
Diameter: 2"
Total Length (TOC to TOS):
Ventilated Cap (Y / N)

GROUT
Composition and Proportions: Type II Cement w/ 5% Bentonite powder
Tremied (Y / N)
Interval BGS: 0.0-1.0' BGS

CENTRALIZERS
Depth(s): N/A

SEAL
Type: Bentonite Pellets
Source: BAROID
Setup / Hydration Time: 24 hrs Vol. Fluid Added
Tremied (Y / N)

FILTER PACK
Type: #10 SAND
Amt. Used: 5 bags
Tremied (Y / N)
Source:
Gr. Size Dist.:

SCREEN
Type: PVC
Diameter: 2"
Slot Size and Type: 0.010
Interval BGS:

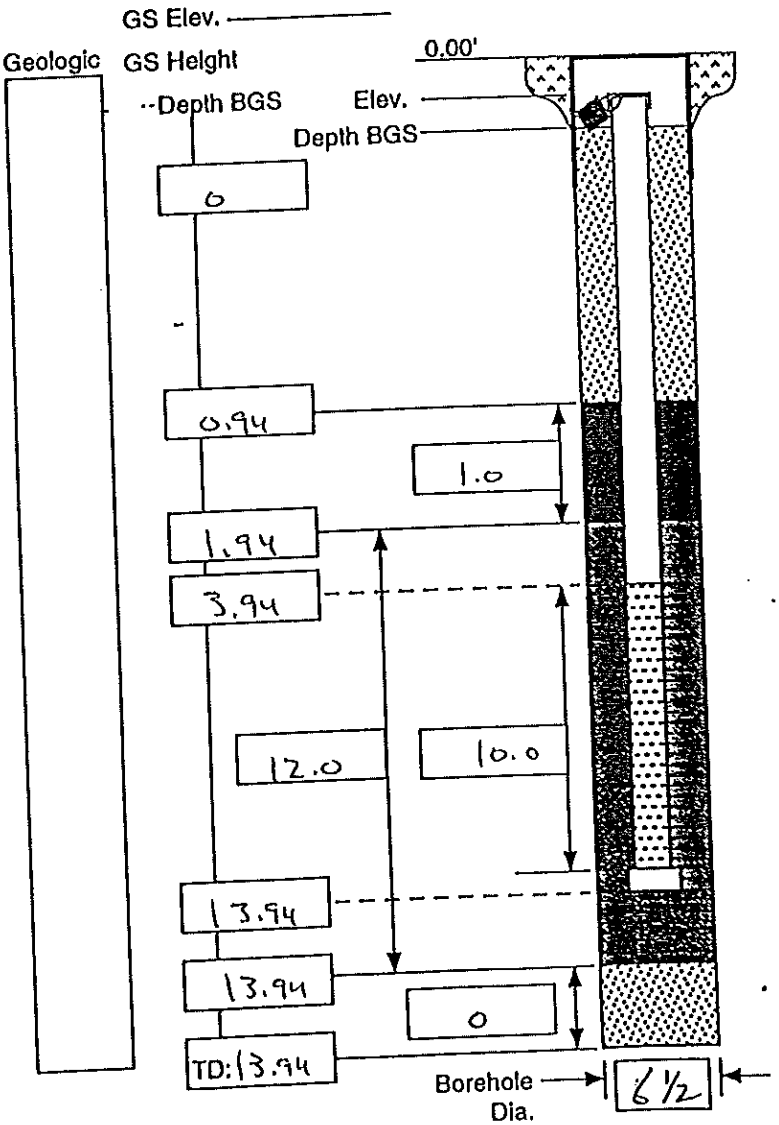
SILT TRAP (Y / N)
Interval BGS: Length
Bottom Cap (Y / N)

BACKFILL PLUG
Material:
Setup / Hydration Time:
Tremied (Y / N)

EARTH TECH

Monitoring Well Construction Log - Flush Mount

Project Name: HAAF Bulk Fuel	Project Number: 34872-95.22	Date: 1/11/00
Well Location: Bulk Fuel	Well ID: MW-05	Sheet 1 of 1
Driller: Richard Mooney	Borehole Diameter (in): 6½"	Total Depth (ft): 13.94
Drilling Agency: Alliance Environmental	Date Started: 1/11/00	Depth to Water (ft): 7.94
Drilling Equipment: Mobile B-59	Date Finished: 1/12/00	Elevation and Datum:
Drilling Method: SS/HSA	Logged by: K.E. Owens	Checked by:
Drilling Fluid: N/A	Number of Samples: 2	Date:



PROTECTIVE CSG
Material / Type:
Diameter:
Depth BGS: Weep Hole (Y / N)

GUARD POSTS (Y / N)
No.: Type:

SURFACE PAD
Composition and Size:

RISER PIPE
Type: PVC
Diameter: 2"
Total Length (TOC to TOS):
Ventilated Cap (Y / N)

GROUT
Composition and Proportions: Type II Cement w/ 5% Bentonite powder
Tremied (Y / N)
Interval BGS: 0.0 - 1.0' Bgs

CENTRALIZERS
Depth(s): N/A

SEAL
Type: Bentonite Pellets
Source: BAROID
Setup / Hydration Time: 24 hrs Vol. Fluid Added
Tremied (Y / N)

FILTER PACK
Type: #10 SAND
Amt. Used: 5 bags
Tremied (Y / N)
Source:
Gr. Size Dist.:

SCREEN
Type: PVC
Diameter: 2"
Slot Size and Type: 0.010
Interval BGS:

SILT TRAP (Y / N)
Interval BGS: Length
Bottom Cap (Y / N)

BACKFILL PLUG
Material:
Setup / Hydration Time: Form
Tremied (Y / N)

EARTH TECH

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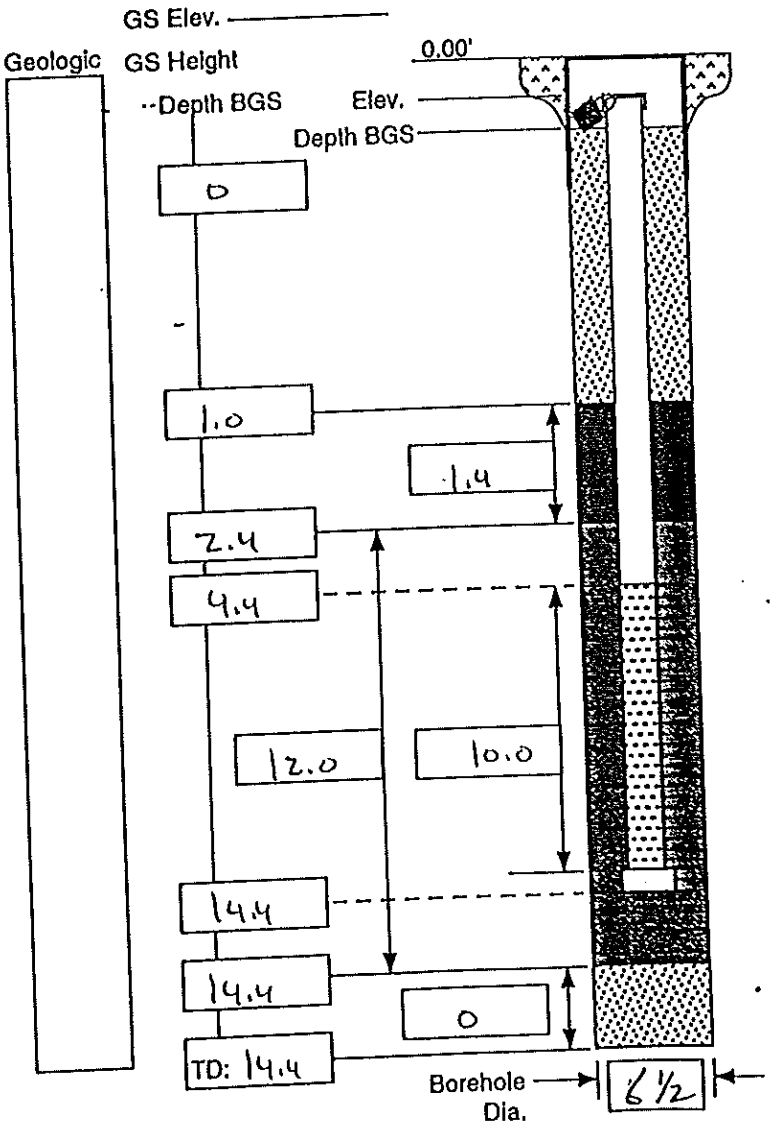
Monitoring Well Construction Log - Flush Mount

Project Name: HAAF Bulk Fuel	Project Number: 34872-95.22	Date: 1/11/00
Well Location: Bulk Fuel	Well ID: MW-03	Sheet 1 of 1
Driller: Richard Mooney	Borehole Diameter (in): 6½"	Total Depth (ft): 14.4
Drilling Agency: Alliance Environmental	Date Started: 1/11/00	Depth to Water (ft): 3.4
Drilling Equipment: Mobile B-59	Date Finished: 1/12/00	Elevation and Datum:
Drilling Method: SS/HSA	Logged by: K.E. Owens	Checked by:
Drilling Fluid: N/A	Number of Samples: 2	Date:



PROTECTIVE CSG
Material / Type:
Diameter:
Depth BGS: Weep Hole (Y / N)

GUARD POSTS (Y / N)
No.: Type:

SURFACE PAD
Composition and Size:

