

**UST 94013 ATEC** 

Technical Report Underground Storage Tank Closure UST Nos. 0038 - 0040 Buildings 2519, 2520, 2686 Fort Devens, Massachusetts

ATEC File: 37.07.91.00451 Contract No. DAK31-91-D-0015

JST 94013 ATTE

Prepared for:

United States Army
Directorate of Contracting
Building 227
Fort Devens, Massachusetts

Attn: Mr. Steven Dijack,

Contracting Officer

January 14, 1994

Janauary 14, 1994

Mr. Steven Dijack, Contracting Officer United States Army Directorate of Contracting Building 227 Fort Devens, Massachusetts 01433-5340

RE: Technical Report

Underground Storage Tank Closure

UST Nos. 0038 - 0040 Fort Devens, Massachusetts ATEC File: 37.07.91.00451

Mr. Dijack:

Attached is Volume 9 of the Technical Report by ATEC Associates, Inc. (ATEC), detailing the closure of three underground storage tanks (UST) referenced as UST Nos. 0038 - 0040, located at Fort Devens, Massachusetts (the site). The Technical Report covers work conducted under Contract No. DAKF31-91-D-0015 as part of Removal of Underground Storage Tanks in the New England Area, US Army Project No. EQ-19027-9P.

ATEC appreciates the opportunity to be of service in this matter. If you have any questions or comments, please do not hesitate to contact our office.

Kerry R. Tull, P.G.

Senior Project Manager

Sincerely,

ATEC Associates, Inc.

Matthew M. Sonne

Environmental Scientist

Ronald Lawson

Assistant Vice President and District Manager

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# UST Nos. 0038 - 0040

# Building Nos. 2519, 2520, 2686

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# UNDERGROUND STORAGE TANK INDEX

<u>UST No.</u>	<u>SIZE (gal)</u>	<u>PRODUCT</u>	LOCATION
0038	1,000	Number 2 Fuel Oil	Building 1605, Fort Devens, MA
0039	1,000	Number 2 Fuel Oil	Building 1666, Fort Devens, MA
0040	1,000	Number 2 Fuel Oil	Building 2290, Fort Devens, MA

### TECHNICAL REPORT

Volume 9

UST Nos. 0038 - 0040

# United States Army Fort Devens, Massachusetts

ATEC Project No. 37.07.91.00451

### 1.0 INTRODUCTION

This volume (Volume 9) of the Technical Report details the removal of three underground storage tanks (USTs) referenced as UST Nos. 0038 - 0040 for the United States Army, located at various buildings, Fort Devens, Massachusetts (the site). The Technical report covers work conducted under Contract No. DAKF31-91-D-0015 as part of Removal of Underground Storage Tanks in the New England Area, United States Army Project No. EQ-19027-9P.

The basic Project Work Scope of Contract No. DAKF31-91-D-0015 included:

- Excavation and removal of 69 USTs at various buildings located at Fort Devens, Massachusetts and USTs at various locations around New England.
- Remedial excavation and disposal of contaminated soil.
- Hydrogeological services to include installation of monitoring wells, sampling and analysis of soil/groundwater, and determination of groundwater flow direction.
- Backfilling and surface restoration of excavations.
- Preparation of a Technical Report to include assimilation of information gathered, major findings, and conclusions.

### 2.0 UST No. 0038

### 2.1 POST REMOVAL REPORT

### 2.1.1 Introduction

This Post-Removal Report details the results of the closure of one 1,000-gallon, single wall, steel, underground storage tank (UST) referenced as UST No. 0038, located at property known as Building 2519, Fort Devens, Massachusetts (the site). The purpose of the closure was to excavate the UST and evaluate the potential for the presence of oil and hazardous material at the site. The closure of this UST was conducted on January 21, 1992.

The basic Project Work Scope included:

- Procurement/administration of all federal, state and local permits, manifests, regulations, etc., associated with UST system closure.
- Excavating, venting, cleaning, transporting, and disposing of one 1,000-gallon UST by appropriately licensed contractors/facilities.
- Disposal of residual UST materials at a licensed facility.
- Field screening and analysis of soil from the excavation by Photoionization Detector (PID) and field analyzed with a portable Non-Dispersive Infrared (NDIR) analyzer, to identify evidence of the release of oil and hazardous materials from the UST, if any.
- Laboratory Analysis of soil sampled from the UST excavation by a USEPA certified laboratory for Total Petroleum Hydrocarbons (TPH) (USEPA Method 418.1).
- Preparation of a Technical Report, to include assimilation of information gathered, major findings and conclusions.

Building Building 2520

NOTE: BASED ON FIEID ESTIMATES". SHALL NOT BE RELIED WPON AS EXACT MEASUREMENTS.

# **UST LOCATION PLAN**

1,000 gallon UST relative to: Building 2519 Fort Devens, Massachusetts PROJECT: 37.07.91.00451

NOT TO SCALE

FIGURE: 2.1



### 2.1.2 Underground Storage Tank Excavation and Removal

On January 21, 1992, one 1,000-gallon, subsurface, No. 2 fuel oil, storage tank was excavated and removed from the site. The UST was located adjacent to the north side of Building 2519 (see Figure 2.1, UST Location Plan). Topography on the site is level with a slightly upgradient slope approximately 100 feet southeast of the site.

Soils in the excavation consisted primarily of medium-brown, fine sand with some medium to coarse gravel, cobbles, and boulders. The tank was covered by 1.5 feet of soil and the bottom of the excavation was 5.5 feet below grade. Groundwater was not encountered within the excavation. All excavated soils required to free the tank appeared visibly contaminated. Soil removed from above the tank appeared visibly stained. Within the excavation, soil was observed to be grossly contaminated with a strong petroleum odor.

The associated piping was drained and tank connections were removed. UST No. 0038 was estimated to contain approximately 48 gallons of No. 2 fuel oil and residuals. Approximately 13 gallons of fuel oil were removed from the tank on January 7, 1992 and transported to a licensed Treatment Storage Disposal Facility (T.S.D.F.) (Beede Waste Oil Corporation, Plainstow, New Hampshire). Approximately 35 gallons of fuel oil and residuals were removed and drummed on January 21, 1992 for disposal at a later date. Drummed material was disposed at Beede Waste Oil Corporation on February 27, 1992. See Section 2.10 for copies of the appropriate Hazardous Waste Manifests.

Tank openings were then capped and the tank was removed from the excavation. Upon excavation and removal, the tank was observed to be in fair condition with no holes or perforations. Some surficial to moderate rusting of the tank was noted and the fill pipe was observed to be broken at the connection with the tank. Following venting of the tank, an access way was cut in the end of the tank to allow entry for cleaning. The tank was then entered and vacuumed/wiped clean of any residual materials.

The scrap tank was removed from the site on January 21, 1992 and transported to the Contractor's yard located on Lake George Street, Fort Devens for temporary storage. The tank was disposed at Tombarello & Sons, located in Lawrence, Massachusetts, a licensed Massachusetts tank yard, on January 28, 1992. A copy of the disposal receipt is included in Section 2.11, Permits and Certifications.

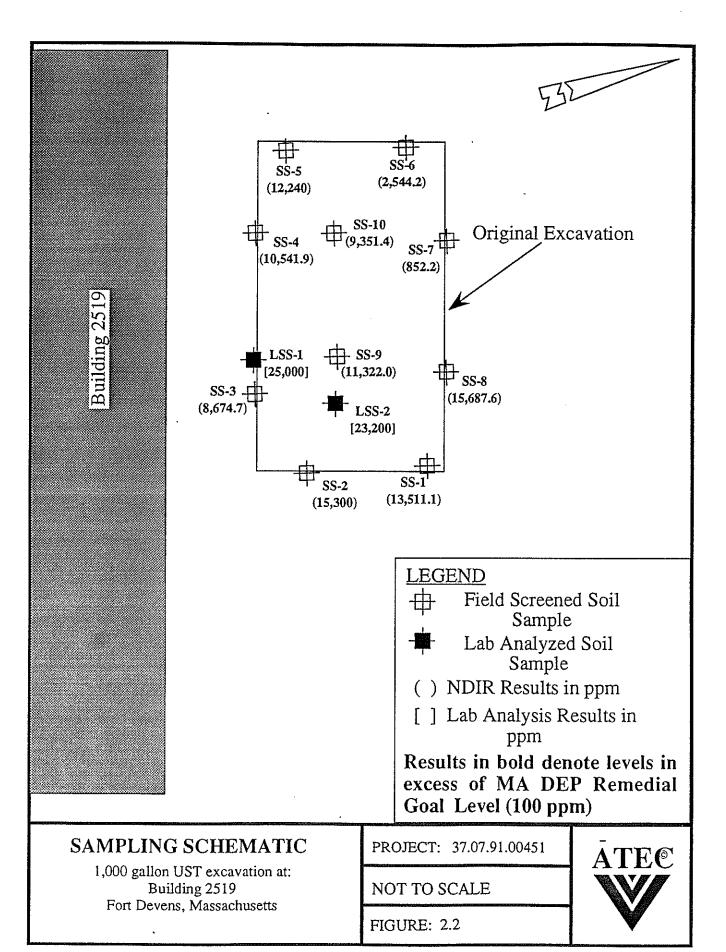
### 2.1.3 Sampling and Analysis Plan

Ten soil samples were obtained from the excavation for field screening with a Photoionization Detector (PID) and field analyzed with a Non-Dispersive Infrared (NDIR) analyzer. The PID field screening for Total Organic Vapors (TOVs) was conducted with an HNu photoionizer utilizing the jar headspace screening procedures outlined in the Hazardous Materials Containment Plan. The NDIR field screening for Total Petroleum Hydrocarbons (TPH) was conducted with a Horiba OCMA 220, utilizing the procedures outlined in the Hazardous Materials Containment Plan.

Eight of the samples (SS-1 to SS-8) were obtained from the excavation walls at a depth of 2.5 to 3.5 feet below grade. Two of the samples (SS-9 and SS-10) were obtained from the bottom of the excavation at a depth of 5.5 feet below grade. Two composite soil samples (Stock-1 and Stock-2) were obtained from stockpiled soils for PID and NDIR field screening.

Two soil samples (LSS-1 and LSS-2) were obtained from the excavation for laboratory analysis. Soil sample LSS-1 was obtained from the south wall of the excavation at a depth of 2.5 to 3.5 feet below grade. Soil sample LSS-2 was obtained from the bottom of the excavation. One composite soil sample (LSS-3) was obtained from stockpiled soils required to free the tank. These samples were analyzed for TPH utilizing USEPA Method 418.1.

Sampling locations are depicted on the Sampling Schematic as Figure 2.2. The



appropriate chain of custodies are included in Section 2.9, Chain of Custody Forms.

### 2.1.4 Analytical Results

The results from analysis with the PID and the NDIR analyzer of the ten soil samples obtained from the excavation, and the two composite samples obtained from stockpiled soil are as follows:

TABLE 2.1 - PID AND NDIR RESULTS

SAMPLE NUMBER	PID (ppm TOV)	NDIR (ppm TPH)
SS-1	132	13,511.1
SS-2	66.0	15,300.0
SS-3	146	8,674.7
SS-4	60.0	10,541.9
SS-5	31.0	12,240.0
SS-6	3.4	2,544.2
SS-7	61.0	852.2
SS-8	76.0	15,687.6
SS-9	91.0	11,322.0
SS-10	52.0	9,351.4
Stock-1	. 64.0	5,370.5
Stock-2	75.0	5,105.9

N.D. = None Detected

Laboratory analytical results of the two soil samples obtained from the excavation revealed TPH concentrations of 25,000 ppm for LSS-1 and 23,200 ppm for LSS-2. Laboratory analysis of the one soil sample obtained from the stockpiled soils revealed a TPH concentration of 4,750 ppm for LSS-3 (see Section 2.8, Laboratory Analytical Results).

### 2.1.5 Conclusions and Recommendations

As presented in ATEC's Post Removal Report dated February 21, 1992, ATEC's conclusions are as follows:

Upon excavation and removal, the tank was observed to be in fair condition with no holes or perforations. Some moderate rusting was noted, and the fill pipe was observed to be broken at the connection with the tank.

Groundwater was not encountered within the excavation.

Excavated soils required to free the tank appeared visibly contaminated. Soils located within the excavation were observed to be stained and had a strong petroleum odor.

Ten soil samples were obtained from the excavation for field screening and field analysis utilizing a PID and NDIR analysis respectively. PID readings revealed TOV concentrations ranging from 3.4 ppm to 146 ppm. NDIR results revealed TPH concentrations ranging from 852.2 ppm to 15,687.6 ppm.

Two soil samples were obtained from the excavation for laboratory analysis for TPH utilizing USEPA Method 418.1. Analytical results for LSS-1 obtained from the south wall of the excavation revealed a TPH concentration of 25,000 ppm. Analytical results for LSS-2 obtained from the bottom of the excavation revealed a TPH concentration of 23,200 ppm.

One composite soil sample (LSS-3) was obtained from stockpiled soils for laboratory analysis. Analytical results for LSS-3 revealed a TPH concentration of 4,750 ppm.

Based on these findings, ATEC recommended the following:

Conduct remedial excavation until background levels of <100 ppm TPH by laboratory analysis are attained. Field screening of soil should be conducted during excavation utilizing a PID until background levels of <1 ppm are attained prior to obtaining samples for laboratory analysis, where applicable.

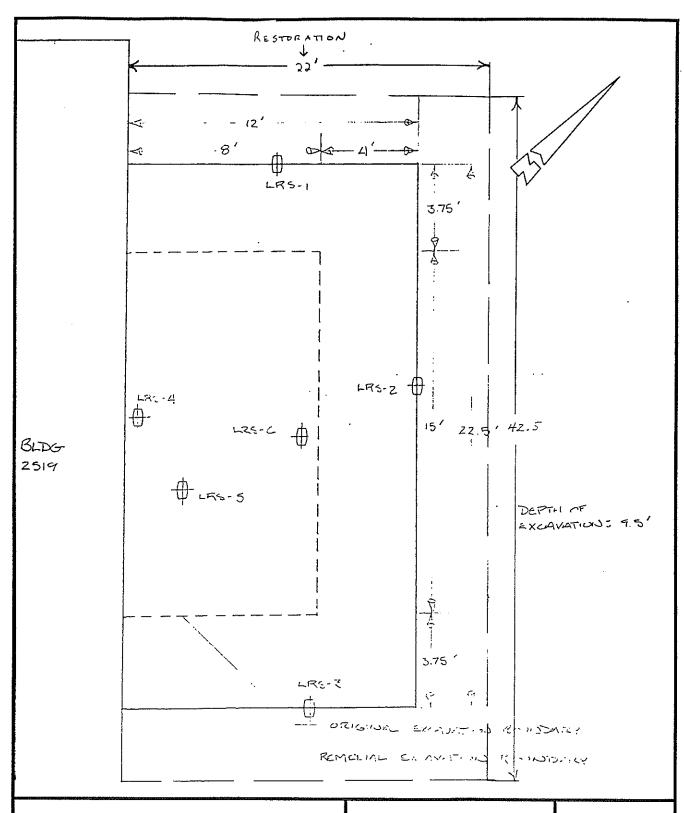
Advance soil borings and install groundwater monitoring wells to determine the vertical and horizontal extent of contamination. Continuous split spoon soil sampling and analysis will be conducted utilizing field analysis techniques, i.e. PID and NDIR analysis and laboratory analysis to document soil contamination levels as specified in the Hazardous Waste Containment Plan.

Stockpiled soils should be laboratory analyzed for VOCs, PCBs, 13 TCLP Metals, flashpoint, corrosivity, sulfide reactivity, and cyanide reactivity for disposal classification.

### 2.2 SITE REMEDIATION AND CONTAMINATED SOIL DISPOSAL

### 2.2.1 Site Remediation

Following review of field screening and laboratory analytical results, additional excavation to remove contaminated soil and to reach background levels by PID (<1 ppm) was conducted per order of the Contracting Officer's Representative and David Salvadore of the Massachusetts Department of Environmental Protection (DEP). Approximately 114.67 tons of contaminated soil were removed from the excavation floor and the north, west, and east sidewalls during remedial excavation on July 31, 1992. Excavation of the south wall could not be conducted due to potential structural and safety concerns. The estimated volume of soil removed was calculated from field drawings produced during the removal and remediation of UST No. 0038 (see Remedial Excavation Plan, Figure 2.3).



# REMEDIAL EXCAVATION PLAN

1,000 gallon UST relative to: Building 2519 Fort Devens, Massachusetts PROJECT: 37.07.91.00451

NOT TO SCALE

FIGURE: 2.3



Six soil samples (RSS-1 to RSS-6) were obtained from the post-remedial excavation for PID field screening. RSS-1 to RSS-4 were obtained from the side walls at a depth of approximately 4 to 5 feet below grade. RSS-5 and RSS-6 were obtained from the bottom of the excavation, approximately 9.5 feet below grade. Due to the severe weather conditions during this period, the PID readings were considered non-representative of normal conditions. Therefore, Mr. Salvadore requested that the data not be used.

Weather conditions, however, do not alter laboratory testing results. Therefore, all six soil samples (LRS-1 to LRS-6) were laboratory analyzed for TPH utilizing modified USEPA Method 418.1. One of the samples (LRS-6) was additionally tested for VOCs (USEPA Method 8240) and 13 Metals by Toxicity Characteristic Leachate Procedure (TCLP) (USEPA Method 6010), (See Table 2.2; Figure 2.2, Sampling Schematic; and Section 2.8, Laboratory Results).

TABLE 2.2 - LABORATORY ANALYSIS

SAMPLE NUMBER	TPH (ppm)	VOAs (ppb)	13 TCLP METALS (ppm)	LOCATION
LRS-1	14	NA	NA	west sidewall (4-5' depth)
LRS-2	ND	NA	NA	north sidewall (4-5' depth)
LRS-3	3,090	NA	NA east sidewall (4-5' depth)	
LRS-4	736	NA	NA south sidewall (4-5' depth)	
LRS-5	179	NA	NA bottom (9.5' depth)	
LRS-6	ND	ND	0.61 (Zn) bottom (9.5' depth)	

LRS = Laboratory Remediation Sample

ND = Not Detected Above Method Reporting Limit

NA = Not Applicable

### 2.2.2 Soil Stratigraphy

The soil stratigraphy of the excavation varied with the depth of the excavation. Soil consisted of coarse gravel fill material from grade level to a depth of approximately 2 feet below grade. From 2 to 9 feet below grade, soil consisted of sand and fine to coarse gravel. The remaining 6 inches (9 to 9.5 feet below grade) of the excavation consisted of clay (see Figure 2.4, Soil Stratigraphy).

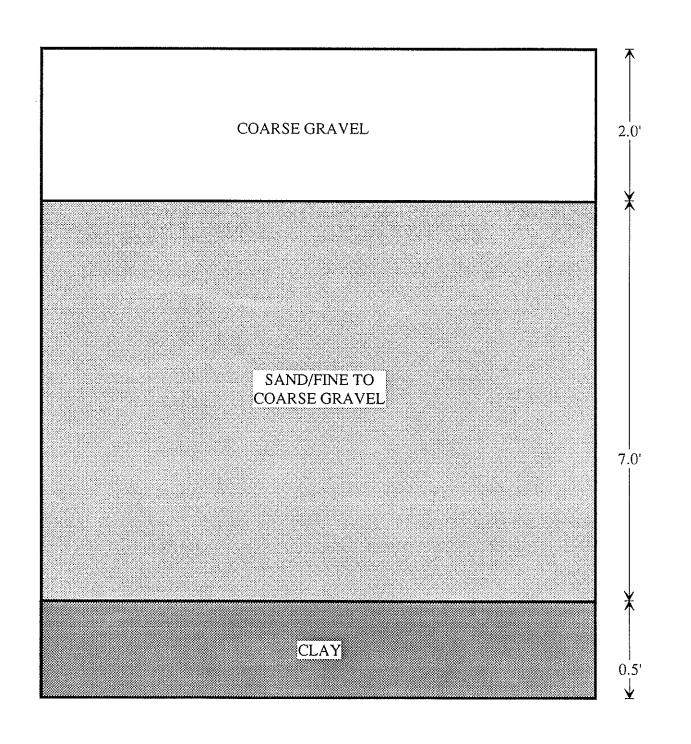
### 2.2.3 Contaminated Soil Disposal

Prior to disposal, contaminated soil was laboratory analyzed for disposal classification purposes. One composite soil sample (LSP-38) was obtained from stockpiled soil associated with the removal of the UST No. 0038 and the additional excavation conducted at the site. Laboratory analyses were performed for VOCs, Semi-volatile Organic Compounds, 13 Metals by Toxicity Characteristic Leachate Procedure (TCLP), Polychlorinated Biphenyls (PCBs), reactive sulfide, reactive cyanide, flashpoint, and corrosivity for characterization and disposal purposes. Laboratory analytical results revealed 7.6 standard units (S.U.) for Corrosivity (pH), 1.0 ppm Lead, 0.05 ppm Copper, and 0.30 ppm Zinc. All other analytical results were below the Method Reporting Limits.

Approximately 45.5 tons of No. 2 fuel oil contaminated soil was removed and stockpiled during the remediation of the excavation. Contaminated soil was disposed for recycling at Trimount Bituminous Products Company, Shrewsbury, Massachusetts.

### 2.3 HYDROGEOLOGICAL SERVICES

Hydrogeological services were not performed relative to UST No. 0038.



# **SOIL STRATIGRAPHY**

1,000 gallon UST Excavation Building 2519 Fort Devens, Massachusetts PROJECT: 37-07-91-00451

UST No. 0038

FIGURE 2.4



### 2.4 BACKFILL

The excavation was lined with polyethylene plastic sheeting and backfilled with approximately 93 cubic yards of uncontaminated fill material on July 31, 1992. Backfilling was conducted with the approval of the Contracting Officer's Representative and the DEP.

### 2.5 SITE RESTORATION

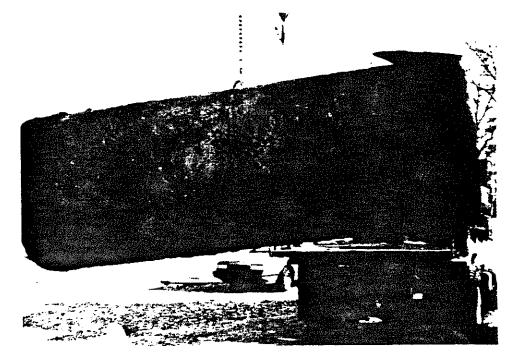
Following backfill of the excavation, approximately 144 square feet of loam was distributed over the excavated area.

# 2.6 PHOTOGRAPHIC DOCUMENTATION

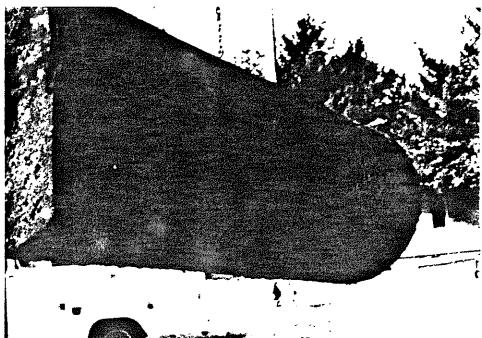
The following photographs are of the removed UST from the excavation and a post removal view of the excavation.

- A-1: One side of removed tank.
- A-2: Opposite side of removed tank.
- A-3: Excavation as viewed from west, facing east.
- A-4: Excavation as viewed from east, facing west.

A-1



A-2



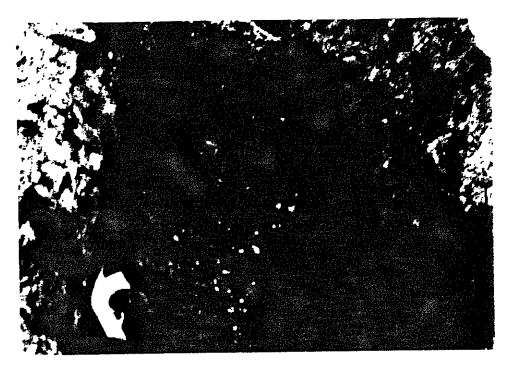
# PHOTO DOCUMENTATION

1,000 gallon UST excavation at:
Building 2519
Fort Devens, Massachusetts

PROJECT: 37.07.91.07451



A-3



A-4



# PHOTO DOCUMENTATION

1,000 gallon UST excavation at:
Building 2519
Fort Devens, Massachusetts

PROJECT: 37.07.91.07451



# 2.7 OCMA 220 DATA SHEETS

The following information was organized from the data collected from the Non-Dispersive Infrared analyzer.

