Technical Report Volume 5 Underground Storage Tank Closure UST Nos. 0025, 0026 & 0028 Fort Devens, Massachusetts

ATEC File: 37.07.91.00451

Contract No. DAKF31-91-D-00015

# Prepared for:

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

UST 93/24 ATEC

Attn: Mr. Steven Dijack, Contracting Officer

December 7, 1993

December 7, 1993

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

RE: Technical Report, Volume 5

Underground Storage Tank Closure UST Nos. 0025, 0026 & 0028 Fort Devens, Massachusetts

ATEC File: 37.07.91.00451

Mr. Dijack:

Attached is a Technical Report (Volume 5) by ATEC Associates, Inc. (ATEC), detailing the closure of three underground storage tanks (UST) referenced as UST Nos. 0025, 0026 and 0028, located at Fort Devens, Massachusetts (the site). The Technical Report covers work conducted under Contract No. DAKF31-91-D-00015 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.

Sincerely,

ATEC Associates, Inc.

Matthew M. Sonne

Environmental Scientist I

James B. O' Brien Division Manager

Ronald Lawson

Officer and District Manager

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# UNDERGROUND STORAGE TANK INDEX

UST No.	SIZE (gal)	PRODUCT	LOCATION
0025	1,000	Number 2 Fuel Oil	Building 1605, Fort Devens, MA
0026	1,000	Number 2 Fuel Oil	Building 1666, Fort Devens, MA
0028	1,000	Number 2 Fuel Oil	Building 2290, Fort Devens, MA

#### TECHNICAL REPORT

Volume 5

UST Nos. 0025, 0026 & 0028

United States Army
Fort Devens, Massachusetts
ATEC Project No. 37.07.91.00451

### 1.0 INTRODUCTION

This volume (Volume 5) of the Technical Report details the removal of three underground storage tank (USTs) referenced as UST Nos. 0025, 0026, and 0028 at various buildings located at Fort Devens, Massachusetts (the site). The Technical Report covers work conducted under Contract No. DAKF31-91-D-00015 as part of Removal of Underground Storage Tanks in the New England Area, US Army Project No. EQ-19027-9P.

The basic Project Work Scope of Contract No. DAKF31-91-D-00015 included:

- Excavation and removal of sixty-nine USTs at various buildings located at various locations in New England.
- Remedial excavation and disposal of contaminated soil, if required.
- Hydrogeological services to include installation of monitoring wells, sampling and analysis of soil/ground water, and determination of groundwater flow direction, if required.
- 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. 0025

### 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. 0025, located at property known as Building 1605, Fort Devens, Massachusetts. The purpose of the closure was to excavate the UST, evaluate the potential for the presence of oil and hazardous material at the site. The closure of this UST was conducted on January 9, and 10, 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 a potential 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.

### 2.1.2 Subsurface Storage Tank Excavation and Removal

On January 9, and 10, 1992, one 1,000-gallon, subsurface, number 2 fuel oil, storage tank was excavated and removed from the site. The UST was located adjacent to the northeast side of Building 1605. Site topography is level.

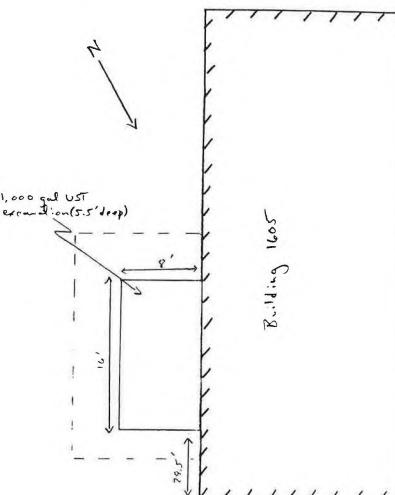
Soils in the excavation consisted primarily of light brown to tan, fine sand with trace fine to coarse gravel, cobbles, and boulders. The tank was covered by approximately 2 feet of soil. The bottom of the excavation was approximately 6 feet below grade. Groundwater was not encountered. Soil within the excavation did not appear contaminated.

The associated piping was drained, and tank connections were removed. UST No. 0025 was estimated to contain 24 gallons of number 2 fuel oil. Approximately 14 gallons of fuel oil was removed on January 6, 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. The tank was observed to be in good condition with no perforations, punctures, or severe corrosion. 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. Approximately 10 gallons residual materials were drummed on January 9, 1992 for transportation at a later date. Drummed material was transported to Beede Waste Oil Corporation on February 25, 1992. See Section 2.10 for copies of the appropriate Hazardous Waste Manifests.

The scrap tank was removed from the site on January 10, 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, a licensed Massachusetts tank yard, located in Lawrence, MA. The disposal receipt is included in Section 2.13.

1,000 gal UST excandion(5.5'deep) 3



# **UST LOCATION PLAN**

1,000 gallon UST relative to: Building 1605 Fort Devens, Massachusetts PROJECT: 37.07.91.00451

NOT TO SCALE

FIGURE: 2.1



### 2.1.3 Sampling and Analysis Plan

Ten soil samples were obtained from the excavation for field screening with a Photoionizing 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.

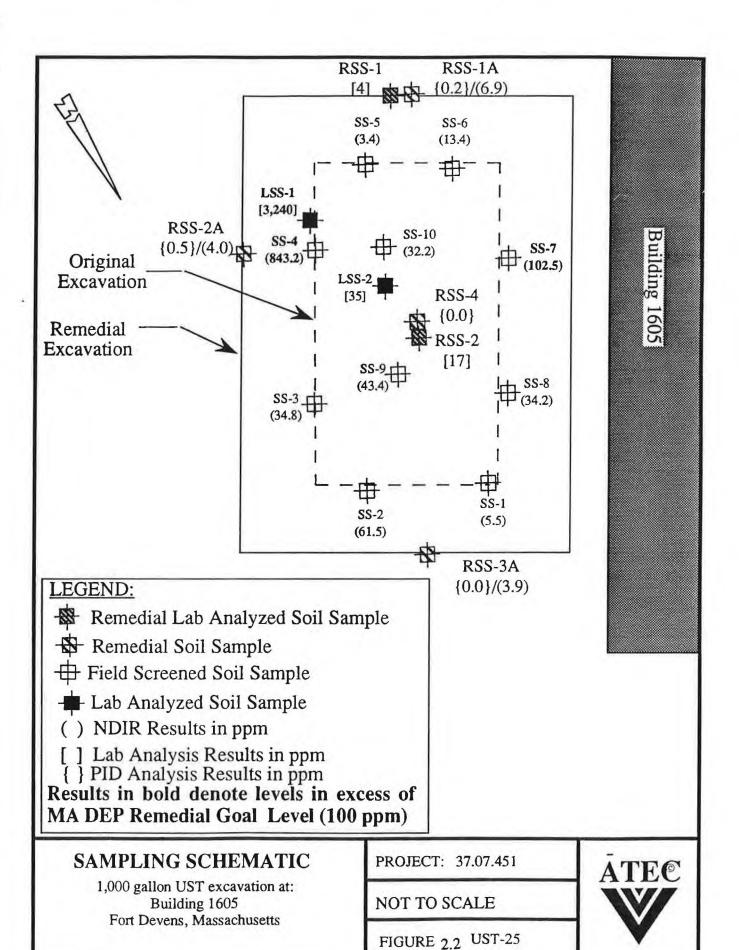
Eight of the samples (SS-1 to SS-8) were obtained from the excavation walls at a depth of approximately 2 to 3 feet below grade. Two of the samples (SS-9 and SS-10) were obtained from the bottom of the excavation at a depth of approximately 5 feet below grade. Two composite soil samples (Stock-1 and 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. 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 for the excavation are depicted on the Sampling Schematic, attached as Figure 2.2. The appropriate chain of custody forms are included in Section 2.9, Chain of Custody Forms.

### 2.1.4 Analytical Results

The results from analysis with the Photoionization Detector (PID) and the Non-Dispersive



Infrared (NDIR) analyzer of the ten samples obtained from the excavation, and the two samples obtained from stockpiled soils are as follows:

TABLE 2.1 - PID AND NDIR RESULTS

SAMPLE NUMBER	PID (ppm TOVs)	NDIR (ppm TPH)
SS-1	0.2	5.5
SS-2	0.4	61.5
SS-3	0.2	34.8
SS-4	42.0	843.2
SS-5	0.4	3.4
SS-6	0.2	13.4
SS-7	3.6	102.5
SS-8	1.6	34.2
SS-9	0.2	43.4
SS-10	3.2	32.2
Stock-1	6.8	262.9
Stock-2	4.4	72.7

Laboratory analytical results of the two soil samples obtained from the excavation revealed a TPH concentration of 3,240.0 ppm for LSS-1, and 35.0 ppm for LSS-2. Laboratory analysis of the one soil sample obtained from the stockpiled soils revealed a TPH concentration of 135.0 ppm for LSS-3. (See Section 2.8, Laboratory Analytical Results).

#### 2.1.5 Conclusions and Recommendations

As noted in ATEC's post removal report dated January 28, 1992, ATEC's conclusions are as follows:

Upon excavation and removal, the tank was observed to be in good condition with no

signs of perforations, punctures, or severe corrosion.

Groundwater was not encountered within the excavation.

Soil within the excavation did not appear 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 0.2 to 42 ppm. NDIR results revealed TPH concentrations ranging from 3.4 to 843.2 ppm.

Two soil samples were obtained from the excavation for laboratory analysis for TPH. Analytical results for LSS-1 obtained from the southeast wall of the excavation revealed a TPH concentration of 3,240 ppm. Analytical results for LSS-2 obtained from the bottom of the excavation revealed a TPH concentration of 35 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 135 ppm.

#### 2.2 SITE REMEDIATION AND CONTAMINATED SOIL DISPOSAL

#### 2.2.1 Site Remediation

Following initial PID screening, additional excavation to remove contaminated soil and reach background levels by PID (<1 ppm) was conducted per order the Contracting Officer's Representative and David Salvadore of the Massachusetts Department of Environmental Protection (DEP). Approximately 15.90 tons of contaminated soil were removed from the excavation floor and all sidewalls during remedial excavation on July 20, 1992. The estimated volume of soil removed was calculated from field drawings

produced during the removal and remediation of UST No. 0025 (see Remedial Excavation Plan, Figure 2.3).

Four soil samples (RSS-1 through RSS-4) were obtained from the post-remedial excavation for PID field screening. RSS-1 through RSS-3 were obtained from the sidewalls at a depth of approximately 4 feet below grade. One soil sample (RSS-4) was obtained from the bottom of the excavation at a depth of 5.5 feet. Final PID results ranged from 0.0 to 0.5 ppm (See Table 2.2 and Figure 2.4).

TABLE 2.2 - PID SCREENING RESULTS

SAMPLE NUMBER	PID (ppm TOVs)	LOCATION
RSS-1	0.2	north sidewall (4' depth)
RSS-2	0.5	east sidewall (4' depth)
RSS-3	0.0	south sidewall (4' depth)
RSS-4	0.0	bottom (5.5' depth)

RSS = Remediation Soil Sample

B.G. = Below Grade

Two soil samples (RSS-1 and RSS-2) were obtained for laboratory analysis for TPH (USEPA Method 418.1).

TABLE 2.3 - LABORATORY ANALYSIS

SAMPLE NUMBER	TPH (ppm)	LOCATION
RSS-1	N.D.	north sidewall (4' depth)
RSS-2	17.0	east sidewall (4' depth)

ND = Not Detected above Method Reporting Limit (MRL)

### 2.2.2 Soil Stratigraphy

The soil stratigraphy of the excavation consisted of an initial 4 inches of top soil followed by 5 feet of light brown to tan, fine to coarse sand (see Figure 2.4 - Soil Stratigraphy).

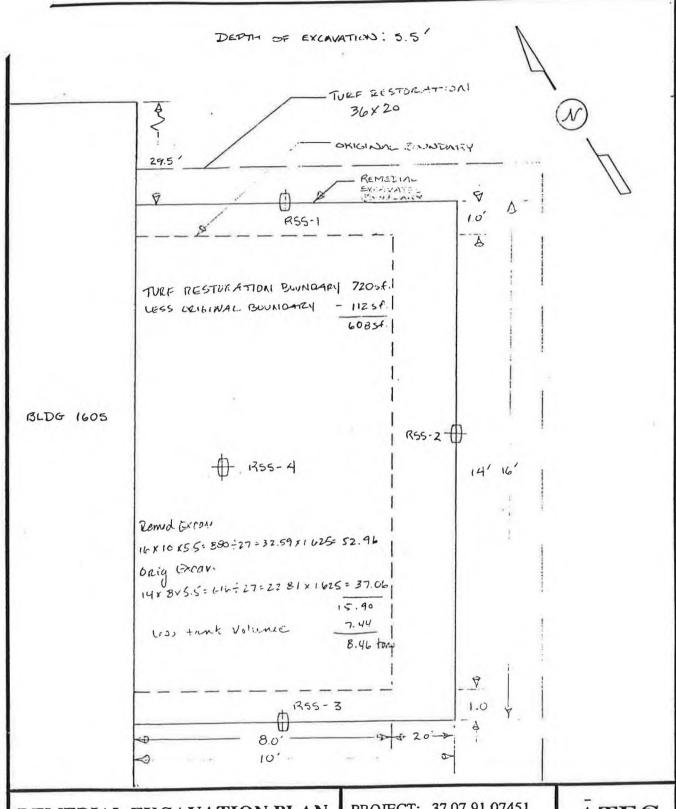
### 2.2.3 Contaminated Soil Disposal

Prior to disposal, contaminated soil was laboratory analyzed for disposal classification purposes. One soil sample (Stock-25) was obtained from the stockpiled soil. Laboratory analyses were performed for Volatile Organic Compounds (VOCs) (USEPA Method 8240), Semi-volatile Organic Compounds (USEPA Method 8270), Flashpoint (USEPA Method 1010), Polychlorinated Biphenyls (PCBs) (USEPA Method 8080), Reactive Sulfide and Reactive Cyanide (USEPA Methods 7.3.4.1 and 7.3.3.2), 13 Metals by Toxicity Characteristic Leachate Procedure (TCLP) (USEPA Method 1311) and Corrosivity (pH) (USEPA Method 9045). Laboratory analytical results revealed 4.7 standard units (S.U.) Corrosivity, 0.05 ppm Copper, 0.78 ppm Zinc, 0.2 ppm Lead. All other analytical results were below the MRL. (See Section 2.8 Laboratory Analytical Results). Soil sample LSS-3 was also collected and analyzed for TPH (USEPA Method 418.1). Analytical results revealed a TPH concentration of 135 ppm.

Approximately 9.78 cubic yards (15.90 tons) of number 2 fuel oil contaminated soil was removed and stockpiled during remediation of the excavation, as estimated through field drawings (see Figure 2.3 - Remedial Excavation Plan). Contaminated soil was transported to Trimount Bituminous Products Company, Shrewsbury, Massachusetts.

### 2.3 HYDROGEOLOGICAL SERVICES

Hydrogeological services were not performed relative to UST No. 0025.



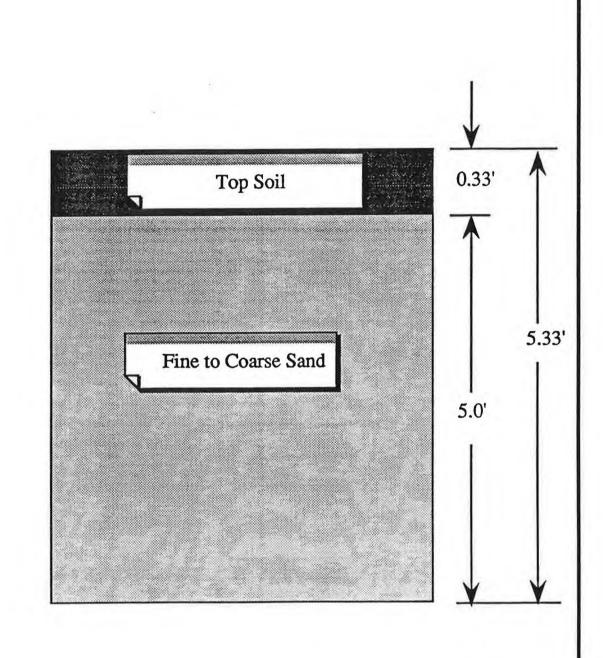
# REMEDIAL EXCAVATION PLAN

1,000 Gallon UST Building 1605 Ft. Devens, Massachusetts PROJECT: 37.07.91.07451

NOT TO SCALE

FIGURE: 2.3





# **SOIL STRATIGRAPHY**

1,000 gallon UST excavation at: Building 1605 Fort Devens, Massachusetts PROJECT: 37.07.91.07451

UST 25

FIGURE: 2.4



### 2.4 BACKFILL

The excavation was lined with polyethylene plastic sheeting and backfilled with approximately 32.6 cubic yards of uncontaminated fill material on July 29, 1992. Backfilling was conducted with the approval of the Contracting Officer's Representative.

# 2.5 SITE RESTORATION

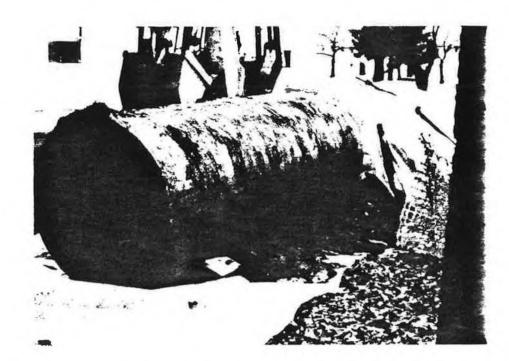
Following backfill of the excavation, approximately 32.0 square feet of loam was distributed over the excavated area. Grass seed was then distributed over the loam.

# 2.6 PHOTOGRAPH DOCUMENTATION

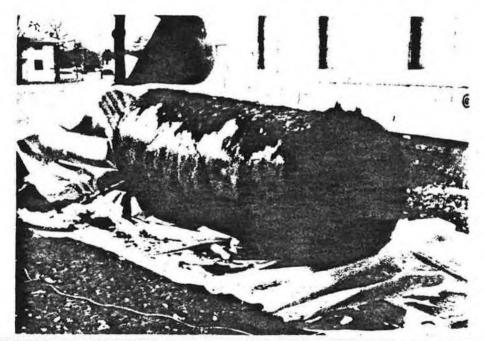
The following photographs are of the removed UST, the excavation and a post-remedial view of the excavation.

- A-1 One side of removed tank.
- A-2 Opposite view of removed tank.
- A-3 Excavation as viewed from north, facing south.
- A-4 Excavation as viewed from south, facing north.
- A-5 Post-remedial view of the excavation from the north, facing south.
- A-6 Post-remedial view of the excavation from the south, facing north.