RISER PIPE
Type: PVC
Diameter: 2"
Total Length (TOC to TOS):
Ventilated Cap (Y / N)

GROUT
Composition and Proportions: Type II Cement w/ 5% Bentonite powder
Tremied (Y / N)
Interval BGS: 0.0-1.0' BGS

CENTRALIZERS
Depth(s): N/A

SEAL
Type: Bentonite Pellets
Source: BAROID
Setup / Hydration Time: 24 hrs Vol. Fluid Added
Tremied (Y / N)

FILTER PACK
Type: #10 SAND
Amt. Used: 5 bags
Tremied (Y / N)
Source:
Gr. Size Dist.:

SCREEN
Type: PVC
Diameter: 2"
Slot Size and Type: 0.010
Interval BGS:

SILT TRAP (Y / N)
Interval BGS: Length
Bottom Cap (Y / N)

BACKFILL PLUG
Material:
Setup / Hydration Time:
Tremied (Y / N)

EARTH TECH

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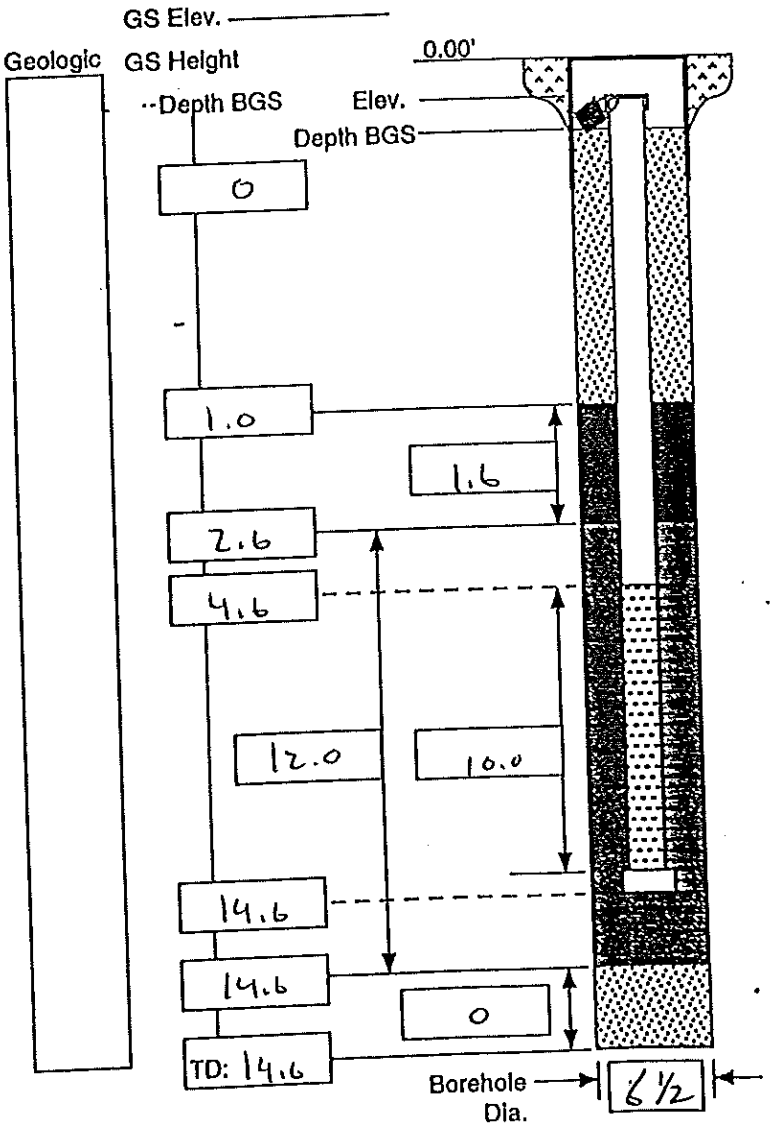
Monitoring Well Construction Log - Flush Mount

Project Name: HAAF Bulk Fuel	Project Number: 34872-95.22	Date: 1/11/00
Well Location: Bulk Fuel	Well ID: MW-04	Sheet 1 of 1
Driller: Richard Mooney	Borehole Diameter (in): 6½"	Total Depth (ft): 14.6
Drilling Agency: Alliance Environmental	Date Started: 1/11/00	Depth to Water (ft): 3.41
Drilling Equipment: Mobile B-59	Date Finished: 1/12/00	Elevation and Datum:
Drilling Method: SS/HSA	Logged by: K.E. Owens	Checked by:
Drilling Fluid: N/A	Number of Samples: 2	Date:



PROTECTIVE CSG
Material / Type:
Diameter:
Depth BGS: Weep Hole (Y / N)

GUARD POSTS (Y / N)
No.: Type:

SURFACE PAD
Composition and Size:

RISER PIPE
Type: PVC
Diameter: 2"
Total Length (TOC to TOS):
Ventilated Cap (Y / N)

GROUT
Composition and Proportions: Type II Cement w/ 5% Bentonite powder
Tremied (Y / N)
Interval BGS: 0.0-1.0' BGS

CENTRALIZERS
Depth(s) N/A

SEAL
Type: Bentonite Pellets
Source: BAROID
Setup / Hydration Time: 24 hrs Vol. Fluid Added
Tremied (Y / N)

FILTER PACK
Type: #10 SAND
Amt. Used: 5 bags
Tremied (Y / N)
Source:
Gr. Size Dist.:

SCREEN
Type: PVC
Diameter: 2"
Slot Size and Type: 0.010
Interval BGS:

SILT TRAP (Y / N)
Interval BGS: Length
Bottom Cap (Y / N)

BACKFILL PLUG
Material:
Setup / Hydration Time:
Tremied (Y / N)

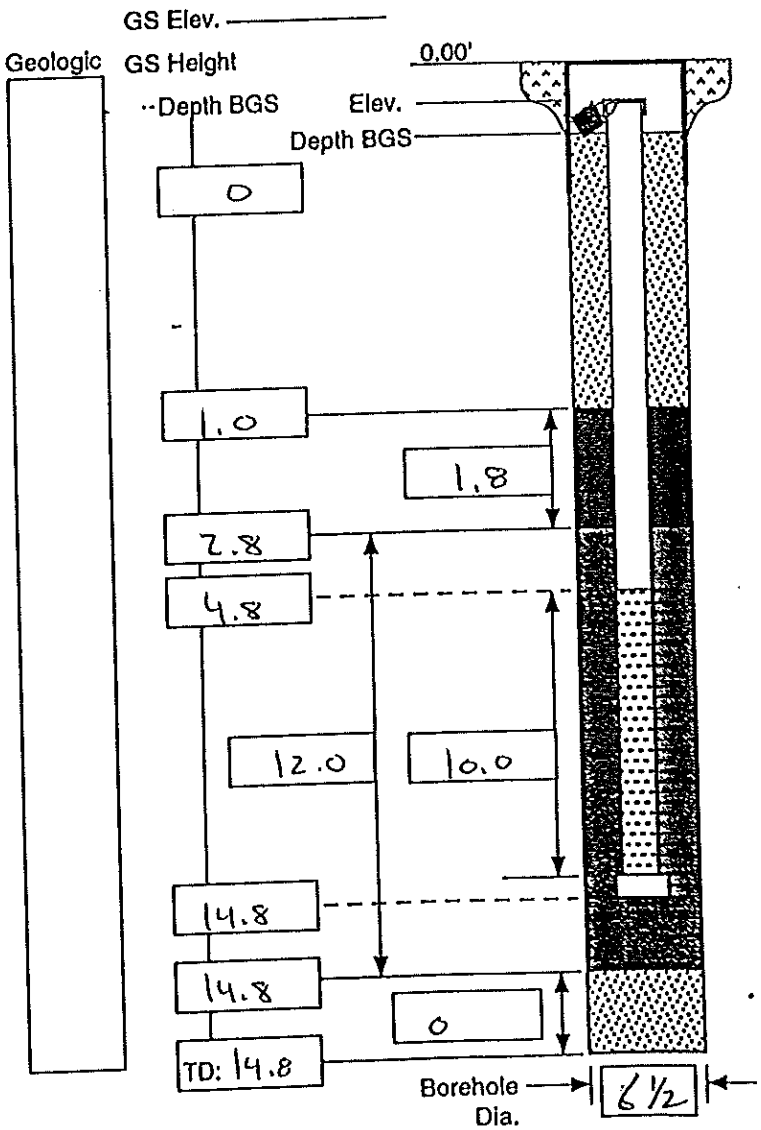
Form F
7.