### I PH SOIL ANALYSES BY NON-DISPERSIVE INFRAPED ANALYZER - MODIFIED EPA STANDARD TEST METHOD 418.1

PROJECT NAME, NUMBER, TANK: U.S. ARMY - FORT DEVENS 37.07.91.451 UST 0038

DATE: Jan 24, 1992

OPERATOR: RICHARD W.GERMAN

### CALIBRATION DATA

TYPE	first re	ADING	SECOND R	EAD DIG	THIRD RE	ADING	SPAN
CALBRATION	DITTAL	FINAL	INTIAL.	FINAL	<u>INITIAL</u>	FINAL	<u>CHECK</u>
77. F			4 1			2.2	00.0
ZERO:	1.5	n'n	<u>-1.1</u>	9,0	0.8	<u> </u>	30.9
SPAN:	0.08	40.0	44.3	40.0	40.4	40.0	
ZCRO:	6.5	0.0	-7.0	0.0	-0.6	0.0	

### ANALYTICAL DATA

Sample	WEIGH	T [F]	1:t DILUTIO	NRATIO (ml)	and DILUTE.	H RATIO [ml]	DISTRUME	T RESULIS	[prin]	CONCENTRATION
NUMBER	GROSS	TARE	F-113	SAMPLE	F-113	SAMPLE	1st	211	<u>3r4</u>	mgil
STOCK-1	85.2	79.1	20.0	<u> </u>		· ·	51.8	52.0		5370,5
STOCK-2	81.9	73,3	20.0	1.0	20.0	0.5	60.0	35.5	35.7	<u>5105.9</u>
\$8-1	81,5	<u>75 0</u>	20,0	0.5	25,0	0.5	68.0	57.2	57.4	13511.1
88-2	82.0	75.9	20,0	0.5	25,0	0.5	69.0	60.8	61.0	15300.0
88-8	87.2	76.3	25.0	0.5			62.1	61.8		9674.7
\$8.4	84.8	75.2	25.0	0.5			63.3	62.7		10541.9
885	83.0	76.3	<u>25.0</u>	0.5			56,0	54.0	53.6	12240.0
884	85.4	78.1	20.0	0.5			16.5	15.0	<u>L5.1</u>	2544.2
88.7	83.5	75,4	20.0	0.5		-	5.4	5,6		852.2
<u> </u>	33.5	76.0	20.0	0.5	25.0	0,5	116.4	77.5	76,9	15687.6
88.9	83.5	<u>76 1</u>	<u>25.u</u>	0,5			55.7	55.5		11322.0
\$\$.10	83.4	76.1	20,0	0.5			<u>55.6</u>	<u>55 5</u>		9351.4
	***************************************	**************************************								"Enor*
### ##################################	##\$##\$1# #4 - 4.0% 15/8 John 16/8 16/8 16/8 16/8 16/8		provided and analysis of			****				#Enor*

### 2.8 LABORATORY ANALYTICAL RESULTS

The following laboratory analytical reports were organized and provided by Environmental Science Services Inc. Results are included for:

- LSS-1, LSS-2, and LSS-3: Soil samples obtained from original excavation.
   Laboratory analyzed for TPH.
- LRS-1, LRS-2, LRS-3, LRS-4, LRS-5, LRS-6: Soil samples obtained from Postremedial excavation. Laboratory analyzed for TPH. LRS-6 was also analyzed for VOCs, and 13 Metals by TCLP.
- LSP-38: Soil sample obtained from stockpiled soil for disposal classification.
   Laboratory analyzed for VOCs, Semi-volitile Organics, 13 Metals by TCLP,
   PCBs, reactive sulfide, reactive cyanide, flashpoint and corrosivity for characterization and disposal purposes.



# CERTIFICATE OF ANALYSIS

Date: 2/03/92 Job: 215

Account: 95659 Received: 1/25/92

Project: DEVENS-TANK 38

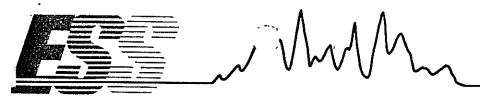
ATEC ENVIRONMENTAL CO. 62 Accord Park Drive Norwell, MA 02061

tn: Mr. Mark Baldi

:

ample umber	Method Number	Parameter	Result	Unit	Sample Description
021501	EPA-160.3 EPA-418.1	Total Solids TPH/IR (Dry Wt.)	84 25000	% mg/kg	LSS1
021502	EPA-160.3 EPA-418.1	Total Solids TPH/IR (Dry Wt.)	85 23200	% mg/kg	LSS2
021503	EPA-160.3 EPA-418.1	Total Solids TPH/IR (Dry Wt.)	89 4750	% mg/kg	LSS3

Laboratory Manager



# **JERTIFICATE OF ANALYSIS**

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-38 ESS Sample ID: 921528-11

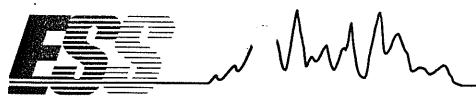
Date Sample Received: 6/11/92 Date Reported: 7/1/92

Parameter	R	esults	Units	MRL	Method
pH (Corrosivity)		7.6	s.u.	N/A	9045
Flashpoint	No :	Flash	°F	200	1010
Polychlorinated Biphenyls		ND	mg/Kg	Attached	8080
Reactive Cyanide		ND	mg/Kg	2	7.3.3.2
Reactive Sulfide		ND	mg/Kg	2	7.3.4.1
Semivolatile Organics		ND	ug/Kg	Attached	8270
Volatile Organics		ND	ug/Kg	Attached	8240
Toxicity Characteristic Leaching Metals	Pro	cedure			1311
Lead Copper Zinc		1.0 0.05 0.30	mg/L mg/L mg/L	Attached Attached Attached	6010 6010 6010

N/A = Not Applicable

ND = Not Detected above Method Reporting Limit (MRL)

Laboratory Director



# CERTIFICATE OF ANALYSIS

### POLYCHLORINATED BIPHENYLS Method 8080

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-38 ESS Sample ID: 921528-11

Date Sample Received: 6/11/92 Date Reported: 6/30/92

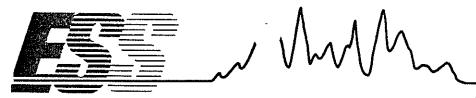
Parameter	Result (mg/Kg)	MRL
Arochlor 1016	ND	0.1
Arochlor 1221	ND	0.1
Arochlor 1232	ND	0.1
Arochlor 1242	ND	0.1
Arochlor 1248	ND	0.1
Arochlor 1254	ND	0.2
Arochlor 1260	ND	0.2

ND = Not Detected above Method Reporting Limit (MRL)

Surrogate Recovery Data	% Recovery	QC Limit
Dibutylchlorendate	88%	50 - 150%

David Dickinson Laboratory Director





# CERTIFICATE OF ANALYSIS

### ACID EXTRACTABLES EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-38 ESS Sample ID: 921528-11

Date Sample Received: 6/9/92 Date Reported: 7/1/92

Parameter	Result (ug/Kg)	MRL	
2-Chlorophenol	ND	1,670	
2-Nitrophenol	ND	1,670	
Phenol	ND	1,670	
2,4-Dimethylphenol	ND	1,670	
2,4-Dichlorophenol	ND	1,670	
2,4-Dinitrophenol	ND	8,350	
Pentachlorophenol	<b>N</b> D	8,350	
4-Nitrophenol	ND	8,350	
2,4,6-Trichlorophenol	ND	1,670	
2,4,5-Trichlorophenol	ND	8,350	
2-Methylphenol	ND	1,670	
4-Methylphenol	ND	1,670	
4-Chloro-3-Methylphenol	ND	1,670	
4,6-Dinitro-2-Methylphenol	ND	8,350	

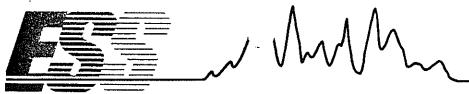
ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

Dávíd Dickinson Laboratory Director Date:

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# CERTIFICATE OF ANALYSIS

### BASE NEUTRAL EXTRACTABLES **EPA 8270**

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-38 ESS Sample ID: 921528-11

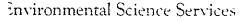
Date Sample Received: 6/9/92 Date Reported: 7/1/92

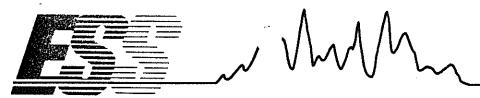
Parameter	Result (ug/Kg)	MRL
Acenaphthylene	ND	1,670
1,2,4-Trichlorobenzene	ND	1,670
Hexachlorobenzene	ND	1,670
Bis(2-chloroethyl)ether	ND	1,670
2-Chloronaphthalene	ND	1,670
1,2-Dichlorobenzene	ND	1,670
1,3-Dichlorobenzene	ND	1,670
1,4-Dichlorobenzene	ND	1,670
3,3-Dichlorobenzidine	ND	3,340
2,4-Dinitrotoluene	ND	1,670
2,6-Dinitrotoluene	ND	1,670
Fluoranthene	ND	1,670
4-Chlorophenyl phenyl ether	ND	1,670
Bis(2-chloroisopropyl) ether	ND	1,670
Bis(2-chloroethoxy) methane	ND	1,670
Hexachlorobutadiene	ND	1,670
Hexachlorocyclopentadiene	ND	1,670
Isophorone	ND	1,670
Naphthalene	ND	1,670
Nitrobenzene	ND	1,670
N-nitrosodiphenylamine	ND	1,670
N-nitrosodi-n-propylamine	ND	1,670
Bis(2-ethylhexyl)phthalate	ND	1,670
Di-n-butylphthalate	ND	1,670
Di-n-octylphthalate	ND	1,670
Diethyl phthalate	ND	1,670
Dimethyl phthalate	ND	1,670
Benzo(a)anthracene	, ND	1,670

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson Laboratory Director





### CERTIFICATE OF ANALYSIS

### BASE NEUTRAL EXTRACTABLES cont. EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-38 ESS Sample ID: 921528-11

Date Sample Received: 6/9/92 Date Reported: 7/1/92

Parameter	Result (ug/Kg)	MRL	
Benzo(a)pyrene	ND	1,670	
Benzo(b)fluoranthene	ND	1,670	
Benzo(k)fluoranthene	ND	1,670	
Chrysene	ND	1,670	
Acenaphthene	. ND	1,670	
Anthracene	ND	1,670	
Benzo(ghi)perylene	ND	1,670	
Fluorene	ND	1,670	
Phenanthrene	· <b>N</b> D	1,670	
Dibenzo(a,h)anthracene	<b>N</b> D	1,670	
Indeno(1,2,3-cd)pyrene	<b>N</b> D	1,670	
Pyrene	ND	1,670	
Hexachloroethane	ND	1,670	
4-Bromophenyl-phenylether	ND	1,670	
Benzyl Alcohol	ND	1,670	
Benzoic Acid	ND	8,350	
Bis(2-Chloroethoxy)methane	ND	1,670	
4-Chloroaniline	ND	1,670	
2-Methylnaphthalene	ND	1,670	
2-Nitroaniline	ND	8,350	
3-Nitroaniline	ND	1,670	
Dibenzofuran	ND	1,670	
4-Nitroaniline	ND	8,350	
Butylbenzylphthalate	ND .	1,670	

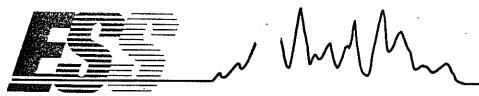
ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

pavid Dickinson/ Laboratory Director Date:

085





# CERTIFICATE OF ANALYSIS

# TCL VOLATILE ORGANICS Method 8240

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-38 ESS Sample ID: 921528-11

Date Sample Received: 6/29/92 Date Reported: 7/1/92

• • • • • • • • • • • • • • • • • • •		
Parameter	Result (ug/Kg)	MRL
Methylene Chloride	ND	1,000
1,1-Dichloroethane	ND	1,000
Chloroform	ND	1,000
Carbon Tetrachloride	ND	1,000
1,2-Dichloropropane	ND	1,000
Dibromochloromethane	ND	1,000
1,1,2-Trichloroethane	ND	1,000
Tetrachloroethene	ND	1,000
Chlorobenzene	ND	1,000
1,2-Dichloroethane	ND	1,000
1,1,1-Trichloroethane	ND	1,000
Bromodichloromethane	ND	1,000
Trans-1,3-Dichloropropene	ND	1,000
Bromoform	ND	1,000
1,1,2,2-Tetrachloroethane	ND	1,000
Benzene	ND	1,000
Toluene	ND	1,000
Ethyl Benzene	ND	1,000
Chloromethane	ND	1,000
Bromomethane	ND	1,000
Vinyl Chloride	ND	1,000
Chloroethane	ND	1,000
1,1-Dichloroethene	ND	1,000
1,2-Dichloroethene (Total)	ND	1,000
Trichloroethene	ND	1,000
Acetone	ND	1,000
Carbon Disulfide	ND	1,000
2-Butanone	ND	1,000
Cis-1,3-Dichloropropene	ND	1,000
4-Methyl-2-Pentanone	ND	1,000
2-Hexanone	ND	1,000
Styrene	. ND	1,000
Xylenes (Total)	ND	1,000

ND = Not Detected above Method Reporting Limit (MRL)

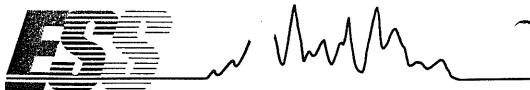
Approved by: \_\_\_\_\_\_\_\_ David Dickinson

Laboratory Director

Date:

030

Environmental Science Services



### CERTIFICATE OF ANALYSIS

### TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

#### **METALS**

#### EPA METHOD 1311

Client: ATEC Environmental Consultants

Date Sampled: 6/9/92

Client Project ID: Stockpiled Soils

Date TCLP Performed: 6/22/92

Client Sample ID: LSP-38

Date Leachate Extracted: 6/23/92

ESS Sample ID: 921528-11

Date Extract Analyzed: 6/24/92

	Act	Actual		Adjusted*	
Target Analyte	Sample Result (mg/L)	Method Reporting Limit	Sample Result (mg/L)	Method Reporting Limit	
Antimony	ND	0.1	ND	0.2	
Arsenic	ND	0.2	ND	0.2	
Cadmium	ND	0.02	ND	0.02	
Chromium	. ND	0.05	ND	0.05	
Lead	1.0	0.1	1.0	0.1	
Mercury	ND	0.005	ND	0.005	
Selenium	ND	0.3	ND	0.3	
Silver	ND	0.05	ND	0.09	
Copper	0.04	0.02	0.05	0.03	
Nickel	ND	0.04	ND	0.04	
Zinc	0.30	0.02	0.30	0.02	
Beryllium	ND	0.02	ND	0.04	
Thallium	ND	0.05	ND	0.09	

<sup>\*</sup> Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson Laboratory Director Date:

037





# CERTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants

Client Project ID: UST 38, Bldg. 2519

Client Sample ID: LRS-1

Date Sample Received: 8/3/92

ESS Project ID: 921997

ESS Sample ID: 921997-01

Date Reported: 8/17/92

Parameter	Results	Units	MRL	Method
Percent Solids	84	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	14	mg/Kg	12	418.1

TPHIR reported on a dry weight basis

MRL = Method Reporting Limit

Approved by:

David Dickinson Laboratory Director Date: /72

001



ESS Project ID: 921997

## **LERTIFICATE OF ANALYSIS**

Client: ATEC Environmental Consultants

Client Project ID: UST 38, Bldg. 2519

Client Sample ID: LRS-2 ESS Sample ID: 921997-02

Date Sample Received: 8/3/92 Date Reported: 8/17/92

Parameter	Results	Units	MRL	Method
Percent Solids	. 88	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	ND	mg/Kg	11	418.1

TPHIR reported on a dry weight basis

ND = Not Detected above the Method Reporting Limit(MRL)

Approved by:

Laborator Director



## CERTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants

Client Project ID: UST 38, Bldg. 2519

Client Sample ID: LRS-3

Date Sample Received: 8/3/92

ESS Project ID: 921997

ESS Sample ID: 921997-03

Date Reported: 8/17/92

Parameter	Results	Units	MRL	Method
Percent Solids	88	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	3,090	mg/Kg	114	418.1

TPHIR reported on a dry weight basis

MRL = Method Reporting Limit

David Dickinson Laboratory Director





ESS Project ID: 921997

## CERTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants

Client Project ID: UST 38, Bldg. 2519

Client Sample ID: LRS-4 ESS Sample ID: 921997-04

Date Sample Received: 8/3/92 Date Reported: 8/17/92

Parameter	Results	Units	MRL	Method
Percent Solids	95	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	736	mg/Kg	11	418.1

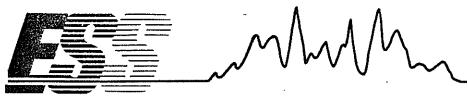
TPHIR reported on a dry weight basis

MRL = Method Reporting Limit

Approved by:

Laboratory Director





## CERTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants

Client Project ID: UST 38, Bldg. 2519

Client Sample ID: LRS-5

Date Sample Received: 8/3/92

ESS Project ID: 921997

ESS Sample ID: 921997-05

Date Reported: 8/17/92

Parameter	Results	Units	MRL	Method
Percent Solids	89	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	179	mg/Kg	11	418.1

TPHIR reported on a dry weight basis

MRL = Method Reporting Limit

Approved by:

David Dickinson Laboratory Director Date:







ESS Project ID: 921997

## CERTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants

Client Project ID: UST 38 Bldg. 2519

Client Sample ID: LRS-6 ESS Sample ID: 921997-06

Date Sample Received: 8/3/92 Date Reported: 8/17/92

Parameter	Results	Units	MRL	Method
Percent Solids	93	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	ND	mg/Kg	11	418.1
Volatile Organics	ND	ug/Kg	Attached	8260
Toxicity Characteristic Leaching	Procedure			1311
Metals Zinc	0.61	mg/L	Attached	6010

TPHIR reported on dry weight basis

ND = Not Detected above the Method Reporting Limit(MRL)

Approved by:

pavie pickrison

Laboratory Director

Date: //





# CERTIFICATE OF ANALYSIS TCL VOLATILE ORGANICS Method 8260

Client: ATEC Environmental Consultants

Client Project ID: UST# 38 ESS Project ID: 921997 Client Sample ID: LRS-6 ESS Sample ID: 921997-06

Date Sample Received: 8/3/92 Date Reported: 8/17/92

Parameter	Result (ug/Kg)	MRL
Methylene Chloride	ND	5
1,1-Dichloroethane	ND	
Chloroform	ND	5 <sub>.</sub> 5
Carbon Tetrachloride	ND	5
1,2-Dichloropropane	ND	5 5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Tetrachloroethene	ND	5 5
Chlorobenzene	ND	5
1,2-Dichloroethane	ND	5
1,1,1-Trichloroethane	ND	5
Bromodichloromethane	ND	5
Trans-1,3-Dichloropropene	ND	5 5
Bromoform	ND	5
1,1,2,2-Tetrachloroethane	ND	5
Benzene	ND	5 5 5
Toluene	ND	5
Ethyl Benzene	ND	5
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl Chloride	ND	10
Chloroethane	ND	10
1,1-Dichloroethene	ND	5
1,2-Dichloroethene (Total)	ND	5 5
Trichloroethene	ND	5
Acetone	ND	10
Carbon Disulfide	ND	5
2-Butanone	ND	10
Cis-1,3-Dichloropropene	ND	5
4-Methyl-2-Pentanone	ND	10
2-Hexanone	ND	10
Styrene	ND	5
Xylenes (Total)	, ND	10

ND = Not Detected above Method Reporting Limit (	MRL)

Approved by:

Laboratory Director

Date: ///252





## CERTIFICATE OF ANALYSIS

## TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

#### **METALS**

#### EPA METHOD 1311

Client: ATEC Environmental Consultants

Date Sampled: 7/31/92

Client Project ID: UST# 38

Date TCLP Performed: 8/6/92

Client Sample ID: LRS-6

Date Leachate Extracted: 8/7/92

ESS Sample ID: 921997-06

Date Extract Analyzed: 8/10/92

	Act	ual	Adjı	ısted*
Target Analyte	Sample Result (mg/L)	Method Reporting Limit	Sample Result (mg/L)	Method Reporting Limit
Antimony	ND	0.2	ND	0.3
Arsenic	ND	0.2	ND	0.2
Cadmium	ND	0.02	ND	0.03
Chromium	ND	0.05	ND	0.05
Lead	ND	0.1	ND	0.1
Mercury	ND	0.005	ND	0.005
Selenium	ND	0.3	ND	0.3
Silver	ND	0.05	ND	0.07
Copper	ND	0.02	ND	0.02
Nickel	ND	0.04	ND	0.04
Zinc	0.61	0.02	0.61	0.02
Beryllium	ND	0.02	ND	0.03
Thallium	ND	0.3	ND	0.4

<sup>\*</sup> Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson Laboratory Director

Date: // // /552



## 2.9 CHAIN OF CUSTODY FORMS

The following chain of custody forms were produced for the soil samples which were laboratory analyzed.

## **CHAIN OF CUSTODY RECORD**

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37.07.45 CLIENT

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#### 2.10 HAZARDOUS WASTE MANIFEST

UST No. 0038 was estimated to contain approximately 48 gallons of No. 2 fuel oil and residuals. Approximately 13 gallons of fuel oil were removed from the tank on January 7, 1992 and transported to a licensed Treatment Storage Disposal Facility (T.S.D.F.) (Beede Waste Oil Corporation, Plaistow, New Hampshire). Approximately 35 gallons of fuel oil and residuals were removed and drummed on January 21, 1992 for disposal at a later date. Drummed material was disposed at Beede Waste Oil Corporation on February 27, 1992.

The following Hazardous Waste Manifests were generated from residual tank materials.

The manifests dated January 7, 1992 and February 27, 1992 are associated with fuel oil and residuals from several USTs. Therefore, the total quantities (1,400 gallons and 385 gallons) is much greater than the amount which was removed from UST 0039.





# COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION DIVISION OF HAZARDOUS WASTE

One Winter Street

Boston, Massachusetts 02108

Pre	ase print or type. (Form designed for use on elite (12-pitch) typewriter.)									
Г	UNIFORM HAZARDOUS 1. Generator US EPA ID No. M	anifest	2. Pa	ge 1   I	nformatio	n in the shade	d areas			
1	WASTE MANIFEST MIAITIZI/10161251/151400	10101	of	_/	is nat requi	red by Federa	al law.			
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	Fort Dec - 1433	5	B.St	ste Gen.						
	4. Generator's Phone 56 & 1 756-3065 - 24 hay 568-756-27	11	i		SAL	Nr				
	5. Transporter 1 Company Name 6. US EPA ID Number	<u> </u>	CSI	ite Trans						
	of the specific of the specifi									
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ĺ	7. Transporter 2 Company Name 8. US EPA ID Number		D Tr	ensporte ate Tran	r's Phone	03 382	2-576	51_		
			] " "	ate 11211.	*. 10		_			
	9. Designated Facility Name and Site Address 10. US EPA ID Number				<u> </u>	<u> </u>	11			
	Beede Waste Oil Corp.		F. Tr	nsporte	r's Phone (					
	Kelley Road PO Box 127		G. St	ste Facil	ity's ID	Not Re	quired			
١,	Plaistow, NH 03865 N H D 1018958140	1 1 1	H. Fa	cility's P	hone (n z	382-	5761			
	·	12. Cont	ainers		13.	14,	f.			
	11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	No.	Туре		otal antity	Unit Wt/Vol	Waste	No.		
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	J. Additional Descriptions for Materials Listed Above finclude physical state and hazard code.)	<u> </u>	к на	odlina C	ories for W	astes Listed	Ahove			
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	b. d.		١,		ı					
	15. Special Handling Instructions and Additional Information	······································	<u> </u>			<del></del>	<u> </u>			
	To be Recycled Excomp E			F	ecyc.	le		:		
- 1		d shows h								
	16. GENERATOR'S CERTIFICATION; I hereby declare that the contents of this consignment are fully and accurately desc proper shipping name and are classified, packed, marked, and tabeled, and are in all respects in proper condition for the content of the conte	ransport by h	¥ ighw#y							
	according to applicable international and national government regulations.									
ł	If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste g	enerated to il	ne degree	I have de	lermined to b	e economically	practicabl	le .		
	and that I have selected the practicable method of treatment, storage, or disposal currently available to me which mi ment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and set	nimizes the p lect the best i	ns Instu em steem	d future 11 nagemen	hreat to hum I method tha	an health and ti t is available to	me and the	a1 l		
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	20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifes	t except as	noted in	Item 19	3	<del></del>	-			
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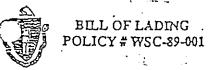
## DIVISION OF HAZARDOUS WASTE One Winter Street

Boston, Massachusetts 02108

Pi	ease print or type. (Form designed for use on elite (12-pitch) typewriter.)				<u>-</u>			
	UNIFORM HAZARDOUS 1. Generator US EPA ID WASTE MÁNIFEST MA 17 2 1 1 0 0		lanifest	2. Pag	4	on in the shade		
	3. Generator's Name and Mailing Address  Dept. of The Al		te Manifest Doci					
	Headquarters F	MA	F3537	77	•			
	4. Generator's Phone ( 508-796-3002 AFZD-DEQEM At	N/A						
	5. Transporter 1 Company Name Fort Devens, M. Beede Waste Oil Corp. N:H	1 4:0	C.Statr Trans ID					
	7. Transporter 2 Company Name 8.		nsporter's Phone	16023	82-5761			
		E. Sta	te Trans. IU	/^	<i></i>			
	9. Designated Facility Name and Site Address 10.  Beede Waste Oil Corp.	F. Trac	nsporter's Phone	<u>'}/7;                                     </u>	//4			
	Kelley Rd., P.O. Box 127	G. State Facility's ID Not Required						
	Plaistow, NH 03865 NI H	D 0; 1; 8, 9; 5; 8	12. Conta		ility's Phone (	14.	1-3.76/	
	11. US DOT Description (Including Proper Shipping Name, Hazard Class, and	d ID Number)	No.	Type	Total Quantity	Unit Wt/Vol	Waste No.	
	. Waste Petroleum Oils N.O.S.							
	Combustable liquid NA 1270	•	007	DM	0:03:8:3	† G	MAOI	
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	15. Special Handling Instructions and Additional Information 4-Bldg 63   1-Bldg 2447  -2616 - 1-3573  To Be Recycled #2 Fuel With SI=Sludge							
	Ton Kecyllar any hand Dispos of Prohib		ibed above by					
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_		Signature				Month	L'ay Year	

## 2.11 WEIGHT DISPOSAL RECEIPTS

The following weight slips document the disposal of contaminated soil associated with UST 0038.