A-1



A-2

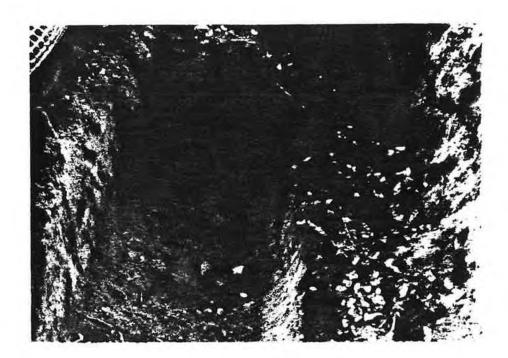


# PHOTO DOCUMENTATION

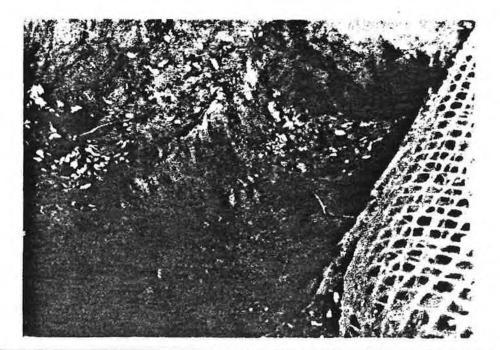
1,000 gallon UST excavation at: Building 1605 Fort Devens, Massachusetts PROJECT: 37.07.91.00451



A-3



A-4

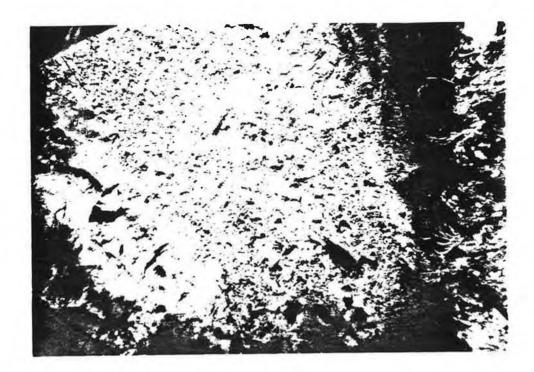


# PHOTO DOCUMENTATION

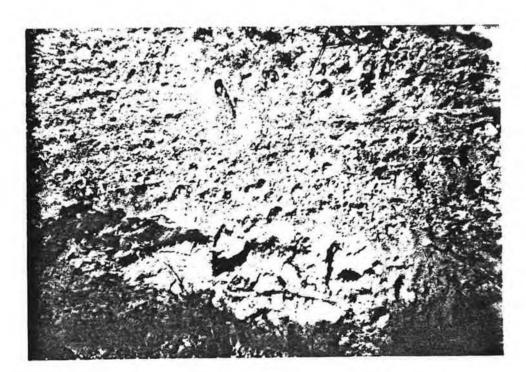
1,000 gallon UST excavation at:
Building 1605
Fort Devens, Massachusetts

PROJECT: 37.07.91.00451

ATEC W A-5



A-6



# PHOTO DOCUMENTATION

1,000 gallon UST excavation at: Building 1605 Fort Devens, Massachusetts PROJECT: 37.07.91.00451



### 2.7 OCMA 220 DATA SHEETS

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

- SS-1 to SS-10, Stock-1 and Stock-2: Soil samples obtained from original excavation.
- RSS-1 to RSS-3: Soil samples obtained from remedial excavation.

#### OCMA Data Sheet Operator Name: Russerau Date: 132072 EBI Project Number: 37.09.451 TR# 45 Calibration Second Reading First Reading Third Reading Initial Final Initial Initial Final 0.4 1-0.3 0.0 Zero Calibration · 0.0 00 Span Calibration

Span Check: 31.0

Testing

Zero Calibration

Wei	ight	First A	pproach	Second.	Approach		Readings	
-Gross	Tare	F-113	Sample	F-113	Sample	First	Second	Third
181,8	75.4		132			7.8	7.7	
			1			1.	17.7	12.2.1
181.8					1	102	1.2	
180-5			L			11.0	11.5	11.51
				1		11.0	1.9	
179.9						171.7	171.4	_
179.7	173.71					101	1.1	
179.7	173.61					1 04	1 04	1
180.0	174-61					12.5	12.7	12.71
180.8				1		11.1	11-1	1
179.9			1120	1		20.1	1.5	1-5-1
181.8	17491					1:4	1.4	
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### TPH SOIL ANALYSES BY NON-DISPERSIVE INFRARED ANALYZER - MODIFIED EPA STANDARD TEST METHOD 418,1

PROJECT NAME, NUMBER, TANK: U.S. ARMY - FORT DEVENS 37,07,91,451 UST 0025

DATE: Jul 24, 1992

OPERATOR: Charles Langenhagen

### CALIBRATION DATA

TYPE	FIRST REA	FIRST READING		SECOND READING		ADING	SPAN
CALIBRATION	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	CHECK
ZERO:	5.7	0.0	1.1	0.0	0.4	0.0	27.6
SPAN:	34.2	40.0	45.8	40.0	40.9	40.0	
ZERO:	6,1	0.0	7.0	0.0	-0.2	0.0	

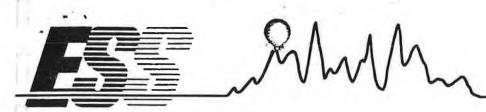
### ANALYTICAL DATA

SAMPLE	WEIGH	IT (g)	1st DILUTION RATIO (ml) 2nd DILUTION RATIO (ml) I				INSTRUMENT RESULTS (ppm)			_ CONCENTRATION
NUMBER	GROSS	TARE	F-113	SAMPLE	F-113	SAMPLE	1st	2nd	3rd	mg/l
RSS-1	80.7	74.8	17.5	3.0	****		0.4	0.2		6.9
RSS-2	80.0	74.9	17.5	3.0			0.3	0.1		4.0
RSS-3	80.1	74.9	17.5	3.0		22	0.1	0.1		3.9

### 2.8 LABORATORY ANALYTICAL REPORTS

The following laboratory analytical reports were organized and provided by Environmental Science Services Inc (ESS).

- LSS-1, LSS-2, and LSS-3: Soil samples obtained from original excavation. Laboratory analyzed for TPH.
- RSS-1 and RSS-2: Soil samples obtained from the post-remedial excavation.
   Laboratory analyzed for TPH.
- Stock-25: Soil sample obtained from stockpiled soil for disposal classification.
   Laboratory analyzed for VOCs, Semi-volatiles, Flashpoint, Reactive Cyanide,
   Reactive Sulfide, PCBs, Corrosivity (pH), and 13 TCLP Metals.



# **CERTIFICATE OF ANALYSIS**

Date: 1/17/92 Job: 100

Account: 95659 Received: 1/13/92

Project: TANK 25

·:0: ATEC ENVIRONMENTAL CO. 62 Accord Park Drive

Norwell, MA 02061

ittn: Mr. Mark Baldi

Sample	Method				
Number	Number	Parameter	Result	Unit	Sample Description
					4
72010001	EPA-160.3	Total Solids	88	*	LSS-1
	EPA-418.1	TPH/IR (Dry Wt.)	3250	mg/kg	
92010002	EPA-160.3	Total Solids	85	8	LSS-2
	EPA-418.1	TPH/IR (Dry Wt.)	35	mg/kg	
92010003	EPA-160.3	Total Solids	90	8	LSS-3
	EPA-418.1	TPH/IR (Dry Wt.)	135	mg/kg	

David Dickinson Laboratory Manager

Page:



In Response for the printer

921907

EXTIFE ATE OF ANALYSIS

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens Remediation ESS Project ID:

Client Sample ID: RSS-1 (25) ESS Sample ID: 921907-05

Date Sample Received: 7/24/92 Date Reported: 8/6/92

Parameter	Results	Units	MRL	Method
Total Petroleum Hydrocarbon-IR	ND	mg/Kg	11	418.1

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

nvironmental Science Services

David Dickinson Laboratory Director



MMm

PRIME SIE OF ANALYSIS

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens Remediation ESS Project ID:

Client Sample ID: RSS-2 (25) ESS Sample ID: 921907-06

Date Sample Received: 7/24/92 Date Reported: 8/6/92

Parameter	Results	Units	MRL	Method
Total Petroleum Hydrocarbon-IR	17	mg/Kg	11	418.1

MRL = Method Reporting Limit

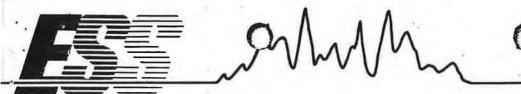
Approved by:

Progremmental Science Services

David Dickinson Laboratory Director Date: 6 chen 1

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921907



# CERTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants

Client Project ID: U.S. Army-Ft. Devens ESS Project ID: 921516

Client Sample ID: Stock-25 ESS Sample ID: 921516-05

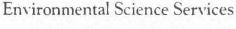
Date Sample Received: 6/10/92 Date Reported: 6/26/92

Parameter	Results	Units	MRL	Method
pH (Corrosivity)	4.7	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 Leach Metals	ing Procedure			1311
Lead	0.2	mg/L	Attached	6010
Copper	0.05	mg/L	Attached	6010
Zinc	0.78	mg/L	Attached	6010

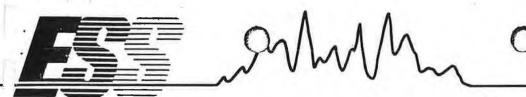
ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson Laboratory Director Date:







# CERTIFICATE OF ANALYSIS

### POLYCHLORINATED BIPHENYLS Method 8080

Client: ATEC Environmental Consultants

Client Project ID: U.S. Army-Ft. Devens

ESS Project ID: 921516

Client Sample ID: Stock-25

ESS Sample ID: 921516-05

Date Sample Received: 6/10/92

Date Reported: 6/26/92

Parameter	Result (mg/Kg)	MRL
Arochlor 1016	ND	1
Arochlor 1221	ND	1
Arochlor 1232	ND	1
Arochlor 1242	ND	1
Arochlor 1248	ND	1
Arochlor 1254	ND ND	1
Arochlor 1260	ND	1

ND = Not Detected above Method Reporting Limit (MRL)

Surrogate Recovery Data	% Recovery	QC Limit
Dibutylchlorendate	82%	50 - 150%

Approved by:

Laboratory Director



### **CERTIFICATE OF ANALYSIS**

### ACID EXTRACTABLES EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: U.S. Army-Ft. Devens ESS Project ID: 921516

Client Sample ID: Stock-25 ESS Sample ID: 921516-05

Date Sample Received: 6/10/92 Date Reported: 6/26/92

Parameter	Result (ug/Kg)	MRI
2-Chlorophenol	ND	330
2-Nitrophenol	ND	330
Phenol	ND	330
2,4-Dimethylphenol	ND	330
2,4-Dichlorophenol	ND	330
2,4-Dinitrophenol	ND	1,650
Pentachlorophenol	ND	1,650
4-Nitrophenol	ND	1,650
2,4,6-Trichlorophenol	ND	330
2,4,5-Trichlorophenol	ND	1,650
2-Methylphenol	ND	330
4-Methylphenol	ND	. 330
4-Chloro-3-Methylphenol	ND	330
4,6-Dinitro-2-Methylphenol	ND	1,650

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson Laboratory Director Date:



# **CERTIFICATE OF ANALYSIS**

### BASE NEUTRAL EXTRACTABLES EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: U.S. Army-Ft. Devens ESS Project ID: 921516

Client Sample ID: Stock-25 ESS Sample ID: 921516-05

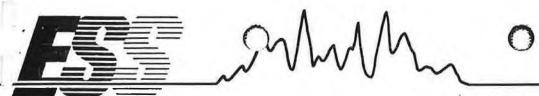
Date Sample Received: 6/10/92 Date Reported: 6/26/92

Parameter	Result (ug/Kg)	MRL	
Acenaphthylene	ND	330	
1,2,4-Trichlorobenzene	ND	330	
Hexachlorobenzene	ND	330	
Bis(2-chloroethyl)ether	ND	330	
2-Chloronaphthalene	ND	330	
1,2-Dichlorobenzene	ND	330	
1,3-Dichlorobenzene	ND	330	
1,4-Dichlorobenzene	ND	330	
3,3-Dichlorobenzidine	ND	660	
2,4-Dinitrotoluene	ND	330	
2,6-Dinitrotoluene	ND	330	
Fluoranthene	ND	330	
4-Chlorophenyl phenyl ether	ND	330	
Bis(2-chloroisopropyl) ether	ND	330	
Bis(2-chloroethoxy) methane	ND	330	
Hexachlorobutadiene	ND	330	
Hexachlorocyclopentadiene	ND	330	
Isophorone	ND	330	
Naphthalene	ND	330	
Nitrobenzene	ND	330	
N-nitrosodiphenylamine	ND	330	
N-nitrosodi-n-propylamine	ND	330	
Bis(2-ethylhexyl)phthalate	ND	330	
Di-n-butylphthalate	ND	330	
Di-n-octylphthalate	ND	330	
Diethyl phthalate	ND	330	
Dimethyl phthalate	ND	330	
Benzo(a)anthracene	ND	330	

ND = Not Detected above Method Reporting Limit (MRL)

Laboratory Director

Date:



# CERTIFICATE OF ANALYSIS

### BASE NEUTRAL EXTRACTABLES cont. EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: U.S. Army-Ft. Devens ESS Project ID: 921516

Client Sample ID: Stock-25 ESS Sample ID: 921516-05

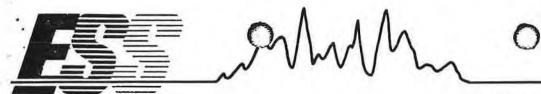
Date Sample Received: 6/10/92 Date Reported: 6/26/92

Parameter	Result (ug/Kg)	MRL	
Benzo(a)pyrene	ND	330	
Benzo(b)fluoranthene	ND	330	
Benzo(k)fluoranthene	ND	330	
Chrysene	ND	330	
Acenaphthene	ND	330	
Anthracene	ND	330	
Benzo(ghi)perylene	ND	330	
Fluorene	ND	330	
Phenanthrene	ND	330	
Dibenzo(a,h)anthracene	ND	330	
Indeno(1,2,3-cd)pyrene	ND	330	
Pyrene	ND	330	
Hexachloroethane	ND	330	
4-Bromophenyl-phenylether	ND	330	
Benzyl Alcohol	ND	330	
Benzoic Acid	ND	1,650	
Bis(2-Chloroethoxy)methane	ND	330	
4-Chloroaniline	ND	330	
2-Methylnaphthalene	ND	330	
2-Nitroaniline	ND	1,650	
3-Nitroaniline	ND	330	
Dibenzofuran	ND	330	
4-Nitroaniline	ND	1,650	
Butylbenzylphthalate	ND	330	

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: //

David Dickinson Laboratory Director Date: 26 June 92



# CERTIFICATE OF ANALYSIS

### TCL VOLATILE ORGANICS Method 8240

Client: ATEC Environmental Consultants

Client Project ID: U.S. Army-Ft. Devens ESS Project ID: 921516

Client Sample ID: Stock-25 ESS Sample ID: 921516-05

Date Sample Received: 6/10/92 Date Reported: 6/26/92

Parameter	Result (ug/Kg)	<b>M</b> RI	G
Methylene Chloride	ND	1,00	00
1,1-Dichloroethane	ND	1,00	
Chloroform	ND	1,00	
Carbon Tetrachloride	ND	1,00	
1,2-Dichloropropane	ND	1,00	
Dibromochloromethane	ND	1,00	
1,1,2-Trichloroethane	ND	1,00	00
Tetrachloroethene	ND	1,00	
Chlorobenzene	ND	1,00	00
1,2-Dichloroethane	ND	1,00	00
1,1,1-Trichloroethane	ND	1,00	00
Bromodichloromethane	ND	1,00	00
Trans-1,3-Dichloropropene	ND	1,00	
Bromoform	ND	1,00	
1,1,2,2-Tetrachloroethane	ND	1,00	00
Benzene	ND	1,00	
Toluene	ND	1,00	00
Ethyl Benzene	ND	1,00	00
Chloromethane	ND	1,00	00
Bromomethane	ND	1,00	00
Vinyl Chloride	ND	1,00	00
Chloroethane	ND	1,00	00
1,1-Dichloroethene	ND	1,00	00
1,2-Dichloroethene (Total)	ND	1,00	
Trichloroethene	ND	1,00	00
Acetone	ND	1,00	00
Carbon Disulfide	ND	1,00	00
2-Butanone	ND	1,00	00
Cis-1,3-Dichloropropene	ND	1,00	
4-Methyl-2-Pentanone	ND	1,00	00
2-Hexanone	· ND	1,00	
Styrene	ND	1,00	00
Xylenes (Total)	ND	1,00	

ND = Not Detected above Method Reporting Limit (MRL)

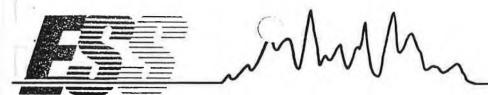
Approved by: David Dickinson

Laboratory Director

Date:

26 Jung - 034

**Environmental Science Services** 



# **CERTIFICATE OF ANALYSIS**

#### BASE-NEUTRAL SURROGATE RECOVERY

Client: ATEC Environmental Consultants Client

Project ID: U.S. Army-Ft. Devens

Date Sample Analyzed: 6/18/92

ESS

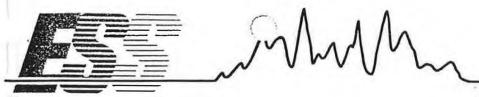
Project ID: 921516

SAMPLE ID	NITROBENZENE-D5 (35-115%)*	2-FLUOROBIPHENYL (43-115%)*	P-TERPHENYL-D14 (33-141%)*
921516-01	97%	97%	79%
921516-02	88	94	69
921516-03	81	90	65
921516-04	81	70	77
921516-05	70	63	48
921516-06	69	81	58

Approved by:

Bavid Bickinson Laboratory Director Date:

<sup>\*</sup> Acceptance criteria.



In Response To The Future

### **CERTIFICATE OF ANALYSIS**

#### VOA SOIL SURROGATE RECOVERY

Client: ATEC Environmental Consultants

Client

Project ID: U.S. Army -Ft. Devens

Date Sample Analyzed:

6/19/92

ESS

Project ID: 921516

1,2 DICHLOROETHANE-D4 (70-121%)*	TOLUENE-D8 (81-117%)*	BFB (74-121%)*
107%	102%	106%
93	108	112
108	110	128
110	104	100
96	101	106
111	102	100
106	115	86
	107% 93 108 110 96 111	(70-121%)*  (81-117%)*  107% 93 108 110 110 110 104 96 101 111 102

\* Acceptance criteria

Approved by:

Laboratory Director

Date:

-



In Response To The Future

ESS Project ID:

921516

6/26/92

### CERTIFICATE OF ANALYSIS

#### TCL VOLATILE ORGANICS Method 8240

Client: ATEC Environmental Consultants

Client Project ID: U.S. Army-Ft. Devens

Client Sample ID: Method Blank ESS Sample ID: VS0619B1

Date Sample Received: 6/10/92 Date Reported:

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

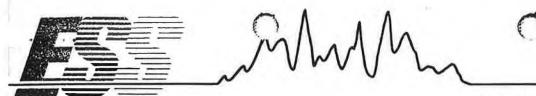
ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson Laboratory Director Date:

26 Jun 92

Environmental Science Services



In Response To The Future

### CERTIFICATE OF ANALYSIS

#### TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

#### METALS

#### MATRIX SPIKE ANALYSIS SUMMARY

#### EPA METHOD 1311

Client: ATEC Environmental Consultants Matrix: Solid

TCLP Batch ID: 151606 Concentration in: mg/L

	Sample	Spike	Spiked Sample	Percent
Target Analyte	Result	Added	Result	Recovery
Antimony	ND	*	ND	83%
Arsenic	ND	2.00	2.13	107
Cadmium	ND	0.5	0.535	107
Chromium	ND	1.0	1.12	112
Lead	0.24	1.0	1.132	89
Mercury	ND	0.002	0.00165	83
Selenium	ND	2.00	2.57	126
Silver	ND	1.0	1.03	103
Copper	0.05	1.0	1.05	100
Nickel	ND	1.0	1.03	103
Zinc	0.37	1.0	1.199	83
Beryllium	ND	*	ND	83
Thallium	ND	*	ND	83

This matrix spike analysis summary applies to the following samples: 921516-01, -02, -03, -04, -05, -06

ND = Not Detected above Method Reporting Limit (MRL)

\* Matrix Spike Recovery based on the lowest spike recovery of the spiked compounds.