EARTH TECH

27

Monitoring Well Construction Log - Flush Mount

Project Name: HAAF Bulk Fuel	Project Number: 34872-95.22	Date: 1/11/00
Well Location: Bulk Fuel	Well ID: MW-05	Sheet 1 of 1
Driller: Richard Mooney	Borehole Diameter (in): 6½"	Total Depth (ft): 14.8
Drilling Agency: Alliance Environmental	Date Started: 1/11/00	Depth to Water (ft): 2.2
Drilling Equipment: Mobile B-59	Date Finished: 1/12/00	Elevation and Datum:
Drilling Method: SS/HSA	Logged by: K.E. Owens	Checked by:
Drilling Fluid: N/A	Number of Samples: 2	Date:



PROTECTIVE CSG
Material / Type:
Diameter:
Depth BGS: Weep Hole (Y / N)

GUARD POSTS (Y / N)
No.: Type:

SURFACE PAD
Composition and Size:

RISER PIPE
Type: PVC
Diameter: 2"
Total Length (TOC to TOS):
Ventilated Cap (Y / N)

GROUT
Composition and Proportions: Type II cement w/ 5% Bentonite powder
Tremied (Y (N))
Interval BGS: 0.0-1.0' Bgs

CENTRALIZERS
Depth(s) N/A

SEAL
Type: Bentonite Pellets
Source: BAROID
Setup / Hydration Time: 24 hrs Vol. Fluid Added
Tremied (Y (N))

FILTER PACK
Type: #10 SAND
Amt. Used: 5 bags
Tremied (Y (N))
Source:
Gr. Size Dist.:

SCREEN
Type: PVC
Diameter: 2"
Slot Size and Type: 0.010
Interval BGS:

SILT TRAP (Y (N))
Interval BGS: Length
Bottom Cap (Y (N))

BACKFILL PLUG
Material:
Setup / Hydration Time:
Tremied (Y / N)

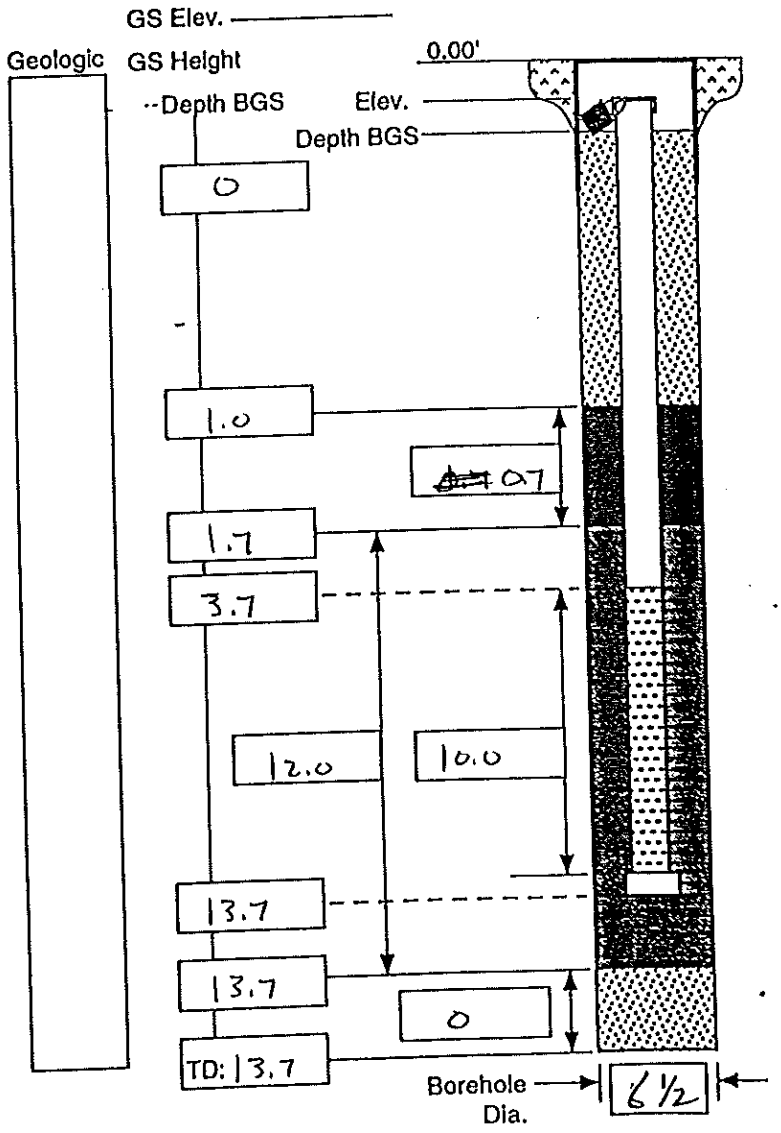
Form

EARTH TECH

28

Monitoring Well Construction Log - Flush Mount

Project Name: HAAF Bulk Fuel	Project Number: 34872-95.22	Date: 1/11/00
Well Location: Bulk Fuel	Well ID: MW-06	Sheet 1 of 1
Driller: Richard Mooney	Borehole Diameter (in): 6½"	Total Depth (ft): 13.7
Drilling Agency: Alliance Environmental	Date Started: 1/11/00	Depth to Water (ft): 3.4
Drilling Equipment: Mobile B-59	Date Finished: 1/12/00	Elevation and Datum:
Drilling Method: SS/HSA	Logged by: K.E. Owens	Checked by:
Drilling Fluid: N/A	Number of Samples: 2	Date:



PROTECTIVE CSG
Material / Type:
Diameter:
Depth BGS: Weep Hole (Y / N)

GUARD POSTS (Y / N)
No.: Type:

SURFACE PAD
Composition and Size:

RISER PIPE
Type: PVC
Diameter: 2"
Total Length (TOC to TOS):
Ventilated Cap (Y / N)

GROUT
Composition and Proportions: Type II Cement w/ 5% Bentonite powder
Tremied (Y / N)
Interval BGS: 0.0-1.0' BGS

CENTRALIZERS
Depth(s) N/A

SEAL
Type: Bentonite Pellets
Source: BAROID
Setup / Hydration Time: 24 hrs Vol. Fluid Added
Tremied (Y / N)

FILTER PACK
Type: #10 SAND
Amt. Used: 5 bags
Tremied (Y / N)
Source:
Gr. Size Dist.:

SCREEN
Type: PVC
Diameter: 2"
Slot Size and Type: 0.010
Interval BGS:

SILT TRAP (Y / N)
Interval BGS: Length
Bottom Cap (Y / N)

BACKFILL PLUG
Material:
Setup / Hydration Time:
Tremied (Y / N)

APPENDIX C

WELL DEVELOPMENT LOGS

Well Develo[illegible]ent/Purge Log

Project Name _____ Project No. _____

PID/FID Readings _____ (Ambient) _____ (Well Mouth)

Static Levels 3.4 (9.7) (Product) _____ (Water)

Pump ☐ /Bail ☐ Rate _____ Total Gal. Extracted _____

Water Column Length 11.2 Well Volumes Extracted _____

Disposition of Discharge Water Demand

Specific Capacity _____ (gpm/ft. drawdown) After _____ Hrs.

Well Information

Number MW-1

Location Bulk Fuel

Datum _____

Elev. Datum Point _____

Ground Elev. _____

Well Diameter 2"

Well Depth 14.6

Well Material PVC

Equipment Information

Bailer No. _____

Pump No. _____

Interface Probe No. _____

Sounder No. _____

pH Meter No. _____

Conductivity Meter No. _____

Thermometer No. _____

Time (24 hr.)	Flow Rate (gpm)	Water Temp. In C°	pH	Cond. µmhos/cm	Dissolved Oxygen mg/l	Turbidity NTU	Settleable Solids (ml)	Gallons Dev./Purge Before Meas.	Water Level (feet)	Remarks (e.g. water clarity)
1310		15.3°	7.70	.674	1.86	246		0	3.4	
1315		~~17.8~~ 17.3	7.66	~~.621~~ .621	1.32	999		3		
1320		17.4°	7.72	.625	1.67	10		15		
1325		17.9	7.50	.640	1.71	10		16		
1334		17.9	7.57	.634	1.69	10		17	3.4	

Notes: 1 ft length of 4" = 0.087 ft3 or 0.65 gal

1 ft length of 2" = 0.022 ft 3 or 0.16 gal

Recorded By _____ Date _____

Checked By _____ Date _____

Form F-1003
7/15/92

20.0
5.4
14.6

C1

30

Well Develo[illegible]ent/Purge Log

Project Name _____ Project No. _____

PID/FID Readings _____ (Ambient) _____ (Well Mouth)

Static Levels 2.94 _____ (Product) _____ (Water)

Pump ☐ /Bail ☐ Rate 1l (96 gal) Total Gal. Extracted _____

Water Column Length _____ Well Volumes Extracted _____

Disposition of Discharge Water _____

Specific Capacity _____ (gpm/ft. drawdown) After _____ Hrs.

Well Information

Number MW-2

Location BULK FUEL

Datum _____

Elev. Datum Point _____

Ground Elev. _____

Well Diameter 2"

Well Depth ~~15~~ 15.94

Well Material PVC

Equipment Information

Bailer No. _____

Pump No. _____

Interface Probe No. _____

Sounder No. _____

pH Meter No. _____

Conductivity Meter No. _____

Thermometer No. _____

Time (24 hr.)	Flow Rate (gpm)	Water Temp. In C°	pH	Cond. µmhos/cm	Dissolved Oxygen mg/l	Turbidity NTU	Settleable Solids (ml)	Gallons Dev./Purge Before Meas.	Water Level (feet)	Remarks (e.g. water clarity)
1010		14.8°C	7.98	.300	.168	999		0	2.94	GRAY
1015		17.3°C	7.58	.361	.166	999		1		
1020		17.4°C	7.71	.368	1.05	838		2		
1025		18.4	7.53	.355	1.75	999		3		
1030		20.1	7.66	.363	1.76	287		4		
1035		19.5	7.58	.366	1.70	235		5		
1040		18.6	7.66	.364	1.68	10		6		
1045		20.1°C	7.55	.358	1.45	706		7		
1050		18.9	7.57	.361	1.25	119		8		
1055		18.8	7.67	.355	1.90	193		9		
1110		19.8	7.57	.355	2.04	458		19		
1125		19.8	7.56	.358	1.95	10		34		
1130		19.8	7.60	.352	2.09	10		35		
1135		19.8	7.57	.359	2.12	10		36		

Notes: 1 ft length of 4" = 0.087 ft3 or 0.65 gal

1 ft length of 2" = 0.022 ft 3 or 0.16 gal

Recorded By _____ Date _____

Checked By _____ Date _____

Form F-1003
7/15/92

C-2

Well Develop[illegible]ent/Purge Log

Page ___ of ___

Project Name _____ Project No. _____

PID/FID Readings _____ (Ambient) _____ (Well Mouth)

Static Levels 3.4 (Product) _____ (Water)

Pump ☐ /Bail ☐ Rate _____ Total Gal. Extracted _____

Water Column Length 11 (96 gal) Well Volumes Extracted _____

Disposition of Discharge Water _____

Specific Capacity _____ (gpm/ft. drawdown) After _____ Hrs.