OF LADING R	. DATE:	DE? CASE I:
ENERATOR NAME/ADDRESS:	5TZ	REET BUILDING 2519 UST #38  WN FORT DEVENS  ATE MA DIA33  ANSPORTATION ACCIDENT? _Y \( \frac{1}{2}\) \( \fra
ATERIAL DESCRIPTION (TOTAL PROJECTED ONTAMINATED SOIL: 37.5 25 vol (cu y		NATED DEBRIS: # shiorbent pads # shiorbent booms vol (cu yds) speedy dri other (specify)
PE OF CONTAMINATION:  _ gazoline	other (specify) ·	ANALYSES ATTACHED?  Volsuites: Y N TPH: XY N
TRIMOUNT BITUMINOS  TO BLAUCHARD RTS.  BURLINGTON MA  INTACTIFLE: DAVID FETER ( MERATOR'S SIGNATURE: MORIZATION: DEF, SIGNATURE (originating (if applicable) DEP. SIGNATURE (destination)	S PRODUCTS  DISOS  DISOS  DEF AVIHORIZATION  Region):	PRIMATION FACILITY NAMEJADDRESS:  RIMOUNT BY TUMINOUS PRODUCTS  (05) LAKE ST.  DAR FUISBURY MA  PREOFFACILITY: V Recycling Landfill Incincrator  DATE: 7.20 92  DATE: 23 July 9  DATE: DATE:
JCK/TRACTOR REGISTRATION A \$600 ALLER REGISTRATION TISITE AT 12:45 BATE WERATOR OR RECIPING FACILITY REPRESENTATIVES SIGNATURE ELVING FACILITY REPRESENTATIVES SIGN	ENTATIVES .	QUANTITY SHIPPED: wa (sons) vol (co yds)  TOTAL PROJECTED  SHIPPED TO DATE  THIS LOAD (estimated)  REMAINING TO BE SHIPPED  TICKET 12418  DATE 7-31-92  DATE 1/31 92 ARR TIME 1:15
VEL)	NSIBLE FOR RETURNING CO ARTIMENT OF ENVIRONMENT BWSC/EMERGENCY RESPO ONE WINTER STREET, BOSTON, MA 02 AND THE ORIGINATING REGIO	ONSE BRANCH 5th FLOOR 2108

FICATION OR MISREPRESENTATION OF ANY OF THE INFORMATION ON THIS BILL OF LADING IS A VIOLATION OF C. 21C AND 310 CMR 30.006 AND 30.007 AND IS SUBJECT TO APPROPRIATE STATUTORY OR REGULATORY ATTES.

. .



# BILL OF LADING . POLICY # WSC-89-001



OF LADING #: DATE: DEP CASE I: SITE OF GENERATION: IK #Z F.O ENERATOR NAME/ADDRESS: LDING 2519 UST#38 TRANSPORTATION ACCIDENT? ONTACT/TEL #: 508-796 ÷ 3002 (ATERIAL DESCRIPTION (TOTAL PROJECTED QUANTITY): DNTAMINATED SOIL: 37.5 25 CONTAMINATED DEBRIS: # absorbent pads ... # absorbent booms ar (rour) vol (az yds) vol (cz ydz) speedy dri \_\_\_ \_\_ other (specify) \_ ANALYSES ATTACHED? YPE OF CONTAMINATION: gasoline X #2 oil \_\_ #4 oil \_\_ #6 oil \_\_ other (specify)\_ Volsuler: Y X N TPH: XY RANSPORTER NAME/ADDRESS: DESTINATION FACILITY NAME/ADDRESS: \_ Landfill ENERATOR'S SIGNATURE: ABOVE ITEMS MUST BE COMPLETED PRIOR TO DEP UTHORIZATION: 'DEF. SIGNATURE (originating region): (if applicable) DE? SIGNATURE (destination region): RUCK/TRACTOR REGISTRATION QUANTITY SHIPPED: ¥4 (tons) vol (cu yds) TRAILER REGISTRATION TOTAL PROJECTED ETSITE AT 9:35 SEPPED TO DATE JENERATOR OR RECEIVING FACILITY REPRESENTATIVES Trill (LAOJ (crimsted) REMAING TO BE SHIPPED SIGNATURE: ARR TIME GENERATOR IS RESPONSIBLE FOR RETURNING COMPLETED FORM WITHIN 5 DAYS TO: **EIVED** DEPARTMENT OF ENVIRONMENTAL PROTECTION BWSC/EMERGENCY RESPONSE BRANCH 2 1 1556 ONE WINTER STREET, 5th FLOOR DEP BOSTON, MA 02108 ral - Red F **TND** THE ORIGINATING REGIONAL OFFICE

LSIFICATION OR MISREPRESENTATION OF ANY OF THE INFORMATION ON THIS BILL OF LADING IS A VIOLATION OF J.L. C. 21C AND 310 CMR 30.006 AND 30.007 AND IS SUBJECT TO APPROPRIATE STATUTORY OR REGULATORY VALUES.

VIN OFFICE: /ERS 750-4200	5 CH DANV SHRE 651 LAK SHRE	TUMINOUS PHO BERRY HIL RIV P.O. BOX 2009 ERS, MA 01923-5 WSBURY DIVIS E STREET AT RI WSBURY, MA 01 B1-1430 PLANT 7	VE 5089 SION TE. 20 1545	T I M	FMN ARRIVED JOI LEFT JOB C	HECK #	TICKE		V CARRII	72463
omer # ATE001 C ASSOC. ACCORD PARK DRIVE WELL, MA 02061 7-878-6200	US B F(	b # BLDGFD 5 ARMY LDG 2517 ORT DEVERS, MA D# 37.04.72053	01433 Gross	RIX \$	#76 Total	HIX NAM	E OIL SOIL		TRUCK# 9	
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				_		· H	ECEIVED BY	'		
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Job Total

190.85

Time & Date

1:15:21 pm Jul 31, 1992 F

Fob/Del

· Load#

THIS COMPANY WILL-NOT BE RESPONSIBLE FOR DAMAGE CAUSED BY TRUCKS DELIVERING MATERIAL BEYOND STREET PAVEMENT.

RECEIVED BY

## 2.12 PERMITS AND CERTIFICATIONS

The following permit was obtained for the proper closure of a UST. Following the permit there is a disposal receipt for the steel UST.



# The Commonwealth of Massachusetts

## DEPARTMENT OF PUBLIC SAFETY DIVISION OF FIRE PREVENTION

PERMIT

FOR REMOVAL AND TRANSPORTATION TO APPROVED TANK YARD

In accordance with the provisions of Chapter 148, 6, 1, as provided in
Section 384 this permit is granted to

In accordance with the provisions of Chapter 148, 6.1. as provided in Section 38A this permit is granted to

Name: Arec Environmental Associates Inc.

Name: Atec Environmental Associates Inc.
Full name of person, firm or Corporation
To transport underground steel storage tank(s)
to Approved tank yardii 1 40

State clearly type of inert gas used in steel storage tank

steel tank: Dry 10.9

Fee paid \$ N/A

Name and address of contractor disposing tank ATEC. Associates GZ Accord Park Dr. Nor Location to which tank will be transported

This permit will expire 31 Jan 1992

oproved tank yard# Tixes Clist Signature of official granting permit(IIILE) (Head of Fire Dept.)

.62 8,46 M.Q.L.

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DIG BAFE NUMBER

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The witness is a section of the first of the	ROUND STEET STORAGE	TO THE REAL PROPERTY OF THE PR	
NAME AND ADDRESS JOHN OF 207 h	€. ¥ØMBARELLO & SONS NARSTON ST.		
APPROVED TANK YARD LAYY	ENCE, MASS. 01841		
approved tank yard no. 1	<u>4 9 0 1                                 </u>		
Tank Yard Ledger 502 CMR 3.03	3(4) Number: <u>Y</u> 2	00/22	
I certify under penalty of law I have delivered to this "approved tank yard	e personally examined the i" by firm, corporation o epted same in conformance or Approving Underground Head of Fire Department	underground steel storage ta r partnership <u>ATEC ENVICOL</u> with Massachusetts Fire Prev Steel Storage Tank dismantlin FDID! <u>1 7 9 1 9</u> to tran	OMENTAL ASSOC. ention g yards.
Λ			
DMLO Maranto	TITLE	/28-92	
This signed receipt of disposal must FDID# 1 7 9 1 9 pursuant to 502	be returned to the local CMR 3:00. (EACH TANK MUS	head of the fire department T HAVE A RECEIPT OF DISPOSAL)	
FORM F.P. 291 (rev. 9/88)	(OVER)	MASSACHUSETTS STATE FI	TE MARSHAL'S OFFICE
			. 1
		4.	
and the same of th	Marine Committee of the off	Burgara Barangan Barangan Barangan	<b>***</b> 6
DIMENSIONS	Tank Remov		
Width Length	<u> </u>	Vens Blag.#2519-	tank#38
Tank 1 48" x 10'8"	(no. str	geet)	
ומווע ז בקבר X אוזיין	AYER	•	
Tank 2 X	(city or to	wn)	*

(city or town)

Fire Department Permit #

Norl-Listed

(if applicable)

Tank 3 ---- X ----

Tank 4 ---- X ----

Tank 5 ---- X ----

(feet) (feet)

## 2.13 INSTALLATION

The installation of a replacement UST No. 0038 was not performed.

#### 3.0 UST No. 0039

#### 3.1 POST REMOVAL REPORT

#### 3.1.1 Introduction

This Post-Removal Report details the results of the closure of one 1,000-gallon, single wall, steel, underground storage tank (UST) referenced as UST No. 0039, located at property known as Building 2520, Fort Devens, Massachusetts (the site). The purpose of the closure was to excavate the UST and to evaluate the potential for the presence of oil and hazardous material at the site. The closure of this UST was conducted on January 21, 1992.

The basic Project Work Scope included:

- Procurement/administration of all federal, state and local permits, manifests, regulations, etc., associated with UST system closure.
- Excavating, venting, cleaning, transporting, and disposing of one 1,000-gallon UST by appropriately licensed contractors/facilities.
- Disposal of residual UST materials at a licensed facility.
- Field screening and analysis of soil in the excavations by a Photoionization Detector (PID) and field analyzed with a portable Non-Dispersive Infrared (NDIR) analyzer, to identify evidence of the release of oil and hazardous materials from the UST, if any.
- Laboratory Analysis of soil sampled from the UST excavation by a USEPA certified laboratory for Total Petroleum Hydrocarbons (TPH) (USEPA Method 418.1).
- Preparation of a Technical Report, to include assimilation of information gathered, major findings and conclusions.

## 3.1.2 Underground Storage Tank Excavation and Removal

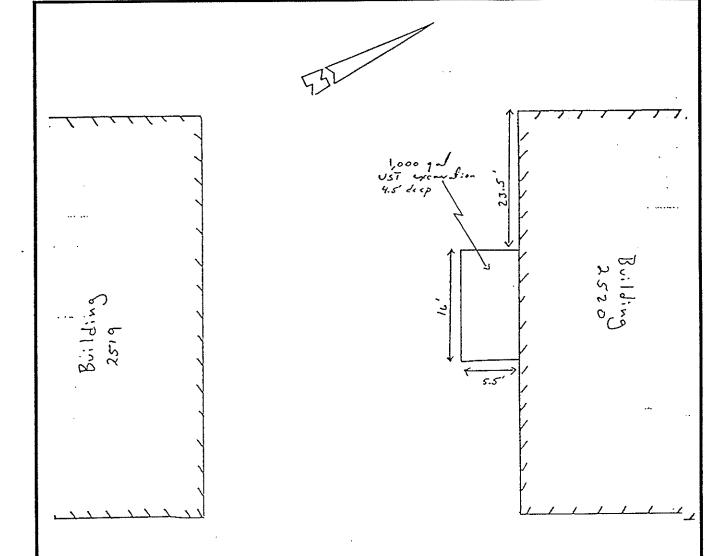
On January 21, 1992, one 1,000-gallon, subsurface, No. 2 fuel oil, storage tank was excavated and removed from the site. The UST was located adjacent to the south side of Building 2520. Topography at the site appeared level with a slighty upgradient slope approximately 100 feet southeast of the site.

Soils in the excavation consisted primarily of brown, fine sand and silt with some coarse gravel, cobbles, and boulders. The tank was covered by approximately 6 inches of soil. The bottom of the excavation was approximately 4.5 feet below grade. Groundwater was not encountered within the excavation. The excavated soils required to free the tank did not appeared to be contaminated. A slight staining of soil was noted at the east corner of the excavation, adjacent to the former fill area.

The associated piping was drained and tank connections were removed. UST No. 0039 was estimated to contain approximately 10 gallons of No. 2 fuel oil and residuals. Following venting of the tank, an access way was cut in the end of the tank to allow entry for cleaning. The tank was then entered and vacuumed/wiped clean of any residual material. The fuel oil and residuals were removed from the tank and drummed on January 21, 1992. Drummed material was transported to a licensed Treatment Storage Disposal Facility (T.S.D.F.) (Beede Waste Oil Corporation, Plainstow, New Hampshire) on February 27, 1992. See Section 3.10 for copies of the appropriate Hazardous Waste Manifests.

Tank openings were then capped and the tank was removed from the excavation. Upon excavation and removal, the tank was observed to be in good condition with some surficial to moderate corrosion. During the removal procedure, following cleaning, the tank was punctured. No spillage or leakage resulted from this incident.

The scrap tank was removed from the site on January 21, 1992 and transported to the



## UST LOCATION PLAN

1,000 gallon UST relative to: Building 2520 Fort Devens, Massachusetts PROJECT: 37.00451

NOT TO SCALE

FIGURE: 3.1



Contractor's yard located on Lake George Street, Fort Devens for temporary storage. The tank was disposed at Tombarello & Sons, located in Lawrence, Massachusetts, a licensed Massachusetts tank yard on February 19, 1992. A copy of the disposal receipt is included in Section 3.11.

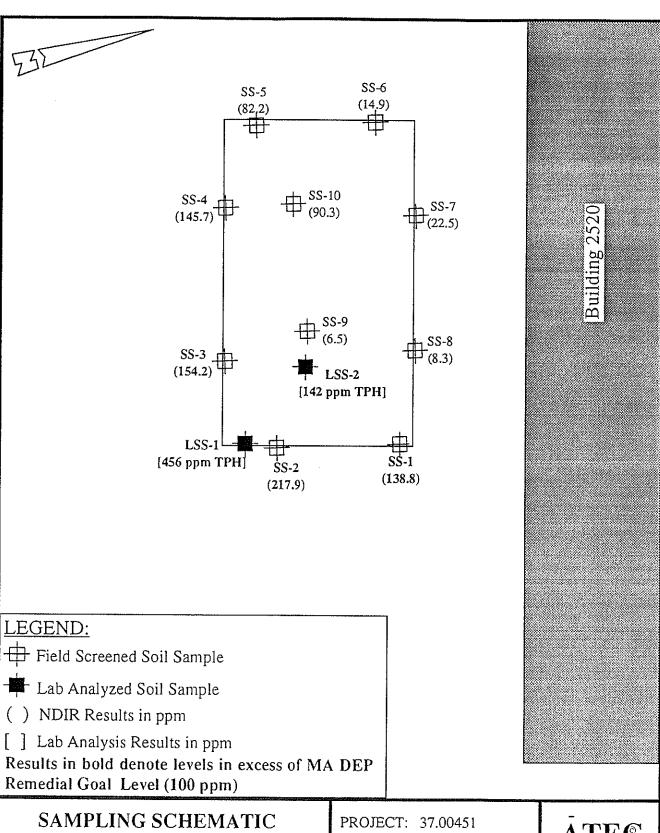
## 3.1.3 Sampling and Analysis Plan

Ten soil samples were obtained from the excavation for field screening with a Photoionization Detector (PID) and field analyzed with a Non-Dispersive Infrared (NDIR) analyzer. The PID field screening for Total Organic Vapors (TOVs) was conducted with an HNu photoionizer utilizing the jar headspace screening procedures outlined in the Hazardous Materials Containment Plan. The NDIR field screening for Total Petroleum Hydrocarbons (TPH) was conducted with a Horiba OCMA 220, utilizing the procedures outlined in the Hazardous Materials Containment Plan.

Eight of the samples (SS-1 to SS-8) were obtained from the excavation walls at a depth of approximately 2 to 3 feet below grade. Two of the samples (SS-9 and SS-10) were obtained from the bottom of the excavation at a depth of approximately 4.5 feet below grade. Two composite soil samples (Stock-1 and Stock-2) were obtained from stockpiled soils for PID and NDIR field screening.

Two soil samples (LSS-1 and LSS-2) were obtained from the excavation for laboratory analysis. Soil Sample LSS-1 was obtained from the southeast wall of the excavation at a depth of 2 to 3 feet below grade. Soil sample LSS-2 was obtained from the bottom of the excavation at a depth of 4.5 feet below grade. One composite, soil sample (LSS-3) was obtained from stockpiled soils required to free the tank. These samples were analyzed for TPH utilizing USEPA Method 418.1.

Sampling locations are depicted on the Sampling Schematic attached as Figure 3.2. The appropriate chain-of-custodies are included in Section 3.9, Chain of Custody Forms.



1,000 gallon UST excavation at:

Building 2520 Fort Devens, Massachusetts NOT TO SCALE

FIGURE: 3.2



#### 3.1.4 Analytical Results

The results from analysis with the PID and the NDIR analyzer of the ten soil samples obtained from the excavation, and the two composite samples obtained from stockpiled soil are as follows:

TABLE 3.1 - PID AND NDIR RESULTS

SAMPLE NUMBER	PID (ppm TOV)	NDIR (ppm TPH)
SS-1	9.0	138.8
SS-2	11.4	217.9
SS-3	1.8	154.2
SS-4	0.8	145.7
SS-5	1.8	82.2
SS-6	0.1	14.9
SS-7	0.1	22.5
SS-8	0.6	8.3
SS-9	1.4	6.5
SS-10	1.2	90.3
Stock-1	7.4	899.8
Stock-2	6.5	271.6

N.D. = None Detected

Laboratory analytical results of the two soil samples obtained from the excavation revealed a TPH concentration of 456 ppm for LSS-1, and 142 ppm for LSS-2. Laboratory analysis of the one soil sample obtained from the stockpiled soils revealed a TPH concentration of 1,090 ppm for LSS-3 (see Section 3.8, Laboratory Analytical Results).

#### 3.1.5 Conclusions and Recommendations

As presented in ATEC's Post Removal Report dated February 3, 1992, ATEC's conclusions are as follows:

Upon excavation and removal, the tank was observed to be in good condition with some corrosion. During the removal procedure, following cleaning, the tank was punctured. No spillage or leakage resulted from this incident.

Groundwater was not encountered within the excavation.

Excavated soils required to free the tank did not appear to be visibly contaminated. A slight staining of soil was noted at the east corner of the excavation, adjacent to the former fill area.

Ten soil samples were obtained from the excavation for field screening and field analysis utilizing a PID and NDIR analysis respectively. PID readings revealed TOV concentrations ranging from 0.1 ppm to 11.4 ppm. NDIR results revealed TPH concentrations ranging from 6.5 to 217.9 ppm.

Two soil samples were obtained from the excavation for laboratory analysis for TPH utilizing USEPA Method 418.8. Analytical results for LSS-1 obtained from the southeast wall of the excavation revealed a TPH concentration of 456 ppm. Analytical results for LSS-2 obtained from the bottom of the excavation revealed a TPH concentration of 142 ppm.

One composite soil sample (LSS-3) was obtained from stockpiled soils for laboratory analysis. Analytical results for LSS-3 revealed a TPH concentration of 1,090 ppm.

Based on these findings, ATEC recommended the following:

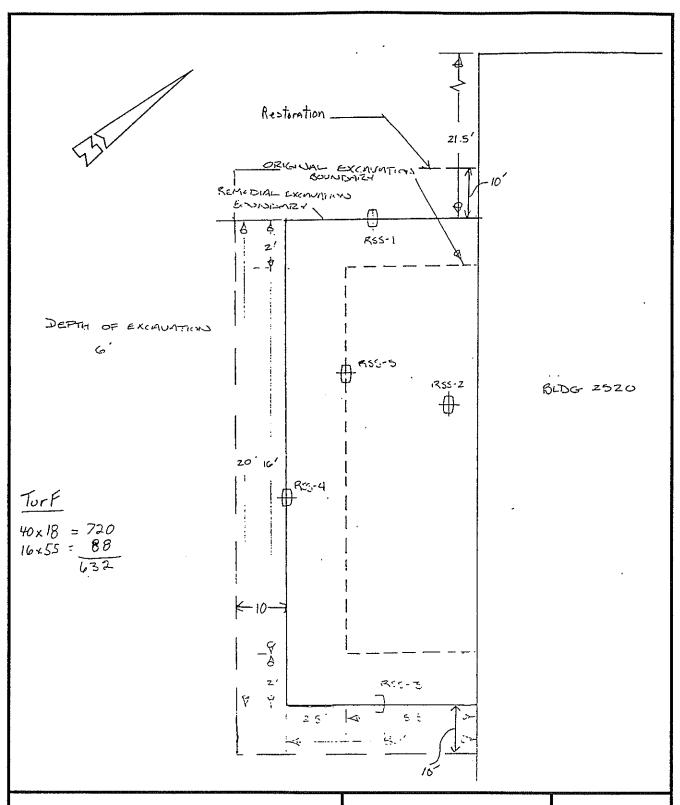
Advance soil borings and install groundwater monitoring wells to determine the vertical and horizontal extent of contamination. Continuous split spoon sampling and analysis will be conducted utilizing field analysis techniques, i.e. PID and NDIR analysis, and laboratory analysis to document soil contamination levels as specified in the Hazardous Waste Containment Plan.

Additionally excavated and stockpiled soils should be laboratory analyzed for VOCs, PCBs, 13 TCLP Metals, flashpoint sulfide reactivity, cyanide reactivity, and corrosivity for disposal classification.

#### 3.2 SITE REMEDIATION AND CONTAMINATED SOIL DISPOSAL

#### 3.2.1 Site Remediation

Following review of field screening and laboratory analytical results, additional excavation to remove contaminated soil and to reach background levels by PID (<1 ppm) was conducted per order of the Contracting Officer's Representative and David Salvadore of the Massachusetts Department of Environmental Protection (DEP). Approximately 33.97 tons of contaminated soil were removed from excavation floor and the east, west and south sidewalls during remedial excavation on July 23, 1992. Excavation could not be conducted on the north sidewall due to structural safety concerns. The estimated volume of soil removed was calculated from field drawings produced during the removal and remediation of UST No. 0039 (see Remedial Excavation Plan, Figure 3.3).



## REMEDIAL EXCAVATION PLAN

1,000 gallon UST relative to: Building 2520 Fort Devens, Massachusetts PROJECT: 37.00451

NOT TO SCALE

FIGURE: 3.3



Five soil samples (RSS-1A to RSS-5A) were obtained from the post-remedial excavation for PID field screening. RSS-1A to RSS-4A were obtained from the side walls at a depth of approximately 3 to 4 feet below grade. RSS-5A was obtained from the bottom of the excavation, approximately 6 feet below grade. PID results revealed TOV concentrations ranging from 0.0 to 13.5 ppm (see Table 3.2).

Further excavation of the west wall was conducted. One soil sample (RSS-1B) was obtained from the west sidewall at a depth of approximately 3 to 4 feet below grade for PID screening. PID results of RSS-1B did not reveal detectable levels of TOVs.

TABLE 3.2 - PID SCREENING RESULTS

SAMPLE NUMBER	PID (ppm TOV)	LOCATION
RSS-1A	13.5	west sidewall (3-4' depth)
RSS-2A	0.0	north sidewall (3-4' depth)
RSS-3A	0.2	east sidewall (3-4' depth)
RSS-4A	0.0	south sidewall (3-4' depth)
RSS-5A	0.0	bottom (6' depth)
RSS-1B	0.0	west sidewall (3-4' depth)

RSS = Remediation Soil Sample

Two soil samples (LRS-1 and LRS-5) were obtained from the excavation. LRS-1 was obtained from the west sidewall at a depth of 3 to 4 feet below grade. LRS-5 was obtained from the bottom of the excavation at a depth of 6 feet below grade. LRS-1 and LRS-5 were laboratory analyzed for TPH (modified USEPA Method 418.1), (see Section 3.8, Laboratory Analytical Results).

Based on these findings, ATEC recommended the following:

Advance soil borings and install groundwater monitoring wells to determine the vertical and horizontal extent of contamination. Continuous split spoon sampling and analysis will be conducted utilizing field analysis techniques, i.e. PID and NDIR analysis, and laboratory analysis to document soil contamination levels as specified in the Hazardous Waste Containment Plan.

Additionally excavated and stockpiled soils should be laboratory analyzed for VOCs, PCBs, 13 TCLP Metals, flashpoint sulfide reactivity, cyanide reactivity, and corrosivity for disposal classification.

## 3.2 SITE REMEDIATION AND CONTAMINATED SOIL DISPOSAL

#### 3.2.1 Site Remediation

Following review of field screening and laboratory analytical results, additional excavation to remove contaminated soil and to reach background levels by PID (<1 ppm) was conducted per order of the Contracting Officer's Representative and David Salvadore of the Massachusetts Department of Environmental Protection (DEP). Approximately 33.97 tons of contaminated soil were removed from excavation floor and the east, west and south sidewalls during remedial excavation on July 23, 1992. Excavation could not be conducted on the north sidewall due to structural safety concerns. The estimated volume of soil removed was calculated from field drawings produced during the removal and remediation of UST No. 0039 (see Remedial Excavation Plan, Figure 3.3).

TABLE 3.3 - LABORATORY ANALYSIS

SAMPLE NUMBER	TPH (ppm)	VOA (ppb)	13 TCPL METALS (ppm)	LOCATION
LRS-1	ND	NA	NA	north sidewall (3-4' depth)
LRS-5	108	NA	NA	bottom (6' depth)

LRS = Laboratory Remediation Sample

ND = Not Detected Above Method Reporting Limit

NA= Not Applicable

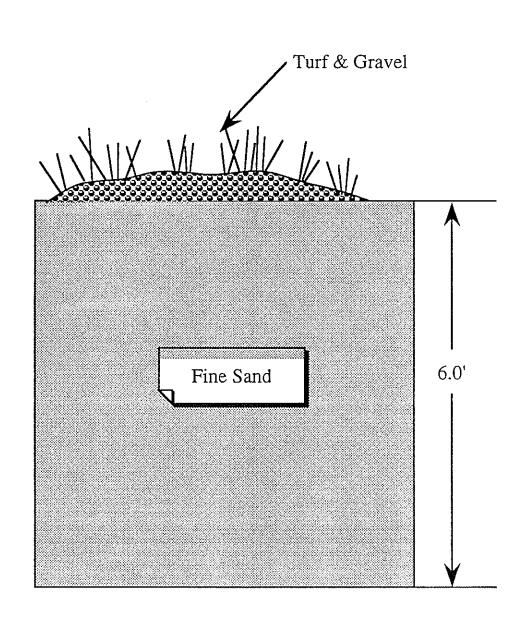
#### 3.2.2 Soil Stratigraphy

Soil stratigraphy within the excavation consisted of fine sand from grade level to a depth of 6 feet below grade (see Figure 3.4, Soil Stratigraphy).