Approved by:

Bavid Dickinson

Laboratory Director

Date:

## 2.9 CHAIN OF CUSTODY FORMS

The following chain of custody forms were produced for the soil samples which were laboratory analyzed. Please refer to laboratory report for time and date analyzed.

### **CHAIN OF CUSTODY RECORD**

PROJ. NO.	PROJEC	CT NAM	E -	Tar	nk	25								LAB	PROJ	, NO,	/					2101	0.6023		/	/
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1552	1/19/92					X						1				×										<b>€</b> m
L553	1/10/92		X			×						1			7	X									Norwell, MA 02061 (617) 878-6200	Enviror Consu
																									02061	Environmentai Consultants Division of ATEC Associates, Inc.
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Relinquished	by: (Signat	ure)	_		/ Tin	ne '	(Sig	eive	d for re)	Labo	orato	by:		Dat	te / Ti	me	Pr	oject	Mana	ger /	Phon	e #:				

### **CHAIN OF CUSTODY RECORD**

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STOCK-23		11:00A	X	X		X				X		3		X	X		X		X	X	X	X	Blog	14	29		
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STOCK-26		11'-454	X	X		X				X		3		X	X		X		X	X	X	X	Blog	. 16	66	62 Accord Park Drive Norwell, MA 02061 (617) 878-6200	Environmental Consultants  Division of ATEC Associates, Inc.
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STOCK-26		11:43	X	X	2.5	X	96	1		X	18	3	1.44	X	X	4	X		X	X	X	X	Bla	9.16	66	Ó	NOOTE I	3	5
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55-2725)				1	1.7.1	i		1.75	143	x	- 2	ir.	2.25		F - 1	X	W.	14.	4.	is	100	133	n (4)	ONS on of ATE cord Park sll, MA 02 878-6200
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25-1 (56)	7-21-92	2		X	0.5	X	17.8	-		x	1	4	1.00	X		X	×		T lo	100	×	. 8	BLOG. 3587	₽Ω ₹
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### 2.10 HAZARDOUS WASTE MANIFESTS

UST No. 0025 was estimated to contain 24 gallons of number 2 fuel oil. Approximately 14 gallons of fuel oil was removed on January 6, 1992, and transported to a licensed Treatment Storage Disposal Facility (T.S.D.F.) (Beede Waste Oil Corporation, Plaistow, New Hampshire). Approximately 10 gallons residual materials were drummed on January 9, 1992 for transportation at a later date. Drummed material was transported to Beede Waste Oil Corporation on February 25, 1992.

The following Hazardous Waste Manifest were generated from the residual tank material. The manifest dated January 6, 1992 is associated with vacuuming product from several USTs. Therefore, the total quantity (2,200 gallons) is much greater than the 14 gallons which was removed from UST 0025. The manifest dated February 25, 1992 is associated with the drummed material from several USTs. Therefore, the total quantity (495 gallons) is much greater than the 10 gallons which was removed from UST 0025.

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mer

CBS

Boston, Massachusetts 02108

ease print or type. (Form designed for use on elit	e (12-pitch) typewriter.)							
UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator US EPA M  A   7   2   1   0	A ID No.  0  2  5  1  5  4	Manife Document		2. Pa		n in the shad ired by Feder	
4. Generator's Phone 508-796-3002	Dept. of The AF Meadquarters Ft MAFZD-WRQEM At	MY Devens Be th: Mark Bo	ox 19		MA 🕏	rte Manifest Docum F 2 9 1 2 1 1 Ite Gen. W	nent Numbe	) . š.
5. Trensporter 1 Company Name Ft. Beede Waste Oil Corp.	Devens Ma 0143	US EPAID	Number	46	C.Ste	te Trans. ID NH	MAGN	34
7. Transporter 2 Company Name	8.	US EPA ID N	Number	Ш		insporter's Phone interest Trans. ID	60313	82-576
S. Designated Facility Came and Site Address Beedle Waste Oil Corp.  Keely RD. PO Box 127  Plastow NH 03865					G. St	insporter's Phone ( ate Facility's ID	Not Re	quired
Plastow NH U3003	ln ln	HIDDII 189		4 D		cility's Phone 60	14.	-5 761
11. US DOT Description (Including Proper St	nipping Name, Hazard Class	s, and ID Number)		Vo.	Type	Total Quantity	Unit Wt/Vol	Waste No.
Waste Petroleum Oils N Combustable liquid N			00	2191	DM	0:014195	G	MADI
b.		j	1	1 1	1	1111		.111
<b>c.</b>			,	•				97 Lal 1
d.		f 4						1
J. Additional Descriptions for Materials Lister	d Above linclude physical s	state and hazard code.	, }	ě N	K. Ha	ndlir:q Codes for W	astes Listed	Above
b. 15. Special Handling Instructions and Addition	d. 1			÷ ;	b	Tar L	d.	با أر نا
To Be Recycled  16. GENERATOR'S CERTIFICATION: I hereby declare proper shipping name and are classified, packed, according to applicable international and national If I an: a large quantity generator, I certify that I hand that I have selected the practicable method oment; OP, if I am a small quantity generator, I have can afford.	that the contents of this consig marked and labeled, and are in I government regulations. ave a program in place to reduce of treatment, storage or disposa	nment are fully and accurate all respects in proper conductive the volume and toxicity of a currently available to me	of waste generat	ed to the	ghway e degree esent and	luture threat to huma	an health and t	ne environ-
Printed/Typed Name		Signal	Allh			_	Month	
17. Transporter 1 Acknowledgement of R	leceipt of Materials	100	-1/					Cate
Printed/Typed Name Brian Ginivan		Brien	gis	ni	-		Month	1215 19 L
18. Transporter 2 Acknowledgement of R	leceipt of Materials	<u> </u>	1					Date
Printed/Typed Name		Signature	V				Month	Day Year
19. Discrepancy Indication Space						(4)		
20. Facility Owner or Operator: Certification	of receipt of hazardous ma	terials covered by this	manifest exce	ept as r	oted in	item 19.		Date
Printed/Typed Name	5	Signature	20 1	12	el.	20	Month	BOX YOU

Form Approved OMB No. 2050-0039, Expires 9-30-91 EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

:E<Y90

FACILITY MAILS TO GENERATOR

FACILITY MAILS TO GENERATOR

MA F353630

FACILITY MAILS TO DESTINATION STATE





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

One Winter Street Boston, Massachusetts 02108

WASTE MANIFEST	1. Generator US EPA I		Manifest Document No.	2. Page		n in the shade ired by Feder	
3. Generator's Name and Malling Address	HQ5 ForT. De		F0600	PATERIO		ment Number	
	AFZD DEQ DE			MARS	据自为自占	10条6	
70 70 · ·	FOT DEVENS,	ma 0143	3	18 State	Goo Pur		
4. Generator's Phone (508):796-3	202 244	US EPAID N	16-2711	Manual Control	THE ATTEMENT	TATE OF THE STATE	e de la companya de l
		IN OIROS	3				文
7. Transporter 2 Company Name	9rp. 8.	US EPA IO N		· Don rans	porters Phone		1
	: 11	1111		· SESSUA	Trans IDE		12 K
8. Designated Facility Name and Site Address	10.	US EPA ID N	umber	建门包含		<b>ENDANCE</b>	
Beede Waste Oil Co	rp.	4		E CONTRACTOR	ported Phone.	CONTRACTOR	Action and
Kelley Road PO Box	127	1.19.14	1.1.1.1.1.16	HI S	v a Phone 1970		
Plaistow, NH 038		I'D' 01895	8140 12.Co	rtainers	13. 60.	782	13000
11. US DOT Description (Including Proper Ship)	ping Name, Hazard Class, a	and ID Numberl.	No.	Туре	Total	Unit Wt/Vol	
· Marthaga						7.7	<b>美國</b>
WASTE PETROLEUM OI	LS N.O.S.		1 1 2	Tran 1	00 4	G	MAG
COMBUSTIBLE LIQUID	NA1270	•		171	12290		MART S
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15. Special Handling Instructions and Additions			Secasion in	4 16:00 Sec	[6355]33E-8	<b>第2部示除</b>	टिकार कि
to opecial mandang instructions and Additions	i information			1 5			
To be Recycled					Recyc	le	
16. GENERATOR'S CERTIFICATION: I hereby declare the	t the contents of this consignm	ent are fully and accurat	ely described above	by ·	ricojo	10	
groper shipping name and are classified, 'packed, ma according to applicable international and national go		respects in proper condi	tion for transport by	highway			
If I am a large quantity generator, I certify that I have	a program in place to reduce th	e volume and toxicity of	waste generated to	the degree I ha	ve determined to b	e economically	practicable
and that I have selected the practicable method of tr ment; OR, If I am a small quantity penerator, I have m	eatment, storage, or disposal cu	prently available to me v	which minimizes the	present and lu	ture threat to hum	an health and th	E GUAROU-
can afford.			/	,			Date
Printed/TypedName		Signature	1/1	9		Month	Day, Y
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17. Transporter 1 Acknowledgement of Rec	eipt of Materials		7 .		1		Date
Printed/Typed Name	14.75	Someting	111	21	6/	Month U11	0145
18. Transporter 2 Acknowledgement of Rec	eint of Materials	Jane	1 /	fary	11.	1011	Date
Printed/Typed Name	* * * *	Signature	3.7	e p		Month	Day Ye
19. Discrepancy Indication Space			-				
*							
70 fT0	The second secon		<b>.</b>	J. 4			
20. Facility Owner or Operator: Cartification of	eceipt of hazardous materi	als covered by this n	nanilest except a	noted in Ite	m 19.		
							Date

### 2.11 WEIGHT RECEIPTS AND BILLS OF LADING

The following weight receipts the disposal of contaminated soil associated with UST 0025. Bills of Lading for UST 0025 are not available.

MAÎN ÓFFIČE:	S CHERRY PORIVE P.O. BO DANVERS, MA 07923-5089 SHREWSBURY DIVISION 651 LAKE STREET AT REE	FMNARRIVED JOB	ash CHECKED B	C.O.D.
DANVERS 750-4200	651 LAKE STREET AT RTE, 20 SHREWSBURY, MA 01545 OFFICE 881-1430 PLANT 754-4709	CHECK	#	

T FMN	jash □	C.O.D. 🗆	Oharge D
M ARRIVED JOB	CHECKED	BY	
E LEFT JOB CHECK	#	CA	ARRIER
7:	% TOUTE	D To	m. ana

Customer # ATEO01 ATEC ASSOC. 62 ACCORD PARK DRIVE NORWELL, MA 02061

Job # BLDG1605 US ARMY

MIR # **#76**  MIX NAME OIL SOIL

TRUCK# 9

617-876-6200

TOBE.

2:13:38

BLDG 1605 TANK 25 FORT DEVENS, MA 01433

PO# 37.04.72053

fare 29500

Net 41400 Grace 71000 Total 20.70

Cost/Ton Percent Tax

Load Cost Amount Tax Dest Charge

\*\*\*\*

Total Cost

Load#

Joh Total 20.70 Time & Date

Fob/Del 2:13:3P ps 3el 2e, 1992 F

THIS COMPANY WILL NOT BE RE-SPONSIBLE FOR DAMAGE CAUSED BY TRUCKS DEFLIVERING MATERIAL BEYOND STREET PAVEMENT.

RECEIVED BY

### 2.12 PERMITS AND CERTIFICATIONS

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



The Commonwealth of Mass

DEPARTMENT OF PUBLIC SAFETY DIVISION OF FIRE PREVENTION

FOR REMOVAL AND TRANSPORTATION TO APPROVED TANK YARD

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

DIG BAFE NUMBER Bliff Bald , made

Name: Atec Environmental Associates Inc.
Full name of person, firm or Corporation
To transport underground steel storage tank(s) to Approved tank yardi. 1.49

State clearly type of inert gas used in steel storage tank

FDID# 17919

Fee paid \$

steel tank! Dr

Name and address of contractor

Accord Park Dr. Norw disposing tank ATEC Associates, Location to which tank will

be transported

BULLER BURGER CONTROL OF THE SECOND SECOND CONTROL OF THE BURGER SECOND SECOND

This permit will expire 31 Jan 1992

(Head of Fire Dept.)

Jank 25 B/dg 1605

OF 20	OHN C. TOMBARELLO & SONS	(2) (REALED)
APPROVED TANK YARD	AWRENCE, MASS. 01841	TEL ST
APPROVED TANK YARD NO	4901	A COUNTY
Tank Yard Ledger 502 CMR 3	.03(4) Number: 92000.98	San
I certify under penalty of law I ! delivered to this "approved tank y and a Regulation 502 CMR 3.00 Provisions	have personally examined the underground steel storage tan yard" by firm, corporation or partnership / / E / accepted same in conformance with Massachusetts Fire Preve s for Approving Underground Steel Storage Tank dismantling TAL Head of Fire Department FDID: / 29/9 to trans	ntion yards.
this tank to this yard.	ed tank yard owner or owners authorized representative:	1000
h 1	할머니는 아이에 가는 프라이탈 중요한 아이들은 이 아름이 있다. 하지만 그렇게 하지만 되었다. 그리고 얼마를 하면 되었다면 하지 않는데 나를 다 하다.	
Marou C	TITLE DATE SIGNED	
This sized weeks of discoul-	ust be returned to the local head of the fire department	
FORM F.P. 291 (rev. 9/88)	(OVER) MASSACHUSETTS STATE FIR	e marshal's of
FORM F.P. 291 (rev. 9/88)		· Allenau Man
FORM F.P. 291 (rev. 9/88)  DIMENSIONS	Tank Removed From	
DIMENSIONS	Tank Removed From  Building 1605	
DIMENSIONS Width Length	Tank Removed From  Building 1605  (no street)	
DIMENSIONS Width Length	Tank Removed From  Building 1605  (no. street)  Fort Devens MA	
DIMENSIONS  Width Length  ank 1 -4-8 x -2-9	Tank Removed From  Building 1605  (no street)	
DIMENSIONS  Width Length  ank 1 -4-8 x -4-0  ank 2 X	Tank Removed From  Building 1605  (no. street)  Fort Devens MA  (city or town)  Fire Department	
DIMENSIONS  Width Length  Tank 1 X	Tank Removed From  Building 1605  (no. street)  Fort Devens MA  (city or town)	
• • • • • • • • • • • • • • • • • • • •	Tank Removed From  Building 1605  (no. street)  Fort Devens MA  (city or town)  Fire Department	

## 2.13 UST CLOSURE CHECKLIST

The following UST closure checklist was produced by ATEC Associates Inc., to ensure quality control of the proper abandonment of an underground storage tank.

UST-CLOSURE O/C CHECK LIST	Tank	7.5 R	AG 1605 Fort	Devens	
1600 5 No 2 F			<u> </u>		
DEFINABLE FEATURE	DATE	TIME	MEASUREMENTS		NOTES
Calibrate PID & LEL/O2 meters	1/10/92	4:00			Site Topography: level
Drain & flush piping & pumps	1/9/52	17:30			
Excavate to top of tank	1/9/92	12:45			Depth to tank:
Vent tank note LEL/O2 levels & times	1/10/19		LEL	O2	
		T1: 7.17	(1 2 2	76.5	
>		T2: 7:70	0-170	70.6	
		T3: 7:1/c	0-990	10,2	
		T4: 3:66	0-99	70.0	
		T5:			
		T6:			
		T7:			
		T8:			
		T9:			
		T10:			
		T11:			
		T12:			
				Α	
Pump & clean tank:	V652	7	gal. liquid + 10 9 2	V	Tank Dimensions: Uy 10.5
Note quantities liquid (gal) & sludge (lbs)	1/16/92	7:60	lbs. sludge		
9;					12 hilly and no and
Remove all tank connections, and cap openings	1/10/92	7:25			
Excavate soils to free tank	1/9/92	2,00			
Segregate stained soils: Note PID readings	1/9/92		PID (ppm)	NDIR (ppm)	none verily out and
(if>10 ppm NDIR also)			6.8		5-1-oc 4 - 1
			4. 4		clock y

DEPOSIT OF THE POSITION				
DEFINABLE FEATURE	DATE	TIME	MEASUREMENTS	NOTES
Remove tank, piping, pumps, and hardware.	1/90/92	2:56	Photographic Descriptions:	Soil Description:
Photograph excavation; note descriptions.			Photo 1: 4	
Sketch Schematic			Photo 2: fanly	
			Photo 3: excav & fact N Photo 4: excav N fact S	
			Photo 4: excav N face 5	
			Photo 5:	Depth to Groundwater/Conditions:
			Photo 6:	
ce tank at safe distance from excavation	1/10/97	2:50		Depth of Excavation:
Secure tanks transport off-site	1/10/92	7:70		
Obtain 10 soil samples from	1/16/92	7.30	PID (ppm) NDIR (ppm)	Sample locations:
excavation walls/bottom: Note PID/NDIR			SS1: Ø 7	
readings and sample locations.			SS2: 0. y	
			SS3: 0.7	
			SS4: 42	
			SS5: 👌 , 🧸	
			SS6: 0.7	
			SS7: 3.6	
			SS8: /. 6	
~			SS9: 0.Z	
			SS10: 3, Z	
Obtain 2 soil samples & 1 water samples	1/18/97	7:30		Sample Locations:
for laboratory analysis. Note sample locations.	17,077	2130		LSS1 % C / /
	_			LSS2: = 5
				LWS1:
**************************************				USS Composito state 2.10

UST.CLOSURE O/C CHECK LIST					
DEFINABLE FEATURE	DATE	TIME	MEASUREMENTS	NOTES	
				tons of backf	ill
Backfill excavation (if clean):				Backfill description:	
Note amount & type of backfill					
Close open excavation (if applicable)					
ore surface and rope off					
Remove rubbish/debris					
Transport hazardous material off-site:				Amount	Classification
Note amount/classification					
Make copies of manifests, permits,					
and disposal receipts.					

.

# 2.14 INSTALLATION

The installation of a replacement UST No. 0025 was not performed.

#### 3.0 UST No. 0026

#### 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. 0026, located at property known as Building 1666, 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 9, and 13, 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 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).
- Preparation of a Technical Report, to include assimilation of information gatherd, major findings, and conclusions.

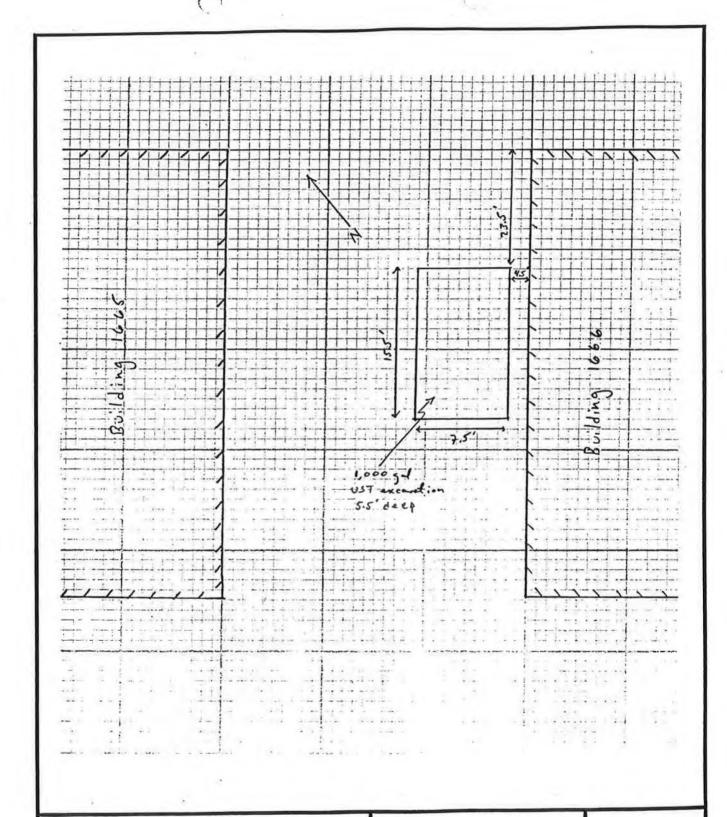
### 3.1.2 Subsurface Storage Tank Excavation and Removal

On January 9, and 13, 1992, one 1,000-gallon, subsurface, number 2 fuel oil, storage tank was excavated and removed from the site. The UST was located adjacent to the northwest side of the Building 1666 (see Figure 3.1 - UST Location Plan). Site topography is level.