Well Information

Number MW-3

Location Bulk Fuel

Datum _____

Elev. Datum Point _____

Ground Elev. _____

Well Diameter 2"

Well Depth 14.4

Well Material PVC

Equipment Information

Bailer No. _____

Pump No. _____

Interface Probe No. _____

Sounder No. _____

pH Meter No. _____

Conductivity Meter No. _____

Thermometer No. _____

Time (24 hr.)	Flow Rate (gpm)	Water Temp. In C°	pH	Cond. µmhos/cm	Dissolved Oxygen mg/l	Turbidity NTU	Settleable Solids (ml)	Gallons Dev./Purge Before Meas.	Water Level (feet)	Remarks (e.g. water clarity)
1000		17.2	8.00	.269	1.15	999		0	3.4	Gray
1015		18.0	7.81	.281	1.14	999		1		
1020		16.7	7.77	.281	1.16	999		2		
1025		18.2°C	7.63	.290	1.21	974		3		
1030		17.5°C	7.76	.299	1.64	384		4		
1035		16.5	7.64	.296	1.59	208		5		
1040		18.4°C	7.59	.297	1.44	80		6		
1045		18.6	7.61	.298	1.00	6		7		
1050		18.7	7.59	.295	1.09	10		8		
1055		18.9°C	7.55	.301	1.05	10		9	3.4	Slightly cloudy

Notes: 1 ft length of 4" = 0.087 ft3 or 0.65 gal

1 ft length of 2" = 0.022 ft 3 or 0.16 gal

Recorded By _____ Date _____

Checked By _____ Date _____

Form F-1003
7/15/92

C-3

24

Well Develop[illegible]ent/Purge Log

Page _____

Project Name _____ Project No. _____

PID/FID Readings _____ (Ambient) _____ (Well Mouth)

Static Levels 3.41 (Product) _____ (Water)

Pump ☐ /Bail ☐ Rate _____ Total Gal. Extracted _____

Water Column Length 11.19 (.98 gal) Well Volumes Extracted _____

Disposition of Discharge Water DRUMMED

Specific Capacity _____ (gpm/ft. drawdown) After _____ Hrs.

Well Information

Number MW-4
Location BULK FUEL
Datum _____
Elev. Datum Point _____
Ground Elev. _____
Well Diameter 2"
Well Depth 14.6'
Well Material PVC

Equipment Information

Bailer No. _____
Pump No. _____
Interface Probe No. _____
Sounder No. _____
pH Meter No. _____
Conductivity Meter No. _____
Thermometer No. _____

Time (24 hr.)	Flow Rate (gpm)	Water Temp. In C°	pH	Cond. µmhos/cm	Dissolved Oxygen mg/l	Turbidity NTU	Settleable Solids (ml)	Gallons Dev./Purge Before Meas.	Water Level (feet)	Remarks (e.g. water clarity)
0810		12°C	7.98	0.333	084	999		0	3.41	GRAY
0830		16°C	8.03	0.261	3.00	999		1		GRAY BROWN
0845		17°C	7.77	.256	2.41	999		2		LT GRAY
0852		19.2°C	7.75	.244	2.92	999		3		
0854		19.9°C	7.76	.240	3.74	999		4		
0900		19.4	7.77	.253	2.78	140		5		
0905		19.4	7.70	.253	2.74	144		6		
0910		19.4	7.74	.252	2.70	10		7		
0920		19.0	7.74	251	2.72	10		8		
0930		19.1	7.73	252	2.70	10		9	3.50	SLIGHTLY CLOUDY

C-4

Notes: 1 ft length of 4" = 0.087 ft3 or 0.65 gal

1 ft le[illegible] of 2" = 0.022 ft 3 or 0.16 gal

Recorded By _____ Date _____

Checked By _____ Date _____

Form F-1003
7/15/92

20.0
5.41 stick-up
14.6

MW

Well Development/Purge Log

Page ____

Project Name _____ Project No. _____

PID/FID Readings _____ (Ambient) _____ (Well Mouth)

Static Levels 2.2 _____ (Product) _____ (Water)

Pump ☐ /Bail ☐ Rate _____ Total Gal. Extracted _____

Water Column Length 12.6 (1.1) _____ Well Volumes Extracted _____

Disposition of Discharge Water DRUMMED

Specific Capacity _____ (gpm/ft. drawdown) After _____ Hrs.

Well Information

Number MW-5

Location BULK FUEL

Datum _____

Elev. Datum Point _____

Ground Elev. _____

Well Diameter 2"

Well Depth 14.8

Well Material PVC

Equipment Information

Bailer No. _____

Pump No. _____

Interface Probe No. _____

Sounder No. _____

pH Meter No. _____

Conductivity Meter No. _____

Thermometer No. _____

Time (24 hr.)	Flow Rate (gpm)	Water Temp. In C°	pH	Cond. µmhos/cm	Dissolved Oxygen mg/l	Turbidity NTU	Settleable Solids (ml)	Gallons Dev./Purge Before Meas.	Water Level (feet)	Remarks (e.g. water clarity)
0840		12°C	7.77	0.143	1.95	999		0	2.2	GRAY
0845		15°C	7.63	.130	2.46	943		1.1		GRAY
0850		15.4°C	7.63	.129	1.90	249		2.2		
0855		15.4°C	7.78	.128	1.82	95		3.3		
0900		15.3°C	7.71	.130	1.82	10		4.4		
0905		15.5°C	7.63	.128	1.86	10		5.5		
0910		15.6°C	7.61	129	1.85	10		6.6	2.2	SLIGHTLY CLOUDY

Notes: 1 ft length of 4" = 0.087 ft3 or 0.65 gal

1 ft length of 2" = 0.022 ft 3 or 0.16 gal

Recorded By _____ Date _____

Checked By _____ Date _____

Form F-1003
1/15/92

20.0
5.2
14.8
- 2.2
12.6

C-5

Well Development/Purge Log

Page ___ of ___

Project Name _____ Project No. _____

PID/FID Readings _____ (Ambient) _____ (Well Mouth)

Static Levels 3.4 (0.9) (Product) _____ (Water)

Pump ☐ /Bail ☐ Rate _____ Total Gal. Extracted _____

Water Column Length 10.3 Well Volumes Extracted _____

Disposition of Discharge Water Drummed

Specific Capacity _____ (gpm/ft. drawdown) After _____ Hrs.

Well Information

Number MW-6

Location Bulk Fuel

Datum _____

Elev. Datum Point _____

Ground Elev. _____

Well Diameter 2"

Well Depth 13.7'

Well Material PVC

Equipment Information

Bailer No. _____

Pump No. _____

Interface Probe No. _____

Sounder No. _____

pH Meter No. _____

Conductivity Meter No. _____

Thermometer No. _____

Time (24 hr.)	Flow Rate (gpm)	Water Temp. In C°	pH	Cond. µmhos/cm	Dissolved Oxygen mg/l	Turbidity NTU	Settleable Solids (ml)	Gallons Dev./Purge Before Meas.	Water Level (feet)	Remarks (e.g. water clarity)
1305		16.7	8.17	1.23	1.96	984	Ø	~~34~~ 0	3.4	
1315		18.6	7.77	.982	1.38	999	~~3~~	3		
1330		18.9	7.61	1.17	2.22	10		15		
1335		19.1	7.58	1.17	2.20	10		16		
1339		19.1	7.58	1.18	2.03	10		17		

Notes: 1 ft length of 4" = 0.087 ft3 or 0.65 gal

1 ft length of 2" = 0.022 ft 3 or 0.16 gal

Recorded By _____ Date _____

Checked By _____ Date _____

Form F-1003
7/15/92

C-6

APPENDIX D

ANALYTICAL RESULTS

LAUCKS TESTING LABORATORIES
940 S. Harney
Seattle, WA 98108

ABBREVIATIONS

Several abbreviations can appear in our reports. The most commonly employed abbreviations are as follows:

U The analyte of interest was not detected to the limit of detection indicated.

SDL Sample Detection Limit. The SDL can vary from sample to sample, depending on sample size, matrix interferences, moisture content and other sample-specific conditions.

PQL Practical Quantitation Limit. The limit is drawn from the test method and usually represents the SDL multiplied by a matrix-specific factor.

DB Dry Basis. The value reported has been back-calculated to normalize for the moisture content of the sample.

AR As-Received. The value has not been normalized for moisture.

ORGANIC ANALYSES:

B When used in relation to organics fractions, the "B" flag indicates the analyte of interest was detected in the method blank associated with the sample, as well as in the sample itself. The "B" flag is applied without regard to the relative concentrations detected in the blank and sample.

J The analyte of interest was detected below the routine reporting limit. This value should be regarded as an estimate.