#### 3.2.3 Contaminated Soil Disposal

Prior to disposal, contaminated soil was laboratory analyzed for disposal classification purposes. One composite soil sample (LSP-39) was obtained from stockpiled soil associated with the removal of the UST No. 0039 and the additional excavation conducted at the site. Laboratory analyses were performed for VOCs, Semi-volatile Organic Compounds, 13 Metals by Toxicity Characteristic Leachate Procedure (TCLP), Polychlorinated Biphenyls (PCBs), reactive sulfide, reactive cyanide, flashpoint, and corrosivity for characterization and disposal purposes. Laboratory analytical results revealed 7.5 S.U. Corrosivity, 0.4 ppm Lead, 0.04 ppm Copper and 0.49 ppm Zinc. All other analytical results were below the Method Reporting Limits (MRL).

Approximately 20.90 cubic yards (33.97 tons) of No. 2 fuel oil contaminated soil was removed and stockpiled during the remediation of the excavation, as estimated through field drawings. Contaminated soil was disposed for recycling at Trimount Bituminous



# SOIL STRATIGRAPHY

1,000 gallon UST excavation at:
Building 2520
Fort Devens, Massachusetts

PROJECT: 37.07.91.00451

UST No. 0039

FIGURE: 3.4



Products Company, Shrewsbury, Massachusetts.

## 3.3 HYDROGEOLOGICAL SERVICES

Hydrogeological services were not performed relative to UST No. 0039.

## 3.4 BACKFILL

The excavation was lined with polyethylene plastic sheeting and backfilled with approximately 35.6 cubic yards of uncontaminated fill material on July 29, 1992. Backfilling was conducted with the approval of the Contracting Officer's Representative and the DEP.

## 3.5 SITE RESTORATION

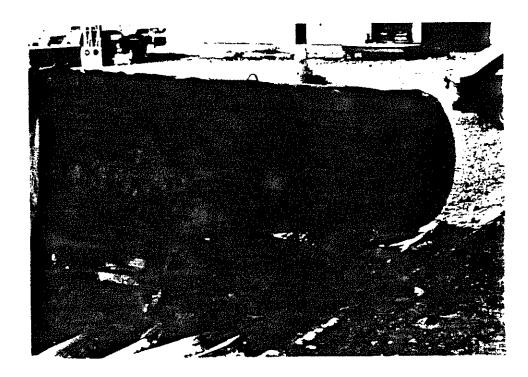
Following backfill of the excavation, approximately 72 square feet of loam was distributed over the excavated area.

## 3.6 PHOTOGRAPHIC DOCUMENTATION

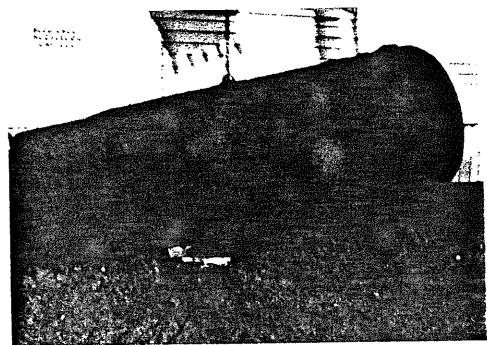
The following photographs are of the removed UST, the excavation, and a post removal view of the excavation.

- A-1: One side of removed tank.
- A-2: Opposite side of removed tank.
- A-3: Excavation as viewed from west, facing east.
- A-4: Excavation as viewed from east, facing west.

A-1



A-2



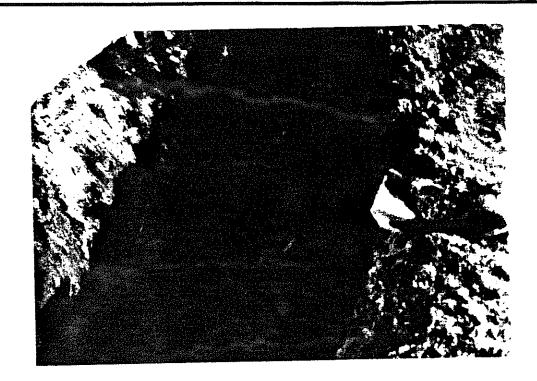
# PHOTO DOCUMENTATION

1,000 gallon UST excavation at:
Building 2520
Fort Devens, Massachusetts

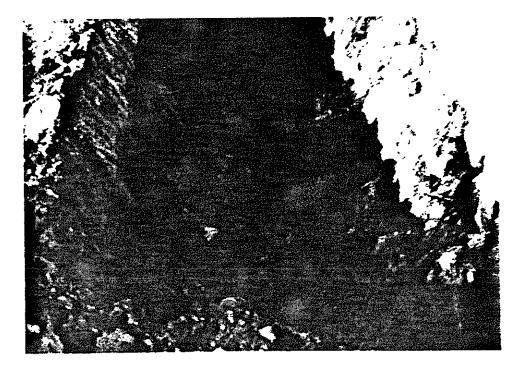
PROJECT: 37.07.451



A-3



A-4



# PHOTO DOCUMENTATION

1,000 gallon UST excavation at: Building 2520 Fort Devens, Massachusetts PROJECT: 37.07.451



# 3.7 OCMA 220 DATA SHEETS

The following information was organized from the data collected from the Non-Dispersive Infrared analyzer.

## TPH SOIL ANALYSES BY NON-DISPERSIVE INFRARED ANALYZER - MODIFIED EPA STANDARD TEST METHOD 418.1

PROJECT NAME, MUMBER, TANK U.S. ARMY - FORT DEVENS 37.07.91.451 UST 0039

DATE: Jan 22, 1992

OPERATOR: RICHARD W. GERMAN

## CALIBRATION DATA

TYPE	FIRST RE	ADING	SECOND RI	EADDIG	THIRD REA	A/ING		SPAN
CALIBRATION	DIFTAC.	FIMAL	DITIAL	FINAL	DITTAL	FINAL		CHECK
			_					
ZERO:	1.0	0.0	0.2	0.0	0.2	0.0	•	26.4
SPAN:	مناه والمراجع			·				•
ZERO.								

#### ANALYTICAL DATA

SAMPLE	WEIGH	I.IgL	1st DILUTE	ON RATIO [ml]	and DILUTE	DH RATIO (m.l)	DISTRUME!	IT RESULTS	[ <u>ppm]</u>	_ CONCENTRATION
NUMBER	GROSS	TARE	F-113	SAMPLE	F-113	SAMPLE	<u> 1st                                   </u>	<u>2nd</u>	3ri -	mg/l
STOCK-I	30.5	<u> 73.9</u>	17.5	1.0			10.6	10.7		879.8
STOCK-2	86.0	76.6	17.5	1.0			4.5	4,6	-	271.6
88-1	83,0	76.6	17.5	1.0			1.5	<u> </u>		138.8
88-2	84.8	74.1	17.5	1.0			4.1	4.2		217.9
88-3	81.1	75.7	17.5	1.0			1.6	1.5		154.2
884	85.7	77.7	17.5	1.0			2.3	2.1	2.1	145.7
88-5	85,5	77.4	17.5	1.0			1.1	1.2	10-14	82.2
88-6	86,3	75.1	17.5	1.0			0.4	0,3		14.9
88-7	81.3	73 9	17.5	1.0			0.2	0.3		22.5
88-8	83,4	76.7	17.5	1.0			0.1	0.1		8.3
នួន្ត-ថ	85.6	77 0	17.5	1.0			0.2	0.1		6,5
\$8-10	\$3.8	75 2	17.5	1.0			1.3	1.4		90.3
										#Enor#
	THE RESERVE AND ADDRESS AND AD									- KENDIA

QUALITY CONTROL SECTION



# CERTIFICATE OF ANALYSIS

#### VOA SOIL SURROGATE RECOVERY

Client: ATEC Environmental Consultants Client

Project ID: UST 38

Date Sample Analyzed: 8/14/92

4/92

Project ID: 921997

ESS

SAMPLE ID	1,2 DICHLOROETHANE-D4 (70-121%)*	TOLUENE-D8 (81-117%)*	BFB (74-121%)*
VS0814B1	76%	88%	110%
921997-06	105	84	83

*	Acceptance	criteria

Approved by:

David Dickinson Laboratory Director Date:

: 17/m=52

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MM

In Response To The Future

# CERTIFICATE OF ANALYSIS TCL VOLATILE ORGANICS Method 8260

Client: ATEC Environmental Consultants

Client Project ID: UST# 38 ESS Project ID: 921997

Client Sample ID: Method Blank ESS Sample ID: VS0814B1

Date Sample Received: NA

Date Reported: 8/17/92

Parameter	Result (ug/Kg)	MRL
Methylene Chloride	ND	5
1,1-Dichloroethane	ND	5
Chloroform	ND	5 5 5 5 5 5
Carbon Tetrachloride	ND	5
1,2-Dichloropropane	ND	5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Tetrachloroethene	ND	5
Chlorobenzene	ND	5
1,2-Dichloroethane	ND	5
1,1,1-Trichloroethane	ND	5
Bromodichloromethane	ND	5
Trans-1,3-Dichloropropene	ND	5 5 5 5 5 5 5 5 5
Bromoform	ND	5
1,1,2,2-Tetrachloroethane	ND	5
Benzene	ND	5
Toluene	ND	
Ethyl Benzene	ND	5
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl Chloride	ND	10
Chloroethane	ND	10
1,1-Dichloroethene	ND	5
1,2-Dichloroethene (Total)	ND	5
Trichloroethene	ND	5
Acetone	ND	10
Carbon Disulfide	ND	5
2-Butanone	ND	10
Cis-1,3-Dichloropropene	ND	5
4-Methyl-2-Pentanone	ND	10
2-Hexanone	ND	10
Styrene	ND	5
Xylenes (Total)	, ND	10

ND	= Not	Detecte	d above	Method Rer	porting	: Limit (MRI	

NA = Not Applicable

Approved by: /

Bayid Bickinson Laboratory Director Date: 172,50

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# ERTIFICATE OF ANALYSIS

#### MATRIX SPIKE ANALYSIS SUMMARY

#### TCLP METALS

#### EPA METHOD 1311

Client: ATEC Environmental Consultants Matrix: Solid

TCLP Batch ID: 202301 Concentration in: mg/L

Target Analyte	Result	Spike Added	Spiked Result	Percent Recovery
Antimony	ND	*	ND	76%
Arsenic	ND	2.00	2.26	113
Cadmium	ND	0.5	0.39	78
Chromium	ND	1.0	1.22	122
Lead	ND	1.0	1.12	112
Mercury	ND	0.02	0.020	100
Selenium	ND	2.00	2.13	107
Silver	ND	1.0	0.76	76
Copper	ND	1.0	1.14	114
Nickel	ND	1.0	1.07	107
Zinc	ND	1.0	1.09	109
Beryllium	ND	*	ND	76
Thallium	ND	*	ND	76

This matrix spike analysis summary applies to the following samples: 921997-06

ND = Not Detected above Method Reporting Limit (MRL)

\* Matrix spike recovery is based on the lowest spike recovery of the spiked analytes.

Approved by:

Laboratory Director

Date: // 2

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#### 3.8 LABORATORY ANALYTICAL RESULTS

The following laboratory analytical reports were organized and provided by Environmental Science Services, Inc. (ESS). Results are included for:

- LSS-1, LSS-2, and LSS-3: Soil samples obtained from original excavation.
   Laboratory analyzed for TPH.
- LRS-1 and LRS-5: Soil samples obtained from post-remedial excavation.
   Laboratory analyzed for TPH.
- LSP-39: Soil sample obtained from stockpiled soil for disposal classification.
   Laboratory analyzed for VOCs, Semi-volatile Compounds, 13 Metals by TCLP,
   PCBs, reactive sulfide, reactive cyanide, flashpoint and corrosivity for characterization and disposal purposes.



# ERTIFICATE OF ANALYSIS

ATEC ENVIRONMENTAL CO. 62 Accord Park Drive

Norwell, MA 02061

Date: 2/03/92 Job: 214

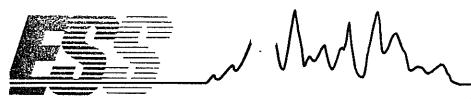
Account: 95659 Received: 1/25/92

Project: DEVENS-TANK 39

tn: Mr. Mark Baldi

ample umber	Method Number	Parameter	Result	Unit	Sample Description
021401	EPA-160.3 EPA-418.1	Total Solids TPH/IR (Dry Wt.)	89 456	% mg/kg	LSS1
021402	EPA-160.3 EPA-418.1	Total Solids TPH/IR (Dry Wt.)	92 142	% mg/kg	LSS2
021403	EPA-160.3 EPA-418.1	Total Solids TPH/IR (Dry Wt.)	89 1090	% mg/kg	LSS3

David Dickinson Laboratory Manager



# CERTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-39 ESS Sample ID: 921528-12

Date Sample Received: 6/11/92 Date Reported: 7/1/92

Parameter	R	esults	Units	MRL	Method
pH (Corrosivity)		7.5	s.u.	N/A	9045
Flashpoint	No :	Flash	°F	200	1010
Polychlorinated Biphenyls		ND	mg/Kg	Attached	8080
Reactive Cyanide		ND	mg/Kg	2	7.3.3.2
Reactive Sulfide		ND	mg/Kg	2	7.3.4.1
Semivolatile Organics		ND	ug/Kg	Attached	8270
Volatile Organics		ND	ug/Kg	Attached	8240
Toxicity Characteristic Leaching Metals	Pro	cedure			1311
Lead Copper Zinc		0.4 0.04 0.49	mg/L mg/L mg/L	Attached Attached Attached	6010 6010 6010

N/A = Not Applicable

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson Laboratory Director Date:

083



# CERTIFICATE OF ANALYSIS

#### POLYCHLORINATED BIPHENYLS Method 8080

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-39 ESS Sample ID: 921528-12

Date Sample Received: 6/11/92 Date Reported: 6/30/92

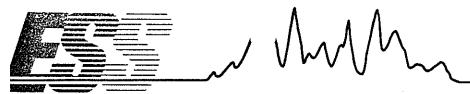
Parameter	Result (mg/Kg)	MRL
Arochlor 1016	ND	0.1
Arochlor 1221	ND .	0.1
Arochlor 1232	ND	0.1
Arochlor 1242	ND	0.1
Arochlor 1248	ND	0.1
Arochlor 1254	ND	0.2
Arochlor 1260	ND	0.2

ND = Not Detected above Method Reporting Limit (MRL)

Surrogate Recovery Data	% Recovery	QC Limit
Dibutylchlorendate	93%	50 - 150%

David Dickinson

Laboratory Director



# ERTIFICATE OF ANALYSIS

#### ACID EXTRACTABLES EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-39 ESS Sample ID: 921528-12

Date Sample Received: 6/9/92 Date Reported: 7/1/92

Parameter	Result (ug/Kg)	MRL
2-Chlorophenol	ND	1,670
2-Nitrophenol	ND	1,670
Phenol	ND	1,670
2,4-Dimethylphenol	ND	1,670
2,4-Dichlorophenol	ND	1,670
2,4-Dinitrophenol	ND	8,350
Pentachlorophenol	ND	8,350
4-Nitrophenol	ND	8,350
2,4,6-Trichlorophenol	ND	1,670
2,4,5-Trichlorophenol	ND	8,350
2-Methylphenol	ND	1,670
4-Methylphenol	ND	1,670
4-Chloro-3-Methylphenol	ND	1,670
4,6-Dinitro-2-Methylphenol	ND	8,350

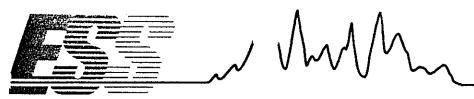
ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson Laboratory Director

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FACTS IN THE CONTRACT OF THE C



# CERTIFICATE OF ANALYSIS

# BASE NEUTRAL EXTRACTABLES EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-39 ESS Sample ID: 921528-12

Date Sample Received: 6/9/92 Date Reported: 7/1/92

Parameter	Result (ug/Kg)	MRL
Acenaphthylene	ND	1,670
1,2,4-Trichlorobenzene	ND	1,670
Hexachlorobenzene	ND ·	1,670
Bis(2-chloroethyl)ether	ND	1,670
2-Chloronaphthalene	ND	1,670
1,2-Dichlorobenzene	ND	1,670
1,3-Dichlorobenzene	$\mathbf{N}$ D	1,670
1,4-Dichlorobenzene	ND	1,670
3,3-Dichlorobenzidine	ND	3,340
2,4-Dinitrotoluene	ND	1,670
2,6-Dinitrotoluene	ND	1,670
Fluoranthene	ND	1,670
4-Chlorophenyl phenyl ether	ND	1,670
Bis(2-chloroisopropyl) ether	ND	1,670
Bis(2-chloroethoxy) methane	ND	1,670
Hexachlorobutadiene	ND	1,670
Hexachlorocyclopentadiene	ND	1,670
Isophorone	ND	1,670
Naphthalene	ND	1,670
Nitrobenzene	ND	1,670
N-nitrosodiphenylamine	ND	1,670
N-nitrosodi-n-propylamine	ND	1,670
Bis(2-ethylhexyl)phthalate	ND	1,670
Di-n-butylphthalate	ND	1,670
Di-n-octylphthalate	ND	1,670
Diethyl phthalate	ND	1,670
Dimethyl phthalate	ND	1,670
Benzo(a)anthracene	ND	1,670

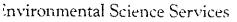
ND = Not Detected above Method Reporting Limit (MRL)

Approved by: / Mallater

David Dickinson Laboratory Director Date:

2/4/1/2







# ERTIFICATE OF ANALYSIS

#### BASE NEUTRAL EXTRACTABLES cont. EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-39 ESS Sample ID: 921528-12

Date Sample Received: 6/9/92 Date Reported: 7/1/92

Parameter	Result (ug/Kg)	MRL
Benzo(a)pyrene	ND	1,670
Benzo(b)fluoranthene	ND	1,670
Benzo(k)fluoranthene	ND	1,670
Chrysene	ND	1,670
Acenaphthene	ND	1,670
Anthracene	ND	1,670
Benzo(ghi)perylene	ND	1,670
Fluorene	ND	1,670
Phenanthrene	ND	1,670
Dibenzo(a,h)anthracene	ND	1,670
Indeno(1,2,3-cd)pyrene	ND	1,670
Pyrene	ND	1,670
Hexachloroethane	ND	1,670
4-Bromophenyl-phenylether	ND	1,670
Benzyl Alcohol	ND	1,670
Benzoic Acid	ND	8,350
Bis(2-Chloroethoxy)methane	ND	1,670
4-Chloroaniline	ND	1,670
2-Methylnaphthalene	ND	1,670
2-Nitroaniline	ND	8,350
3-Nitroaniline	ND	1,670
Dibenzofuran	ND	1,670
4-Nitroaniline	ND	8,350
Butylbenzylphthalate	ND	1,670

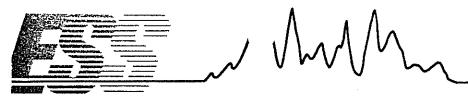
ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson Laboratory Director Date:

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# ERTIFICATE OF ANALYSIS

# TCL VOLATILE ORGANICS Method 8240

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-39 ESS Sample ID: 921528-12

Date Sample Received: 6/29/92 Date Reported: 7/1/92

Parameter	Result (ug/Kg)	MRL
Methylene Chloride	ND	1,000
1,1-Dichloroethane	ND	1,000
Chloroform	ND	1,000
Carbon Tetrachloride	ND	1,000
1,2-Dichloropropane	ND	1,000
Dibromochloromethane	ND	1,000
1,1,2-Trichloroethane	ND	1,000
Tetrachloroethene	ND	1,000
Chlorobenzene	ND	1,000
1,2-Dichloroethane	ND	1,000
1,1,1-Trichloroethane	ND	1,000
Bromodichloromethane	ND	1,000
Trans-1,3-Dichloropropene	ND	1,000
Bromoform	ND	1,000
1,1,2,2-Tetrachloroethane	ND	1,000
Benzene	ND	1,000
Toluene	ND	1,000
Ethyl Benzene	. ND	1,000
Chloromethane	ND	1,000
Bromomethane	ND	1,000
Vinyl Chloride	ND	1,000
Chloroethane	ND	1,000
1,1-Dichloroethene	ND	1,000
1,2-Dichloroethene (Total)	ND	1,000
Trichloroethene	ND	1,000
Acetone	ND	1,000
Carbon Disulfide	ND	1,000
2-Butanone	ND	1,000
Cis-1,3-Dichloropropene	ND	1,000
4-Methyl-2-Pentanone	ND	1,000
2-Hexanone	ND	1,000
Styrene	ND	1,000
Xylenes (Total)	ND	1,000

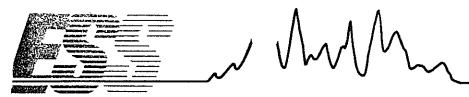
ND = Not Detected above Method Reporting	Limit	(MRL)
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Approved by: //// Javid Dickinson

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nvironmental Science Services

Laboratory Director



## ERTIFICATE OF ANALYSIS

## TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

#### **METALS**

#### EPA METHOD 1311

Client: ATEC Environmental Consultants

Client Project ID: Stockpiled Soils

Client Sample ID: LSP-39

ESS Sample ID: 921528-12

Date Sampled: 6/9/92

Date TCLP Performed: 6/22/92

Date Leachate Extracted: 6/23/92

Date Extract Analyzed: 6/24/92

	Act	ual	Adj	usted*
Target Analyte	Sample Result (mg/L)	Method Reporting Limit	Sample Result (mg/L)	Method Reporting Limit
Antimony	ND	0.1	, ND	0.2
Arsenic	ND	0.2	ND	0.2
Cadmium	ND	0.02	ND	0.02
Chromium	ND	0.05	ND	0.05
Lead	0.4	0.1	0.4	0.1
Mercury	ND	0.005	ND	0.0052
Selenium	ND	0.3	ND	0.3
Silver	ND	0.05	ND	0.09
Copper	0.03	0.02	0.04	0.03
Nickel	ND	0.04	ND	0.04
Zinc	0.49	0.02	0.49	0.02
Beryllium	ND	0.02	ND	0.04
Thallium	ND	0.05	ND	0.09

<sup>\*</sup> Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Bickinson

Laboratory Director

ate: 260

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# CERTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants

UST 37 Bldg. 2461, UST 39 Bldg. 2520 Client Project ID:

Client Sample ID: LRS-1 UST 39

Date Sample Received: 8/5/92 ESS Project ID: 922026

ESS Sample ID: 922026-07

Date Reported: 8/18/92

Parameter	Results	Units	MRL	Method
Percent Solids	89	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	ND	mg/Kg	11	418.1

TPHIR reported on dry weight basis

ND = Not Detected above the Method Reporting Limit(MRL)

Approved by:

Laboratory Director



 $MMM_{m}$ 

In Response To The Future

# CERTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants

Client Project ID: UST 37 Bldg. 2461,

UST 39 Bldg. 2520

Client Sample ID: LRS-5 UST 39

Date Sample Received: 8/5/92

ESS Project ID: 922026

ESS Sample ID: 922026-08

Date Reported: 8/18/92

Parameter	Results	Units	MRL	Method
Percent Solids	88	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	108	mg/Kg	11	418.1

TPHIR reported on dry weight basis

MRL = Method Reporting Limit

Approved by:

Laboratory Director

Date: 18 An; 52

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ESS Project ID:

922026

#### TCL VOLATILE ORGANICS CERTIFICATE OF ANALYSIS Method 8260

Client: ATEC Environmental Consultants

Client Project ID: UST 37 Bldg. 2461, UST 39 Bldg. 2520'

Client Sample ID: Method Blank ESS Sample ID: WS0814B1

Date Sample Received: Date Reported: 8/18/92

Parameter	Result (ug/Kg)	MRL
Methylene Chloride	ND	5
1,1-Dichloroethane	ND	5
Chloroform	ND	5
Carbon Tetrachloride	ND	5
1,2-Dichloropropane	ND	5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Tetrachloroethene	ND	5
Chlorobenzene	ND	5
1,2-Dichloroethane	ND	5
1,1,1-Trichloroethane	ND	5
Bromodichloromethane	ND	5
Trans-1,3-Dichloropropene	ND	5
Bromoform	ND	5
1,1,2,2-Tetrachloroethane	ND	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
Benzene	ND	5
Toluene	ND	5
Ethyl Benzene	ND	5
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl Chloride	ND	10
Chloroethane	ND	10
1,1-Dichloroethene	ND	5
1,2-Dichloroethene (Total)	ND	5
Trichloroethene	ND	5
Acetone	ND	10
Carbon Disulfide	ND	5
2-Butanone	ND	10
Cis-1,3-Dichloropropene	ND	5
4-Methyl-2-Pentanone	ND	10
2-Hexanone	ND	10
Styrene	ND	5
Xylenes (Total)	ND	10
wateries (local)	ND	10

ND = Not Detected above Method Reporting Limit (MRL)

NA = Not Applicable

Approved by:

David Dickinson Laboratory Director



# CERTIFICATE OF ANALYSIS

#### MATRIX SPIKE ANALYSIS SUMMARY

#### TCLP METALS

#### EPA METHOD 1311

Client: ATEC Environmental Consultants Matrix: Solid

TCLP Batch ID: 202301 Concentration in: mg/L

Antimony ND * Arsenic ND 2.00 Cadmium ND 0.5 Chromium ND 1.0 Lead ND 1.0 Mercury ND 0.02 Selenium ND 2.00 Silver ND 1.0 Copper ND 1.0 Nickel ND 1.0 Beryllium ND 1.0 Beryllium ND *	Spiked Result	Percent Recovery
Arsenic       ND       2.00         Cadmium       ND       0.5         Chromium       ND       1.0         Lead       ND       1.0         Mercury       ND       0.02         Selenium       ND       2.00         Silver       ND       1.0         Copper       ND       1.0         Nickel       ND       1.0         Zinc       ND       1.0	ND	76%
Chromium         ND         1.0           Lead         ND         1.0           Mercury         ND         0.02           Selenium         ND         2.00           Silver         ND         1.0           Copper         ND         1.0           Nickel         ND         1.0           Zinc         ND         1.0	2.26	113
Lead       ND       1.0         Mercury       ND       0.02         Selenium       ND       2.00         Silver       ND       1.0         Copper       ND       1.0         Nickel       ND       1.0         Zinc       ND       1.0	0.39	78
Mercury         ND         0.02           Selenium         ND         2.00           Silver         ND         1.0           Copper         ND         1.0           Nickel         ND         1.0           Zinc         ND         1.0	1.22	122
Mercury         ND         0.02           Selenium         ND         2.00           Silver         ND         1.0           Copper         ND         1.0           Nickel         ND         1.0           Zinc         ND         1.0	1.12	112
Selenium         ND         2.00           Silver         ND         1.0           Copper         ND         1.0           Nickel         ND         1.0           Zinc         ND         1.0	0.020	100
Copper         ND         1.0           Nickel         ND         1.0           Zinc         ND         1.0	2.13	107
Copper ND 1.0 Nickel ND 1.0 Zinc ND 1.0	0.76	76
Nickel ND 1.0 Zinc ND 1.0	1.14	114
	1.07	107
Beryllium ND *	1.09	109
	ND	76
Thallium ND *	ND	76

This matrix spike analysis summary applies to the following samples: 922026-04, -05

ND = Not Detected above Method Reporting Limit (MRL)

\* Matrix spike recovery is based on the lowest spike recovery of the spiked analytes.