Soils in the excavation consisted primarily of light to medium-brown, fine sand with little fine to coarse gravel. The tank was covered by approximately 1.5 feet of soil. The bottom of the excavation was approximately 5.5 feet below grade. Groundwater was not encountered. Soil within the excavation appeared uncontaminated. However, fragments of the tank's asphalt coating were evident within the soil matrix of the walls and bottom of the excavation.

The associated piping was drained and tank connections were removed. UST No. 0026 was estimated to contain 945 gallons of number 2 fuel oil and residuals. Approximately 935 gallons of fuel oil were removed on January 6, 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. The tank was observed to be in good condition with no perforations, punctures, or severe corrosion. 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. Approximately 10 gallons of residual tank materials were removed and drummed on January 9, 1992 for transportation at a later date. Drummed material was transported to Beede Waste Oil Corporation on February 25, 1992. See Section 3.10 for copies of the appropriate Hazardous Waste Manifests.



# **UST LOCATION PLAN**

1,000 gallon UST relative to: Building 1666 Fort Devens, Massachusetts PROJECT: 37.07.91.07451

NOT TO SCALE

FIGURE: 3.1



The scrap tank was removed from the site on January 13, 1992 and transported to the Contractor's yard, located on Lake George Street, Fort Devens for temporary storage. The tank was disposed of at Tombarello & Sons, a licensed Massachusetts tank yard, located in Lawrence, MA, on January 24, 1992. A copy of the disposal receipt is included in Section 3.11, Permits and Certifications.

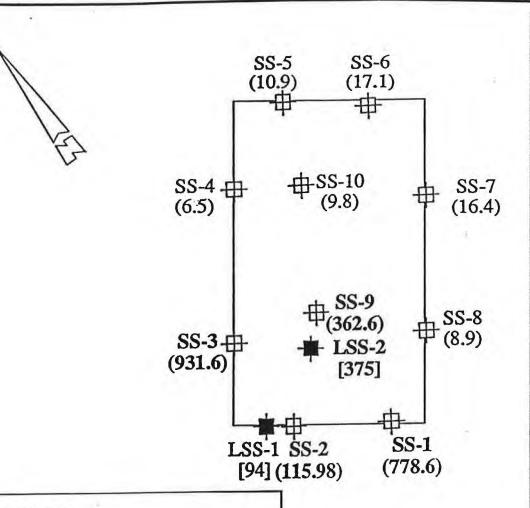
#### 3.1.3 Sampling and Analysis Plan

Ten soil samples were obtained from the excavation for field screening with a Photoionizing 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 analysis 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 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 southwest wall of the excavation. 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 (USEPA Method 418.1).

Sampling locations are depicted on the Sampling Schematic attached as Figure 3.2. The appropriate chain of custody forms are included in Section 2.9, Chain of Custody Forms.



# LEGEND:

- Field Screened Soil Sample
- Lab Analyzed Soil Sample
- ( ) NDIR Results in ppm
- [ ] Lab Analysis Results in ppm

Results in bold denote levels in excess of MA DEP Remedial Goal Level (100 ppm)

## SAMPLING SCHEMATIC

1,000 gallon UST excavation at: Building 1666 Fort Devens, Massachusetts PROJECT: 37.07.91.07451

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 samples obtained from the excavation are as follows:

TABLE 2.1 - PID AND NDIR RESULTS

SAMPLE NUMBER	PID (ppm TOVs)	NDIR (ppm TPH)	
SS-1	1.2	778.62	
SS-2	4.5	115.98	
SS-3	1.7	931.60	
SS-4	0.0	6.50	
SS-5	0.1	10.90	
SS-6	0.2	17.10	
SS-7	0.0	16.40	
SS-8	0.1	8.90	
SS-9	0.4	362.60	
SS-10	5.8	9.80	
Stock-1	0.1	25.60	
Stock-2	0.2	70.40	

Laboratory analytical results of the two soil samples obtained from the excavation revealed a TPH concentration of 94 ppm for LSS-1, and 375 ppm for LSS-2. Laboratory analysis of the one soil sample obtained from the stockpiled soils revealed a TPH concentration of 60 ppm for LSS-3. (See Section 3.8, Laboratory Analytical Results.)

#### 3.1.5 Conclusions and Recommendations

As noted in ATEC's Post Removal Report dated February 14, 1992, ATEC's conclusions are as follows:

Upon excavation and removal, the tank was observed to be in good condition with no signs of perforations, punctures, or severe corrosion.

Groundwater was not encountered within the excavation.

Excavated soils appeared to be uncontaminated. However, fragments of the tank's asphalt coating were evident within the soil matrix of the walls and bottom of the excavation.

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 0.0 to 5.8 ppm. NDIR results revealed TPH concentrations ranging from 6.5 to 931.6 ppm.

Two soil samples were obtained from the excavation for laboratory analysis for TPH. Analytical results for LSS-1 obtained from the southwest wall of the excavation revealed a TPH concentration of 94 ppm. Analytical results for LSS-2 obtained from the bottom of the excavation revealed a TPH concentration of 375 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 60 ppm.

The following were recommended and implemented by ATEC subsequent to the submittal of the Post Removal Report.

Remedial excavation of the south end and the bottom of the excavation was conducted until laboratory analysis of soil samples showed a TPH concentration of <100 ppm. Field screening of soil was conducted during excavation utilizing a Photoionization Detector until background levels of <1 ppm were attained prior to obtaining samples for laboratory analysis.

Soils excavated during the tank removal and remediation were disposed at a licensed T.S.D.F.

#### 3.2 SITE REMEDIATION AND CONTAMINATED SOIL DISPOSAL

#### 3.2.1 Site Remediation

Following initial PID screening, additional excavation to remove contaminated soil and reach background levels (<1 ppm TOVs by PID) was conducted per order of the Contracting Officer's Representative and David Salvadore of the Massachusetts Department of Environmental Protection (DEP). Approximately 189 tons of contaminated soil were removed from excavation floor and all side walls during remedial excavation on July 21, 1992. The estimated volume of removed soil was calculated from field drawings produced during the removal and remediation of UST No. 0026 (See Figure 3.3, Remedial Excavation Plan).

Eight soil samples (RSS-1 through RSS-5A, 5B, 5C, 5D) were obtained during remedial excavation for PID field screening. RSS-1 through RSS-4 were obtained from the sidewalls at a depth of approximately 7 feet below grade. RSS-5A was obtained from the bottom of the excavation at a depth of approximately 8 feet below grade. All PID readings for TOVs of the soil samples were below 1.0 ppm with the exception of RSS-5A (60 ppm). Therefore, an additional 2 feet of soil was excavated from the bottom of the excavation per direction of the Contracting Officer's Representative (COR).

13.54 7.54 5.5= 6 1 /27 = 23.7 \* 1.625 38.5 (REM) TUKF Pem 34 (19/415) + 29 (14/415) = 986 SF = <116.25 SF> = 769.75 SF 2.26 8 R55-2 BLDG # RSS-5 1666 # R55-4 19.0 15.5 2.25 R55-3 ORIGINAL EXCAVATION DEPTH OF EXCAVATION: 14' KEMEDIAL PROJECT: 37.07.91.07451 REMEDIAL EXCAVATION PLAN ATEC 1,000 gallon UST NOT TO SCALE Building Pt. Devens FIGURE: 3.3

Soil 12×14× 14=3734/27 HO +160=227.5

A second sample (RSS-5B) was then obtained from the bottom of the excavation at a depth of 10 feet for PID screening. PID screening for TOVs revealed 70 ppm.

A third sample (RSS-5C) was obtained from the bottom of the excavation at a depth of 12 feet. PID screening for TOVs revealed 80 ppm.

Further excavation from the bottom of the pit was conducted to a depth of approximately 14 feet below grade (RSS-5D). The final PID screening revealed 95 ppm for RSS-5D (See Table 3.2). Further excavation from the bottom of the excavation was not conducted per order of the Contracting Officer's Representative.

TABLE 3.2 - PID SCREENING RESULTS

SAMPLE NUMBER	PID (ppm TOVs)	LOCATION
RSS-1	0.2	north sidewall (7' depth)
RSS-2	0.0	east sidewall (7' depth)
RSS-3	0.2	south sidewall (7' depth)
RSS-4	5.0	west sidewall (7' depth)
RSS-5A	60.0	bottom (8' depth)
RSS-5B	70.0	bottom (10 ' depth)
RSS-5C	80.0	bottom (12' depth)
RSS-5D	95.0 bottom (14' dep	

RSS = Remediation Soil Sample

Two soil samples (RSS-1 to RSS-2) were obtained for laboratory analysis for TPH (USEPA Method 418.1). RSS-1 was obtained from the north sidewall at a depth of approximately 12 feet below grade. RSS-2 was obtained from the east sidewall at a depth of approximately 12 feet below grade. The following table presents levels revealed by laboratory analysis:

**TABLE 3.3 - LABORATORY ANALYSIS** 

SAMPLE NUMBER	TPH (ppm)	LOCATION
RSS-1	514.0	north sidewall (12' depth)
RSS-2	3,630.0	east sidewall (12' depth)

See Section 3.8 - Laboratory Analytical Results.

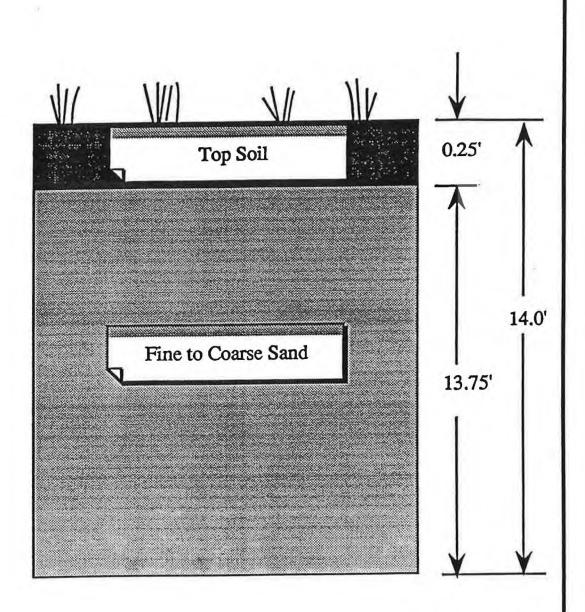
### 3.2.2 Soil Stratigraphy

Soil stratigraphy for the excavation consisted of unstratified light to medium brown, fine to coarse sand (see Soil Stratigraphy - Figure 3.4).

#### 3.2.3 Contaminated Soil Disposal

Prior to disposal, contaminated soil was laboratory analyzed for disposal classification purposes. One soil sample (Stock-26) was obtained from stockpiled soil. Laboratory analyses were performed for Volatile Organic Compounds (VOCs) (USEPA Method 8240), Semi-volatile Organic Compounds (USEPA Method 8270), Flashpoint (USEPA Method 1010), Polychlorinated Biphenyls (PCBs) (USEPA Method 8080), Reactive Sulfide and Reactive Cyanide (USEPA Method 7.3.4.1 and 7.3.3.2), 13 Metals by Toxicity Characteristic Leachate Procedure (TCLP) (USEPA Method 1311), and Corrosivity (pH) (USEPA Method 9045). Laboratory analytical results revealed 5.5 standard units (S.U.) Corrosivity, 0.05 ppm Copper, 0.40 ppm Zinc, 0.3 ppm Lead. All other analytical results were below the Method Reporting Limits (MRL). (see Section 3.8 Laboratory Analytical Results).

Approximately 116.30 cubic yards (189 tons) of number 2 fuel oil contaminated soil was removed and stockpiled during the remediation of the excavation, as estimated through field drawings (See Figure 3.3 - Remedial Excavation Plan). Contaminated soil was



# **SOIL STRATIGRAPHY**

1,000 gallon UST excavation at: Building 1666 Fort Devens, Massachusetts PROJECT: 37.07.91.07451

UST-26

FIGURE: 3.4



disposed for recycling at Trimount Bituminous Products Company, Shrewsbury, Massachusetts.

#### 3.3 HYDROGEOLOGICAL SERVICES

Hydrogeological services were not performed relative to UST 0026. However, based upon PID field screening and laboratory analytical results, subsurface concentrations of TOVs and TPH were observed to increase. ATEC recommends the installation of monitoring wells to evaluate groundwater in the vicinity of the former UST No. 0026 for the presence of petroleum hydrocarbons.

#### 3.4 BACKFILL

The excavation was lined with polyethylene plastic sheeting and backfilled with 137.9 cubic yards of uncontaminated fill material on July 29, 1992, as estimated through field drawings. Backfilling was conducted with the approval of the Contracting Officer's Representative.

#### 3.5 SITE RESTORATION

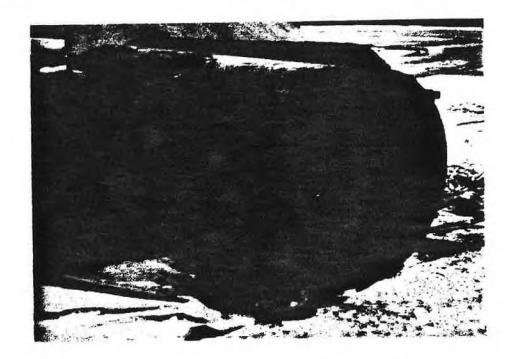
Following backfill of the excavation, approximately 149.8 square feet of loam was distributed over the excavated area.

#### 3.6 PHOTOGRAPHIC DOCUMENTATION

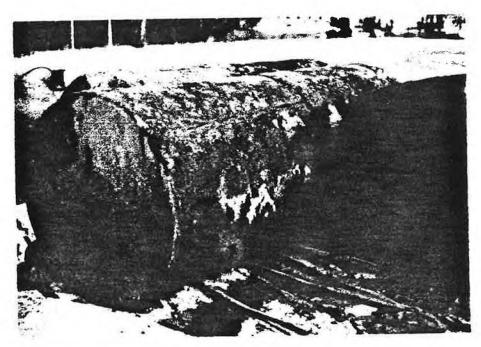
The following photographs are of the removed UST, the excavation and a post remedial view of the excavation.

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

A-1



A-2



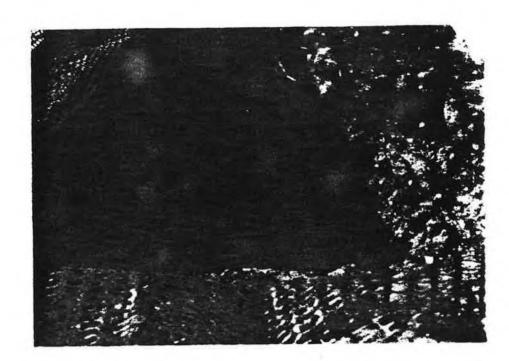
# PHOTO DOCUMENTATION

1,000 gallon UST excavation at:
Building 2290
Fort Devens, Massachusetts

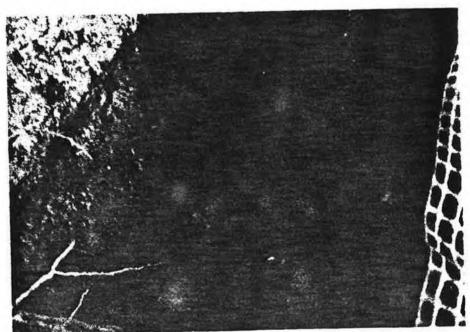
PROJECT: 37.07.91.07451



A-3



A-4



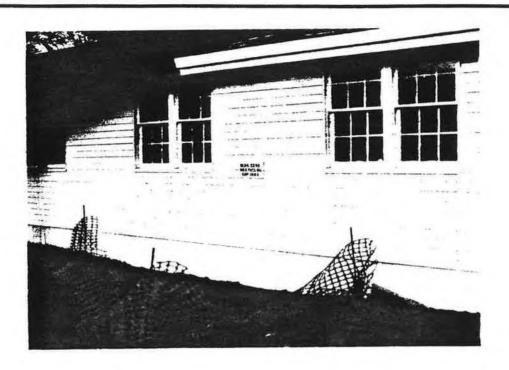
# PHOTO DOCUMENTATION

1,000 gallon UST excavation at:
Building 2290
Fort Devens, Massachusetts

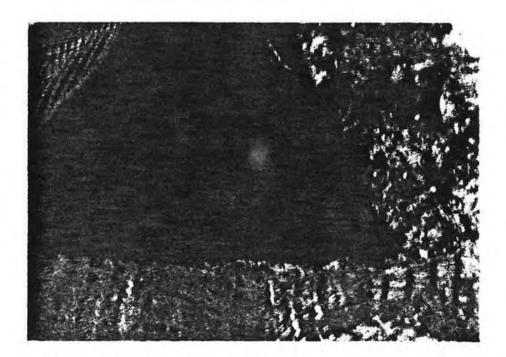
PROJECT: 37.07.91.07451



A-5



A-6



# PHOTO DOCUMENTATION

1,000 gallon UST excavation at:
Building 2290
Fort Devens, Massachusetts

PROJECT: 37.07.91.07451



## 3.7 OCMA 220 DATA SHEETS

The following information was organized from the data collected from the NDIR analyzer.

- SS-1 to SS-10, Stock-1 and Stock-2: Soil samples obtained from the original excavation.
- RSS-1 to RSS-3: Soil samples obtained from remedial excavation.