T The flagged values represent the SUM of two co-eluting compounds. The SUM of these two values is shown as though it were a result for each of them. The two figures should not be added together.

E The flagged value was reported from an analysis which exceeded the linear range of the instrument. See additional comments for further discussion of the circumstances. Values so flagged should be considered estimates.

D The value reported derives from analysis of a diluted sample of sample extract.

P When a dual column GC technique is employed, this flag indicates that test results from the two columns differ by more than 25%. Generally, we report the higher value.

C The flagged analyte has been confirmed by GC/MS analysis. The value reported may be derived from either the initial of confirmatory (GC/MS) analysis. See specific report comments for details.

CRQL Client Requested Quantitation Limit, usually the limit of detection specified at your request. Might also be referred to as Contract Required Quantitation Limit.

LAUCKS TESTING LABORATORIES
940 S. Harney
Seattle, WA 98108

RELEASE OF DATA

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature."

Respectfully submitted,

Jenna Gorham
Project Manager

23 Feb 2000
(DATE)

Mike Nelson
Technical Director

23 Feb 2000
(DATE)

HOW TO CONTACT US:

All Laucks Testing Laboratories staff members can be reached at the same telephone and facsimile numbers: (206) 767-5060 by phone, (206) 767-5063 by FAX.

REQUESTS FOR DUPLICATE COPIES:

This packet has been checked for accuracy. All pages are present and in sequential order. Please see Attachment B for a detailed record.

In the event that duplicate data copies are needed, Laucks will accommodate your request at a fee of twenty-five cents ($0.25) per copy, plus shipping. If the data are in storage, there will also be a fee for retrieval.

ANALYTICAL DATA VALIDATION FLAGGING CODES

Holding Times

A01 Extraction holding times were exceeded.
A02 Extraction holding times were grossly exceeded.
A03 Analysis holding times were exceeded.
A04 Analysis holding times were grossly exceeded.
A05 Samples were not preserved properly.
A06 Professional judgment was used to qualify the data.
A07 Sample reanalyzed outside two times the holding time.

GC/MS Tuning

B01 Mass calibration was in error, even after applying expanded criteria.
B02 Mass calibration was not performed every 12 hours.
B03 Mass calibration did not meet ion abundance criteria.
B04 Professional judgment was used to qualify the data.

Initial/Continuing Calibration-Organics

C01 Initial calibration RRF was less than 0.05.
C02 Initial calibration RSD was greater than 30 percent.
C03 Initial calibration sequence was not followed as required.
C04 Continuing calibration RRF was less than 0.05.
C05 Continuing calibration %D was greater than 25 percent.
C06 Continuing calibration was not performed at the required frequency.
C07 Resolution criteria were not met.
C08 RPD criteria were not met.
C09 RSD criteria were not met.
C10 Retention time of compounds was outside windows.
C11 Compounds were not adequately resolved.
C12 Breakdown of endrin or DDT was greater than 20 percent.
C13 Combined breakdown of endrin/DDT was greater than 30 percent.
C14 Professional judgment was used to qualify the data.

Initial/Continuing Calibration-Inorganics

D01 ICV or CCV was not performed for every analyte.
D02 ICV recovery was above the upper control limit.
D03 ICV recovery was below the lower control limit.
D04 CCV recovery was above the upper control limit.
D05 CCV recovery was below the lower control limit.
D06 Standard curve was not established with the minimum number of standards.
D07 Instrument was not calibrated daily or each time the instrument was set UP
D08 Correlation coefficient was less than 0.995.
D09 Mid-range cyanide standard was not distilled.
D10 Professional judgement was used to qualify the data.

ICP and Furnace Requirements

E01 Interference check sample recovery was outside the control limit.
E02 Duplicate injections were outside the control limit.
E03 Post-digestion spike recovery was outside the control limit.
E04 MSA was required but not performed.
E05 Correlation coefficient was less thari 0.995.
E06 MSA spikes were not at the correct concentration.
E07 Serial dilution criteria were not met.
E08 Professional judgment was used to qualify the data.

Blanks

F01 Sample data were qualified as a result of the method blank.
F02 Sample data were qualified as a result of the field blank.
F03 Sample data were qualified as a result of the equipment rinsate.
F04 Sample data were qualified as a result of the trip blank.
F05 Gross contamination exists.
F06 Concentration of the contaminant was detected at a level below the CRQL.
F07 Concentration of the contaminant was detected at a level less than the action limit, but greater than the CRQL.
F08 Concentration of the contaminant was detected at a level that exceeds the action level.
F09 No laboratory blanks were analyzed.
F10 Blank had a negative value greater than 2 times the IDL.
F11 Blanks were not analyzed at required frequency.
F12 Professional judgment was used to qualify the data.

Surrogate Recovery

G01 Surrogate recovery was above the upper control limit.
G02 Surrogate recovery was below the lower control limit.
G03 Surrogate recovery was less than 10 percent.
G04 Surrogate recovery was zero.
G05 Surrogate recovery was not present.
G06 Professional judgment was used to qualify the data.
G07 Surrogate recovery was out for the lab blank.

Matrix Spike/Matrix Spike Duplicate

H01 MS/MSD recovery was above the upper control limit.
H02 MS/MSD recovery was below the lower control limit.
H03 MS/MSD recovery was less than 10 percent.
H04 MS/MSD pairs exceed the RPD limit.
H05 No action was taken on MS/MSD results.
H06 Professional judgment was used to qualify the data.

Matrix Spike

I01 MS recovery was above the upper control limit.
I02 MS recovery was below the lower control limit.
I03 MS recovery was less than 30 percent.
I04 No action was taken on MS data.
I05 Professional judgment was used to qualify the data.

Laboratory Duplicate

J01 Duplicate RPD/radiological DER was outside the control limit.
J02 Duplicate sample results were greater than 5 times the CRDL.
J03 Duplicate sample results were less than 5 times the CRDL.
J04 Professional judgment was used to qualify the data.
J05 Duplicate was not analyzed at the required frequency.

Internal Area Summary

K01 Area counts were outside the control limits.
K02 Extremely low area counts or performance was exhibited by a major drop off.
K03 IS retention time varied by more than 30 seconds.
K04 Professional judgment was used to qualify the data.

Pesticide Cleanup Checks

L01 Ten percent recovery was obtained during either check.
L02 Recoveries during either check were greater than 120 percent.
L03 GPC cleanup recoveries were outside the control limits.
L04 Florisil cartridge cleanup recoveries were outside the control limits.
L05 Professional judgment was used to qualify the data.

Target Compound Identification

M01 %D between the two GC columns was greater than 25%.
M02 Qualitative criteria were not met.
M03 Cross contamination occurred.
M04 Confirmatory analysis was not performed.
M05 No results were provided.
M06 Analysis occurred outside 12-hour GC/MS window.
M07 Professional judgment was used to qualify the data.
M08 The %D between the two pesticide/PCB column checks was greater than 25 percent.

Compound Quantitation and Reported CROLs

N01 Quantitation limits were affected by large off-scale peaks.
N02 MDLs reported by the laboratory exceeded corresponding CRQLs.
N03 Professional judgment was used to qualify the data.

Laboratory Control Samples

P01 LCS recovery was above upper control limit.
P02 LCS recovery was below lower control limit.
P03 LCS recovery was less than 50 percent.
P04 No action was taken on the LCS data.
P05 LCS was not analyzed at required frequency.
P08 Professional judgement was used to qualify the data.

Field Duplicate

Q01 No action was taken on the basis of field duplicate RPDs.
Q03 Duplicate sample results were greater than 5 times the CRDL.
Q04 Duplicate sample results were less than 5 times the CRDL.

Site: Bulk Fuel Facility (HAA-09), Facility Identificaton Number 9-025113,Hunter Army Airfield

SOIL

MW-01-01 0 to 2 FT

Collection Date: 1/11/2000 1:30:0
Lab ID: 0001212-07

	Result MG/KG	Qualifiers Lab	Qualifiers Data	Data Validation Code
8015 - DRO				
Diesel (C12-C24)	530		J	G01
	Result mg/Kg	**Qualifiers Lab**	**Qualifiers Data**	**Data Validation Code**
8015 - GRO				
Gasoline	440		J	G01
	Result UG/KG	**Qualifiers Lab**	**Qualifiers Data**	**Data Validation Code**
8270B-BTEX				
Benzene	3	U	U	
Ethylbenzene	9			
m,p-Xylene	3	U	U	
o-Xylene	3	U	U	
Toluene	3	U	U	
	Result ug/kg	**Qualifiers Lab**	**Qualifiers Data**	**Data Validation Code**
8310- PAH				
Acenaphthene	76	U	U	
Acenaphthylene	150	U	U	
Anthracene	86	P	J	G01, M01
Benzo(a)anthracene	740	DPX	J	G01, M01
Benzo(a)pyrene	7.6	U	U	
Benzo(b)fluoranthene	15	U	U	
Benzo(g,h,i)perylene	15	U	U	
Benzo(k)fluoranthene	7.6	U	U	
Chrysene	7.6	U	U	
Dibenzo(a,h)anthracene	15	U	U	
Fluoranthene	970	DPX	J	G01.M01
Fluorene	180	P	J	G01, M01
Indeno(1,2,3-cd)pyrene	7.6	U	U	
Naphthalene	76	U	U	
Phenanthrene	490	DX	J	G01
Pyrene	550	DPX	J	G01,M01