Approved by:

David Dickinson Laboratory Director Date: // // /52

# 3.9 CHAIN OF CUSTODY FORMS

The following chain of custody forms were produced for the soil samples which were laboratory analyzed.

#### CHAIN OF CUSTODY RECORD

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## **CHAIN OF CUSTODY RECORD**

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#### 3.10 HAZARDOUS WASTE MANIFEST

UST No. 0039 was estimated to contain approximately 10 gallons of No. 2 fuel oil. Approximately 10 gallons of fuel oil were removed on January 21, 1992, and transported to a licensed Treatment Storage Disposal Facility (T.S.D.F.) (Beede Waste Oil Corporation, Plaistow, New Hampshire) on February 27, 1992.

The following Hazardous Waste Manifests were generated from residual tank materials. The manifest dated February 27, 1992 is associated with tank product and residuals from several USTs. Therefore, the total quantity (385 gallons) is greater than the 10 gallons which were removed from UST No. 0039.



# DIVISION OF HAZARDOUS WASTE

#### One Winter Street

Boston, Massachusetts 02108

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	4. Generator's Phone ( 508-796-3002	B. State Gen. tD											
	5. Transporter 1 Company Name	C.State Trans. ID											
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	Combustable liquid NA		0.017	DH	0103181	dG	MAOT						
G	b.					<u> </u>		1					
E				1	] ]			13.00					
N E							<u> </u>	刻點測性					
R	Con i					•							
î					} , }			137.45					
O R	d.				╁╌┼	!!		453.548					
	<b>\</b>												
-	Additional Descriptions for Materials Listed Above Involves physical state and hazard code.  K. Handling Codes for Wast												
	<b>发展的基本条件,并不是有一个</b> 可以	A 野 图 题 心脏		in the Wali		F F	13 - 34 25						
i	15. Special Handling Instructions and Additional	Information	4-Ada 6	31 1-6	ido 2	447 1-7	686 -	1-3572					
	15. Special Handling Instructions and Additional Information —— 4-8dq 631 1-8dq 2447 1-2676 — 1-3573  To Be Recycled #2 Fuel With SI=Sludge,												
	For Recylling out hand Disposal Prohisitio.												
	16. GENERATOR'S CERTIFICATION: I hereby declare that the confents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway												
	according to applicable international and national government regulations.												
	If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the depree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environ-												
ment; OR, if I am a small quantity generator. I have made a good faith effort to minimize my waste generation and beleet the bust waster fanagement method that is available can afford.													
			-18	/			Date						
	Printed/Typed Name		Signature	Z#64Z			Month	Day Year					
T	17. Transporter 1 Acknowledgement of Rece	riot of Materials		~7/-			Vie	Date					
R	Printed/Typed Name		Aignatura .		<u> </u>		Month						
5	Brian Ginivan	Bren	<u>- 4</u>		2	100	127192						
O R	18. Transporter 2 Acknowledgement of Rece	ipt of Materials		-A				Date					
Į.	Printed/Typed Name	ļ	Signature	0			Month	Day Year					
.,	19. Discrepancy Indication Space	<u> </u>						1 1 1 1 -					
F			•										
ĉ													
L	20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Itum 19.												
i T					_,,		Date						
Ý	Printed/Typed Name		Signature				Month I	Clay Year					

# 3.11 WEIGHT DISPOSAL RECEIPTS

The following weight slips are associated with contaminated soil disposal associated with UST 0039.

	OUNT BITUMINOUS PRODUC 5 CHERRY H RIVE P.O. BOX 69 DANVERS, MA 01923-5089		FMN	ash  CHECKED B	C.O.D. Charge
MAIN OFFICE: DANVERS 750-4200	SHREWSBURY DIVISION 651 LAKE STREET AT RTE. 20 SHREWSBURY, MA 01545 OFFICE 881-1430 PLANT 754-47	. ŽEL	LEFT JOB CHECK	TIČKET	CARRIER 72863.
Customer # ATE001 ATEC ASSOC. 62 ACCORD PARK DRIVE NORWELL, MA 62061 617-878-6200	Job * BLDGFD US ARMY BLDG Z447 ¢ 252 FORT DEVENS, HA 0143: PO\$ 37.04.72053		ł <b>‡</b> 39	NAME OIL SOIL	TRUCK\$ 9
Time Tare 9:20:30 3960  Cost/Ton Percent Tare		<b>0</b> 0160	Total 30.28 otal Cost		
Load# Job 1		Date Fob/Do ug 5, 1992 F	el	RECEIVED BY	THIS COMPANY WILL NOT BE RE SPONSIBLE FOR DAMAGE CAUSE BY TRUCKS DELIVERING MATERI BEYOND STREET PAVEMENT.
MAIN OFFICE: DANVERS 750-4200	DANVERS, MA 01923-5089 SHREWSBURY DIVISION 651 LAKE STREET AT RTE. SHREWSBURY, MA 01545 OFFICE 881-1430 PLANT 754-4	M I 20 E	FMN ARRIVED JOB LEFT JOB	Cash  CHECKED	CARRIER
Customer # ATEGO1 ATEC ASSOC. 62 ACCORD PARK DRIVE RORWELL, MA 02061 617-878-6200	Job # BLDGED US APMY BLDG 之らこの <b>TAI</b> FORT DEVERS, HA 011 PO# 37.04.72053		<b># ⊈</b> ∤ \$7 <u>0 HI</u> I	E NAME OTE SCIL	TRUCK≉ 9
/ Time	re Net 200 46860 wx Load Cost Amount Tax	Groos 743o0 Pest Charge	Total 25.45 Total Cost		
Load <b>i</b> Jo		& Date Fob/ Aug 3, 1992 F			THIS COMPANY WILL NOT BE R

SPONSIBLE FOR DAMAGE CAUS BY TRUCKS DELIVERING MATER BEYOND STREET PAVEMENT.

RECEIVED BY \_\_\_

# 3.12 PERMITS AND CERTIFICATIONS

The following permit was obtained for the proper closure of a UST. Following the permit there is a disposal receipt for the steel UST.

# The Commonwealth of Massachusetts

DEPARTMENT OF PUBLIC SAFETY DIVISION OF FIRE PREVENTION

FOR REMOVAL AND TRANSPORTATION TO APPROVED TANK YARD In accordance with the provisions of Chapter 148, Gill as provided in Section 38A this permit is granted to

Name:

Arec Environmental Associates Tric.

Full name of person, firm or Corporation

To transport underground steel storage tank(s)

to Approved tank yard# 3

State clearly type of inert gas used in steel storage tank

Fee paid \$

steel tank! DR

Name and addfess of contractor disposing tank Sociation to which tal be transported

BLD6 25

Contract of the Contract of th

ć, 62 8,46 k.d.l. . .

fiel balt . ...

This permit will expire

1,000 natyre of official granting permi (Head of Fire Dept.)

RECEIPT OF DISPOSAL OF UNDERGROUND S	TEEL STORAGE TANK
<del></del>	<u> </u>
OF CARSTON ST APPROVED TANK YARD ANGENCE MASS. 0	1:34:
approved tank yard no. $1490$	
Tank Yard Ledger 502 CMR 3.03(4) Num	
I certify under penalty of law I have personal delivered to this "approved tank yard" by firm	, corporation or partnership ATEC ENVIRONMENTAL ASSOC. INC
Regulation 502 CMR 3.00 Provisions for Approvi A valid permit was issued by LOCAL Head of this tank to this yard.	in conformance with Massachusetts Fire Prevention ng Underground Steel Storage Tank dismantling yards. Fire Department FDID# 1 7 9 19 to transport
Name and official title of approved tank yard	
SIGNATURE TITLE	DATE SIGNED
This signed receipt of disposal must be return FDID# 1 7 9 1 9 pursuant to 502 CMR 3:00.	ed to the local head of the fire department (EACH TANK MUST HAVE A RECEIPT OF DISPOSAL)
FORM F.P. 291 (rev. 9/88) (OVE	R) MASSACHUSETTS STATE FIRE MARSHAL'S OFFICE
	•
	·
•	
	<b>.</b>
DIMENSIONS	Tank Removed From
	FT. DEVEN'S BLOW. 2520 -tank #39
Width Length	(no. street)
Tank 1 -48" x 10'8" (1,000902)	AYER
Tank 2 X	(city or town)
	· · · · · · · · · · · · · · · · · · ·
Tank 3 X	Fire Department None-Listea
Tank 4 X	Permit #3-0110
Tank 5 X	
(feet) (feet)	

# 3.13 INSTALLATION

The installation of a replacement UST No. 0039 was not performed.

#### 4.0 UST No. 0040

#### 4.1 POST REMOVAL REPORT

#### 4.1.1 Introduction

This Post Removal Report details the results of the closure of one 1,000-gallon, single wall, steel, underground storage tank (UST) referenced as UST No. 0040, located at property known as Building 2686, Fort Devens, Massachusetts (the site). The purpose of the closure was to excavate the UST and evaluate the potential for the presence of oil and hazardous material at the site. The closure of this UST was conducted on January 23 and 24, 1992.

The basic Project Work Scope included:

- Procurement/administration of all federal, state and local permits, manifests, regulations, etc., associated with UST system closure.
- Excavating, venting, cleaning, transporting, and disposing of one 1,000-gallon UST by appropriately licensed contractors/facilities.
- Disposal of residual UST materials at a licensed facility.
- Field screening and analysis of soil in the excavations by a Photoionization Detector (PID) and field analyzed with a portable Non-Dispersive Infrared (NDIR) analyzer, to identify evidence of the release of oil and hazardous materials from the UST, if any.
- Laboratory Analysis of soil sampled from the UST excavation by a USEPA certified laboratory for Total Petroleum Hydrocarbons (TPH) (USEPA Method 418.1).
- Preparation of a Technical Report to include assimilation of information gathered, major findings and conclusions.

#### 4.1.2 Underground Storage Tank Excavation and Removal

On January 23, and 24, 1992, one 1,000-gallon, subsurface, No. 2 fuel oil, storage tank was excavated and removed from the site. The UST was located adjacent to the southwest side of Building 2686 (see UST Location Plan, Figure 4.1). Site topography is relatively level with a gentle downgradient slope to the south.

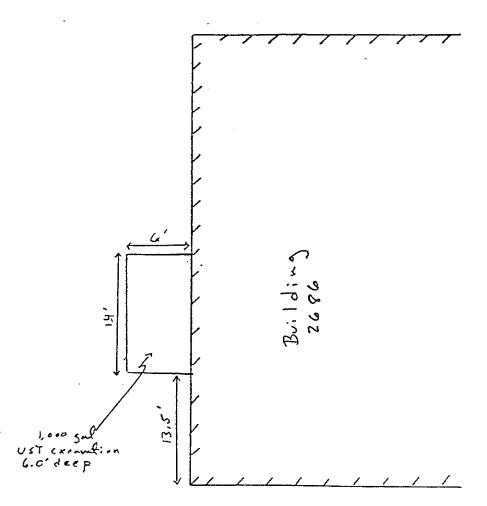
Soils in the excavation consisted primarily of brown, fine sand with some medium to coarse gravel and cobbles. The tank was covered by approximately 2 feet of soil. The bottom of the excavation was approximately 6 feet below grade. Groundwater was not encountered within the excavation. Excavated soils required to free the tank appeared visibly contaminated, particularly those soils removed from the top of the tank. Soils observed at the southeast end of the excavation were visibly contaminated.

The associated piping was drained and tank connections were removed. UST No. 0040 was estimated to contain approximately 60 gallons of No. 2 fuel oil and residual materials. Approximately 30 gallons of fuel oil were removed on January 7, 1992 and transported to a licensed Treatment Storage Disposal Facility T.S.D.F. (Beede Waste Oil Corporation, Plaistow, New Hampshire).

Tank openings were then capped and the tank was removed from the excavation. Upon excavation and removal, the tank was observed to be in good condition with no holes or perforations. There was some surficial to moderate corrosion and the vent pipe was loosely threaded to the tank.

Following venting of the tank, an access way was cut in the end of the tank to allow entry for cleaning. The tank was then entered and vacuumed/wiped clean of any residual materials. Thirty gallons of fuel oil and residual materials were drummed on January 23, 1992, and disposed of at Beede Waste Oil Corporation located in Plaistow, New Hampshire on February 27, 1992. See Section 4.10 for copies of the appropriate

532



NOTE BASED ON FIEID ESTIMATES" SHALL
NOT BE RELIED UPON AS EXACT MEASUREMENTS

# **UST LOCATION PLAN**

1,000 gallon UST relative to:
Building 2686
Fort Devens, Massachusetts

PROJECT: 37.07.91.00451

NOT TO SCALE

FIGURE: 4.1



Hazardous Waste Manifests.

The scrap tank was removed from the site on January 24, 1992 and disposed at Tombarello & Sons, located in Lawrence, Massachusetts, a licensed Massachusetts tank yard on January 28, 1992. A copy of the disposal receipt is included Section 4.11, Permits and Certificates.

#### 4.1.3 Sampling and Analysis Plan

Ten soil samples were obtained from the excavation for field screening with a Photoionization Detector (PID) and field analyzed with a Non-Dispersive Infrared (NDIR) analyzer. The PID field screening for Total Organic Vapors (TOVs) was conducted with an HNu photoionizer utilizing the jar headspace screening protocol outlined in the Hazardous Materials Containment Plan. The NDIR field screening for Total Petroleum Hydrocarbons (TPH) was conducted with a Horiba OCMA 220, utilizing the procedures outlined in the Hazardous Materials Containment Plan.

Eight of the samples (SS-1 to SS-8) were obtained from the excavation walls at a depth of approximately 2.5 to 3.5 feet below grade. Two of the samples (SS-9 and SS-10) were obtained from the bottom of the excavation at a depth of approximately 6 feet below grade. Two composite soil samples (Stock-1 and Stock-2) were obtained from stockpiled soils for PID and NDIR field screening.

Two soil samples (LSS-1 and LSS-2) were obtained from the excavation for laboratory analysis. Soil sample LSS-1 was obtained from the southeast wall of the excavation at a depth of approximately 2.5 to 3.5 feet below grade. Soil sample LSS-2 was obtained from the bottom of the excavation. One composite soil sample (LSS-3) was obtained from stockpiled soils required to free the tank. These samples were analyzed for TPH utilizing USEPA Method 418.1.

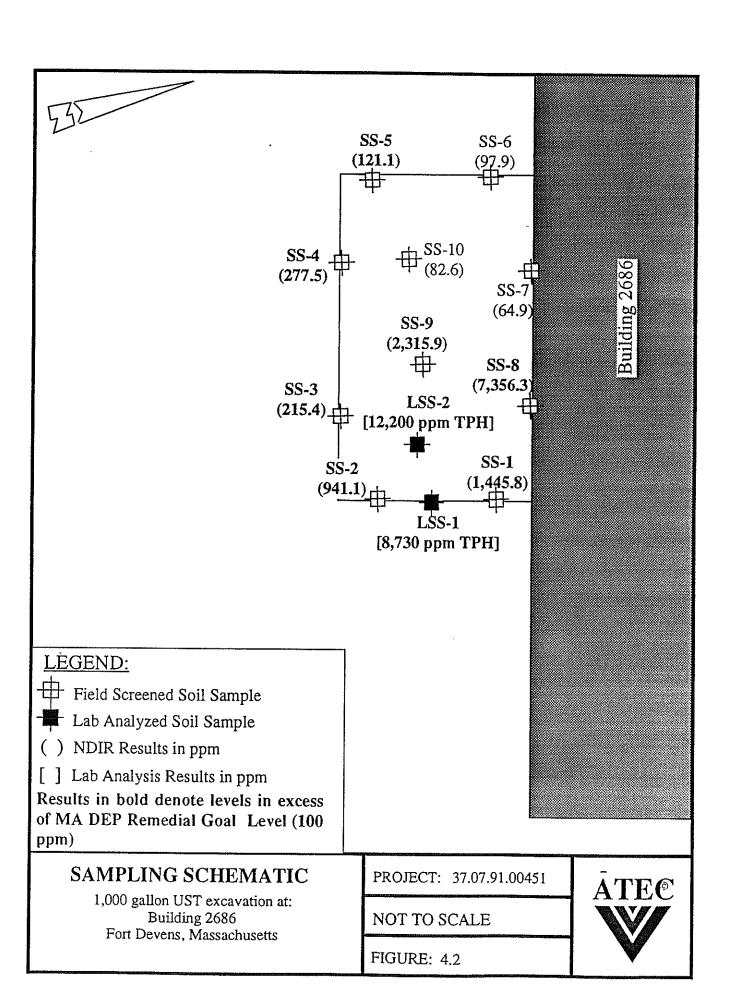
Sampling locations are depicted on the Sampling Schematic as Figure 4.2. The appropriate chain of custodies are included in Section 4.9, Chain of Custody Forms.

# 4.1.4 Analytical Results

The results from analysis with the PID and the NDIR analyzer of the ten soil samples obtained from the excavation, and the two composite samples obtained from stockpiled soil are as follows:

TABLE 4.1 - PID AND NDIR RESULTS

SAMPLE NUMBER	PID (ppm TOV)	NDIR (ppm TPH)
SS-1	52.0	1,445.8
SS-2	44.0	941.1
SS-3	32.0	215.4
SS-4	10.4	277.5
SS-5	2.2	121.1
SS-6	1.8	97.9
SS-7	26.0	64.9
SS-8	106	7,356.3
SS-9	110	2,315.9
SS-10	4.6	82.6
Stock-1	9.1	386.8
Stock-2	9.0	445.6



Laboratory analytical results of the two soil samples were obtained from the excavation revealing TPH concentrations of 8,730 ppm for LSS-1 and 12,200 ppm for LSS-2. Laboratory analysis of one soil sample obtained from the stockpiled soils produced a TPH concentration of for LSS-3. (see Section 4.8, Laboratory Analytical Results).

#### 4.1.5 Conclusions and Recommendations

As presented in ATEC's Post Removal Report dated February 21, 1992, ATEC's conclusions are as follows:

Upon excavation and removal, the tank was observed to be in good condition with no holes or perforations. There was some corrosion and the vent pipe was loosely threaded to the tank.

Groundwater was not encountered within the excavation.

Excavated soils required to free the tank appeared visibly contaminated, particularly those soils removed from the top of the tank. Soils observed at the southeast end of the excavation were visibly contaminated.

Ten soil samples were obtained from the excavation for field screening and field analysis utilizing a PID and NDIR analysis respectively. PID readings revealed TOV concentrations ranging from 1.8 ppm to 110 ppm. NDIR results revealed TPH concentrations ranging from 64.9 ppm to 7,356.3 ppm.

Two soil samples were obtained from the excavation for laboratory analysis for TPH utilizing USEPA Method 418.1. Analytical results for LSS-1 obtained from the southeast wall of the excavation revealed a TPH concentration of 8,730 ppm. Analytical results for LSS-2 obtained from the bottom of the excavation revealed a TPH concentration of 12,200 ppm.

#### 4.1.2 Underground Storage Tank Excavation and Removal

On January 23, and 24, 1992, one 1,000-gallon, subsurface, No. 2 fuel oil, storage tank was excavated and removed from the site. The UST was located adjacent to the southwest side of Building 2686 (see UST Location Plan, Figure 4.1). Site topography is relatively level with a gentle downgradient slope to the south.

Soils in the excavation consisted primarily of brown, fine sand with some medium to coarse gravel and cobbles. The tank was covered by approximately 2 feet of soil. The bottom of the excavation was approximately 6 feet below grade. Groundwater was not encountered within the excavation. Excavated soils required to free the tank appeared visibly contaminated, particularly those soils removed from the top of the tank. Soils observed at the southeast end of the excavation were visibly contaminated.

The associated piping was drained and tank connections were removed. UST No. 0040 was estimated to contain approximately 60 gallons of No. 2 fuel oil and residual materials. Approximately 30 gallons of fuel oil were removed on January 7, 1992 and transported to a licensed Treatment Storage Disposal Facility T.S.D.F. (Beede Waste Oil Corporation, Plaistow, New Hampshire).

Tank openings were then capped and the tank was removed from the excavation. Upon excavation and removal, the tank was observed to be in good condition with no holes or perforations. There was some surficial to moderate corrosion and the vent pipe was loosely threaded to the tank.

Following venting of the tank, an access way was cut in the end of the tank to allow entry for cleaning. The tank was then entered and vacuumed/wiped clean of any residual materials. Thirty gallons of fuel oil and residual materials were drummed on January 23, 1992, and disposed of at Beede Waste Oil Corporation located in Plaistow, New Hampshire on February 27, 1992. See Section 4.10 for copies of the appropriate

One composite soil sample (LSS-3) was obtained from stockpiled soils for laboratory analysis. Analytical results for LSS-3 revealed a TPH concentration of 648 ppm.

Based on these findings, ATEC recommended the following:

Conduct remedial excavation of the south wall, east wall, northeast wall, west corner, and east portion of the bottom of the excavation until background levels of <100 ppm TPH by laboratory analysis are attained. Field screening of soil should be conducted during excavation utilizing a PID until background levels of <1 ppm are attained prior to obtaining samples for laboratory analysis.

Advance soil borings and install groundwater monitoring wells to determine the vertical and horizontal extent of contamination. Continuous split spoon sampling and analysis will be conducted utilizing field analysis techniques, i.e. PID and NDIR Analysis, and laboratory analysis to document soil contamination levels as specified in the Hazardous Waste Containment Plan.

Additionally excavated and stockpiled soils should be laboratory analyzed for TPHs, VOCs, PCBs, 13 TCLP Metals, flashpoint, corrosivity, sulfide reactivity, and cyanide reactivity for disposal classification.

### 4.2 SITE REMEDIATION AND CONTAMINATED SOIL DISPOSAL

#### 4.2.1 Site Remediation

Following review of field screening and laboratory analytical results, additional excavation to remove contaminated soil and reach background levels by PID (<1 ppm) was conducted per order of the Contracting Officer's Representative and David Salvadore of the Massachusetts Department of Environmental Protection (DEP). Approximately 321.0 tons of contaminated soil were removed from the excavation floor and from the south,

east and west sidewalls during remedial excavation on August 11, 1992. The estimated volume of soil removed was calculated from field drawings produced during the removal and remediation of UST No. 0040. Excavation of the north wall was not conducted due to potential safety and structural concerns (see Remedial Excavation Plan, Figure 4.3).

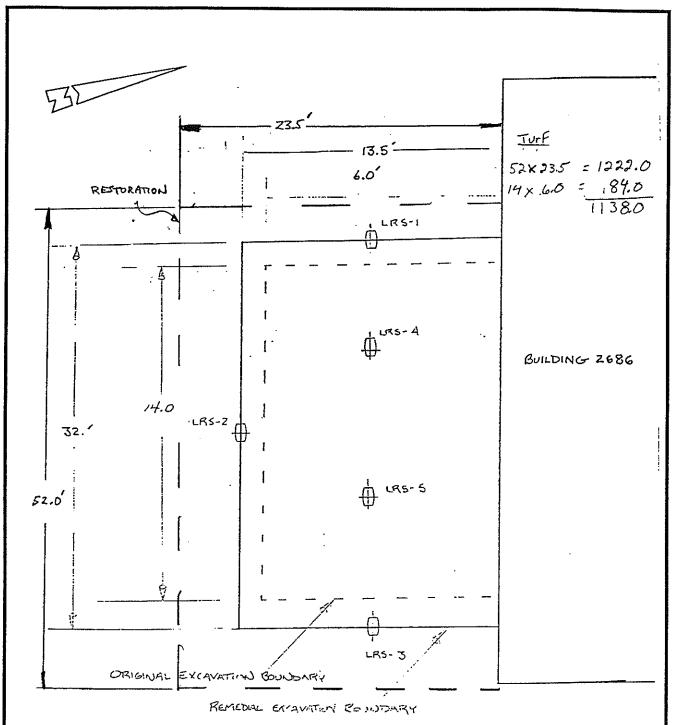
Five soil samples (RSS-1A to RSS-5A) were obtained from the post-remedial excavation for PID field screening. RSS-1A to RSS-3A were obtained from the side walls at a depth of approximately 6 to 7 feet below grade. RSS-4A and RSS-5A were obtained from the bottom of the excavation, approximately 13.5 feet below grade. PID readings for TOVs ranged from 9.0 to 200 ppm.