# OCMA Data Sheet

Operator N	lame: Ruxerou
------------	---------------

Date: 13 mile

EBI Project Number: 37.07.451

TK#26

# Calibration

	Firs Initial	t Reading Final	Seco Initial	nd Reading Final	Third Reading Initial Final		
Zero Calibration ·	1-0.3	100	10.0	1 0.0	1 -	$\sim 1$	1
Span Calibration	L				1		
Zero Calibration	L	1	1	1	1	1	
		. (0)				Span Check:	31.0

# Testing

Weight		First A	pproach	Second.	Approach	Readings		
6-Gross	Tare	F-113	Sample	F-113	Sample	First	Second	Third
182.2	75.8					0.5	10-83	10.8
	174.601					12.1	12.2	1 -
179. 2	179.3 1					119.4	119,0	119.0
180.1	174.8 1					12,5	13.0	13.0
182,7	175.2	2				128.9	134.0	134
180-8	174.5 1				1	1.2	1.2	1
181.3	175.01					1 .3	1.4	1.4
182.2						1.6	1.6	1-
181.5					1	1.6	1012	1-
181.3						1.2	1.3	1.3
181.8	175.3 1					111.5	111.5	-
182.3	176.0					1.2	1,3	1.3
1	i i				7	1		i
	1		1.		1		i	
			i				1	
1	1						1.	
1	1					-		-
1		-		-			-	-
1				-		-		-
-	1		1	-		-	-	_
	1		1		-	<del></del>	-	-
1			-				-	-
-			1	-		-		
-	1		-					-
	6-Gross 182.7 181.0 149.2 180.1 180.8 180.8 181.3	82,1   75.8   181.8   174.6   174.6   174.6   174.8   180.1   174.8   182,7   175.2   180.8   174.5   180.2   175.0   181.3   174.1   181.8   175.3	Gross Tare F-113    82.7	6-Gross Tare F-113 Sample    82.1	82.2   75.8	©-Gross Tare F-113 Sample F-113 Sample    82.7		82,7

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

PROJECT NAME, NUMBER, TANK: U.S. ARMY - FORT DEVENS 37,07,91,451 UST 0026

DATE: Jul 24, 1992

OPERATOR: Charles Langenhagen

## CALIBRATION DATA

TYPE	FIRST REA	ADING	SECOND RI	EADING	THIRD REA	ADING	SPAN
CALIBRATION	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	CHECK
ZERO:	5.7	0.0	-1,1	0.0	-0.4	0.0	27.6
SPAN:	34.2	40.0	45.8	40.0	40.9	40.0	
ZERO:	6.1	0.0	-7.0	0.0	-0.2	0.0	

#### ANALYTICAL DATA

SAMPLE	WEIGH	IT (g)	1st DILUTIO	ON RATIO (ml)	2nd DILUTIO	ON RATIO (ml)	INSTRUME	NT RESULTS	(ppm)	_ CONCENTRATION
NUMBER	GROSS	TARE	F-113	SAMPLE	F-113	SAMPLE	1st	2nd	3rd	mg/l
RSS-1	80.5	75.0	17.5	3.0			0.2	0.2		7.5
RSS-2	79.9	74.7	17.5	3.0	14	**	0,2	0.3		11.8
RSS-3	80.5	74.9	17.5	3.0	166		0.0	0.0		0,0

#### 3.8 LABORATORY ANALYTICAL REPORTS

The following laboratory analytical reports are associated with the removal, remedial excavation, and stockpiled soil. These reports were organized and provided by Environmental Science Services Inc.

- LSS-1, LSS-2, and LSS-3: Soil samples obtained from original excavation.
   Laboratory analyzed for TPH.
- RSS-1 and RSS-2: Soil samples obtained from post-remedial excavation.
   Laboratory analyzed for TPH.
- Stock-26: Soil sample obtained from stockpiled soil for disposal classification.
   Laboratory analyzed for VOCs, Semi-volatiles, Flashpoint, Reactive Cyanide,
   Reactive Sulfide, PCBs, Corrosivity (pH), and 13 TCLP Metals.



## CERTIFICATE OF ANALYSIS

Job: 112 Date: 1/17/92

Account: 95659

Received: 1/14/92

Project: TANK 26

ATEC ENVIRONMENTAL CO. 0:

62 Accord Park Drive Norwell, MA 02061

ttn: Mr. Mark Baldi

Number	Parameter	Result	Unit	Sample Description
EPA-160.3 EPA-418.1	Total Solids TPH/IR (Dry Wt.)	90 94	% mg/kg	LSS-1
EPA-160.3 EPA-418.1	Total Solids TPH/IR (Dry Wt.)	93 375	% mg/kg	LSS-2
EPA-160.3 EPA-418.1	Total Solids TPH/IR (Dry Wt.)	86 60	% mg/kg	LSS-3
	EPA-418.1 EPA-160.3 EPA-418.1 EPA-160.3	EPA-418.1 TPH/IR (Dry Wt.)  EPA-160.3 Total Solids  EPA-418.1 TPH/IR (Dry Wt.)  EPA-160.3 Total Solids	EPA-160.3 Total Solids 90 EPA-418.1 TPH/IR (Dry Wt.) 94 EPA-160.3 Total Solids 93 EPA-418.1 TPH/IR (Dry Wt.) 375 EPA-160.3 Total Solids 86	EPA-418.1 TPH/IR (Dry Wt.) 94 mg/kg  EPA-160.3 Total Solids 93 %  EPA-418.1 TPH/IR (Dry Wt.) 375 mg/kg  EPA-160.3 Total Solids 86 %

David Dickinson Laboratory Manager

age:



MM

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens Remediation ESS Project ID: 921907

Client Sample ID: RSS-1 (26) ESS Sample ID: 921907-07

Date Sample Received: 7/24/92 Date Reported: 8/6/92

Parameter	Results	Units	MRL	Method
Total Petroleum Hydrocarbon-IR	514	mg/Kg	11	418.1

MRL = Method Reporting Limit

Approved by:

David Dickinson Laboratory Director

It was to the state that the terminal and the area of the

Date: 6 Aug 4 L

Company to the return



MM

In Response To The Fittine

## CERTIFICALE OF ANALYSIS

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens Remediation ESS Project ID: 921907

Client Sample ID: RSS-2 (26) ESS Sample ID: 921907-08

Date Sample Received: 7/24/92 Date Reported: 8/6/92

Parameter	Results	Units	MRL	Method
Total Petroleum Hydrocarbon-IR	3,630	mg/Kg	105	418.1

MRL = Method Reporting Limit

Approved by:

David Dickinson Laboratory Director Date:

6 Aug 92



921516

## **CERTIFICATE OF ANALYSIS**

Client: ATEC Environmental Consultants

Client Project ID: U.S. Army-Ft. Devens ESS Project ID:

Client Sample ID: Stock-26 ESS Sample ID: 921516-06

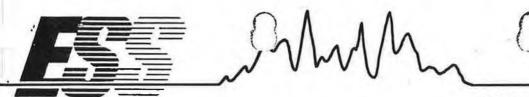
Date Sample Received: 6/10/92 Date Reported: 6/26/92

Parameter	1	Results	Units	MRL	Method
pH (Corrosivity)		5.5	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
<b>Volatile Organics</b>		ND	ug/Kg	Attached	8240
Toxicity Characteristic Leaching Metals	Pro	ocedure			1311
Lead		0.3	mg/L	Attached	6010
Copper		0.05	mg/L	Attached	6010
Zinc		0.40	mg/L	Attached	6010

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson Laboratory Director Date:



# **CERTIFICATE OF ANALYSIS**

#### POLYCHLORINATED BIPHENYLS Method 8080

Client: ATEC Environmental Consultants

Client Project ID: U.S. Army-Ft. Devens

Client Sample ID: Stock-26

Date Sample Received: 6/10/92

ESS Sample ID: 921516-06

Date Reported: 6/26/92

ESS Project ID: 921516

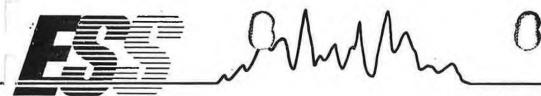
Parameter	Result (mg/Kg)	MRL
Arochlor 1016	ND	1
Arochlor 1221	ND	1
Arochlor 1232	ND	1
Arochlor 1242	ND	1
Arochlor 1248	ND	1
Arochlor 1254	ND	1
Arochlor 1260	ND	1

ND = Not Detected above Method Reporting Limit (MRL)

Surrogate Recovery Data	% Recovery	QC Limit
Dibutylchlorendate	78%	50 - 150%

Approved by:

Laboratory Director



## **CERTIFICATE OF ANALYSIS**

#### ACID EXTRACTABLES EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: U.S. Army-Ft. Devens ESS Project ID: 921516

Client Sample ID: Stock-26 ESS Sample ID: 921516-06

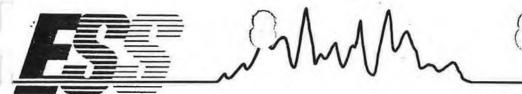
Date Sample Received: 6/10/92 Date Reported: 6/26/92

Parameter	Result (ug/Kg)	MRL	
2-Chlorophenol	ND	330	
2-Nitrophenol	ND	330	
Phenol	ND	330	
2,4-Dimethylphenol	ND	330	
2,4-Dichlorophenol	ND	330	
2,4-Dinitrophenol	ND	1,650	
Pentachlorophenol	ND	1,650	
4-Nitrophenol	ND	1,650	
2,4,6-Trichlorophenol	ND	330	
2,4,5-Trichlorophenol	ND	1,650	
2-Methylphenol	ND	330	
4-Methylphenol	ND	330	
4-Chloro-3-Methylphenol	ND	330	
4,6-Dinitro-2-Methylphenol	ND	1,650	

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson Laboratory Director Date:



## CERTIFICATE OF ANALYSIS

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

Client: ATEC Environmental Consultants

Client Project ID: U.S. Army-Ft. Devens 921516 ESS Project ID:

Client Sample ID: Stock-26 ESS Sample ID: 921516-06

Date Sample Received: 6/10/92 Date Reported: 6/26/92

Parameter	Result (ug/Kg)	MRL
Acenaphthylene	ND	330
1,2,4-Trichlorobenzene	ND	330
Hexachlorobenzene	ND	330
Bis(2-chloroethyl)ether	ND	330
2-Chloronaphthalene	ND	330
1,2-Dichlorobenzene	ND	330
1,3-Dichlorobenzene	ND	330
1,4-Dichlorobenzene	ND	330
3,3-Dichlorobenzidine	ND	660
2,4-Dinitrotoluene	ND	330
2,6-Dinitrotoluene	ND	330
Fluoranthene	ND	330
4-Chlorophenyl phenyl ether	ND	330
Bis(2-chloroisopropyl) ether	ND	330
Bis(2-chloroethoxy) methane	ND	330
Hexachlorobutadiene	ND	330
Hexachlorocyclopentadiene	ND	330
Isophorone	ND	330
Naphthalene	ND	330
Nitrobenzene	ND	330
N-nitrosodiphenylamine	ND	330
N-nitrosodi-n-propylamine	ND ·	330
Bis(2-ethylhexyl)phthalate	ND	330
Di-n-butylphthalate	ND	330
Di-n-octylphthalate	ND	330
Diethyl phthalate	ND	330
Dimethyl phthalate	ND	330
Benzo(a)anthracene	ND	330

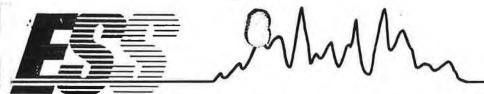
ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Bickinson Laboratory Director

Date: 26 June 92





## **CERTIFICATE OF ANALYSIS**

#### BASE NEUTRAL EXTRACTABLES cont. EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: U.S. Army-Ft. Devens ESS Project ID: 921516

Client Sample ID: Stock-26 ESS Sample ID: 921516-06

Date Sample Received: 6/10/92 Date Reported: 6/26/92

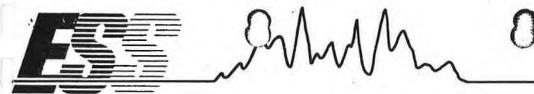
Parameter	Result (ug/Kg)	MRL
Benzo(a)pyrene	ND	330
Benzo(b) fluoranthene	ND	330
Benzo(k)fluoranthene	ND	330
Chrysene	ND	330
Acenaphthene	ND	330
Anthracene	ND	330
Benzo(ghi)perylene	ND	330
Fluorene	ND	330
Phenanthrene	ND	330
Dibenzo(a,h)anthracene	ND	330
Indeno(1,2,3-cd)pyrene	ND	330
Pyrene	ND	330
Hexachloroethane	ND	330
4-Bromophenyl-phenylether	ND	330
Benzyl Alcohol	ND	330
Benzoic Acid	ND	1,650
Bis(2-Chloroethoxy)methane	ND	330
4-Chloroaniline	ND	330
2-Methylnaphthalene	ND	330
2-Nitroaniline	ND	1,650
3-Nitroaniline	ND	330
Dibenzofuran	ND	330
4-Nitroaniline	ND	1,650
Butylbenzylphthalate	ND	330

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

Laboratory Director

Date:



## CERTIFICATE OF ANALYSIS

#### TCL VOLATILE ORGANICS Method 8240

Client: ATEC Environmental Consultants

Client Project ID: U.S. Army-Ft. Devens ESS Project ID: 921516

Client Sample ID: Stock-26 ESS Sample ID: 921516-06

Date Sample Received: 6/10/92 Date Reported: 6/26/92

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

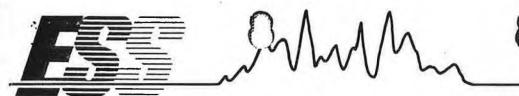
ND = Not Detected above Method Reporting Limit (MRL)

Laboratory Director

Date:

26 /2092

**Environmental Science Services** 



## CERTIFICATE OF ANALYSIS

### TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

#### METALS

#### EPA METHOD 1311

Client: ATEC Environmental Consultants

Date Sampled: 6/8/92

· Client Project ID: U.S. Army-Ft. Devens

Date TCLP Performed: 6/18/92

Client Sample ID: Stock-26

Date Leachate Extracted: 6/19/92

ESS Sample ID: 921516-06

Date Extract Analyzed: 6/22/92

	Act	ual	Adj	usted*			
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	0.02			
Chromium	ND	0.05	ND	0.05			
Lead	0.2	0.1	0.3	0.2			
Mercury	ND	0.002	ND	0.003			
Selenium	ND	0.3	ND	0.3			
Silver	ND	0.05	ND	0.05			
Copper	0.05	0.02	0.05	0.02			
Nickel	ND	0.04	ND	0.05			
Zinc	0.37	0.02	0.40	0.03			
Beryllium	ND	0.01	ND	0.02			
Thallium	ND	0.05	ND	0.06			

<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:

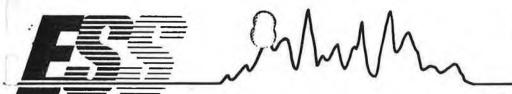
David Dickinson Laboratory Director

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Date: 26 June 92



QUALITY CONTROL SECTION



## **CERTIFICATE OF ANALYSIS**

#### ACID SURROGATE RECOVERY

Client: ATEC Environmental Consultants

Client

Project ID: U.S. Army-Ft. Devens

Date Sample Analyzed: 6/18/92

ESS

Project ID: 921516

SAMPLE ID	PHENOL-D5 (10-94%)*	2-FLUOROPHENOL (21-100%)*	2,4,6 TRIBROMOPHENOL (10-123%)*
921516-01	69%	69%	25%
921516-02	40	40	25
921516-03	55	54	10
921516-04	74	57	25
921516-05	50	73	1**
921516-06	37	74	15

Approved by:

David Dickinson

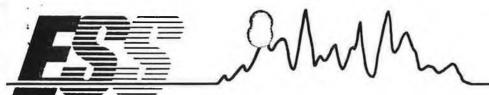
Laboratory Director

Date:

26 Jun 52

<sup>\*</sup> Acceptance criteria.

<sup>\*\*</sup> Recovery is outside of QC Limits



## CERTIFICATE OF ANALYSIS

#### BASE-NEUTRAL SURROGATE RECOVERY

Client: ATEC Environmental Consultants Client

Project ID: U.S. Army-Ft. Devens

Date Sample Analyzed: 6

6/18/92

ESS

Project ID: 921516

SAMPLE ID	NITROBENZENE-D5 (35-115%)*	2-FLUOROBIPHENYL (43-115%)*	P-TERPHENYL-D14 (33-141%)*
921516-01	97%	97%	79%
921516-02	88	94	69
921516-03	81	90	65
921516-04	81	70	77
921516-05	70	63	48
921516-06	69	81	58

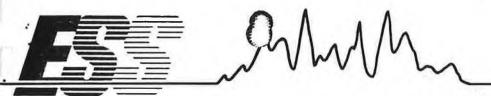
\* Acceptance criteria.

Approved by:

Laboratory Director

Date:

26 Jun 92



## **CERTIFICATE OF ANALYSIS**

## VOA SOIL SURROGATE RECOVERY

Client: ATEC Environmental Consultants Client

Project ID: U.S. Army -Ft. Devens

Date Sample Analyzed: 6/19/92 ESS

Project ID: 921516

SAMPLE ID	1,2 DICHLOROETHANE-D4	TOLUENE-D8	BFB
	(70-121%)*	(81-117%)*	(74-121%)*
VS0619B1	107%	102%	106%
921516-01	93	108	112
921516-02	108	110	128
921516-03	110	104	100
921516-04	96	101	106
921516-05	111	102	100
921516-06	106	115	86

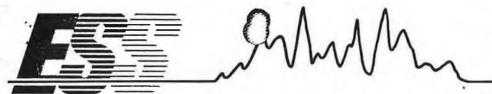
\* Acceptance criteria

Approved by:

Laboratory Director

Date:





## **CERTIFICATE OF ANALYSIS**

#### TCL VOLATILE ORGANICS Method 8240

Client: ATEC Environmental Consultants

Client Project ID: U.S. Army-Ft. Devens ESS Project ID: 921516

Client Sample ID: Method Blank ESS Sample ID: VS0619B1

Date Sample Received: 6/10/92 Date Reported: 6/26/92

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)

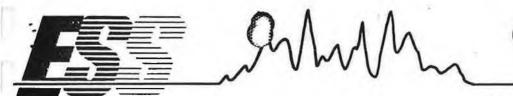
Approved by: David Dickinson

Laboratory Director

Date: 26 /2052

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**Environmental Science Services** 



## ERTIFICATE OF ANALYSIS

### TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

#### METALS

#### MATRIX SPIKE ANALYSIS SUMMARY

#### EPA METHOD 1311

. Client: ATEC Environmental Consultants Matrix: Solid

TCLP Batch ID: 151606 Concentration in: mg/L

Target Analyte	Sample Result	Spike Added	Spiked Sample Result	Percent Recovery
Antimony	ND	*	ND	83%
Arsenic	ND	2.00	2.13	107
Cadmium	ND	0.5	0.535	107
Chromium	ND	1.0	1.12	112
Lead	0.24	1.0	1.132	89
Mercury	ND	0.002	0.00165	83
Selenium	ND	2.00	2.57	126
Silver	ND	1.0	1.03	103
Copper	0.05	1.0	1.05	100
Nickel	ND	1.0	1.03	103
Zinc	0.37	1.0	1.199	83
Beryllium	ND	*	ND	83
Thallium	ND	*	ND	83

This matrix spike analysis summary applies to the following samples: 921516-01, -02, -03, -04, -05, -06

ND = Not Detected above Method Reporting Limit (MRL)

\* Matrix Spike Recovery based on the lowest spike recovery of the spiked compounds.

Approved by:

Laboratory Director

## 3.9 CHAIN OF CUSTODY FORMS

The following chain of custody forms were produced for the soil samples which were laboratory analyzed. Please refer to analytical report for dates and times of analysis.

## CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJEC	CT NAM	E	Te.	uh	2	6 411							LAB	PRO	J. NC	).	/								
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<i>LSS3</i>	1/13/92			X		X						1				×										Enviro Cons Division of ATE 62 Accord Park Norwell, MA 02 (617) 878-6200
																										Environmental Consultants Consultants Division of ATEC Associates, Inc. 62 Accord Park Drive Norwell, MA 02061 (617) 878-6200
Relinquished	by: (Signal)	Ure)		Date		ne	Rec	eive	dby:	(Sign	ature	1	P	elinq	uishe	d by:	(Sign	ature	)		Date	/Tin	ne	Rec	eived	by: (Signature)
Relinquished	by: (Signat	ure)		Date		10	(Sig	eive natui	d for	Lapo	rator	ry by:	17	Dat	te / Ti	me	P	Projec	t Ma	nage	r / Ph	none	#:	1		

# CHAIN OF CUSTODY RECORD

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STOCK-25		11:30A	X	X		X	12			X		3		X	X		X		X	X	X	X		160		ivisio 2 Acc orwel 517) 8	0 3
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## **CHAIN OF CUSTODY RECORD**

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Relinquished	by; (Signat	ure)	1	Date	/ Tin	ne	Rec	eive	d by:	(Sign	ature,	)	F	Relinq	uishe	d by:	(Sign	ature)		Dat	e / Ti	me	Receiv	ed by:	(Signature	)
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#### 3.10 HAZARDOUS WASTE MANIFESTS

UST No. 0026 was estimated to contain 945 gallons of number 2 fuel oil and residuals. Approximately 935 gallons of fuel oil were removed on January 6, 1992, and transported to a licensed Treatment Storage Disposal Facility (T.S.D.F.) (Beede Waste Oil Corporation, Plaistow, New Hampshire). Approximately 10 gallons of residual tank materials were removed and drummed on January 9, 1992 for transportation at a later date. Drummed material was transported to Beede Waste Oil Corporation on February 25, 1992.

The following Hazardous Waste Manifests were generated from residual tank materials during the vacuum process and cleaning process. The manifest dated January 6, 1992 is associated with vacuuming product of several USTs. Therefore, the total quantity (2,200 gallons) is much greater than the 935 gallons which was removed from UST 0026. The manifest dated February 25, 1992 is associated with the drummed material from several USTs. Therefore, the total quantity (495 gallons) is much greater than the 10 gallons which was removed from UST 0026.

F353630

FACILITY MAILS TO DESTINATION STATE





# COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION DIVISION OF HAZARDOUS WASTE One Winter Street

Boston, Massachusetts 02108

UNIFORM HAZARDOUS	1. Generator US		Manifest Document N	2 Page 1		n in the shade	
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4. Generator's Phone (5081 796-					A TOPAL	2400	35.6
5. Transporter 1 Company Name		6. US EPA	D Number	· FO State A	70.00	SALCONO.	The Late
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8. Designated Facility Name and Site Address	•	10. US EPA	D Number	超過影		<b>PARTY</b>	はいる
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16. Special Handling Instructions and Addition	nal Information				*	*	
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To be Recycled .			į.		Recyc	le	
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18. Transporter 2 Acknowledgement of Re	cept of Materials	Character	1.7	- /	//	14	Date
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O. Facility Owner or Operator: Certification of	receipt of hezardous n	naterials covered by thi	s manifest except a	s noted in Item	19.		*
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UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator US EPA ID No. M  A   7   2   1   0   0   2   5   1   5   4	Manifest PD 16 13 18	2. Pa			0.7 3 7 7 7 7
3. Generator's Name and Mailing Address D	ept. of The ARMY eadquarters Ft. Devens Bo AFZD-REGEM Attn: Mark Bos	ox 19	A. St	F291211 ste Gen. V	nent Numbe	
5. Trensporter 1 Company Name Ft. Beede Waste 011 Corp.	Devens Ma 01433 USEPAIDN	lumber	C.Ste	NH	MAGN	341
7. Transporter 2 Company Name	8. US EPA ID N			ansporter's Phone I ate Trans. ID	603	382-5
Beede Waste 011 Corp. Keely RD. PO Box 127 Plastow NH 03865			G. St	ansporter's Phone ( ate Facility's ID cility's Phone 600		equired
11. US DOT Description (Including Proper Shi	pping Name, Hazard Class, and ID Number)	12. Cont		13. Total Quantity	14. Unit Wt/Vol	I. Waste N
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To Be Recycled #  16. GENERATOR'S CERTIFICATION: I hereby declare to proper shipping name and are classified, packed, in according to applicable international and national and that I have selected the practicable method of ment; OR, if I am a small quantity generator, I have can afford.  Printed/Typed Name  17. Transporter Acknowledgement of Reference of the printed/Typed Name	nat the contents of this consignment are fully and accura- harked and labeled, and are in all respects in proper condi- government regulations.  We a program in place to reduce the volume and toxicity of treatment, storage, or disposal currently available to me or made a good faith effort to minimize my waste generation  Signature  Signature	ition for transport by h  I waste generated to the original state of the first state of the formula of the form	ighway ne degree resent an	d future threat to huma	Month	Date Day Ye Day Ye Day Ye Date
To Be Recycled #  16. GENERATOR'S CERTIFICATION: I hereby declare to proper shipping name and are classified, packed, in according to applicable international and national and that I have selected the practicable method of ment; OR, if I am a small quantity generator, I have can afford.  Printed/Typed Name  17. Transporter 1 Acknowledgement of Reference of the printed/Typed Name  Brian Ginivan  18. Transporter 2 Acknowledgement of Reference of	nat the contents of this consignment are fully and accura- narked and labeled, and are in all respects in proper condi- povernment regulations.  It is a program in place to reduce the volume and toxicity of treatment, storage, or disposal currently available to me is made a good faith effort to minimize my waste generation  Signature  Signature  Signature	ition for transport by h  I waste generated to the original state of the first state of the formula of the form	ighway ne degree resent an	d future threat to huma	Month	Date Day Ye Date Day Ye Date Day Ye Date
To Be Recycled #  16. GENERATOR'S CERTIFICATION: I hereby declare to proper shipping name and are classified, packed, in according to applicable international and national and that I have selected the practicable method of ment; OR, if I am a small quantity generator, I have can afford.  Printed/Typed Name  17. Transporter 1 Acknowledgement of Reprinted/Typed Name  Brian Ginivan  18. Transporter 2 Acknowledgement of Reprinted/Typed Name  19. Discrepancy Indication Space	nat the contents of this consignment are fully and accura- narked and labeled, and are in all respects in proper condi- povernment regulations.  It is a program in place to reduce the volume and toxicity of treatment, storage, or disposal currently available to me is made a good faith effort to minimize my waste generation  Signature  Signature  Signature	f waste generated to the which minimizes the pin and select the best waste generated to the pin and select the best waste generated to the pin and select the best waste generated to the pin and select the best waste generated to the pin and select the best waste generated to the pin and select the best waste generated to the pin and select the best waste generated to the pin and select the	ighway ne degree resent and waste mai	d future threat to humanagement method that	Month	Date Day Ye Day Ye Day Ye Date Day Ye Date

FACILITY MAILS TO GENERATOR

· :E<Y90)

## 3.11 WEIGHT RECEIPTS AND BILLS OF LADING

The following wight receipt documents the disposal of contaminated soil associated with UST 0025. The corresponding Bill of Lading is not available.

THE TRI	MOUNT BITUMINOUS PRODUC 5 CHERRY HI RIVE P.O. BOX	TS CO. T	FMN	CHECKE	C.O.D. [	] charge [
MAIN OFFICE: DANVERS 750-4200	SHREWSBURY DIVISION 651 LAKE STREET AT RTE. 20	M E	LEFT JOB C			
14	SHREWSBURY, MA 01545 OFFICE 881-1430 PLANT 754-470	9		TICKE	T #R	CARRIER 71908
10.0	* * * * * * * * * * * * * * * * * * * *	1	<i>j</i>	v i	14.	
Customer # ATEO01 ATEC ASSOC. 62 ACCORD PARK DRIVE MORVELL, MA 02061 617-878-6200	Job # BLDG1666 US ARMY BLDG 1666 FORT DEVENS, MA 01433 PO# 37.04.72057	HIX	<b>\$</b> 76	MIN NAME OIL SOIL		TRUCK# 9
Time Ta 2:52:55 29		ross 6980	Total 18.69	- B		
Cost/Ton Percent	ax Load Cost Amount Tax	Dest Charge	Total Cost	Part of the second		
	ob Total Time &		el	**************************************		1.1
3	59.45 2:52:55 pm Ju	1 21, 1992 F			SPONSIBLE	ANY WILL NOT BE RE-
			*		BEYOND ST	DELIVERING MATERIAL REET PAVEMENT.
E1 1	4			RECEIVED B	Y(	
MAIN OFFICE: DANVERS 759-4200	GIMOUNT BITUMINOUS PRODU 5 CHERRY H P.O. BOX DANVERS, MA 01923-5089 SHREWSBURY DIVISION 651 LAKE STREET AT RTE. 2 SHREWSBURY, MA 01545 OFFICE 881-1430 PLANT 754-4	o E	ARRIVED JO	CHECK #	C.O.D.	CARRIER 71889
		4				
Customer # ATEO01 ATEC ASSOC. 62 ACCORD PARK DRIVE NORWELL, MA 02061 617-878-6200	Job # BLDG1666 US ARMY BLDG 1666 FORT DEVENS, MA 0143 PO# 37.04.72053	MIX 33	<b>1</b> 176	MIN NAME OIL SOI	L	TRUCK# 9
		Gross 73480	Total 21.94			
Cost/Ten Percent			Total Cost			
						33
Load# 2	Job Total Time 6 40.76 12:09:59 pm J				SPONSIBLE BY TRUCKS	PANY WILL NOT BE RE- E FOR DAMAGE CAUSE: S DELIVERING MATERIA TREET PAVEMENT.

RECEIVED BY \_

	5 CH	ERRY H	E	FMN		ash 🗆	C.O.D. [	harge [	1
		ERS, MA 01923-50	089	M ARRIVED JO	)B	CHECKED I	3Y	n-th	
MAIN OFFICE: ? DANVERS 750-4200	651 LAK	WSBURY DIVISION OF STREET AT RT	E. 20	E LEFT JOB	HECK #			1	1
		WSBURY, MA 015 81-1430 PLANT 75			+ .	TICKET	#R	CARRIER 719	25
			4	Y 45		23000	537		23
				0.00		- Sy			
Customer # ATEOO1 ATEC ASSOC. 62 ACCORD PARK DRIVE MORWELL, HA 02061 617-878-6200	US BI FC	0 # BLDG1666 5 ARMY LDG 1666 DRT DEVERS, MA 0 0# 37.04.72057	4, 18	HIX 4 \$76	MIX NAME	OIL SOIL		TRUCK# 9	
	Tare 29600	Net 39360	Gross 68960	Total 19.68		- 19	nie.		
Cost/Ton Percent	Tax Load	Cost Amount T	ax Dest Char	ge Total Cost					
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Load#	Job Total	Tie	e & Date	Fob/Del	20	y 14	4 5	4.04	
. 1	19.68	9:40:00 am	Jul 22, 199	2 F			THIS COMP.	ANY WILL NOT BE	RF.
							SPONSIBLE	FOR DAMAGE CA	USED
								DELIVERING MAT	
4						7 45	1	11	1
					REC	EIVED BY	J		
MAIN OFFICE: DANVERS 750-4200	5 C DAN' <b>SHRI</b> 651 LA SHRI	TUMINOUS PROHERRY H. P.O. BOX VERS, MA 01923-5 EWSBURY DIVIS KE STREET AT RT EWSBURY, MA 01 981-1430 PLANT 7	/E 5089 FION FE. 20 545	M ARRIVED J	OB	ash □ CHECKED		CARRIER	
Customer # ATEOO1 ATEC ASSOC. 62 ACCORD PARK DRIVE MORWELL, MA 02051 617-878-6200		ob # BLDG1666 IS ARMY SLDG 1666 FORT DEVENS, MA PORT 37.04.72053	01433	MIX # #76	MIX NAKE	OIL SOIL		TRUCKS 9	
Time 4:26:33	Tare 29600	Net 43860	Gross 73460	Total 21.93					
Cost/Ton Percen	t Tax Load	Cost Amount	Tax Dest Cha	rge Total Cost					
Load#	Job Total 21.93		me & Date me Jul 20, 19	Fob/Del 92 F				2	
							SPONSIBL BY TRUCK	PANY WILL NOT B E-FOR DAMAGE C S DELIVERING MA TREET PAVEMEN	AUSEL

RECEIVED BY .

C.O.D. 🗆 dharge 🗖

# MAIN OFFICE:

**DANVERS 750-4200** 

TRIMOUNT BITUMINOUS PRODUCTS CO.

5 CHERRY HI P.O. BOX DANVERS, MA 01923-5089 SHREWSBURY DIVISION

651 LAKE STREET AT RTE. 20 SHREWSBURY, MA 01545 OFFICE 881-1430 PLANT 754-4709

T	FMN	esh 🗆 . C	C.O.D. Charge
М	ARRIVED JOB	HECKED BY_	V
E	LEFT JOB CHECK	#	
			CARRIER \
-		TICKET #F	71871

MIX NAME OIL SOIL

Customer # ATEO01

ATEC ASSOC. 62 ACCORD PARK DRIVE

NORWELL, NA 02061 617-878-6200

Job # BLDG1666

US ARMY

**BLDG 1666** FORT DEVENS, MA 01433

PO# 37.04.72053

Time 9:16:13

Tare 29600

Net 37640 Gross 67240 Total 18.82

Cost/Ton Percent Tax

Load Cost Amount Tax Dest Charge Total Cost

Load

Job Total 18.82 Time & Date

Fob/Del 9:16:13 am Jul 21, 1992 F

distribution of the contract o

THIS COMPANY WILL NOT BE RE-SPONSIBLE FOR DAMAGE CAUSE! BY TRUCKS DELIVERING MATERIA BEYOND STREET PAVEMENT.

71871

RECEIVED BY

#### BILL OF LADING POLICY # WSC- 400-89

THE CELTABLE	a 4:	DATE: 7-22-92	DEP'CASE #:	
US A		14 Miles - L	g 1666 No Name St Devens	~ J ***
	D-EM "Box 19 Devens	STATE MA	- 9.61	1860
	IL 6 (508) 746- 3002	TRANSPORTATION A	CODENTI _Y Y_X	
MATERIAL I CONTAMINA	DESCRIPTION (TOTAL PROJECTED QUANTI TED SOIL: 373 75 w (was) vol (co y ds)	CONTAMINATED DEBRIE .	shaorbent pads (s absorbent bid other (specify)	booms
	TAMINATIONS MAI _ SKAU _ eds.(	gedly) Volub	YARS ATTACHED!	N S
Trimou Fo RI Burling	er HAMELADDRESSI  The Bityminous Productions hard Point  10 MA 01803  10 David Peter (617) 221-8	5/4 Storews	Bituminous I Street bury MA  Krenyeling Landon	
WHO WE ITEM	S SUCKATURE: THAT IS S MUST BE COMPLETED PRIOR TO DEGE A LOS DEGE SIGNATURE (originating region): ALL) DEGE SUCKATURE (destination region):	UTHORIZATION A	DATE: 7	16/92
TRUCK/TRACT TRAILER REG	TOR REGISTRATION 996-031  ISTRATION DATE 7-  OR RECEIVING PACILITY REPRESENTATIVE	-22-92 SHIPPED TO DA	PPED: w. (local) vol (in the control) 19.68 RESHIPPED	m A <sub>5</sub> 7.
	RS SIGNATURE LETTLE BLUE ACTUMY REPRESENTATIVES SIGNATURE	cuts Mille DATE	7-22-92 DATE 7/2492 ARRIDA	9140A
	DEPARIMENT OF I	FOR RETURNING COMMETED FORM TO ENVIRONMENTAL Protection MERGENCY RESPONSE BRANCH WINTER STREET, 5th FLOOR BOSTON, MA 02108  ANTI ANTI CEGNAL OFFICE	WITHIN 5 DAYS TO:	•

FALSIFICATION OR MISREPRESENTATION OF ANY OF THE INFORMATION ON THIS BILL OF LADING IS A VIOLATION OF M.G.L. C. 21C AND 310 CMR 30.006 AND 30.007 AND IS SUBJECT TO APPROPRIATE STATUTORY OR REGULATORY PENALTIES.

# BILL OF LADING POLICY # WSC- 400-89

DATE:	DEP 'CASE #
WENERATOR NAME/ADDRESS:	BITE OF GENERATIONS
AFZD-EM Box 19	TOWN Fort Devens
Fort Devens	STATE MA . 01433
CONTACTOR # (5-8) 746- 3002	TRANSPORTATION ACCIDENT? _Y _XX
CONTAMINATED SOIL 37.5 75 CON	TAMINATED DEBRIE # shortest pads # absortest booms // vel (co yel) spendy dri ether (specify)
TYPE OF CONTAMINATIONS Section \$4 all \$6 all other (specify)	ANALYSES ATTACHED? Valation KY N Trit KY N
Trimount Bituminous Products	DESTINATION FACTLITY NAMELADDRESS:  Trimous Products
70 Blonghard Road	651 Lake Street
CONTACTION David Peter (417) 221-8400	TYPE OFFACILITY: K Recycling Landilli Ludaware
SENERATOR'S SKINATURE:  ABOVE TIEMS MUST BE COMPLETED PRIOR TO DEGE AUTHORIZATION  DEGE SIGNATURE (originality region):  OTHER IZATION: DEGE SIGNATURE (originality region):	Ryme Charell DATE 7/16/92
(if applicable) DECE SHRYATURE (destination region):	DATE
PRAILER REGISTRATION 896 031 A14  PRAILER REGISTRATION DATE 7-20-12  BENERATOR OR RECEIVING FACILITY REPRESENTATIVES  EGNATURE:	TOTAL PROBECTED
RECEIVEND FACILITY REPRESENTATIVES SIGNATURE	
CONCRATOR IS RESPONSIBLE FOR RETURNIN	O COMPLETED FORM WITHIN 5 DAYS TO:
DEPARTMENT OF ENVIRONMEN BWSC/EMERGENCY R ONE WINTER STRI BOSTON, M	TAL Protection esponse eranch ter, sh floor

FALSIFICATION OR MISREPRESENTATION OF ANY OF THE INFORMATION ON THIS BILL OF LADING IS A VIOLATION OF M.G.L. C. 21C AND 310 CMR 30.006 AND 30.007 AND IS SUBJECT TO APPROPRIATE STATUTORY OF REGULATORY PENALTIES.

#### BILL OF LADING POLICY #WSC- 400-89

r.c

ERL OF LADING 4: 5	DEP'CASE #
US 'Acmy	STREET Building 1666 No Name Street Bar
AFZD-EM "Box19	TOWN Fort Devens
Fort Devens	
CONTACTOR # (5-4) 746- 3002	TRANSPORTATION ACCIDENTS _Y _XX
CONTANDATED SOIL 37.5 35 CON	TAMINATED DEBRIE # sharebest pads # absorbest booms #
TYPE OF CONTAMINATIONS	ANALYSES ATTACHED?  Volumes KY N TPH: KY N
Trimount Bityminous Products	Trimer & Bituminous Product
Burlington MA 01803	651 Lake Street
. CONTACTUEL # David Peter (417) 221-8400	TYPE OFFACILITY KRONGING LENGTH Landing
CENERATOR'S SKINATURES MANY OF THE COMPLETED PRIOR TO DEGE AUTHORIZATE	DATE: 6-29-92
AUTHORIZATION: DECE SIGNATURE (originaling region): N. T. (if applicable) DECE SIGNATURE (destination region):	DATE: 7/16/92
TRUCK/TRACTOR REGISTRATION 866-031 MA TRAILER REGISTRATION LEFT SITE AT 2.05 DATE 7-21-92 CENERATOR OR RECEIVING PACILITY REPRESENTATIVES SIGNATURE:	QUANTITY SHIPPED: wt (out) vol (ou you)  TOTAL PROJECTED  SHIPPED TO DATE  THIS LOAD (residented)  REMADENCY TO BE SHIPPED  A 1 (A) 12
TRANSPORTERS SIGNATURE STONE BULLET	DATE 7/21/92 ARRIDGE 21.52
GENERATOR IS RESPONSIBLE FOR RETURN	DO COMO ETHO FORM WITHIN 5 DAYS TO:
DEPARTMENT OF ENVIRONME BW3C/EMERGENCY ONE WINTER ST	

FALSIPICATION OR MISREPRESENTATION OF ANY OF THE INFORMATION ON THIS BILL OF LADING IS A VIOLATION OF MLGL. C. 21C AND 310 CMR 30,006 AND 30,007 AND IS SUBJECT TO APPROPRIATE STATUTORY OR REGULATORY PENALTIES.