Site: Bulk Fuel Facility (HAA-09), Hunter Army Airfield
ID number 9- 025113

MW-01-02 2 to 4 FT Collection Date: 1/11/2000 1:40:0
Lab ID: 0001212-08

8015 - DRO	Result MG/KG	Qualifiers Lab	Qualifiers Data	Data Validation Code
Diesel (C12-C24)	1300	D	J	G01

8015 - GRO	Result mg/Kg	Qualifiers Lab	Qualifiers Data	Data Validation Code
Gasoline	6.1	U	U	

8270B-BTEX	Result UG/KG	Qualifiers Lab	Qualifiers Data	Data Validation Code
Benzene	3	U	U	
Ethylbenzene	3	U	U	
m,p-Xylene	3	U	U	
o-Xylene	3	U	U	
Toluene	3	U	U	

8310- PAH	Result ug/kg	Qualifiers Lab	Qualifiers Data	Data Validation Code
Acenaphthene	82	U	U	
Acenaphthylene	160	U	U	
Anthracene	290	P	J	G01,M01
Benzo(a)anthracene	2000	DPX	J	G01,M01
Benzo(a)pyrene	8.2	U	U	
Benzo(b)fluoranthene	40		J	G01
Benzo(g,h,i)perylene	16	U	U	
Benzo(k)fluoranthene	52	P	J	G01,M01
Chrysene	320	P	J	G01,M01
Dibenzo(a,h)anthracene	16	U	U	
Fluoranthene	3000	DPX	J	G01,M01
Fluorene	620	P	J	G01,M01
Indeno(1,2,3-cd)pyrene	8.2	U	U	
Naphthalene	300		J	G01
Phenanthrene	1500	DX	J	G01
Pyrene	1800	DPX	J	G01,M01

Site: Bulk Fuel Facility (HAA-09), Hunter Army Airfield
ID number 9- 025113

MW-01-03 0 to 1 FT Collection Date: 1/11/2000 1:30:0
Lab ID: 0001212-09

8015 - DRO	Result MG/KG	Qualifiers Lab	Qualifiers Data	Data Validation Code
Diesel (C12-C24)	230			

8015-GRO	Result mg/kg	Qualifiers Lab	Qualifiers Data	Data Validation Code
Gasoline	380		J	G01

8270B-BTEX	Result UG/KG	Qualifiers Lab	Qualifiers Data	Data Validation Code
Benzene	3	U	U	
Ethylbenzene	24		J	G01
m,p-Xylene	3	U	UJ	G01
o-Xylene	3	U	UJ	G01
Toluene	3	U	UJ	G01

8310- PAH	Result ug/kg	Qualifiers Lab	Qualifiers Data	Data Validation Code
Acenaphthene	80	U	U	
Acenaphthylene	150	U	U	
Anthracene	60	P	J	G01,M01
Benzo(a)anthracene	8	U	U	
Benzo(a)pyrene	8	U	U	
Benzo(b)fluoranthene	15	U	U	
Benzo(g,h,i)perylene	15	U	U	
Benzo(k)fluoranthene	8	U	U	
Chrysene	85	P	J	G01,M01
Dibenzo(a,h)anthracene	15	U	U	
Fluoranthene	660	DPX	J	G01,M01
Fluorene	130	P	J	G01,M01
Indeno(1,2,3-cd)pyrene	8	U	U	
Naphthalene	80	U	U	
Phenanthrene	310		J	G01
Pyrene	420	DPX	J	G01,M01

Site: Bulk Fuel Facility (HAA-09), Hunter Army Airfield
ID number 9- 025113

MW-02-01 0 to 2 FT Collection Date: 1/11/2000 1:05:0
Lab ID: 0001212-10

8015 - DRO	Result MG/KG	Qualifiers Lab	Qualifiers Data	Data Validation Code
Diesel (C12-C24)	29	U	U	

8015 - GRO	Result mg/Kg	Qualifiers Lab	Qualifiers Data	Data Validation Code
Gasoline	72		J	G01

8270B-BTEX	Result UG/KG	Qualifiers Lab	Qualifiers Data	Data Validation Code
Benzene	3	U	U	
Ethylbenzene	16			
m,p-Xylene	8			
o-Xylene	2	J	J	N01
Toluene	3	U	U	

8310- PAH	Result ug/kg	Qualifiers Lab	Qualifiers Data	Data Validation Code
Acenaphthene	79	U	U	
Acenaphthylene	150	U	U	
Anthracene	7.9000	U	U	
Benzo(a)anthracene	7.9000	U	U	
Benzo(a)pyrene	7.9000	U	U	
Benzo(b)fluoranthene	15	U	U	
Benzo(g,h,i)perylene	17			
Benzo(k)fluoranthene	7.9000	U	U	
Chrysene	7.9000	U	U	
Dibenzo(a,h)anthracene	15	U	U	
Fluoranthene	15	U	U	
Fluorene	7.9000	U	U	
Indeno(1,2,3-cd)pyrene	8.2			
Naphthalene	79	U	U	
Phenanthrene	7.9000	U	U	
Pyrene	7.9000	U	U	

Site: Bulk Fuel Facility (HAA-09), Hunter Army Airfield
ID number 9- 025113

MW-02-02 2 to 4 FT Collection Date: 1/11/2000 1:20:0
Lab ID: 0001212-11

8015 - DRO	Result MG/KG	Qualifiers Lab	Qualifiers Data	Data Validation Code
Diesel (C12-C24)	31	U	U	

8015 - GRO	Result mg/Kg	Qualifiers Lab	Qualifiers Data	Data Validation Code
Gasoline	70		J	G01

8270B-BTEX	Result UG/KG	Qualifiers Lab	Qualifiers Data	Data Validation Code
Benzene	3	U	U	
Ethylbenzene	3	U	U	
m,p-Xylene	3	U	U	
o-Xylene	3	U	U	
Toluene	3	U	U	

8310- PAH	Result ug/kg	Qualifiers Lab	Qualifiers Data	Data Validation Code
Acenaphthene	83	U	U	
Acenaphthylene	160	U	U	
Anthracene	8.3000	U	U	
Benzo(a)anthracene	8.3000	U	U	
Benzo(a)pyrene	8.3000	U	U	
Benzo(b)fluoranthene	16	U	U	
Benzo(g,h,i)perylene	16	U	U	
Benzo(k)fluoranthene	8.3000	U	U	
Chrysene	8.3000	U	U	
Dibenzo(a,h)anthracene	16	U	U	
Fluoranthene	16	U	U	
Fluorene	8.3000	U	U	
Indeno(1,2,3-cd)pyrene	8.3000	U	U	
Naphthalene	83	U	U	
Phenanthrene	8.3000	U	U	
Pyrene	8.3000	U	U	

Site: Bulk Fuel Facility (HAA-09), Hunter Army Airfield
ID number 9- 025113

MW-03-01 0 to 2 FT

Collection Date: 1/11/2000 10:45:
Lab ID: 0001212-12

	Result	Qualifiers		
8015 - DRO	MG/KG	Lab	Data	Data Validation Code
Diesel (C12-C24)	31	U	U	

	Result	Qualifiers		
8015 - GRO	mg/Kg	Lab	Data	Data Validation Code
Gasoline	1100		J	G01

	Result	Qualifiers		
8270B-BTEX	UG/KG	Lab	Data	Data Validation Code
Benzene	2	J	J	N01
Ethylbenzene	4500	D		
m,p-Xylene	17000	D		
o-Xylene	3	U	U	
Toluene	2	J	U	F03

	Result	Qualifiers		
8310- PAH	ug/kg	Lab	Data	Data Validation Code
Acenaphthene	83	U	U	
Acenaphthylene	160	U	U	
Anthracene	8.3000	U	U	
Benzo(a)anthracene	8.3000	U	U	
Benzo(a)pyrene	20	P	J	M01
Benzo(b)fluoranthene	16	U	U	
Benzo(g,h,i)perylene	16	U	U	
Benzo(k)fluoranthene	8.3000	U	U	
Chrysene	8.3000	U	U	
Dibenzo(a,h)anthracene	16	U	U	
Fluoranthene	16	U	U	
Fluorene	8.3000	U	U	
Indeno(1,2,3-cd)pyrene	30			
Naphthalene	83	U	U	
Phenanthrene	8.9			
Pyrene	8.3000	U	U	

Site: Bulk Fuel Facility (HAA-09), Hunter Army Airfield
ID number 9- 025113

MW-03-02 2 to 4 FT Collection Date: 1/11/2000 9:55:0
Lab ID: 0001212-13

	Result	Qualifiers		
8015 - DRO	MG/KG	Lab	Data	Data Validation Code
Diesel (C12-C24)	31	U	U	

	Result	Qualifiers		
8015 - GRO	mg/Kg	Lab	Data	Data Validation Code
Gasoline	100		J	G01

	Result	Qualifiers		
8270B-BTEX	UG/KG	Lab	Data	Data Validation Code
Benzene	2	J	J	N01
Ethylbenzene	180			
m,p-Xylene	3500	D		
o-Xylene	3	U	U	
Toluene	3	U	U	

	Result	Qualifiers		
8310- PAH	ug/kg	Lab	Data	Data Validation Code
Acenaphthene	83	U	U	
Acenaphthylene	160	U	U	
Anthracene	8.3000	U	U	
Benzo(a)anthracene	8.3000	U	U	
Benzo(a)pyrene	8.3000	U	U	
Benzo(b)fluoranthene	16	U	U	
Benzo(g,h,i)perylene	16	U	U	
Benzo(k)fluoranthene	8.3000	U	U	
Chrysene	8.3000	U	U	
Dibenzo(a,h)anthracene	16	U	U	
Fluoranthene	16	U	U	
Fluorene	8.3000	U	U	
Indeno(1,2,3-cd)pyrene	8.3000	U	U	
Naphthalene	83	U	U	
Phenanthrene	8.3000	U	U	
Pyrene	8.3000	U	U	