Following the removal of additional soil from the excavation, five soil samples (RSS-1B to RSS-5B) were obtained from the excavation south, east, and west sidewalls (6 to 7 feet below grade) and at the bottom (13.5 feet below grade) of the excavation. PID readings for TOVs ranged from 0.5 to 7.0 ppm.

An additional two soil samples (RSS-1C and RSS-4C) were obtained from the excavation following the additional removal of soil. RSS-1C was obtained from the west sidewall at a depth of 6 to 7 feet below grade. RSS-4C was obtained from the bottom of the excavation at a depth of 13 feet below grade. PID readings for TOVs ranged from 12.0 to 15.0 ppm.

Subsequent to the additional removal of soil from the west sidewall, soil sample RSS-1D was obtained from the excavation at a depth of 6 to 7 feet below grade. PID readings for TOVs were 0.2 ppm.

See Table 4.2 for PID screening results.



DEPTH OF EXCAVATION: 13.5'
DEPTH OF ORIG. EXCAV.=6.0'

# REMEDIAL EXCAVATION PLAN

1,000 gallon UST relative to:
Building 2686
Fort Devens, Massachusetts

PROJECT: 37.00451

NOT TO SCALE

FIGURE: 4.3



TABLE 4.2 - PID SCREENING RESULTS

SAMPLE NUMBER	PID (ppm TOV)	LOCATION	
RSS-1A	200	west sidewall (6-7' depth)	
RSS-2A	55.0	south sidewall (6-7' depth)	
RSS-3A	40.0	east sidewall (6-7' depth)	
RSS-4A	30.0	bottom (13.5' depth)	
RSS-5A	9.0	bottom (13.5' depth)	
RSS-1B	4.0	west sidewall (6-7' depth)	
RSS-2B	0.5	south sidewall (6-7' depth)	
RSS-3B	0.8	east sidewall (6-7' depth)	
RSS-4B	7.0	bottom (13.5' depth)	
RSS-5B	6.0	bottom (13.5' depth)	
RSS-1C	12.0	west sidewall (6-7' depth)	
RSS-4C	15.0	bottom (13.5' depth)	
RSS-1D	0.2	east sidewall (6-7' depth)	

RSS = Remediation Soil Sample

Three soil samples (LRS-1 through LRS-3) were obtained for laboratory analysis for TPH. One soil sample (LRS-1) was also laboratory analyzed for VOCs, and 13 Metals by Toxicity Characteristic Leachate Procedure (TCLP). See Table 4.3; Figure 4.2, Sampling Schematic; Section 4.8, Laboratory Analytical Results.

**TABLE 4.3 - LABORATORY ANALYSIS** 

SAMPLE NUMBER	TPH (ppm)	VOA (ppb)	13 TCPL METALS (ppm)	LOCATION
LRS-1	ND	ND	0.05 Ni, 0.25 Zn	west sidewall (6-7' depth)
LRS-2	ND	NA	NA	south sidewall (6-7' depth)
LRS-3	16.0	NA	NA	east sidewall (6-7' depth)

LRS = Laboratory Remediation Sample

ND = Not Detected Above Method Reporting Limit

NA= Not Applicable

One composite soil sample (LSS-3) was obtained from stockpiled soils for laboratory analysis. Analytical results for LSS-3 revealed a TPH concentration of 648 ppm.

Based on these findings, ATEC recommended the following:

Conduct remedial excavation of the south wall, east wall, northeast wall, west corner, and east portion of the bottom of the excavation until background levels of <100 ppm TPH by laboratory analysis are attained. Field screening of soil should be conducted during excavation utilizing a PID until background levels of <1 ppm are attained prior to obtaining samples for laboratory analysis.

Advance soil borings and install groundwater monitoring wells to determine the vertical and horizontal extent of contamination. Continuous split spoon sampling and analysis will be conducted utilizing field analysis techniques, i.e. PID and NDIR Analysis, and laboratory analysis to document soil contamination levels as specified in the Hazardous Waste Containment Plan.

Additionally excavated and stockpiled soils should be laboratory analyzed for TPHs, VOCs, PCBs, 13 TCLP Metals, flashpoint, corrosivity, sulfide reactivity, and cyanide reactivity for disposal classification.

### 4.2 SITE REMEDIATION AND CONTAMINATED SOIL DISPOSAL

#### 4.2.1 Site Remediation

Following review of field screening and laboratory analytical results, additional excavation to remove contaminated soil and reach background levels by PID (<1 ppm) was conducted per order of the Contracting Officer's Representative and David Salvadore of the Massachusetts Department of Environmental Protection (DEP). Approximately 321.0 tons of contaminated soil were removed from the excavation floor and from the south,

#### 4.2.2 Soil Stratigraphy

The soil stratigraphy of the excavation varied with the depth of the excavation. The stratigraphy, to a depth of approximately 7 feet below grade, consisted of sand and gravel with cobbles. From a depth of 7 to 7.2 feet, the soil consisted of sand. The soil consisted of sand and gravel with cobbles at a depth from 7.2 feet to 12.5 feet below grade. Glacial till was encountered at approximately 12.5 feet below grade. Bedrock was encountered at approximately 13.5 feet below grade (see Figure 4.4, Soil Statigraphy).

#### 4.2.3 Contaminated Soil Disposal

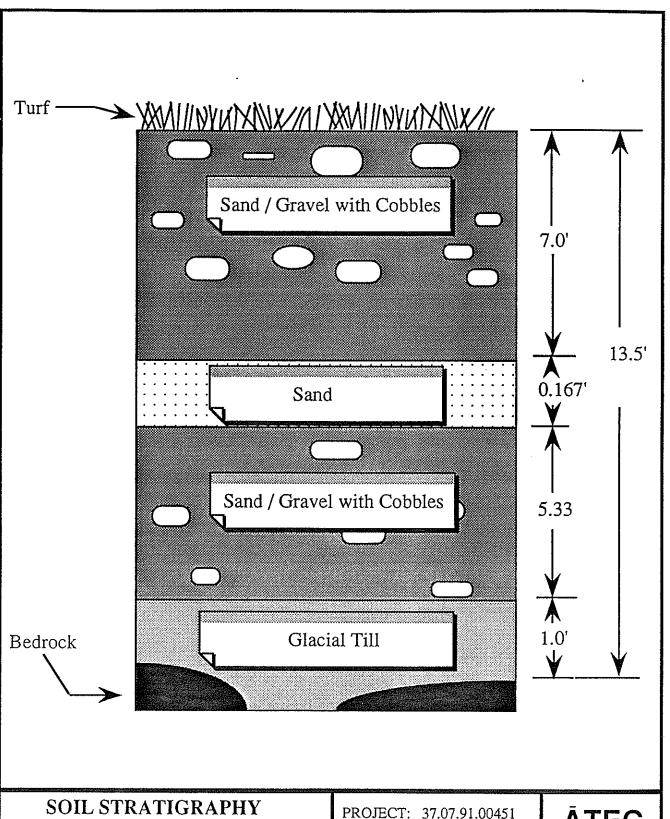
Approximately 197.53 cubic yards (321.0 tons) of No. 2 fuel oil contaminated soil were removed and stockpiled during the additional excavation conducted at the site, as estimated through field drawings. Contaminated soil was disposed for recycling at Trimount Bituminous Products Company, Shrewsbury, Massachusetts.

#### 4.3 HYDROGEOLOGICAL SERVICES

A hydrogeological investigation was conducted on the immediate area of UST No. 0040 to include the installation of groundwater monitoring wells on September 30, 1992 by ATEC. However, auger refusal prior to encountering groundwater prevented installation of monitoring wells. Split spoon samples obtained during the advancement of the soil borings were screened utilizing the PID and NDIR analysis.

## 4.3.1 General Explanation of Procedures

At the time of removal of UST No. 0040, laboratory analysis of two soil samples obtained from the sidewall and bottom of the excavation revealed TPH concentrations of 8,730 and 12,200 ppm, respectively. Due to these elevated levels, two monitoring wells were proposed to be installed in the vicinity of UST No. 0040 to assess soil and



1,000 gallon UST excavation at: Building 2686 Fort Devens, Massachusetts

NOT TO SCALE

FIGURE: 4.4

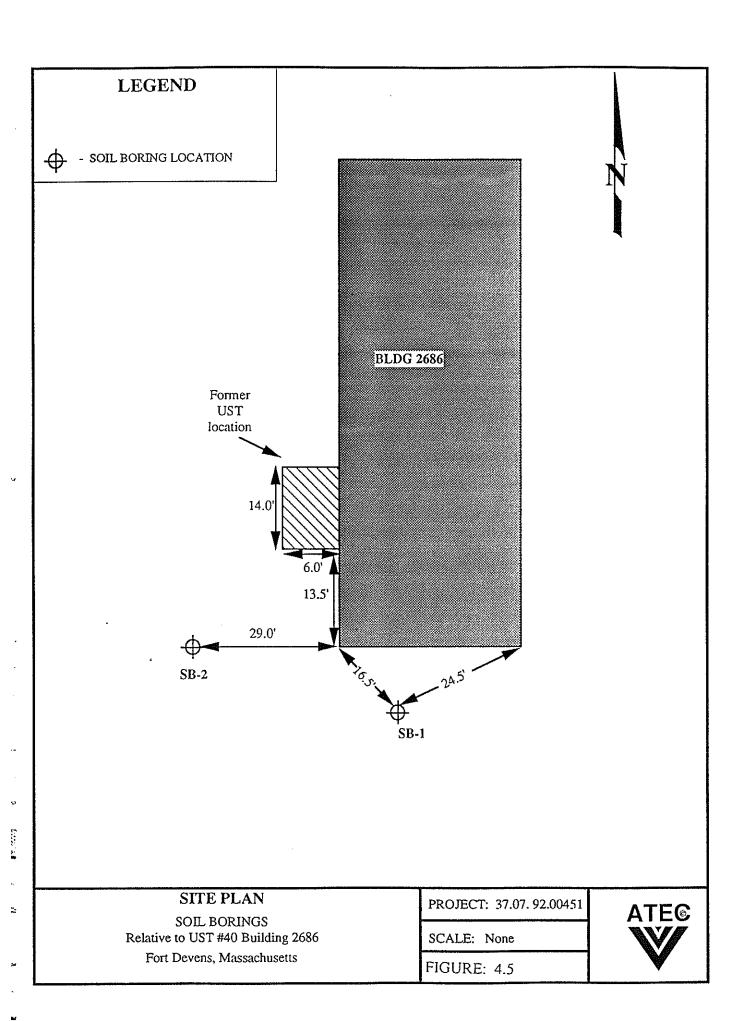


groundwater conditions. Due to shallow bedrock in the area, the installation of the wells was terminated per order of the Contracting Officer Representative. Soils were collected before drilling termination and were analyzed for TOVs and TPH.

Prior to advancing the soil borings at the site, "Dig-Safe" was contacted. Dig-Safe contacts various utilities to mark their service connections on public ground surfaces. The Fort Devens Plumbing Department was contacted and site plans were reviewed that depicted underground utilities (i.e. water, gas, and sewer). Ron DeFilippo, Contracting Officer Representative (COR) met with Craig D. Trombly, Project Manager with ATEC to determine monitoring well locations to assess the potential release of No. 2 fuel oil from the 1,000-gallon UST (UST No. 0040). Geosearch, Inc. of Leominister, Massachusetts, was subcontracted by ATEC to perform the soil borings at the site. Soil borings were advanced on September 30, 1992, utilizing hollow stem auger drilling techniques. Split spoon samplers were utilized to collect subsurface soil samples and determine soil types at 5 foot intervals.

#### 4.3.2 Soil Borings

Soil boring SB-1 was advanced approximately 10 feet south of Building 2686 and approximately 20 feet southeast of the backfilled tank excavation (see Figure 4.5, Site Plan). SB-1 was advanced to a depth of 15 feet to assess the potential release of No. 2 fuel oil from the removed UST. Soil types encountered from grade level to a depth of approximately 2 feet below grade consisted primarily of very loose, brown, fine sand. Soil types encountered from a depth of approximately 4 to 6 feet below grade consisted primarily of dense, brown/grey, fine sand. Soil types encountered from a depth of approximately 9 to 11 feet below grade consisted primarily of very dense, brown/grey fine sand. Results of PID screenings revealed no detectable TOV concentrations in soil samples collected at grade level to 2 feet below grade, 4 to 6 feet below grade, and 9 to 11 feet below grade. Petroleum odors were not noted in the sampled soils. Auger refusal was encountered at a depth of 13 feet below grade (see Figure 4.14, Soil Boring Logs).



Soil boring SB-2 was performed approximately 29 feet west of Building 2686 and approximately 10 feet southwest of the backfilled tank excavation (see Figure 4.5, Site Plan). SB-2 was advanced to a depth of 14.5 feet to assess the potential release of No. 2 fuel oil from the removed UST. Soil types encountered from grade level to a depth of approximately 2 feet below grade consisted primarily of very loose, dark brown, fine sand. Soil types encountered from a depth of approximately 4 to 6 feet below grade consisted primarily of dense, brown, fine sand. Soil types encountered from a depth of approximately 9 to 11 feet below grade consisted primarily of very dense, tan sand and gravel. Results of PID screenings revealed TOV concentrations of 10.0 ppm, 0.0 ppm, 7.0 ppm, and 5.0 ppm in soil samples collected at grade level to 2 feet below grade, 4 to 6 feet below grade, 9 to 11 feet below grade, and 14 feet below grade (bedrock), respectively. Petroleum odors were not noted in soils obtained from the sampled depths. Auger refusal was encountered at a depth of 14 feet below grade (see Figure 4.14, Soil Boring Logs).

Further attempts to install groundwater monitoring wells in the vicinity of UST No. 0040 were not conducted per order of the Contracting Officer Representative.

#### 4.3.3 Results of Soil Screenings and Chemical Analyses

Split spoon soil samples were obtained at minimum 5 foot intervals during the soil borings. Split spoon soil samples were screened for TPH utilizing NDIR (modified EPA Standard Test Method 418.1). Subsurface soil samples were placed directly into prelabeled, precleaned 500-ml amber glass jars and immediately placed on ice for shipment to the laboratory.

Four subsurface soil samples were selected during soil boring one (SB-1) and labelled SB-1.1, SB-1.2, SB-1.3, and SB-1.4. Results of NDIR screening revealed TPH concentrations of 13.7 ppm, 28.7 ppm, 26.0 ppm, and 47.8 ppm in soil samples SB-1.1, SB-1.2, SB-1.3, and SB-1.4, respectively.

Four subsurface soil samples were selected during soil boring two (SB-2) and labelled SB-2.1, SB-2.2, SB-2.3, and SB-2.4. Results of NDIR screening revealed TPH concentrations of 25.2 ppm, 18.3 ppm, 25.6 ppm, and 10.2 ppm in soil samples SB-2.1, SB-2.2, SB-2.3, and SB-2.4, respectively.

Analytical results of subsurface soil samples collected during the site investigation are depicted in Table 4.4 - Summary of Subsurface Soil Analyses.

TABLE 4.4 - SUMMARY OF SUBSURFACE SOIL ANALYSES

SAMPLE NUMBER	SAMPLE DEPTH	ТРН (ррт)
SB-1.1	0' - 2'	13.7
SB-1.2	4' - 6'	28.7
SB1.3	9' - 11'	26.0
SB-1.4	13' - 15'	47.8
SB-2.1	0' - 2'	25.2
SB-2.2	4' - 6'	18.3
SB-2.3	9' - 11'	25.6
SB-2.4	14' -14.5'	10.2

#### 4.3.4 Details of Soil Borings

Soil boring locations are depicted on Figure 4.5, Site Plan.

#### 4.3.5 Summary of Findings

On September 30, 1992, two soil borings were performed to assess soil and groundwater conditions in the vicinity of UST No. 0040. Soil samples collected during drilling were screened in the field for TOVs utilizing a PID. The soil sample (SB-2.1) exhibiting the highest TOV concentration of 10.0 ppm was obtained during soil boring SB-2 at a depth

of grade level to 2 feet below grade.

NDIR screening of the subsurface soil samples collected during soil borings SB-1 and SB-2 revealed TPH concentrations ranging between 10.2 ppm and 47.8 ppm. The soil sample (SB-1.4) exhibiting the highest TPH concentration of 10.2 ppm was obtained at soil boring SB-1 at a depth of 13 feet below grade.

#### 4.3.6 Recommendations

Based upon TPH concentrations in soil samples, ATEC recommends installation of bedrock groundwater monitoring wells to evaluate the potential for petroleum hydrocarbons to have impacted the bedrock groundwater aquifer.

#### 4.4 BACKFILL

The excavation was lined with polyethylene plastic sheeting and backfilled with 216 cubic yards of uncontaminated fill material. Backfilling was conducted with the approval of the Contracting Officer's Representative.

#### 4.5 SITE RESTORATION

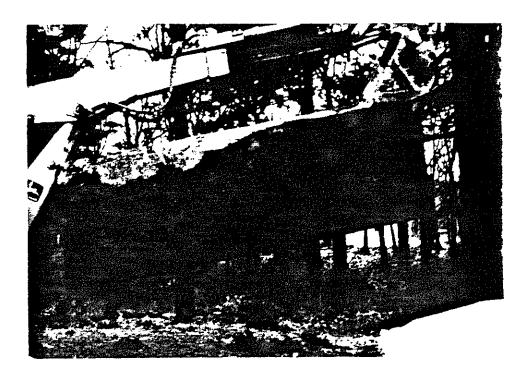
Following backfill of the excavation 348 square feet of loam was distributed over the excavated area.

### 4.6 PHOTOGRAPHIC DOCUMENTATION

The following photographs are of the removed UST, the excavation, and a post removal view of the excavation.

- A-1: One side of removed tank.
- A-2: Opposite side of removed tank.
- A-3: Excavation as viewed from northwest, facing southeast.
- A-4 Excavation as viewed from the southeast, facing northwest.
- A-5 Remedial excavation as viewed from the east, facing west.
- A-6 Remedial excavation as viewed from the south facing north.

A-1



A-2



# PHOTO DOCUMENTATION

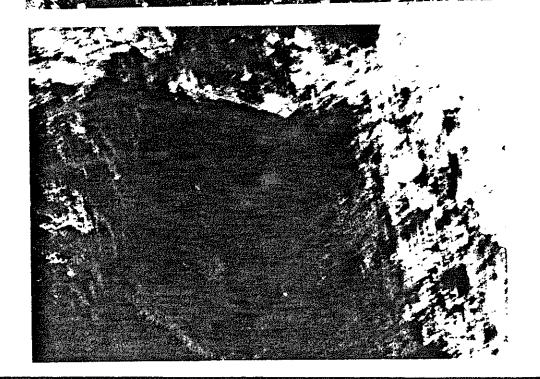
1,000 gallon UST excavation at:
Building 2686
Fort Devens, Massachusetts

PROJECT: 37.07.91.07451



A-3

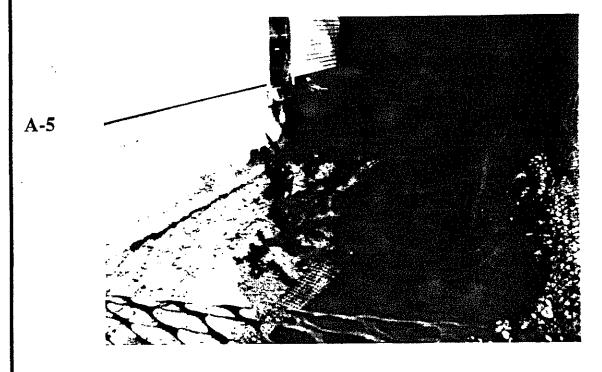
A-4



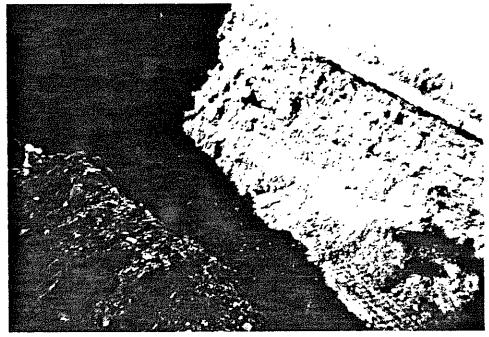
# PHOTO DOCUMENTATION

1,000 gallon UST excavation at: Building 2686 Fort Devens, Massachusetts PROJECT: 37.07.91.07451





**A-6** 



# PHOTO DOCUMENTATION

1,000 gallon UST excavation at:
Building 2686
Fort Devens, Massachusetts

PROJECT: 37.07.91.00451



### 4.7 OCMA 220 DATA SHEETS

The following information was organized from the data collected from the Non-Dispersive Infrared analyzer.

- SS-1 to SS-10: Obtained from original excavation during the removal of UST 0040.
- SS-1.1 to 1.4 and SS-2.1 to 2.4: Obtained from soil borings during attempted groundwater monitoring well installation.

#### TPH SOIL ANALYSES BY NON-DISPERSIVE INFRARED ANALYZER - MODIFIED EPA STANDARD TEST METHOD 418.1

PROJECT NAME, NUMBER, TANK: U.S. ARMY - FORT DEVENS 37.07.91.4 UST 40

BLDG.2686

DATE: Nov 4, 1992

OPERATOR: DAVID G. PANNUTO

#### CALIBRATION DATA

TYPE	FIRST REA	ADING	SECOND RE	EADING	THIRD REA	ADING	SPAN
CALIBRATION	INITIAL	<u>FINAL</u>	<u>INITIAL</u>	FINAL	INITIAL	<u>FINAL</u>	CHECK
ZERO:	0.9	0.0	3,2	0.0	0,1	0.0	30.1
SPAN:	38.7	40.0	39.8	40.0	40.1	40.0	
ZERO:	0,5	0.0	-0,3	0.0	-0.1	0.0	

#### ANALYTICAL DATA

SAMPLE	WEIGH	T (g)	1st DILUTIO	ON RATIO (ml)	2nd DILUTIO	ON RATIO (ml)	INSTRUME	NT RESULTS	(ppm)	CONCENTRATION
<u>NUMBER</u>	GROSS	TARE	F-113	SAMPLE	F-113	SAMPLE _	1st	2nd	3rd	mg/l
SB-1,1	84.6	78.6	17.5	3,0		<u> </u>	1,1	0.4		13.7
SB-1.2	83.6	78.6	17.5	3.0			1,2	0.7		28,7
SB-1.3	85.8	78.7	17,5	3.0			8,0	0.9		26.0
SB-1,4	82,3	76.3	17.5	3.0		****	0.4	1.4		47.8
SB-2.1	83.9	78.2	17,5	3.0			0.7	0.7		25,2
SB-2,2	83.1	77.5	17.5	3.0			1,1	0.5		18.3
SB-2.3	83	77.8	17.5	3.0			0.7	0.8		25.6
SB-2.4	84.0	78.8	17.5	3.0			0.3	0.3		10,2

### 4.8 LABORATORY ANALYTICAL RESULTS

The following laboratory analytical reports were organized and provided by Environmental Science Services Inc. Results are included for:

- LSS-1, LSS-2, and LSS-3: Soil samples obtained from original excavation and stockpile. Laboratory analyzed for TPH.
- LRS-1, LRS-2, and LRS-3: Soil samples obtained from post-remedial excavation.
   Laboratory analyzed for TPH. LRS-1 was also analyzed for VOCs and 13 Metals by TCLP.
- LSP-40: Soil sample obtained from stockpiled soil for disposal classification.
   Laboratory analyzed for VOCs, Semi-volitile Organics, 13 Metals by TCLP,
   PCBs, reactive sulfide, reactive cyanide, flashpoint and corrosivity for characterization and disposal purposes.