THE ORIGINATING REGIONAL OFFICE

BILL OF LADING POLICY # WSC- 400-89 AUT OLIVDING 4: DEP'CASE M. RITE OF GENERATIONS CHENERATOR NAME/ADDRESS No. St. STREET Building 1666 TOWN For " Box 19" STATE MH でいいる自然をおりません 01433 evens to Charte & which shine CONTACTUEL & (508) 746- 3002 TRANSPORTATION ACCIDENTY \_\_Y KN THE THE PARTY OF T MATERIAL DESCRIPTION (TOTAL PROJECTED QUANTITY) d absorbed booms CONTAMINATED DEERIN # shootbest pads\_ CONTAMINATED SOIL 37.5 we (sons) well (cu yes) wel (cs yes) speedy del \_\_ other (specify) TYPE OF CONTAMINATIONS ANALYXES ATTACHED? Volatilez KY N TPH: KY He He He Mary Man Man other (medity) 75.25 TRANSPORTER NAME/ADDRESS! DESTINATION FACILITY NAME/ADDRESS: Products Fininges 01803 David Peter (417)221-8400 TYPE OF FACILITY: K Resyeling mark DATE: 6 GENERATOR'S SIGNATURE CABOVE TIEMS MUST BE COMPLETED PRIOR TO DEGE AUTHORIZATION AUTHORIZATION: DECESIONATURE (originating region): (if amplicable) DECE SHENATURE (destination region): DATE 1.77 TRUCK/TRACTOR REGISTRATION 896-031 QUANTITY SHIPPEDA vol (mydi) Mr (hope) TOTAL PROJECTED

TRUCK/TRACTOR REGISTRATION 896-071 MA QUANTITY SHIPPED: WILLIAM WELL (EVAL)

TRAILER REGISTRATION

LEFT SITE AT 2 1/15 DATE 7-21-12

SHIPPED TO DATE

THIS LOAD (reinsted)

REMAINING TO BE SHIPPED

TO LATE

THIS LOAD (reinsted)

REMAINING TO BE SHIPPED

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TO LATE

THIS LOAD (reinsted)

REMAINING TO BE SHIPPED

TO LATE

GENERATOR IS RESPONSIBLE FOR RETURNING COMMETED FORM WITHIN 5 DAYS TO:

DEPARTMENT OF ENVIRONMENTAL Protection BWSC/EMERGENCY RESPONSE BRANCH ONE WINTER STREET, 5th FLOOR BOSTON, MA 02108 AND

THE ORIGINATING REGIONAL OFFICE

FALSIFICATION OR MISREPRESENTATION OF ANY OF THE INFORMATION ON THIS BILL OF LADING IS A VIOLATION OF M.G.L. C. 21C AND 310 CMR 30.006 AND 30.007 AND IS SUBJECT TO APPROPRIATE STATUTORY OR REGULATORY PENALTIES.

## BILL OF LADING POLICY # WSC- 400-89

BILL OF LADI	NG 4: DATE:	7/21/92 DEP CASE #
	R NAME/ADDRESS:	STREET Court Court
	D-EM "Box 19	STATE M.H. 01433
	M. (508) 746- 300 Z	TRANSPORTATION ACCIDENTYY &N
	DESCRIPTION (TOTAL PROJECTED QUANTITY): ATED SOIL: 37.5 75 ex (bont) vol (co yés)	ONTAMINATED DEBUIL # shandpat pads # absorbent booms / wel (co yets) spendy dri ether (specify)
TYPE OF CO.	NTAMINATIONS  ** 42 all _ #4 all _ #6 all _ ather (specify) _	ANALYSES ATTACHED?  Velselles: KY N TPH: KY N
Trimo. 70 R. Burlin	IN NAMELADDRESSI and Bityminous Products langhard Road you MA 01803	Trinco & Bitminous Products 651 Lake Street Shorews hory MA:
GENERATOR (ABOVE ITEM AUTHORIZAT	S SKINATURE: Manh B  S MUST BE COMPLETED PRIOR TO DEGE AUTHORIZA  ICH: DEGE SIGNATURE (originating region):  Abia) DEGE SIGNATURE (destination region):	TYPE OPPACILITY: K Recycling Leadill Indianator  DATE: 6-29-92  Tryph Clupsell DATE: 7/16/92  DATE: DATE: DATE: 116/92
TRAILER REC LEFT SITE AT CENERATOR SIGNATURE:	TOR REGISTRATION 896-031 A.A. INSTRATION DATE 7-21-92 OR RECEIVING FACILITY REPRESENTATIVES	QUANTITY SHIPPED: wt (bond) vol (as yeld) TOTAL PROJECTED SHIPPED TO DATE THIS LOAD (residual) REMAINING TO BE SHIPPED Ticket R 1 (87)
	ACTUTY REPRESENTATIVES SIGNATURE	DATE 7/21/91 ARR TIME
	DEPARTMENT OF ENVIRONM BW3C/EMERGENC) ONE WINTER ST BOSTON	NING COMPLETED FORM WITHIN 5 DAYS TO:  ENTAL Protection (RESPONSE BRANCH (REST, 5th FLOOR ), MA 02108 NII GREGIONAL OFFICE

FALSIFICATION OR MUSREPRESENTATION OF ANY OF THE INFORMATION ON THIS BILL OF LADING IS A VIOLATION OF M.G.L. C. 21C AND 310 CMR 30.006 AND 30.007 AND IS SUBJECT TO APPROPRIATE STATUTORY OR REGULATORY PENALTIES.

# 3.12 PERMITS AND CERTIFICATIONS

The following permit was obtained, from the Fire Department, for the proper closure of an underground storage tank. 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, G.L. as provided in Section 38A this permit is granted to

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

State clearly type of Inert gas used in steel storage tank

FDID# 17919<sub>N/A</sub> Fee pald \$

steel tank:

Name and address of contractor disposing tank ATEC Location to which tank will be transported

15 His .... 11 "....

This permit will expire 31 Jan 1992

nature of official granting (Head of Fire Dept.)

Tonk 26 Bldg 1666

hang of history of m		WANTA	
OF 2 APPROVED TANK YARD L APPROVED TANK YARD NO	OHN C. TOMBARELLO & SONS 207 MARSTON ST. AWRENCE, MASS. 01841		
Regulation 502 CMR 3.00 Provision A valid permit was issued by LOX this tank to this yard. Name and official title of approv	have personally examined the u yard" by firm, corporation or accepted same in conformance w as for Approving Underground St CAL Head of Fire Department F wed tank yard owner or owners a	partnership / / C / rith Massachusetts Fire Preventiceel Storage Tank dismantling ya DID# / J / J to transportuthorized representative:	rds.
SIGNATURE This signed receipt of disposal model 17919 pursuant to	nust be returned to the local h	DATE SIGNED  DEAD of the fire department HAVE A RECEIPT OF DISPOSAL)	
ODM F B 201 ( 0/00)	(CUED)	MACCACHICONNO CHARG PIDE M	ADOUNT TO OFFI
	(OVER)	MASSACHUSETTS STATE FIRE M	
FORM F.P. 291 (rev. 9/88)  DIMENSIONS		The section of the section of	
	Tank Removed	From 1666	20620.04.
DIMENSIONS Width Length	Tank Removed	From  59 1666  Evens MA	2012
DIMENSIONS  Width Length  k 1 - X - Lo	Tank Removed  Buildi  (no. street  Fort D  (city or town)	From  50 1666  Evens MA	20620.04
DIMENSIONS Width Length	Tank Removed  Buildi  (no. street  Fort D	From  50 1666  Evens MA	2012

## 3.13 UST CLOSURE CHECKLIST

The following UST closure checklist was produced by ATEC Associates Inc., to ensure Quality Control of the proper abandonment of an underground storage tank.

UST-CLOSURE O/C CHECK LIST 74, 4 26 1666 Fort Devens 1000 gal No ? Fuel DEFINABLE FEATURE MEASUREMENTS NOTES DATE TIME Site Topography: 1evol Calibrate PID & LEL/O2 meters 1/13/91 8:00 Drain & flush piping & pumps 8:30 1/13/91 Excavate to top of tank Depth to tank: 15 2:30 1/9/51 Vent tank note LEL/O2 levels & times LEL 02 1/13/91 T1: 8:45 20,5 T2: 9:00 20.7 T3: 9:15 70.9 T4: 9 . 30 70.9 T5: T6: T7: T8: T9: T10: T11: T12: Tank Dimensions: 4/x /0.5/L Pump & clean tank: gal liquid + 10 gal 1/6/91 Tunk good roud & no hobs e quantities liquid (gal) & sludge (lbs) 1/13/91 lbs. sludge Remove all tank connections, and cap openings 1/13/91 8:30 Excavate soils to free tank 1/9/91 2:30 Segregate stained soils: Note PID readings PID (ppm) NDIR (ppm) 7:30 1/9/91 (if>10 ppm NDIR also) 1/13/1 9130 5+0-4-1 0.1 none vicibly contaminated stock-7 0.2 pieces of asshall coating of UST in encour

UST-CLOSURE O/C CHECK LIST				
DEFINABLE FEATURE	DATE	TIME	MEASUREMENTS	NOTES
Remove tank, piping, pumps, and hardware.	1/13/91	8130	Photographic Descriptions:	Soil Description://ght-medblown fine son
Photograph excavation; note descriptions.			Photo 1:	little find - could growth
Sketch Schematic			Photo 2:	
			Photo 3:	
			Photo 4:	
			Photo 5:	Depth to Groundwater/Conditions: / / /-
			Photo 6:	
æ tank at safe distance from excavation	1/13/41	8130		Depth of Excavation: 7,
Secure tanks transport off-site	1/13/91	9:30		
Obtain 10 soil samples from	1/13/71	8:45	PID (ppm) NDIR (ppm)	Sample locations: 7.5.7.5' (see scheads)
excavation walls/bottom: Note PID/NDIR			SS1: /. Z	10 001
readings and sample locations.			SS2: 4,5	Wwall
			SS3: 1.7	N) wall
			SS4: 0.0	N. 10-11
	N .		SS5: O./	Evall
			SS6: O. Z	E wall
			SS7: 0.0	5
			SS8: 0./	5 wall
			SS9: 5.8	botsom
			SS10: 0.4	batton
Obtain 2 soil samples & 1 water samples	1/3/51	8:45		Sample Locations:
for laboratory analysis. Note sample locations.				LSS1: ~ 367
The state of the s				LSS2: 4 5< 9
				LWS1:
				1557: composite etacledile

UST.CLOSURE O/C CHECK LIST					
DEFINABLE FEATURE	DATE	TIME	MEASUREMENTS	NOTES	
				tons of back	511
Backfill excavation (if clean):				Backfill description:	
Note amount & type of backfill					
Close open excavation (if applicable)					
ore surface and rope off					
Remove rubbish/debris					
Transport hazardous material off-site:				Amount	Classification
Note amount/classification					
Make copies of manifests, permits,					
and disposal receipts.					

# 3.14 INSTALLATION

The installation of a replacement UST No. 0026 was not performed.

#### 4.0 UST No. 0028

#### 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. 0028, located at property known as Building 2290, 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 9, and 10, 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).
- Preparation of a Technical Report, to include assimilation of information gatherd, major findings, and conclusions.

## 4.1.2 Subsurface Storage Tank Excavation and Removal

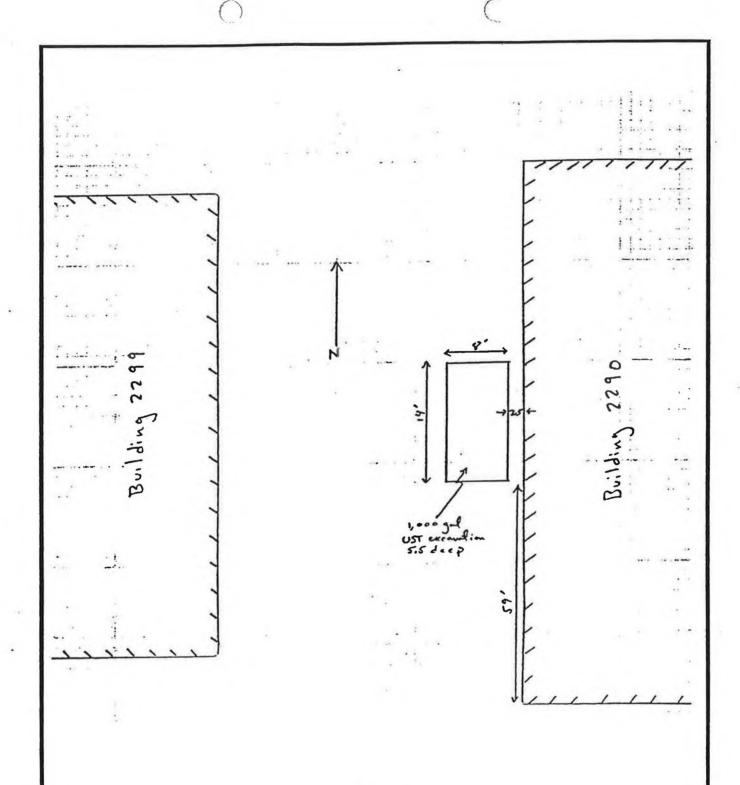
On January 9, and 10, 1992, one 1,000-gallon, subsurface, number 2 fuel oil, storage tank was excavated and removed from the site. The UST was located adjacent to the southwest side of the Building 2290. Site topography is level. Topography gently slopes downgradient to the south approximately 75 feet south of the site.

Soils in the excavation consisted primarily of tan to medium-brown, fine sand and silt with some medium to coarse gravel. The tank was covered by approximately 1.5 feet of soil. The bottom of the excavation was approximately 5.5 feet below grade. Groundwater was not encountered. Excavated soil appeared uncontaminated.

The associated piping was drained, and tank connections were removed. UST No. 0028 was estimated to contain 14 gallons of number 2 fuel oil. The fuel oil was removed on January 6, 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. The tank was observed to be in good condition with no perforations, punctures, or severe corrosion. The tank was observed to have some surficial rust. 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. See Section 4.10 for copies of the appropriate Hazardous Waste Manifests.

The scrap tank was removed from the site on January 10, 1992 and transported to the Contractor's yard located on Lake George Street, Fort Devens for temporary storage. The tank was disposed of at Tombarello & Sons, a licensed Massachusetts tank yard, located Lawrence, MA, on January 28, 1992. A copy of the disposal receipt is included in Section 4.11, Permits and Certifications.



# **UST LOCATION PLAN**

1,000 gallon UST relative to: Building 2290 Fort Devens, Massachusetts PROJECT: 37.07.91.07451

NOT TO SCALE

FIGURE: 4.1



#### 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 procedure 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.

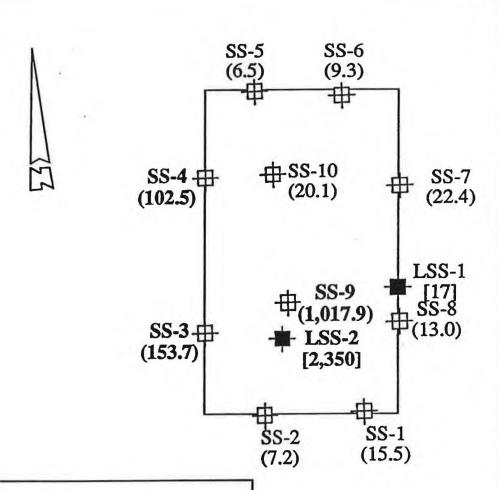
Eight of the samples (SS-1 to SS-8) were obtained from the excavation walls at a depth of approximately 2.5 to 3 feet below grade. Two of the samples (SS-9 and SS-10) were obtained from the bottom of the excavation at a depth of approximately 5.5 feet below grade. Two composite soil samples (Stock-1 and Stock-2) were obtained from stockpiled soils for NDIR field analysis.

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. 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 (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 samples obtained from the excavation are as follows:



# **LEGEND:**

- Field Screened Soil Sample
- Lab Analyzed Soil Sample
- ( ) NDIR Results in ppm
- [ ] Lab Analysis Results in ppm

Results in bold denote levels in excess of MA DEP Remedial Goal Level (100 ppm)

# **SAMPLING SCHEMATIC**

1,000 gallon UST excavation at: Building 2290 Fort Devens, Massachusetts PROJECT: 37.07.91.07451

NOT TO SCALE

FIGURE: 4.2



TABLE 4.1 - PID AND NDIR RESULTS

SAMPLE NUMBER	PID (ppm TOVs)	NDIR (ppm TPH)
SS-1	8.2	15.5
SS-2	11.0	7.2
SS-3	13.2	153.7
SS-4	3.0	102.5
SS-5	1.5	6.5
SS-6	9.4	9.3
SS-7	11.8	22.4
SS-8	10.6	13.0
SS-9	11.8	1,017.9
SS-10	2.0	20.1
Stock-1	N.A.	175.1
Stock-2	N.A.	57.8

N.A. = Not Applicable

N.D. = None Detected

Laboratory analytical results of the two soil samples obtained from the excavation revealed a TPH concentration of 17 ppm for LSS-1, and 2,350 ppm for LSS-2. Laboratory analysis of the one soil sample obtained from the stockpiled soils revealed a TPH concentration of 216 ppm for LSS-3 (see Section 4.9, Laboratory Analytical Results).

#### 4.1.5 Conclusions and Recommendations

As noted 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 signs of perforations, punctures, or severe corrosion. The tank was observed to have some surficial rust.

Groundwater was not encountered within the excavation.

Petroleum impacted soil was not observed during the excavation of the UST.

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 1.5 ppm to 13.2 ppm. NDIR results revealed TPH concentrations ranging from 6.5 ppm to 1,017.9 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 17 ppm. Analytical results for LSS-2 obtained from the bottom of the excavation revealed a TPH concentration of 2,350 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 216 ppm. Two composite soil samples were obtained from stockpiled soil (Stock-1 and Stock-2) for NDIR analysis. NDIR results revealed a TPH concentration of 175.1 ppm and 57.8 ppm, respectively.

Based on these findings, ATEC recommended the following:

Groundwater samples should be periodically collected and analyzed for TPH and volatile organic compounds (VOCs) to ensure that the environmental integrity of the site is maintained.