Site: Bulk Fuel Facility (HAA-09), Hunter Army Airfield
ID number 9- 025113

MW-03-03 2 to 4 FT — Collection Date: 1/11/2000 10:00: — Lab ID: 0001212-14

	Result	Qualifiers		
8015 - DRO	MG/KG	Lab	Data	Data Validation Code
Diesel (C12-C24)	31	U	U	
	Result	**Qualifiers**		
8015 - GRO	mg/Kg	Lab	Data	Data Validation Code
Gasoline	130		J	G01
	Result	**Qualifiers**		
8270B-BTEX	UG/KG	Lab	Data	Data Validation Code
Benzene	1	J	J	N01
Ethylbenzene	76			
m,p-Xylene	810	D		
o-Xylene	3	U	U	
Toluene	3	U	U	
	Result	**Qualifiers**		
8310- PAH	ug/kg	Lab	Data	Data Validation Code
Acenaphthene	83	U	U	
Acenaphthylene	160	U	U	
Anthracene	8.3000	U	U	
Benzo(a)anthracene	8.3000	U	U	
Benzo(a)pyrene	8.3000	U	U	
Benzo(b)fluoranthene	16	U	U	
Benzo(g,h,i)perylene	16	U	U	
Benzo(k)fluoranthene	8.3000	U	U	
Chrysene	8.3000	U	U	
Dibenzo(a,h)anthracene	16	U	U	
Fluoranthene	16	U	U	
Fluorene	8.3000	U	U	
Indeno(1,2,3-cd)pyrene	8.3000	U	U	
Naphthalene	83	U	U	
Phenanthrene	8.3000	U	U	
Pyrene	8.3000	U	U	

Site: Bulk Fuel Facility (HAA-09), Hunter Army Airfield
ID number 9- 025113

MW-04-01 0 to 2 FT

Collection Date: 1/11/2000 8:10:0
Lab ID: 0001212-15

	Result MG/KG	Qualifiers Lab	Qualifiers Data	Data Validation Code
8015 - DRO				
Diesel (C12-C24)	31	U	U	

	Result mg/Kg	Qualifiers Lab	Qualifiers Data	Data Validation Code
8015 - GRO				
Gasoline	20			

	Result UG/KG	Qualifiers Lab	Qualifiers Data	Data Validation Code
8270B-BTEX				
Benzene	3	U	U	
Ethylbenzene	3	U	U	
Fluoranthene	16	U	U	
m,p-Xylene	1	J	J	N01
o-Xylene	3	U	U	
Toluene	3	U	U	

	Result ug/kg	Qualifiers Lab	Qualifiers Data	Data Validation Code
8310- PAH				
Acenaphthene	84	U	U	
Acenaphthylene	160	U	U	
Anthracene	8.4	U	U	
Benzo(a)anthracene	8.4	U	U	
Benzo(a)pyrene	8.4	U	U	
Benzo(b)fluoranthene	25			
Benzo(g,h,i)perylene	16	U	U	
Benzo(k)fluoranthene	96	P	J	M01
Chrysene	8.4	U	U	
Dibenzo(a,h)anthracene	16	U	U	
Fluorene	8.4	U	U	
Indeno(1,2,3-cd)pyrene	8.4	U	U	
Naphthalene	84	U	U	
Phenanthrene	8.4	U	U	
Pyrene	8.4	U	U	

Site: Bulk Fuel Facility (HAA-09), Hunter Army Airfield
ID number 9- 025113

MW-04-02 2 to 4 FT

Collection Date: 1/11/2000
Lab ID: 0001212-16

	Result	Qualifiers		
8015 - DRO	MG/KG	Lab	Data	Data Validation Code
Diesel (C12-C24)	32	U	U	

	Result	Qualifiers		
8015 - GRO	mg/Kg	Lab	Data	Data Validation Code
Gasoline	30			

	Result	Qualifiers		
8270B-BTEX	UG/KG	Lab	Data	Data Validation Code
Benzene	4	U	U	
Ethylbenzene	4	U	U	
m,p-Xylene	4	U	U	
o-Xylene	4	U	U	
Toluene	4	U	U	

	Result	Qualifiers		
8310- PAH	ug/kg	Lab	Data	Data Validation Code
Acenaphthene	87	U	U	
Acenaphthylene	170	U	U	
Anthracene	8.7	U	U	
Benzo(a)anthracene	8.7	U	U	
Benzo(a)pyrene	8.7	U	U	
Benzo(b)fluoranthene	24			
Benzo(g,h,i)perylene	17	U	U	
Benzo(k)fluoranthene	8.7	U	U	
Chrysene	8.7	U	U	
Dibenzo(a,h)anthracene	17	U	U	
Fluoranthene	17	U	U	
Fluorene	8.7	U	U	
Indeno(1,2,3-cd)pyrene	8.7	U	U	
Naphthalene	87	U	U	
Phenanthrene	8.7	U	U	
Pyrene	8.7	U	U	

Site: Bulk Fuel Facility (HAA-09), Hunter Army Airfield
ID number 9- 025113

MW-05-01 0 to 2 FT Collection Date: 1/11/2000
Lab ID: 0001212-03

	Result MG/KG	Qualifiers Lab	Qualifiers Data	Data Validation Code
8015 - DRO				
Diesel (C12-C24)	390			
	Result mg/Kg	**Qualifiers Lab**	**Qualifiers Data**	**Data Validation Code**
8015 - GRO				
Gasoline	8.8000			
	Result UG/KG	**Qualifiers Lab**	**Qualifiers Data**	**Data Validation Code**
8270B-BTEX				
Benzene	4	U	U	
Ethylbenzene	4	U	U	
m,p-Xylene	2	J	J	N01
o-Xylene	4	U	U	
Toluene	4	U	U	
	Result ug/kg	**Qualifiers Lab**	**Qualifiers Data**	**Data Validation Code**
8310- PAH				
Acenaphthene	78	U	U	
Acenaphthylene	150	U	U	
Anthracene	7.8000	U	U	
Benzo(a)anthracene	7.8000	U	U	
Benzo(a)pyrene	7.8000	U	U	
Benzo(b)fluoranthene	15	U	U	
Benzo(g,h,i)perylene	23	P	J	M01
Benzo(k)fluoranthene	7.8000	U	U	
Chrysene	7.8000	U	U	
Dibenzo(a,h)anthracene	15	U	U	
Fluoranthene	40			
Fluorene	7.8000	U	U	
Indeno(1,2,3-cd)pyrene	7.8000	U	U	
Naphthalene	78	U	U	
Phenanthrene	7.8000	U	U	
Pyrene	92	P	J	M01

Site: Bulk Fuel Facility (HAA-09), Hunter Army Airfield
ID number 9- 025113

MW-05-02 2 to 4 FT

Collection Date: 1/11/2000 9:35:0
Lab ID: 0001212-04

8015 - DRO	Result MG/KG	Qualifiers Lab	Qualifiers Data	Data Validation Code
Diesel (C12-C24)	32	U	U	

8015 - GRO	Result mg/Kg	Qualifiers Lab	Qualifiers Data	Data Validation Code
Gasoline	12			

8270B-BTEX	Result UG/KG	Qualifiers Lab	Qualifiers Data	Data Validation Code
Benzene	4	U	U	
Ethylbenzene	4	U	U	
m,p-Xylene	4	U	U	
o-Xylene	4	U	U	
Toluene	1	J	U	F03

8310- PAH	Result ug/kg	Qualifiers Lab	Qualifiers Data	Data Validation Code
Acenaphthene	85	U	U	
Acenaphthylene	160	U	U	
Anthracene	8.5	U	U	
Benzo(a)anthracene	8.5	U	U	
Benzo(a)pyrene	8.5	U	U	
Benzo(b)fluoranthene	16	U	U	
Benzo(g,h,l)perylene	16	U	U	
Benzo(k)fluoranthene	240	P		M01
Chrysene	8.5	U	U	
Dibenzo(a,h)anthracene	16	U	U	
Fluoranthene	16	U	U	
Fluorene	8.5	U	U	
Indeno(1,2,3-cd)pyrene	8.5	U	U	
Naphthalene	85	U	U	
Phenanthrene	8.5	U	U	
Pyrene	8.5	U	U	

Site: Bulk Fuel Facility (HAA-09), Hunter Army Airfield
ID number 9- 025113

MW-06-01 0 to 2 FT

Collection Date: 1/11/2000 3:35:0
Lab ID: 0001212-05

	Result MG/KG	Qualifiers Lab	Qualifiers Data	Data Validation Code
8015 - DRO				
Diesel (C12-C24)	30	U	U	

	Result mg/Kg	Qualifiers Lab	Qualifiers Data	Data Validation Code
8015 - GRO				
Gasoline	6	U	U	

	Result UG/KG	Qualifiers Lab	Qualifiers Data	Data Validation Code
8270B-BTEX				
Benzene	3	U	U	
Ethylbenzene	3	U	U	
m,p-Xylene	3	U	U	
o-Xylene	3	U	U	
Toluene	3	U	U	