# **CERTIFICATE OF ANALYSIS**

Date: 2/03/92 Job: 233

Account: 95659 Received: 1/28/92

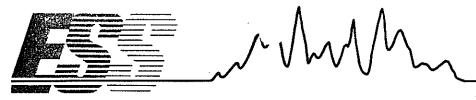
Project: DEVENS-TANK 40

ATEC ENVIRONMENTAL CO. 62 Accord Park Drive Norwell, MA 02061

tn: Mr. Mark Baldi

ample umber	Method Number	Parameter	Result	Unit	Sample Description
023301	EPA-160.3 EPA-418.1	Total Solids TPH/IR (Dry Wt.)	84 8730	% mg/kg	LSS1
:023302	EPA-160.3 EPA-418.1	Total Solids TPH/IR (Dry Wt.)	85 12200	% mg/kg	LSS2
023303	EPA-160.3 EPA-418.1	Total Solids TPH/IR (Dry Wt.)	89 648	% mg/kg	LSS3

David Dickinson Laboratory Manager



# CERTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-40 ESS Sample ID: 921528-13

Date Sample Received: 6/11/92 Date Reported: 7/1/92

Parameter	Results	Units	MRL	Method
pH (Corrosivity)	7.5	s.u.	N/A	9045
Flashpoint	No Flash	°F	200	1010
Polychlorinated Biphenyls	ND	mg/Kg	Attached	8080
Reactive Cyanide	ND	mg/Kg	2	7.3.3.2
Reactive Sulfide	ND	mg/Kg	2	7.3.4.1
Semivolatile Organics Pyrene	3,170	ug/Kg	Attached	8270
Volatile Organics	ND	ug/Kg	Attached	8240
Toxicity Characteristic Leaching Metals	Procedure			1311
Lead Copper Zinc	0.2 0.05 0.10	mg/L mg/L mg/L	Attached Attached Attached	6010 6010 6010

N/A = Not Applicable

ND = Not Detected above Method Reporting Limit (MRL)

Laboratory Director



# CERTIFICATE OF ANALYSIS

#### POLYCHLORINATED BIPHENYLS Method 8080

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-40 ESS Sample ID: 921528-13

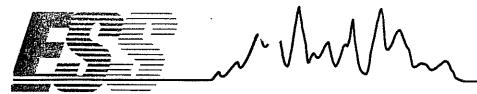
Date Sample Received: 6/11/92 Date Reported: 6/30/92

Parameter	Result (mg/Kg)	MRL
Arochlor 1016	ND	0.1
Arochlor 1221	ND	0.1
Arochlor 1232	ND	0.1
Arochlor 1242	ND	$0.\overline{1}$
Arochlor 1248	ND	0.1
Arochlor 1254	ND	0.2
Arochlor 1260	ND	0.2

ND = Not Detected above Method Reporting Limit (MRL)

Surrogate Recovery Data	% Recovery	QC Limit
Dibutylchlorendate	94%	50 - 150%

Dávid Dickinson Laboratory Director



# CERTIFICATE OF ANALYSIS

#### ACID EXTRACTABLES EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-40 ESS Sample ID: 921528-13

Date Sample Received: 6/9/92 Date Reported: 7/1/92

Parameter	Result (ug/Kg)	MRL
2-Chlorophenol	ND	1,670
2-Nitrophenol	ND	1,670
Phenol	ND	1,670
2,4-Dimethylphenol	ND	1,670
2,4-Dichlorophenol	ND	1,670
2,4-Dinitrophenol	ND	8,350
Pentachlorophenol	ND	8,350
4-Nitrophenol	ND	8,350
2,4,6-Trichlorophenol	ND	1,670
2,4,5-Trichlorophenol	ND	8,350
2-Methylphenol	ND	1,670
4-Methylphenol	ND	1,670
4-Chloro-3-Methylphenol	ND	1,670
4,6-Dinitro-2-Methylphenol	ND	8,350

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

Laboratory Director

Date:

Q 301/1C



# CERTIFICATE OF ANALYSIS

#### BASE NEUTRAL EXTRACTABLES EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-40 ESS Sample ID: 921528-13

Date Sample Received: 6/9/92 Date Reported: 7/1/92

Parameter	Result (ug/Kg)	MRL
Acenaphthylene	ND	1,670
1,2,4-Trichlorobenzene	ND	1,670
Hexachlorobenzene	ND	1,670
Bis(2-chloroethyl)ether	ND	1,670
2-Chloronaphthalene	ND	1,670
1,2-Dichlorobenzene	ND	1,670
1,3-Dichlorobenzene	ND	1,670
1,4-Dichlorobenzene	ND	1,670
3,3-Dichlorobenzidine	ND	3,340
2,4-Dinitrotoluene	ND	1,670
2,6-Dinitrotoluene	ND	1,670
Fluoranthene	ND	1,670
4-Chlorophenyl phenyl ether	ND	1,670
Bis(2-chloroisopropyl) ether	ND	1,670
Bis(2-chloroethoxy) methane	ND	1,670
Hexachlorobutadiene	ND	1,670
Hexachlorocyclopentadiene	ND	1,670
Isophorone	ND	1,670
Naphthalene	ND	1,670
Nitrobenzene	ND	1,670
N-nitrosodiphenylamine	ND	1,670
N-nitrosodi-n-propylamine	ND	1,670
Bis(2-ethylhexyl)phthalate	ND	1,670
Di-n-butylphthalate	ND	1,670
Di-n-octylphthalate	ND	1,670
Diethyl phthalate	ND	1,670
Dimethyl phthalate	ND	1,670
Benzo(a) anthracene	ND	1,670

ND = Not Detected above Method Reporting Limit (MRL)

Laboratory Director



# CERTIFICATE OF ANALYSIS

#### BASE NEUTRAL EXTRACTABLES cont. EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-40 ESS Sample ID: 921528-13

Date Sample Received: 6/9/92 Date Reported: 7/1/92

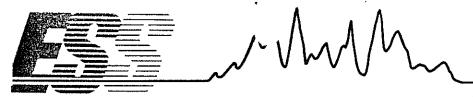
Parameter	Result (ug/Kg)	MRL
Benzo(a)pyrene	ND	1,670
Benzo(b)fluoranthene	ND	1,670
Benzo(k)fluoranthene	ND	1,670
Chrysene	ND	1,670
Acenaphthene	ND	1,670
Anthracene	ND	1,670
Benzo(ghi)perylene	ND	1,670
Fluorene	ND	1,670
Phenanthrene	ND	1,670
Dibenzo(a,h)anthracene	ND '	1,670
Indeno(1,2,3-cd)pyrene	ND	1,670
Pyrene	3,170	1,670
Hexachloroethane	ND	1,670
4-Bromophenyl-phenylether	ND	1,670
Benzyl Alcohol	ND	1,670
Benzoic Acid	ND .	8,350
Bis(2-Chloroethoxy)methane	ND	1,670
4-Chloroaniline	ND	1,670
2-Methylnaphthalene	ND	1,670
2-Nitroaniline	ND	8,350
3-Nitroaniline	ND	1,670
Dibenzofuran	ND	1,670
4-Nitroaniline	ND	8,350
Butylbenzylphthalate	ND	1,670

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

pavid Dickinson Laboratory Director Date:

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## CERTIFICATE OF ANALYSIS

# TCL VOLATILE ORGANICS Method 8240

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-40 ESS Sample ID: 921528-13

Date Sample Received: 6/29/92 Date Reported: 7/1/92

Parameter	Result (ug/Kg)	MRL
Methylene Chloride	ND	1,000
1,1-Dichloroethane	ND	1,000
Chloroform	ND	1,000
Carbon Tetrachloride	ND	1,000
1,2-Dichloropropane	ND	1,000
Dibromochloromethane	ND	1,000
1,1,2-Trichloroethane	ND	1,000
Tetrachloroethene	ND	1,000
Chlorobenzene	ND	1,000
1,2-Dichloroethane	ND	1,000
1,1,1-Trichloroethane	ND	1,000
Bromodichloromethane	ND	1,000
Trans-1,3-Dichloropropene	ND	1,000
Bromoform	ND	1,000
1,1,2,2-Tetrachloroethane	ND	1,000
Benzene	ND	1,000
Toluene	ND	1,000
Ethyl Benzene	ND	1,000
Chloromethane	ND	1,000
Bromomethane	ND	1,000
Vinyl Chloride	ND	1,000
Chloroethane	ND	1,000
1,1-Dichloroethene	ND	1,000
1,2-Dichloroethene (Total)	ND	1,000
Trichloroethene	ND	1,000
Acetone	ND	1,000
Carbon Disulfide	ND	1,000
2-Butanone	ND	1,000
Cis-1,3-Dichloropropene	ND	1,000
4-Methyl-2-Pentanone	ND	1,000
2-Hexanone	ND	1,000
Styrene	ND	1,000
Xylenes (Total)	ND	1,000

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: Payid Dickinson

Date:

1176

Laboratory Director

Invironmental Science Services



## CERTIFICATE OF ANALYSIS

#### TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

#### **METALS**

#### EPA METHOD 1311

Client: ATEC Environmental Consultants

Client Project ID: Stockpiled Soils

Client Sample ID: LSP-40

ESS Sample ID: 921528-13

Date Sampled: 6/9/92

Date TCLP Performed: 6/22/92

Date Leachate Extracted: 6/23/92

Date Extract Analyzed: 6/24/92

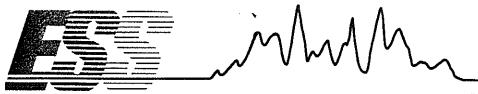
	Act	ual	Adjusted*					
Target Analyte	Sample Result (mg/L)	Method Reporting Limit	Sample Result (mg/L)	Method Reporting Limit				
Antimony	ND	0.1	ND	0.2				
Arsenic	ND	0.2	ND	0.2				
Cadmium	ND	0.02	ND	0.02				
Chromium	ND	0.05	ND	0.05				
Lead	0.2	0.1	0.2	0.1				
Mercury	ND	0.005	ND	0.0052				
Selenium	ND	0.3	ND	0.3				
Silver	ND	0.05	ND	0.09				
Copper	0.04	0.02	0.05	0.03				
Nickel	ND	0.04	ND	0.04				
Zinc	0.10	0.02	0.10	0.02				
Beryllium	ND	0.02	ND	0.04				
Thallium	ND	0.05	ND	0.09				

<sup>\*</sup> Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson Laboratory Director



### CERTIFICATE OF ANALYSIS

## TOTAL PETROLEUM HYDROCARBON-IR Method 418.1

Client: ATEC Environmental Consultants

Client Project ID: UST 40-Bldg 2686 ESS Project ID: 922108

Date Samples Received: 8/13/92 Date Reported: 8/27/92

Client ID	Lab ID	Results	Units	MRL	% Solids
LRS-1	922108-01	ND	mg/Kg	11	93%
LRS-2	922108-02	ND	mg/Kg	11	95
LRS-3	922108-03	16	mg/Kg	11	91

ND = Not Detected above Method Reporting Limit (MRL)

Note: Results reported on a dry weight basis.

Approved by: Telly Vaus for

Laboratory Director

Date: august 27, 1992

(A)





## **CERTIFICATE OF ANALYSIS**

## TCL VOLATILE ORGANICS Method 8260

Client: ATEC Environmental Consultants

Client Project ID: UST 40-Bldg 2686 ESS Project ID: 922108

Client Sample ID: LRS-1 ESS Sample ID: 922108-01

Date Sample Received: 8/13/92 Date Reported: 8/27/92

Methylene Chloride	Parameter	Result (ug/Kg)	MRL
Chloroform         ND         5           Carbon Tetrachloride         ND         5           1,2-Dichloropropane         ND         5           Dibromochloromethane         ND         5           1,1,2-Trichloroethane         ND         5           Tetrachloroethane         ND         5           Chlorobenzene         ND         5           1,2-Dichloroethane         ND         5           1,1,1-Trichloroethane         ND         5           Bromodichloromethane         ND         5           Bromoform         ND         5           Trans-1,3-Dichloropropene         ND         5           Bromoform         ND         5           I,1,2,2-Tetrachloroethane         ND         5           Benzene         ND         5           Toluene         ND         5           Ethyl Benzene         ND         5           Chloromethane         ND         10           Promomethane         ND         10           Vinyl Chloride         ND         10           Chloroethane         ND         5           1,1-Dichloroethene         ND         5           Trich	Methylene Chloride	ND	5
Carbon Tetrachloride       ND       5         1,2-Dichloropropane       ND       5         Dibromochloromethane       ND       5         1,1,2-Trichloroethane       ND       5         Tetrachloroethene       ND       5         Chlorobenzene       ND       5         1,2-Dichloroethane       ND       5         1,1,1-Trichloroethane       ND       5         Bromodichloromethane       ND       5         Bromoform       ND       5         Trans-1,3-Dichloropropene       ND       5         Bromoform       ND       5         1,1,2,2-Tetrachloroethane       ND       5         1,1,2,2-Tetrachloroethane       ND       5         Toluene       ND       5         Ethyl Benzene       ND       5         Chloromethane       ND       10         Stonomethane       ND       10         Vinyl Chloride       ND       10         Chloroethane       ND       10         1,1-Dichloroethene       ND       5         1,2-Dichloroethene       ND       5         1,2-Dichloroethene       ND       5         Acetone	1,1-Dichloroethane	ND	5
1,2-Dichloropropane       ND       5         Dibromochloromethane       ND       5         1,1,2-Trichloroethane       ND       5         Tetrachloroethene       ND       5         Chlorobenzene       ND       5         1,2-Dichloroethane       ND       5         1,1,1-Trichloroethane       ND       5         Bromodichloromethane       ND       5         Bromoform       ND       5         Bromoform       ND       5         1,1,2,2-Tetrachloroethane       ND       5         Benzene       ND       5         Toluene       ND       5         Ethyl Benzene       ND       5         Chloromethane       ND       5         Chloromethane       ND       10         Bromomethane       ND       10         Chloroethane       ND       10         1,1-Dichloride       ND       10         Chloroethane       ND       5         1,2-Dichloroethene       ND       5         1,2-Dichloroethene       ND       5         1,2-Dichloroethene       ND       5         Acetone       ND       5		ND	5
1,2-Dichloropropane	Carbon Tetrachloride	ND	5
1,1,2-Trichloroethane       ND       5         Tetrachloroethene       ND       5         Chlorobenzene       ND       5         1,2-Dichloroethane       ND       5         1,1,1-Trichloroethane       ND       5         Bromodichloromethane       ND       5         Bromoform       ND       5         Bromoform       ND       5         I,1,2,2-Tetrachloroethane       ND       5         Benzene       ND       5         Toluene       ND       5         Ethyl Benzene       ND       5         Chloromethane       ND       10         Bromomethane       ND       10         Vinyl Chloride       ND       10         Chloroethane       ND       10         1,1-Dichloroethene       ND       5         1,2-Dichloroethene (Total)       ND       5         1,2-Dichloroethene       ND       5         1,2-Dichloroethene       ND       5         2-Butanone       ND       5         Carbon Disulfide       ND       5         2-Butanone       ND       5         4-Methyl-2-Pentanone       ND		ND	5
Toluene         ND         5           Ethyl Benzene         ND         5           Chloromethane         ND         10           Bromomethane         ND         10           Vinyl Chloride         ND         10           Chloroethane         ND         10           1,1-Dichloroethene         ND         5           1,2-Dichloroethene (Total)         ND         5           Trichloroethene         ND         5           Acetone         ND         10           Carbon Disulfide         ND         5           2-Butanone         ND         10           Cis-1,3-Dichloropropene         ND         5           4-Methyl-2-Pentanone         ND         10           2-Hexanone         ND         10           Styrene         ND         5	Dibromochloromethane	ND	5
Toluene         ND         5           Ethyl Benzene         ND         5           Chloromethane         ND         10           Bromomethane         ND         10           Vinyl Chloride         ND         10           Chloroethane         ND         10           1,1-Dichloroethene         ND         5           1,2-Dichloroethene (Total)         ND         5           Trichloroethene         ND         5           Acetone         ND         10           Carbon Disulfide         ND         5           2-Butanone         ND         10           Cis-1,3-Dichloropropene         ND         5           4-Methyl-2-Pentanone         ND         10           2-Hexanone         ND         10           Styrene         ND         5	1,1,2-Trichloroethane	ND	5
Toluene         ND         5           Ethyl Benzene         ND         5           Chloromethane         ND         10           Bromomethane         ND         10           Vinyl Chloride         ND         10           Chloroethane         ND         10           1,1-Dichloroethene         ND         5           1,2-Dichloroethene (Total)         ND         5           Trichloroethene         ND         5           Acetone         ND         10           Carbon Disulfide         ND         5           2-Butanone         ND         10           Cis-1,3-Dichloropropene         ND         5           4-Methyl-2-Pentanone         ND         10           2-Hexanone         ND         10           Styrene         ND         5	Tetrachloroethene	ND	5
Toluene         ND         5           Ethyl Benzene         ND         5           Chloromethane         ND         10           Bromomethane         ND         10           Vinyl Chloride         ND         10           Chloroethane         ND         10           1,1-Dichloroethene         ND         5           1,2-Dichloroethene (Total)         ND         5           Trichloroethene         ND         5           Acetone         ND         10           Carbon Disulfide         ND         5           2-Butanone         ND         10           Cis-1,3-Dichloropropene         ND         5           4-Methyl-2-Pentanone         ND         10           2-Hexanone         ND         10           Styrene         ND         5		ND	5
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Toluene         ND         5           Ethyl Benzene         ND         5           Chloromethane         ND         10           Bromomethane         ND         10           Vinyl Chloride         ND         10           Chloroethane         ND         10           1,1-Dichloroethene         ND         5           1,2-Dichloroethene (Total)         ND         5           Trichloroethene         ND         5           Acetone         ND         10           Carbon Disulfide         ND         5           2-Butanone         ND         10           Cis-1,3-Dichloropropene         ND         5           4-Methyl-2-Pentanone         ND         10           2-Hexanone         ND         10           Styrene         ND         5	1,1,1-Trichloroethane	ND	5
Toluene         ND         5           Ethyl Benzene         ND         5           Chloromethane         ND         10           Bromomethane         ND         10           Vinyl Chloride         ND         10           Chloroethane         ND         10           1,1-Dichloroethene         ND         5           1,2-Dichloroethene (Total)         ND         5           Trichloroethene         ND         5           Acetone         ND         10           Carbon Disulfide         ND         5           2-Butanone         ND         10           Cis-1,3-Dichloropropene         ND         5           4-Methyl-2-Pentanone         ND         10           2-Hexanone         ND         10           Styrene         ND         5	Bromodichloromethane	ND	5
Toluene         ND         5           Ethyl Benzene         ND         5           Chloromethane         ND         10           Bromomethane         ND         10           Vinyl Chloride         ND         10           Chloroethane         ND         10           1,1-Dichloroethene         ND         5           1,2-Dichloroethene (Total)         ND         5           Trichloroethene         ND         5           Acetone         ND         10           Carbon Disulfide         ND         5           2-Butanone         ND         10           Cis-1,3-Dichloropropene         ND         5           4-Methyl-2-Pentanone         ND         10           2-Hexanone         ND         10           Styrene         ND         5	Trans-1,3-Dichloropropene	ND	5
Toluene         ND         5           Ethyl Benzene         ND         5           Chloromethane         ND         10           Bromomethane         ND         10           Vinyl Chloride         ND         10           Chloroethane         ND         10           1,1-Dichloroethene         ND         5           1,2-Dichloroethene (Total)         ND         5           Trichloroethene         ND         5           Acetone         ND         10           Carbon Disulfide         ND         5           2-Butanone         ND         10           Cis-1,3-Dichloropropene         ND         5           4-Methyl-2-Pentanone         ND         10           2-Hexanone         ND         10           Styrene         ND         5		ND	5
Toluene         ND         5           Ethyl Benzene         ND         5           Chloromethane         ND         10           Bromomethane         ND         10           Vinyl Chloride         ND         10           Chloroethane         ND         10           1,1-Dichloroethene         ND         5           1,2-Dichloroethene (Total)         ND         5           Trichloroethene         ND         5           Acetone         ND         10           Carbon Disulfide         ND         5           2-Butanone         ND         10           Cis-1,3-Dichloropropene         ND         5           4-Methyl-2-Pentanone         ND         10           2-Hexanone         ND         10           Styrene         ND         5	1,1,2,2-Tetrachloroethane	ND	5
Toluene         ND         5           Ethyl Benzene         ND         5           Chloromethane         ND         10           Bromomethane         ND         10           Vinyl Chloride         ND         10           Chloroethane         ND         10           1,1-Dichloroethene         ND         5           1,2-Dichloroethene (Total)         ND         5           Trichloroethene         ND         5           Acetone         ND         10           Carbon Disulfide         ND         5           2-Butanone         ND         10           Cis-1,3-Dichloropropene         ND         5           4-Methyl-2-Pentanone         ND         10           2-Hexanone         ND         10           Styrene         ND         5		ND	5
Ethyl Benzene       ND       5         Chloromethane       ND       10         Bromomethane       ND       10         Vinyl Chloride       ND       10         Chloroethane       ND       10         1,1-Dichloroethene       ND       5         1,2-Dichloroethene (Total)       ND       5         Trichloroethene       ND       5         Acetone       ND       10         Carbon Disulfide       ND       5         2-Butanone       ND       10         Cis-1,3-Dichloropropene       ND       5         4-Methyl-2-Pentanone       ND       10         2-Hexanone       ND       10         Styrene       ND       5	Toluene	ND	5
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Chloroethane       ND       10         1,1-Dichloroethene       ND       5         1,2-Dichloroethene (Total)       ND       5         Trichloroethene       ND       5         Acetone       ND       10         Carbon Disulfide       ND       5         2-Butanone       ND       10         Cis-1,3-Dichloropropene       ND       5         4-Methyl-2-Pentanone       ND       10         2-Hexanone       ND       10         Styrene       ND       5	Vinyl Chloride	ND	10
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Trichloroethene         ND         5           Acetone         ND         10           Carbon Disulfide         ND         5           2-Butanone         ND         10           Cis-1,3-Dichloropropene         ND         5           4-Methyl-2-Pentanone         ND         10           2-Hexanone         ND         10           Styrene         ND         5	1,2-Dichloroethene (Total)	ND	
Carbon DisulfideND52-ButanoneND10Cis-1,3-DichloropropeneND54-Methyl-2-PentanoneND102-HexanoneND10StyreneND5		ND	
2-Butanone       ND       10         Cis-1,3-Dichloropropene       ND       5         4-Methyl-2-Pentanone       ND       10         2-Hexanone       ND       10         Styrene       ND       5	Acetone	ND	10
Cis-1,3-DichloropropeneND54-Methyl-2-PentanoneND102-HexanoneND10StyreneND5	Carbon Disulfide	ND	5
4-Methyl-2-Pentanone       ND       10         2-Hexanone       ND       10         Styrene       ND       5	2-Butanone	ND	10
4-Methyl-2-Pentanone       ND       10         2-Hexanone       ND       10         Styrene       ND       5	Cis-1,3-Dichloropropene		5
2-Hexanone ND 10 Styrene ND 5		ND	10
Styrene ND 5			10
	Styrene		5
Xylenes (Total) ND 10	<b>-</b>		

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: Value la:

David Dickinson

Laboratory Director

Date: August 27, 1992





### CERTIFICATE OF ANALYSIS

#### TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

#### **METALS**

#### EPA METHOD 1311

Client: ATEC Environmental Consultants

Client Project ID: UST 40-Bldg 2686

Client Sample ID: LRS-1

ESS Sample ID: 922108-01

Date Sampled: 8/10/92

Date TCLP Performed: 8/18/92

Date Leachate Extracted: 8/19/92

Date Extract Analyzed: 8/21/92

	Act	ual	Adjusted*					
Target Analyte	Sample Result (mg/L)	Method Reporting Limit	Sample Result (mg/L)	Method Reporting Limit				
Antimony	ND	0.2	ND	0.4				
Arsenic	ND	0.2	ND	0.4				
Cadmium	ND	0.02	ND	0.04				
Chromium	ND	0.05	ND	0.08				
Lead	ND	0.1	ND	0.2				
Mercury	ND	0.005	ND	0.005				
Selenium	ND	0.3	ND	0.5				
Silver	ND	0.05	ND	0.09				
Copper	ND	0.02	ND	0.03				
Nickel	0.05	0.04	0.06	0.05				
Zinc	0.25	0.02	0.30	0.04				
Beryllium	ND	0.02	ND	0.04				
Thallium	ND	0.1	ND	0.2				

<sup>\*</sup> Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: Celly Vario

David Dickinson \\
Laboratory Director

Date: August 27, 1992





## CERTIFICATE OF ANALYSIS

#### TCL VOLATILE ORGANICS Method 8260

Client: ATEC Environmental Consultants

Client Project ID: UST 40-Bldg 2686

ESS Project ID: 922108 Client Sample ID: Method Blank ESS Sample ID: VS0820B1

Date Sample Received: Date Reported: 8/27/92

Parameter	Result (ug/Kg)	MRL
Methylene Chloride	ND	5
1,1-Dichloroethane	ND	
Chloroform	ND	5
Carbon Tetrachloride	ND	5
1,2-Dichloropropane	ND	5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Tetrachloroethene	ND	5
Chlorobenzene	ND .	5
1,2-Dichloroethane	ND	5
1,1,1-Trichloroethane	$\mathbf{N}$ D	5
Bromodichloromethane	ND	5
Trans-1,3-Dichloropropene	ND	5
Bromoform	ND	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
1,1,2,2-Tetrachloroethane	ND	5
Benzene	ND	5
Toluene	ND	5
Ethyl Benzene	ND	5
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl Chloride	ND	10
Chloroethane	ND	10
1,1-Dichloroethene	ND	5
1,2-Dichloroethene (Total)	ND	5
Trichloroethene	ND	5
Acetone	ND	10
Carbon Disulfide	ND	5
2-Butanone	ND	10
Cis-1,3-Dichloropropene	ND	5
4-Methyl-2-Pentanone	ND	10
2-Hexanone	ND	10
Styrene	ND	5
Xylenes (Total)	ND	10

ND = Not Detected above Method Reporting Limit (MRL)

N/A = Not Applicable

Laboratory Director



## CERTIFICATE OF ANALYSIS

#### VOA SOIL SURROGATE RECOVERY

Client: ATEC Environmental Consultants Client

Project ID: UST 40-Bldg 2686

Date Sample Analyzed: 8/20/92

ESS

Project ID: 922108

SAMPLE ID	1,2 DICHLOROETHANE-D4 (70-121%)*	TOLUENE-D8 (81-117%)*	BFB (74-121%)*
VS0820B1	105%	100%	98%
922108-01	92	95	86

\* Acceptance criteria

Approved by:

David Dickinson ()

Laboratory Director

Date: august 27, 1992

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## CERTIFICATE OF ANALYSIS

#### MATRIX SPIKE ANALYSIS SUMMARY

#### TCLP METALS

#### EPA METHOD 1311

Client: ATEC Environmental Consultants Matrix: Soil

TCLP Batch ID: 209501 Concentration in: mg/L

Target Analyte	Result	Spike Added	Spiked Result	Percent Recovery
Antimony	ND	*	ND	52%
Arsenic	ND	2.00	1.23	62
Cadmium	· ND	0.5	0.26	52
Chromium	ND	1.0	0.62	62
Lead	ND	1.0	0.80	80
Mercury	ND	0.02	0.020	100
Selenium	ND	2.00	1.25	63
Silver	ND	1.0	0.52	52
Copper	ND	1.0	0.79	79
Nickel	ND	1.0	0.86	86
Zinc	0.39	1.0	1.23	84
Beryllium	ND	*	ND	52
Thallium	ND	*	ND	52

This matrix spike analysis summary applies to the following samples: 922108-01

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: Celly Vacus of

David/Dickinson (

Laboratory Director

Date: (lugus 27, 1992

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## 4.9 CHAIN OF CUSTODY FORMS

The following chain of custody forms were produced for the soil samples which were laboratory analyzed.

#### **CHAIN OF CUSTODY RECORD**

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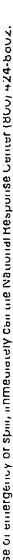
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**CHAIN OF CUSTODY RECORD** PROJ. NO. | PROJECT NAME Ft. Devens - Stockpiled Soils
UST #'s 28,29,38,31,32,33,34,35,36,37,38,39,40,41,42,43
CLIENT LAB PROJ. NO. Van Tik Gramas Bull TO'AL MOSOCARSONS SAMPLERS: (Signature) 1074 WET 4.5(8) NUMBER OF CONTAINERS COMPOSITE 15145/Composite ACIDIFIED FILTERED LAB I.D. NUMBER GRAB ICED SAMPLE TIME DATE I.D. NO. 6/26/92 2296 5-30 Division of ATEC Associates, Inc. 62 Accord Park Drive Norwell, MA 02061 (617) 878-6200 Environmental onsultants 2 Q 2520 2686 LS-40 2732 Received by: (Signature) 6/29/42 Relinquished by: (Signature) Date / Time Received by: (Signature) Date / Time Relinquished by: (Signature) Gearles Langenhager 6/27 11:45 am Received for Laboratory by: Date / Time Project Manager / Phone #: Date / Time Relinquished by: (Signature) (Signature)

#### 4.10 HAZARDOUS WASTE MANIFEST

UST No. 0040 was estimated to contain 64 gallons of No. 2 fuel oil and residual materials. Approximately 30 gallons of fuel oil were removed on January 7, 1992 and transported to a licensed Treatment Storage Disposal Facility T.S.D.F. (Beede Waste Oil Corporation, Plaistow, New Hampshire). An additional 30 gallons of fuel oil and residual materials were removed January 23, 1992, and transported to Beede Waste Oil Corporation on February 27, 1992.

The following Hazardous Waste Manifests were generated from residual tank materials. The manifest dated January 7, 1992 and February 27, 1992 are associated with the vacuumed product from several USTs. Therefore, the total quantity (1,400 gallons and 385 gallons) are greater than the amount which was removed from UST 0080.







#### COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION DIVISION OF HAZARDOUS WASTE

One Winter Street

Boston, Massachusetts 02108 rease print or type. (Form designed for use on elite (12-pitch) typewriter.) Manifest 2. Page 1 Information in the shaded areas UNIFORM HAZARDOUS 1. Generator US EPA ID No. MIA17121/161612151/1314010101011 is not required by Federal law. WASTE MANIFEST HAS FOUR DECES A. State Manifest Document Number 3. Generator's Name and Mailing Address F353641 ort Deien My 11433 B. State Gen. ID 141-1518-751-2711 4. Generator's Phone 56 £ 1 756 - 3 063 C.State Trans. ID 5. Transporter 1: Company Name US EPA ID Number Beede Waste Oil Corp. 財 H D 10189581401 NINARKIZIZIOLLL D. Transporter's Phone 03 382-576] 7. Transporter 2 Company Name US EPA ID Number E. State Trans. ID 9. Designated Facility Name and Site Address US EPA ID Number Beede Waste Oil Corp. F. Transporter's Phone ( G. State Facility's ID Kelley Road PO Box 127 Not Required H. Facility's Phone 10 3 382 Plaistow, NH 03865 H ID 10189581401 5761 13. 12. Containers Unit Total Waste No. 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number) Туре Quantity Wt/Vol No. WASTE PETROLEUM OILS N.O.S. 1 G MAO1 COMBUSTIBLE LIQUID NA1270 1149 b. J. Additional Descriptions for Materials Listed Above finclude physical state and hazard code.) K. Handling Codes for Wastes Listed Above 15. Special Handling Instructions and Additional Information To be Recycled Recycle 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and tabeled, and are in all respects in proper condition for transport by high-way according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environ ment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford. Date Printed/Typed Name Signature Month Day Year 17. Transporter 1 Acknowledgement of Receipt of Materials Date Printed/Typed Name Day Murchy V (17) 212 18. Transporter 2 Acknowledgement of Receipt of Materials Date Printed/Typed Name Signature Day Year 19. Discrepancy Indication Space 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.





#### DEPARTMENT OF ENVIRONMENTAL PROTECTION . DIVISION OF HAZARDOUS WASTE

One Winter Street

Boston, Massachusetts 02108

le	ase print or type, (Form designed for use on elite (12-pitch) typewriter.)					
•	UNIFORM HAZARDOUS  1. Generator US EPA ID No.  WASTE MANIFEST  M A 7 2 1 0 0 2 5 1 5 4	Manifest 4 FD 62 9	2. Pag	· .	n in the shade ired by Foder	
	3. Generator's Name and Mailing Address Dept. of The ARMY		A. Sta	te Manifest Docu F3537		:
	Headquarters Ft. Devens 4. Generator's Phone (508-796-3002 AFZD-DEQEM Attn: Mark I	Box 19. Boser	<del></del>	te Gen. ID	4	
	5. Transporter 1 Company Name Fort Devens, MA 01420 ID	Number	C.Sta	1/ Trans. ID		
	Beede Waste Oil Corp.   N H D O 1 8 9   7. Transporter 2 Company Name   B. USEPAID!		J	Insporter's Phone	4 1	02-1761
			E. 512	ite Trans. ID	<u> </u>	24.2.10L
	9. Designated Facility Name and Site Address 10. US EPAID N Beede Waste Oil Corp.	Number	F, Tra	naporter's Phone		·
	Kelley Rd., P.O. Box 127	Q. 5. 8. 1. /. O	1	ite Facility's ID		quired
	Plaistow, NH 03865   N H D 0 1 8;	12. Cont		13.	14.	1.
	11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	No.	Тура	Total Quantity	Unit Wt/Vol	Waste No.
	Waste Petroleum Oils N.O.S. Combustable liquid NA 1270					
		0,0,7	DIM	00383	<del>  9</del> _	MACI
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	Cr <sub>2</sub> ;		1			<b>多名的</b>
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1	d.			<del></del> _	<u> </u>	20.40 E
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	Additional Descriptions for Materials Listed Above faction physical state and hazard code.	TOTAL SALVES	K. Ha	ndling Codes for V	Vastes Listed	Above 3
	· · · · · · · · · · · · · · · · · · ·	<u>Problems and a</u>	a	_ <del> </del>	6.	The same
	b. The state of th		<u></u>		d	
	15. Special Handling Instructions and Additional Information  To Be Recycled #2 Fuel With SI=Sludge.	631 1-8	idg 2	947 1-26	;86 -	1-3573
	For Theyellar only Land Disposal Prohitics.  16. GENERATOR'S CERTIFICATION I hereby reclare that the contents of this consignment are fully and accur	taludarenhad shows				
	proper shipping name and are classified, backed, marked, and tabeled, and are in all respects in proper con- according to applicable international and national government regulations.	idition for transport by h	ighway			
	If t am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity and that I have selected the practicable method of treatment, storage, or disposal currently available to me	e which minimizes the p	resent and	future threat to hurr	san health and ti	ne environ
	ment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste general can afford.	ion and select the bust	waste far	nagement method the	et is available to	me and that I
	Printed/Typed Name Signature Signature	THA!	·		Month	
	17. Transporter 1 Acknowledgement of Receipt of Materials	12749			00	Date
	Printed/Typed Name Brian Ginivan	Q;	<i>-</i>	•	Month	Day Year
)	18. Transporter 2 Acknowledgement of Receipt of Materials					Date
į	Printed/Typed Name Signature	<i>(</i> /			Month	Day Year
:	19. Discrepancy Indication Space					
•	20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this	manifest except as	noted in	Item 19.		Date
•	Printed/Typed Name Signature				Month	
- 1	· 1				1 !	

## 4.11 WEIGHT DISPOSAL RECEIPTS

The following weight slips document the disposal of contaminated soil associated with UST 0040.

MAIN OFFICE: DANVERS 750-4200	MOUNT BITUMIN PRODUCT S CHERRY DRIVE P.O. BOX 2089 DANVERS, MA 01923-5089 SHREWSBURY DIVISION 651 LAKE STREET AT RTE. 20 SHREWSBURY, MA 01545	M	FMN 4 ARRIVED JOB LEFT JOB	CHECKED E	C.O.D. Charge D
	OFFICE 881-1430 PLANT 754-47	709		TICKET	#R 73341
Customer # ATEO01 ATEC ASSOC. 62 ACCORD PARK DRIVE NORWELL, MA 02061 617-875-6200	Job & BLDGFD US ARMY BLDG 7686 TANK FORT DEVENS, MA 0143 PO# 37.04.72053		<b>†</b> ‡76	MIX NAME OIL SOIL	TRUCK# 9
		Gross 98900	Total 29.65		
Cost/Ton Percent	Tax Load Cost Amount Tax	Dest Charge	Total Cost		
£oad¶ J 2		i Date Fob/ uug 11, 1992 F			THIS COMPANY WILL NOT BE RE- SPONSIBLE FOR DAMAGE CAUSED BY TRUCKS DELIVEBING MATERIA BEYOND STREET PAVEMENT.
				RECEIVED BY	
MAIN OFFICE: DANVERS 750-4200	FIMOUNT BITUMINO PROD  5 CHERRY PORIVE P.O. BOX 2089 DANVERS, MA 01923-5089 SHREWSBURY DIVISIO 651 LAKE STREET AT RTE. SHREWSBURY, MA 01549 OFFICE 881-1430 PLANT 754-	9 N 20 5	FMN ARRIVED JO LEFT JOB		CARRIER
Customer # ATEOOI ATEC ASSOC. 62 ACCORD PARK DRIVE NORWELL, MA 02061 617-876-6200	Job # BLDGFD US ARMY BLDG FORT DEVENS, MA CI- PO# 37.04.72053		% <b>.‡ \$</b> 76	NIX NAME OIL SOIL	TRUCKE 9
Time 9:06:43	Tare Net 19600 54760	Gross 94360	Total 27.38		
Cost/Ton Percent	; Tax Load Cost Amount Ta	x Dest Charge	Total Cost		•
Load <b>‡</b> 3		& Date Fo	b/Del F		

THIS COMPANY WILL NOT BE RE SPONSIBLE FOR DAMAGE CAUSI BY TRUCKS DELIVERING MATER BEYOND STREET PAVEMENT.

RECEIVED BY \_\_\_

TRIM	MOUNT BITUMINO PRODU 5 CHERRY DRIVE P.O. BOX 2089 DANVERS, MA 01923-5089		FMN	Cash ☐	C.O.D. Charge
MAIN GÉSICE: DANVERS 750-4200	SHREWSBURY DIVISION 651 LAKE STREET AT RTE. 2 SHREWSBURY, MA 01545 OFFICE 881-1430 PLANT 754-4	o <u> </u>	LEFT JOB ()	· · · · · · · · · · · · · · · · · · ·	CARRIER
`.		•		TICELL	#IN /3340
Customer # ATEOO1 \ ATEC ASSOC. 62 ACCORD PARK DRIVE NORWELL, HA 02961 617-878-6200	Job & BEDGFD US ARMY PLDG Z G B C TAG FORT DEVENS, NA 0143 PO# 37.04.72053	HIK # NL 40 83	#76	HIX NAME OIL SOIL	TRUCK# 9
Time Tan 9:12:24 3966		Gross 92660	Total 26.53		*
Cost/Ton Percent Ta	x Load Cost Amount Tax	Dest Charge	Total Cost		
	7 Total Time 8 149.49 9:12:24 am 8	i Date Fob/D ing 11, 1992 F	el		THIS COMPANY WILL NOT BE RESPONSIBLE FOR DAMAGE CAUSE BY TRUCKS DELIVERING MATERIBEYOND STREET PAVEMENT.
				RECEIVED BY	
MAIN OFFICE: DANVERS 750-4200	MOUNT BITUMINO PRODU 5 CHERRY DRIVE P.O. BOX 2089 DANVERS, MA 01923-5089 SHREWSBURY DIVISION 651 LAKE STREET AT RTE. SHREWSBURY, MA 01545 OFFICE 881-1430 PLANT 754-	E .	FMN ARRIVED JOI LEFT JOB		CARRIER
Customer # ATEQUI ATEC ASSOC. 62 ACCORD PARK DRIVE NORWELL, MA 02001 617-878-6200	Job # BLDGFD US ARMY BLDG 2 6 8 6 70 FORT DEVENS, MA 014 PO# 37.04.72053	HIX PANK 40 133	¥ #76	MIX NAME GIL SOIL	TRUCK# 9
Time Ta 9:09:56 390	ale Het 600 63420	Gross 103020	Total 31.71		
Cost/Ton Percent 1	'ax Load Cost Amount Tax	: Dest Charge	Total Cost		
Load‡ Jo 4		& Date Fob/ Aug 11, 1992 F			

THIS COMPANY WILL NOT BE RE SPONSIBLE FOR DAMAGE CAUS BY TRUCKS DEPAYERING MATER BEYOND STREET PAVEMENT.

RECEIVED BY \_

MAIN OFFICE: DANVERS 750-4200	. ,	3-5089 M /ISION E RTE. 20 E 01545	FMN ARRIVED JOB LEFT JOB	Cash CHECKED B	CARRIER
Customer # ATE001 ATEC ASSOC. 62 ACCORD PARK DRIVE NORWELL, MA 02061 617-878-6200	Job # BLDGFD US ARMY BLDG Z 6 8 6 FORT DEVENS, 1 PO# 37.04.720	MA 01433		IX NAME OIL SOIL	TRUCK* 9
Cost/Ton Percen	Tare Net 39600 S8320 t Tax Load Cost Amoun	Gross 97920 nt Tax Dest Charge	Total 29.16 Total Cost		
Load# 7	Job Total 203.50 12:11:50	Time & Date Fob. ) pm Aug 11, 1992 F			THIS COMPANY WILL NOT BE RE- SPONSIBLE FOR DAMAGE CAUSED BY TRUCKS DELIVERING MATERIAL BEYOND STREET PAVEMENT.
MAIN OFFICE: DANVERS 750-4200	TRIMOUNT BITUMINO  5 CHERRY P.O. BOX 208 DANVERS, MA 019 SHREWSBURY D. 651 LAKE STREET A SHREWSBURY, M. OFFICE 881-1430 PLAN	DRIVE 99 23-5089 VISION F RTE. 20 A 01545	FMN ABBIVED JOB	Cash C CHECKED I	CARRIER
Customer & ATE001 ATEC ASSOC. 62 ACCORD PARK DRIV NORWELL, HA 02061 617-878-6200	Job # BLDGFD US ARMY E BLDG 2686 FORT DEVENS, PC# 37.04.720	TANK 40	. <b>€</b> \$76 (	HIK NAME OIL SOIL	TRUCK# 9
Time 12:07:03 Cost/Ton Perce	Tare Net 39600 49700  nt Tax Load Cost Amou	Gross 89300 int Tax Dest Charge	Total 24.85 Total Cost		
Load≇ 6	Job Total	·	/Del	3.	THIS COMPANY WILL NOT BE RESPONSIBLE FOR DAMAGE CAUSED BY TRUCKS DELIVERING MATERIAL BEYOND STREET PAVEMENT.

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MAIN OFFICE:	SHI	REWSBURY DIV AKE STREET AT	ISION BTF 20	::::E	LEFT JOE	CHECK	#	,'	CARRI	ER Y
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NORWELL, MA 02061		FORT DEVENS,	58 VI933							
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İ			Time & Da 17 pm Aug					SP RY	ONSUBIJE FO	Y WILL NOT BE OR DAMAGE CA ELIVERING MAT EET PAVEMENT

RECEIVED BY \_

MAIN OFFICE: DANVERS 750-420	0 6:	S CHERRY H PROPERTY H P.O. BOX 2089 DANVERS, MA 01923-SHREWSBURY DIVISOR LAKE STREET AT RESHREWSBURY, MA 0 FICE 881-1430 PLANT	VE 5089 SION ITE. 20 1545	FMN		CARRIER 7.3416
Custower # ATEO01 ATEC ASSOC. 62 ACCORD PARK DR NORWELL, MA 02061 617-878-6200		Job # BLDGFD US ARMY BLDG 2732 F FORT DEVENS, MA PO# 37.04.72053	01433	HIX 1 176 TANK 41 \$ 40	MIX NAME OIL SOIL	TRUCK# 9
Time 3:33:36 Cost/Ton Perc	Tare 39600 cent Tax	Het 57900 Load Cost Amount	Gross 97500 Tax Dest C	Total 28.95 marge Total Cost		

Load# Job Total Time & Date Fob/Del
11 314.20 3:33:37 pm Aug 11, 1992 F

THIS COMPANY WILL NOT BE RESPONSIBLE FOR DAMAGE CAUSED BY TRUCKS DELIVEBING MATERIAL BEYOND STREET PAVEMENT.

RECEIVED BY.

### 4.12 PERMITS AND CERTIFICATIONS

The following permit was obtained from the Fort Devens Fire Department for the proper closure of a UST. Following the permit there is a disposal receipt for the steel UST.

## The Commonwealth of Massachusetts

## DEPARTMENT OF PUBLIC SAFETY DIVISION OF FIRE PREVENTION

PERMIT
FOR REMOVAL AND TRANSPORTATION TO APPROVED TANK YARD

C.62 8.46 M.C.L.
DIG BAFE HUMBER

In accordance with the provisions of Chapter 148, G.L. as provided in Section 384 this permit is granted to

Name: Arec Environmental Associates Inc.
Full name of person, firm or Corporation
To transport underground steel storage tank(s)
to Approved tank yard# ]

State clearly type of inert gas used in steel storage tank

Fee paid \$ N/A

steel tank: Dry, ics

Name and address of contractor disposing tank ATEC Associates 62 Accord Park Dr., No. Location to which tank will be transported

This permit will expire 31 Jan 1992

bignature of official granting permit(IIILE)
(Head of Fire Dept.)

4

RECEIPE OF DISPOSAL	OF UNDERGROUND STEED STO	AGD TANKS TO SEE THE SECOND	
NAME AND ADDRESS OF APPROVED TANK YARD	JOHN C. TOMBARELLO & SO 207 MARSTON ST. LAWRENCE, MASS. 01841	NS	
APPROVED TANK YARD	4 4 0 0 1	*	
Tank Yard Ledger 50	2 CMR 3.03(4) Number: 9	200123	
I certify under penalty o	f law I have personally examined	the underground steel storage takens on or partnership ATEC <u>Environ</u>	nk
Regulation 502 CMR 3.00 P A valid permit was issued this tank to this yard.	and accepted same in conform rovisions for Approving Undergro	wance with Massachusetts Fire Prevound Steel Storage Tank dismantlingment FDID# 1799 to tran	ention g yards.
James Maranto	) Onto	1-28-92	
This signed receipt of di	sposal must be returned to the laurant to 502 CAR 3:00. (EACH TANK	Local head of the fire department ( MUST HAVE A RECEIPT OF DISPOSAL)	
FORM F.P. 291 (rev. 9/8	B) (OVER)	MASSACHUSETTS STATE FI	RE MARSHAL'S OFFIC
a so the order set to the set to	· Joseph of Mangara and Joseph and Joseph	g to strawn with a total activities of the strains	w
DIMENSIONS	 Tank Rer	noved From	
	F+. D1	Wis Blog. # 2686 d	onk#40
Width Length	(no.	street)	
Tank 1 48" x 10'8"	Ayer	•	
Tank 2 X	(city or		
Tank 3 X	Fire Dep	artment was 1.5/- a	
Tank 4 X	Permit #	(if applicable)	
Tank 5 X		.•	
(feet) (feet)		•	

## 4.13 INSTALLATION

The installation of a replacement UST No. 0040 was not performed.

#### 4.14 BORING LOGS

The attached boring logs were recorded during drilling and soil boring activities of SB-1 and SB-2, located at Building 2686, Fort Devens, Massachusetts (the site). Soil borings were performed on September 30, 1992 to assess for potential petroleum hydrocarbon contamination associated with one 1,000-gallon No. 2 fuel UST removed from the site.

Soil types encountered from grade level to a depth of approximately 2 feet below grade consisted typically of very loose, brown fine sand. Soil types encountered from a depth of approximately 4 to 6 feet below grade consisted typically of dense brown fine sand. Soil types encountered from a depth of approximately 9 to 11 feet below grade consisted typically of very dense, brown/grey/tan fine sand and shale.

Groundwater was not encountered during the soil borings. Auger refusal was encountered in SB-1 at a depth of 15 feet, and 14.5 in SB-2.



# GROUND WATER MONITORING WELL BORING/INSTALLATION LOG

LOG OF BORING/WELL: 5012 BERING -1

PROJECT NAME: FT. NEVENS
PROJECT NUMBER: 37-07-451

PROJECT LOCATION: WST # 40; BLOG. 2686

BORING LOCATION: SEE, SCHEMATIC

FOREMAN: MATT BOVENZI INSPECTOR: O. TROMBLY

DATE: 9-30-92 .

L CONTROCK DECORPORA	Decor.	Tonio	CDT	7	T ~	Length of Casing Above
SOIL/ROCK DESCRIPTION	DEPTH	SAMP.	S.P.T.			Surface.Elevation
		, <u> </u>		┤╏┌╴	7	- Length of Riser Above
FINE SAND COLOR: BLANIU	0'-2'	S. B.	TFF			Surface Elevation
CONSISTENCY! VERY LUGSE		1-1			<b>M</b>	Surface Elevation
					<b>III</b>	Type/Thickness
NOTES: NO PETRO. 0402					鬥	of Surface Seal
P14: N.D.			1		11 -	€ ID/Type of
FINE SAND AND GRAVEL		_		十七	计	Protect, Casing
' ' '	4'-6'	.s. B.	ع ۱- 12 - 13 - 13		t _	- Depth Bottom
BULUR: BLOWN-GREY		1.2				of Casing
CONSISTENCY: DENSE						
NOTES: NO PETID. ODOR						← ID/OD/
PID: N.D.						Type Riser
	<u> </u>			기점	12	Completer of
FINE SAND			19-26,25-			Borehole
COLUR! BROWN-GREY	9'-11'	5.8.				
CONCISTENCY: VERY DENSE		1 3.	Í		1	Type of Backfill
NOTES: NO PETED. OLOR				-	1	@ Riser
PID: N.D.						
			· ·			w is a second
}					園	DeptivType Bottom Seal
		}				Dottotti 269
13.0	13'	850-R	) C F		- S	
		050 6	-	7  Æ ≘	<b>4</b>	€— Depth Top
BEAROLE AND STAFF	-+5'					of Screen
	7.5					
1			l İ			F- IDIODATUS
						€— ID/OD/Typa Screen
		l				Octobri
		}			-	Type Backfill
		1				@ Screen
		]		3.0	*** <b>~</b>	€ Depth Sottom
				2		of Screen
						Type of Backfill
		1	L		<u> </u>	Below Screon



GROUND WATER MONITORING WELL BORING/INSTALLATION LOG

LOG OF BORING/WELL: Soil BORING-2

PROJECT NAME: FT. DEVENS
PROJECT NUMBER: 37 07 451

PROJECT LOCATION: 427#40; BW6 2686 BORING LOCATION; SEE SITE SCHEMATIC

POREMAN: MATT BOVENZI INSPECTOR: C. TROWBLY

DATE: 9-30-72

SOLUROCK DESCRIPTION	DEPTH FEET	SAMP.	S.P.T.			Langth of Casing Above Surface Elevation
FINE SAND	0-2	S.B. 2.l	TFF			Length of Riser Above Surface Elevation
CONSISTENCY: VERY LOOSE NOTES: NO PETRO, OBOR				January Imperator	3	Surface Elevation  Type/Thickness of Surface Seal
PID: 10.0 PPM FINE SAND	4'-6'	5. B.	13.23.26.12		-	ID/Type of Protect. Casing
CUEOR - BROWN CONSISTENCY: DENSE		2.2				Depth Bottom of Casing
NOTES: NO PETRO, ODOR				13.13		ID/OD/ Type Riser
FINE SAND/SHALE	9-11	S. B.	30.30.28.32	12.63	-	Diameter of Borehole
CONSISTENCY: VERY DENSE NOTE: NO PETRO. ODOR PID: 7.0, PPM.		•		13333		Type of Backfill @ Riser
PIG = 5.0 PPM.	14!- 14:-5	5.B 2,4	REFUSAL	13.43 W	-	Depth/Type Bottom Seal
					-	Depth Top
						of Screen
					-	ID/OD/TypeScreen
					-	Type Backfill @ Screen
						Depth Bottom of Screen
					<b>-</b>	Type of Backfill Below Screen

## **ATEC Promises**

- ▼ To be totally responsive to our clients' wants and needs with a constant sense of urgency.
- ▼ To perform high quality services with technically superior personnel.
- To perform all assignments for a reasonable fee and within budget.
- ▼ To communicate with our clients frequently so there will be no surprises.
- To complete our assignments and deliver reports when promised.
- To review reports with our clients to be sure there are no misunderstandings.
- To deliver accurate invoices to our clients within seven (7) days after the completion of the assignment or as required by the clients.
- ▼ To follow up with the clients to be sure services completely satisfied their wants and needs.



At ATEC, "Client satisfaction with a constant sense of urgency" is our goal. If you have concerns with an ATEC project or service that your local ATEC Representative has not resolved, please call 1-800-800-ATEC, a "hot line" to my office. We will do everything possible to satisfy your concerns. If you have received quality service, we would appreciate knowing that as well. Thank you for allowing us to work on your team.

Sincerely,

Gerald D. Mann

President

ATEC Associates, Inc.

Corporate Headquarters – Client Satisfaction Hot Line
1-800-800-ATEC
(1-800-800-2832)