	Result ug/kg	Qualifiers Lab	Qualifiers Data	Data Validation Code
8310- PAH				
Acenaphthene	80	U	U	
Acenaphthylene	150	U	U	
Anthracene	8	U	U	
Benzo(a)anthracene	8	U	U	
Benzo(a)pyrene	8	U	U	
Benzo(b)fluoranthene	15	U	U	
Benzo(g,h,i)perylene	15	U	U	
Benzo(k)fluoranthene	8	U	U	
Chrysene	8	U	U	
Dibenzo(a,h)anthracene	15	U	U	
Fluoranthene	15	U	U	
Fluorene	8	U	U	
Indeno(1,2,3-cd)pyrene	8	U	U	
Naphthalene	80	U	U	
Phenanthrene	8	U	U	
Pyrene	8	U	U	

Site: Bulk Fuel Facility (HAA-09), Hunter Army Airfield
ID number 9- 025113

MW-06-02 2 to 4 FT

Collection Date: 1/11/2000 3:45:0
Lab ID: 0001212-06

	Result	Qualifiers		
8015 - DRO	MG/KG	Lab	Data	Data Validation Code
Diesel (C12-C24)	32	U	U	

	Result	Qualifiers		
8015 - GRO	mg/Kg	Lab	Data	Data Validation Code
Gasoline	6.3000	U	U	

	Result	Qualifiers		
8270B-BTEX	UG/KG	Lab	Data	Data Validation Code
Benzene	3	U	U	
Ethylbenzene	3	U	U	
m,p-Xylene	3	U	U	
o-Xylene	3	U	U	
Toluene	3	U	U	

	Result	Qualifiers		
8310- PAH	ug/kg	Lab	Data	Data Validation Code
Acenaphthene	85	U	U	
Acenaphthylene	160	U	U	
Anthracene	8.5	U	U	
Benzo(a)anthracene	8.5	U	U	
Benzo(a)pyrene	8.5	U	U	
Benzo(b)fluoranthene	16	U	U	
Benzo(g,h,i)perylene	16	U	U	
Benzo(k)fluoranthene	8.5	U	U	
Chrysene	8.5	U	U	
Dibenzo(a,h)anthracene	16	U	U	
Fluoranthene	16	U	U	
Fluorene	8.5	U	U	
Indeno(1,2,3-cd)pyrene	8.5	U	U	
Naphthalene	85	U	U	
Phenanthrene	8.5	U	U	
Pyrene	8.5	U	U	

Site: Bulk Fuel Facility (HAA-09), Hunter Army Airfield
ID number 9- 025113

WATER - QC SAMPLES

MW-01-ER

Collection Date: 1/11/2000 4:30:0
Lab ID: 0001212-01

8015 - DRO	Result mg/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Diesel (C12-C24)	0.25	U	U	

8015 - GRO	Result ug/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Gasoline	25	U	U	

8270B-BTEX	Result UG/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Benzene	1	U	U	
Ethylbenzene	1	U	U	
m,p-Xylene	1	U	U	
o-Xylene	1	U	U	
Toluene	0.6000	J	J	N01

8310- PAH	Result ug/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Acenaphthene	1.1000	U	U	
Benzo(a)pyrene	0.11	U	U	
Benzo(b)fluoranthene	0.21	U	U	
Benzo(g,h,i)perylene	0.21	U	U	
Benzo(k)fluoranthene	0.11	U	U	
Chrysene	0.11	U	U	
Dibenzo(a,h)anthracene	0.21	U	U	
Fluoranthene	0.21	U	U	
Fluorene	0.11	U	U	
Indeno(1,2,3-cd)pyrene	0.11	U	U	
Naphthalene	1.1000	U	U	
Phenanthrene	0.11	U	U	
Pyrene	0.11	U	U	

8310-PAH	Result ug/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Benzo(a)anthracene	0.11	U	U	

Site: Bulk Fuel Facility (HAA-09), Hunter Army Airfield
ID number 9- 025113

MW-05-02ER

Collection Date: 1/11/2000*
Lab ID: 0001212-02

8015 - DRO	Result mg/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Diesel (C12-C24)	0.25	U	U	

8015 - GRO	Result ug/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Gasoline	25	U	U	

8270B-BTEX	Result UG/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Benzene	1	U	U	
Ethylbenzene	1	U	U	
m,p-Xylene	1	U	U	
o-Xylene	1	U	U	
Toluene	0.8000	J	J	N01

8310- PAH	Result ug/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Anthracene	0.1000	U	U	
Benzo(a)anthracene	0.1000	U	U	
Benzo(a)pyrene	0.1000	U	U	
Benzo(b)fluoranthene	0.2000	U	U	
Benzo(g,h,i)perylene	0.2000	U	U	
Benzo(k)fluoranthene	0.1000	U	U	
Chrysene	0.1000	U	U	
Dibenzo(a,h)anthracene	0.2000	U	U	
Fluoranthene	0.2000	U	U	
Fluorene	0.1000	U	U	
Indeno(1,2,3-cd)pyrene	0.1000	U	U	
Naphthalene	1	U	U	
Phenanthrene	0.1000	U	U	
Pyrene	0.1000	U	U	

Site: Bulk Fuel Facility (HAA-09), Hunter Army Airfield
ID number 9- 025113

PW-1

Collection Date:
Lab ID:

	Result mg/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
8015 - DRO				
Diesel (C12-C24)	0.96			
	Result ug/L	**Qualifiers Lab**	**Qualifiers Data**	**Data Validation Code**
8015 - GRO				
Gasoline	140			
	Result UG/L	**Qualifiers Lab**	**Qualifiers Data**	**Data Validation Code**
8270B-BTEX				
Benzene	0.9			
Ethylbenzene	1.8			
m,p-Xylene	3			
o-Xylene	0.6000	J	J	N01
Toluene	1.3			
	Result ug/L	**Qualifiers Lab**	**Qualifiers Data**	**Data Validation Code**
8310- PAH				
Benzo(a)anthracene	0.1000	U		
Benzo(a)pyrene	0.1000	U		
Benzo(b)fluoranthene	0.21	U		
Benzo(g,h,i)perylene	0.21	U		
Benzo(k)fluoranthene	0.1000	U		
Dibenzo(a,h)anthracene	0.21	U		
Fluorene	0.2800	P		
Indeno(1,2,3-cd)pyrene	0.1000	U		
Naphthalene	2.2000			
Phenanthrene	0.2700	P		
Pyrene	0.1000	U		
	Result ug/L	**Qualifiers Lab**	**Qualifiers Data**	**Data Validation Code**
8310-PAH				
Anthracene	0.1000	U		
Chrysene	0.1000	U		
Fluoranthene	0.21	U		

Site: Bulk Fuel Facility (HAA-09), Hunter Army Airfield
ID number 9- 025113

SW-1

Collection Date:
Lab ID:

8015 - DRO	Result mg/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Diesel (C12-C24)	0.25	U		

8015 - GRO	Result ug/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Gasoline	25	U		

8270B-BTEX	Result UG/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Benzene	1	U		
Ethylbenzene	1	U		
m,p-Xylene	1	U		
o-Xylene	1	U		
Toluene	1	U		

8310- PAH	Result ug/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Anthracene	0.11	U		
Benzo(a)anthracene	0.11	U		
Benzo(a)pyrene	0.11	U		
Benzo(b)fluoranthene	0.22	U		
Benzo(k)fluoranthene	0.11	U		
Chrysene	0.11	U		
Dibenzo(a,h)anthracene	0.22	U		
Fluorene	0.11	U		
Indeno(1,2,3-cd)pyrene	0.11	U		
Naphthalene	1.1000	U		
Phenanthrene	0.2000			
Pyrene	0.11	U		

8310-PAH	Result ug/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Benzo(g,h,i)perylene	0.22	U		
Fluoranthene	0.22	U		

Site: Bulk Fuel Facility (HAA-09), Hunter Army Airfield
ID number 9- 025113

TB-01 — Collection Date: 1/11/2000 4:35:0 — Lab ID: 0001212-17

8015 - GRO	Result ug/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Gasoline	25	U	U	

8270B-BTEX	Result UG/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Benzene	1	U	U	
Ethylbenzene	1	U	U	
m,p-Xylene	1	U	U	
o-Xylene	1	U	U	
Toluene	1	U	U	

TB-3 — Collection Date: — Lab ID:

8015 - GRO	Result ug/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Gasoline	25	U		

8270B-BTEX	Result UG/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Benzene	1	U		
Ethylbenzene	1	U		
m,p-Xylene	1	U		
o-Xylene	1	U		
Toluene	1	U		

WATER - QC SAMPLES - QC SA

MW-01-ER — Collection Date: 1/11/2000 4:30:0 — Lab ID: 0001212-01

8310- PAH	Result ug/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Acenaphthylene	2.1	U	U	
Anthracene	0.11	U	U	

Site: Bulk Fuel Facility (HAA-09), Hunter Army Airfield
ID number 9- 025113

MW-05-02ER — Collection Date: 1/11/2000* — Lab ID: 0001212-02

8310- PAH	Result ug/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Acenaphthene	1	U	U	
Acenaphthylene	2	U	U	

PW-1 — Collection Date: — Lab ID:

8310- PAH	Result ug/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Acenaphthene	1	U		
Acenaphthylene	2.1	U		

SW-1 — Collection Date: — Lab ID:

8310- PAH	Result ug/L	Qualifiers Lab	Qualifiers Data	Data Validation Code
Acenaphthene	1.1000	U		
Acenaphthylene	2.2000	U		