#### 4.2 SITE REMEDIATION AND CONTAMINATED SOIL DISPOSAL

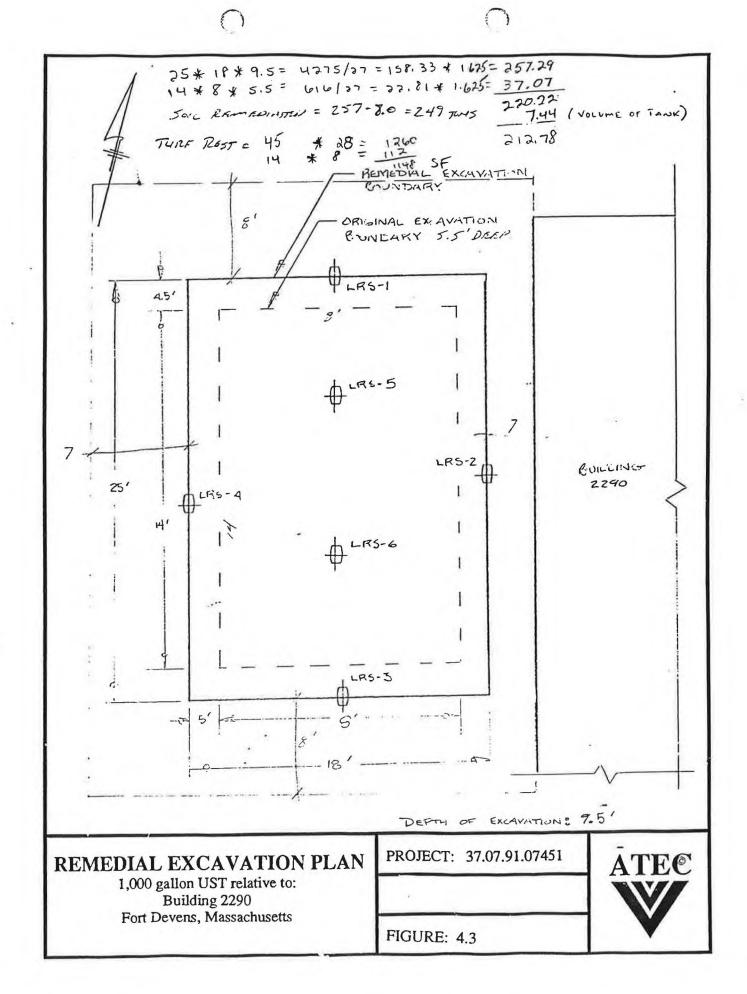
#### 4.2.1 Site Remediation

Following initial PID screening, additional excavation to remove contaminated soil and reach background levels (<1ppm TOVs by PID) was conducted per order of the Contracting Officer's Representative and David Salvadore of the Massachusetts Department of Environmental Protection (DEP). Approximately 220.22 tons of contaminated soil were removed from excavation floor and all sidewalls during remedial excavation on August 6, 1992. The estimated volume of soil removed was calculated from field drawings produced during the removal and remediation of UST No. 0028 (see Remedial Excavation Plan, Figure 4.3).

Six soil samples (RSS-1A through RSS-6A) were obtained from the post-remedial excavation for PID field screening. RSS-1A through RSS-4A were obtained from the side walls at a depth of approximately 4 feet below grade. RSS-5A and RSS-6A were obtained from the bottom of the excavation at a depth of 6 feet below grade. PID results ranged from 18 to 150 ppm.

Further excavation was conducted from the bottom of the excavation and from all sidewalls. Four soil samples (RSS-1B through RSS-4B) were obtained from sidewalls at a depth of approximately 4 feet below grade. RSS-5B and RSS-6B were obtained from the bottom of the excavation at a depth of 7 feet below grade. PID results for RSS-1B through RSS-6B revealed TOV concentrations ranging from 26.0 to 180.0 ppm.

Subsequent to further excavation, four soil samples (LRS-3C through LRS-6C) were obtained for PID field screening. Two soil samples (LRS-1C and LRS-2C) were not obtainable due to obstructions (pine tree and building). LRS-3C and LRS-4C were obtained from the side walls of the excavation at a depth of approximately 4 feet below



grade. LRS-5C and LRS-6C were obtained from the bottom of the excavation at a depth of 9.5 feet below grade. Final PID results ranged from 60 to 250 ppm (See Table 2.2). Further remedial excavation was not conducted per order of the Contracting Officer.

TABLE 4.2 - PID SCREENING RESULTS

SAMPLE NUMBER	PID (ppm TOV)	LOCATION
RSS-1A	30.0	north sidewall (4' depth)
RSS-2A	150.0	east sidewall (4' depth)
RSS-3A	30.0	south sidewall (4' depth)
RSS-4A	45.0	west sidewall (4' depth)
RSS-5A	40.0	bottom (6' depth)
RSS-6A	18.0	bottom (6' depth)
RSS-1B	180.0	north sidewall (4' depth)
RSS-2B	70.0	east sidewall (4' depth)
RSS-3B	45.0	south sidewall (4' depth)
RSS-4B	40.0	west sidewall (4' depth)
RSS-5B	45.0	bottom (7' depth)
RSS-6B	26.0	bottom (7' depth)
RSS-1C	N.A.	north sidewall (4' depth)
RSS-2C	N.A.	east sidewall (4' depth)
RSS-3C	170.0	south sidewall (4' depth)
RSS-4C	250.0	west sidewall (4' depth)
RSS-5C	60.0	bottom (9.5' depth)
RSS-6C	70.0	bottom (9.5' depth)

N.A. = Not Applicable

Six soil samples (LRS-1 through LRS-6) were obtained from the remedial excavation for laboratory analysis for TPH (USEPA Method 418.1). Two of the soil samples (LRS-4 and LRS-6) were additionally analyzed for Volatile Organic Compounds (VOCs) (USEPA

Method 8240) and 13 Metals by Toxicity Characteristic Leachate Procedure (TCLP) (USEPA Method 1311). The following table contained levels revealed by laboratory analysis:

**TABLE 4.3 - LABORATORY ANALYSIS** 

SAMPLE NUMBER	TPH (ppm)	VOCs (ppm)	13 TCLP METALS (ppm)	LOCATION
LRS-1	81.0	N.A.	N.A.	north sidewall (4' depth)
LRS-2	135.0	N.A.	N.A.	east sidewall (4' depth)
LRS-3	112.0	N.A.	N.A.	south sidewall 4' depth)
LRS-4	125.0	N.D.	N.D.	west sidewall (4' depth)
LRS-5	4,840.0	N.A.	N.A.	bottom (9.5' depth)
LRS-6	4,030.0	30.0 ethyl benzene	0.38 zinc	bottom (9.5' depth)

LRS = Laboratory Remediation Sample

N.D. = Not Detected above the Method Reporting Limit (MRL)

N.A. = Not Applicable

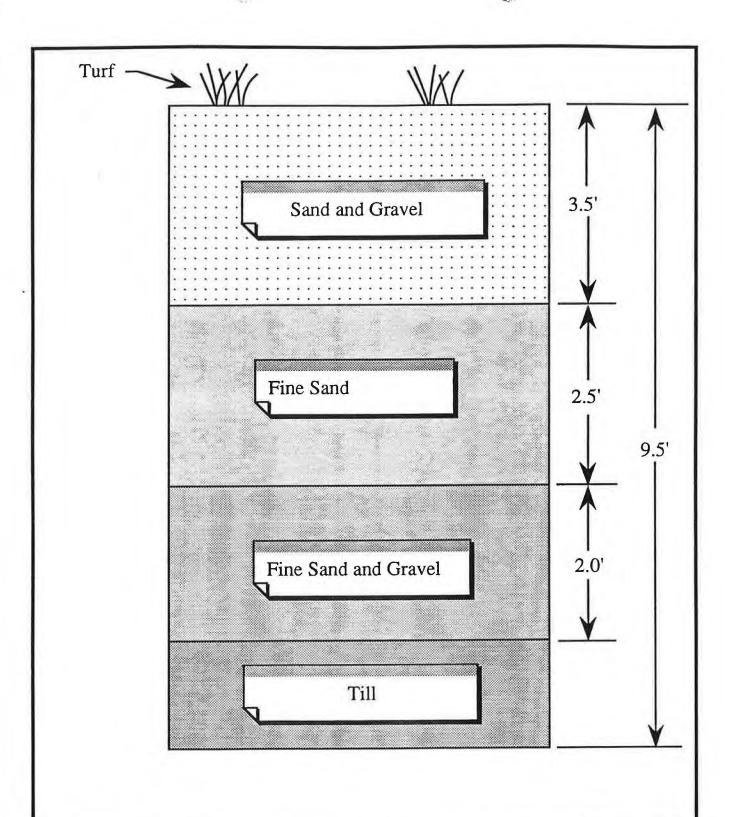
See Section 4.8 - Laboratory Analytical Results

### 4.2.2 Soil Stratigraphy

The stratigraphy of the soil consisted of brown sand and gravel for approximately the first 3.5 feet. The following 2.5 feet was made up of fine sand. The next 2 feet of the excavation revealed brown, fine sand and gravel. Glacial till was encountered from approximately 8 feet to the bottom of the excavation at 9.5 feet below grade. (See Soil Stratigraphy - Figure 4.4.)

# 4.2.3 Contaminated Soil Disposal

Prior to disposal, contaminated soil was laboratory analyzed for disposal classification



# SOIL STRATIGRAPHY

1,000 gallon UST excavation at: Building 2290 Fort Devens, Massachusetts PROJECT: 37.07.91.07451

UST-28

FIGURE: 4.4



purposes. One soil sample (LSP-28) was obtained from stockpiled soil. Laboratory analyses were performed for VOCs, Semi-volatiles, Flashpoint, PCBs, Reactive Sulfide Reactive Cyanide, Corrosivity (pH), and 13 TCLP Metals.

Laboratory analytical results revealed 8.3 standard units (S.U.) Corrosivity, 0.06 ppm Copper, 0.20 ppm Zinc, 0.04 ppm Nickel, 0.4 ppm Lead. All other analytical results were below the Method Reporting Limits (MRL). (See Section 4.8 Laboratory Analytical Results).

Approximately 135.50 cubic yards (220.22 tons) of number 2 fuel oil contaminated soil was removed and stockpiled during remediation of the excavation, as estimated through field drawings (see Figure 4.3 - Remedial Excavation Plan). Contaminated soil was disposed for recycling at Trimount Bituminous Products Company, Shrewsbury, Massachusetts.

#### 4.3 HYDROGEOLOGICAL INVESTIGATION

#### 4.3.1 General Explanation of Procedures

At the time of the removal of UST No. 0028, laboratory analysis of one soil sample obtained from the bottom of the excavation revealed a TPH concentration of 2,350.0 ppm. Following additional excavation of petroleum contaminated soil, laboratory analytical results of two soil samples obtained from the bottom of the excavation revealed TPH concentrations ranging from 4,030.0 to 4,840.0 ppm. Therefore, three groundwater monitoring wells were drilled and installed in the vicinity of UST No. 0028 to assess soil and groundwater conditions.

Prior to advancing 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 number 2 fuel oil from the 1,000-gallon UST (UST No. 0028). Geosearch, Inc. of Leominister, Massachusetts, was subcontracted by ATEC to install the monitoring wells at the site. Monitoring well 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 five foot intervals.

#### 4.3.2 Soil Borings for Monitoring Wells

Monitoring well MW-1 was installed approximately 47.5 feet west of Building 2290 and approximately 39.5 feet west of the backfilled tank excavation (see Figure 4.5 Site Plan). MW-1 is located hydrogeologically crossgradient of the former UST No. 0028. MW-1 was advanced to a depth of 12.5 feet to assess the potential release of number 2 fuel oil from the removed UST. Soil types encountered from grade level to a depth of approximately 6 feet below grade consisted primarily of very loose to medium dense, fine to coarse light-brown sand. Soil encountered from a depth of approximately 9 to 11 feet below grade consisted primarily of stiff, grey, silty clay. Concentrations of TOVs were not detected by field screening with a PID. Furthermore, no petroleum odors were noted. Groundwater was encountered during drilling at approximately 11 feet below grade. Auger refusal was encountered at a depth of approximately 12.5 feet below grade. See Section 4.14 - Boring Logs for further information.

Monitoring well MW-2 was installed approximately 23 feet west of Building 2290 and approximately 15 feet north of the backfilled tank excavation (see Figure 4.5 Site Plan). MW-2 is located hydrogeologically upgradient of the former UST No. 0028. MW-2 was advanced to a depth of 15 feet to assess the potential release of number 2 fuel oil from the removed UST. Soil types encountered from grade level to a depth of approximately 6 feet below grade consisted primarily of very loose to medium dense, fine to coarse

light-brown sand. Soil encountered from a depth of approximately 9 to 11 feet below grade consisted primarily of stiff, grey, silty clay. Concentrations of TOVs were not detected by field screening with a PID. Furthermore, petroleum odors were not noted. Groundwater was encountered during drilling at approximately 11 feet below grade. Auger refusal was encountered at a depth of approximately 15 feet below grade. See Section 4.14 - Boring Logs for further information.

Monitoring well MW-3 was installed approximately 18 feet west of Building 2290 and approximately 26.5 feet south of the backfilled tank excavation (see attached Site Plan, Figure 4.5). MW-3 is located hydrogeologically downgradient of the former UST No. 0028. MW-3 was advanced to a depth of 14 feet to assess the potential release of number 2 fuel oil from the removed UST. Soil types encountered from grade level to a depth of approximately 6 feet below grade consisted primarily of very loose to medium dense, fine to coarse light-brown sand. Soil encountered from a depth of approximately 9 to 11 feet below grade consisted primarily of very stiff, grey-blue, silt. Results of PID screening revealed a TOV concentration of 65.0 ppm in one soil sample (MW-3.3) collected at 9 to 11 feet below grade. Petroleum odors were noted in soil sample MW-3.3. Groundwater was encountered during drilling at approximately 9 feet below grade. Auger refusal was encountered at a depth of approximately 14 feet below grade. See Section 4.14 - Boring Logs for further information.

## 4.3.3 Results of Soil Screenings and Chemical Analyses

Split spoon soil samples were obtained at minimum five foot intervals during the installation of monitoring wells at the site. Split spoon soil samples were screened for TPH utilizing a NDIR. Subsurface soil samples were placed directly into pre-labeled, precleaned containers and immediately placed on ice for shipment to the laboratory. TPH samples were placed in 500-ml amber glass jars.

Three subsurface soil samples were selected during the installation of monitoring well one

(MW-1) and labelled MW-1.1, MW-1.2, and MW-1.3. Results of NDIR screening revealed TPH concentrations of 27.1 ppm, 11.8 ppm, and 37.3 ppm in soil samples MW-1.1, MW-1.2, and MW-1.3, respectively.

Three subsurface soil samples were selected during the installation of monitoring well two (MW-2) and labelled MW-2.1, MW-2.2, and MW-2.3. Results of NDIR screening revealed TPH concentrations of 18.6 ppm, 18.3 ppm, and 11.6 ppm in soil samples MW-2.1, MW-2.2, and MW-2.3, respectively.

Three subsurface soil samples were selected during the installation of monitoring well three (MW-3) and labelled MW-3.1, MW-3.2, and MW-3.3. Results of NDIR screening revealed TPH concentrations of 26.1 ppm, 10.0 ppm, and 1,376.0 ppm in soil samples MW-3.1, MW-3.2, and MW-3.3, respectively.

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

TABLE 4.4 - SUMMARY OF SUBSURFACE SOIL ANALYSES

SAMPLE NUMBER	DEPTH (ft.)	TPH (ppm)
MW-1.1	0-2	27.1
MW-1.2	4-6	11.8
MW-2.3	9-11	37.3
MW-2.1	0-2	18.6
MW-2.2	4-6	18.3
MW-2.3	9-11	11.6
MW-3.1	0-2	26.1
MW-3.2	4-6	10.0
MW-3.3	9-11	1,376.0

### 4.3.4 Details of Monitoring Well Construction

Monitoring wells were typically constructed of 10 feet of, bottom-plugged, 2 inch diameter Polyvinyl Chloride (PVC) well screen (0.010 inch slot) followed by a length of 2 inch diameter PVC solid riser to grade level. No. 2 washed, silica sand was packed to approximately 1 foot above the screen followed by a 1 to 2 foot thick bentonite grout packing. The remainder of the boring was backfilled with washed silica sand and concrete surface seal to grade.

Monitoring wells were fitted with a 6 inch diameter flush mount cast iron roadbox.

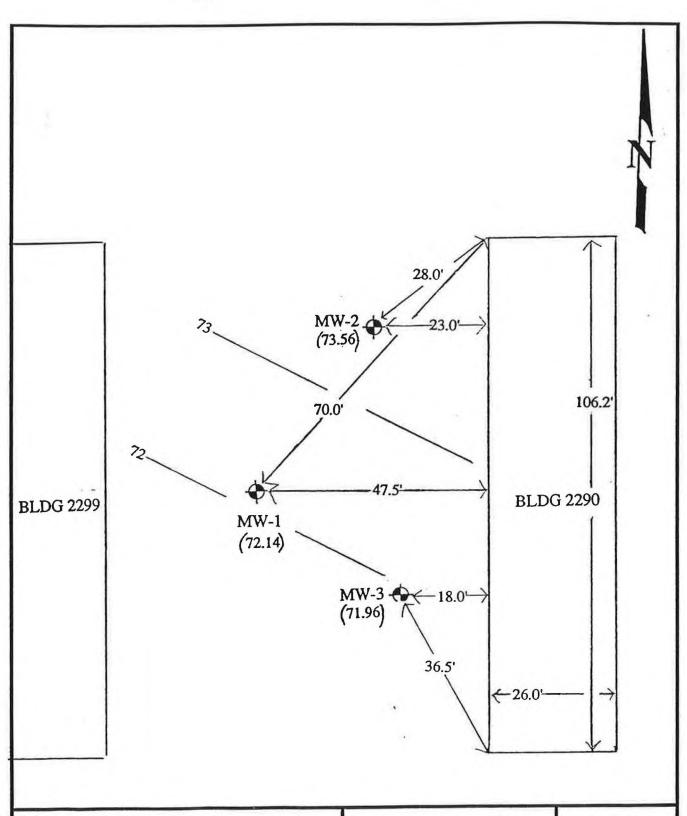
Monitoring well locations are depicted on Figure 4.5 - Site Plan. Boring logs are included in Section 4.14.

## 4.3.5 Standard Type Survey and Determination of Groundwater Gradient

An instrument survey was conducted by Glen Harrington, Scientist II and Andrea Mischel, Environmental Scientist, to determine the relative locations and elevations of the groundwater monitoring wells and significant surficial features. The monitoring wells were gauged utilizing an electronic water level meter prior to sampling to determine the groundwater elevations at each well.

Groundwater elevations were then calculated utilizing the survey and gauging data. Based on the gauging data, groundwater in the area flows generally to the southwest across the site at a lateral hydraulic gradient of 3.4 percent. Groundwater at the site occurs at depths of 10.52 feet, 9.15 feet, and 10.35 feet below grade for MW-1, MW-2, and MW-3, respectively.

Table 4.5 - summarizes groundwater elevations measured at the three monitoring wells installed at the site.



# SITE PLAN

GROUNDWATER MONITORING WELLS UST #28 relative to: Building 2290 Fort Devens, Massachusetts PROJECT: 37.07.92.00451

SCALE: 1 IN. = 20 FT.

FIGURE: 4.5



TABLE 4.5 - SUMMARY OF GROUNDWATER ELEVATIONS

MONITORING WELL	DATE	RIM ELEVATION	DEPTH TO GROUNDWATER	GROUNDWATER ELEVATION
MW-1	11-4-92	82.66	10.52	72.14
MW-2	11-4-92	82.61	9.15	73.56
MW-3	11-4-92	82.31	10.35	71.96

#### 4.3.6 Results of Groundwater Chemical Analyses

Each of the three groundwater monitoring wells were sampled on November 4, 1992. The groundwater samples were analyzed for TPH. Approximately three well casing volumes of groundwater were purged from each well prior to sample collection.

Groundwater samples were placed directly into pre-labeled, precleaned 500 ml amber glass jars and immediately placed on ice for shipment to the laboratory. The samples were analyzed for TPH by Environmental Science Services (ESS) of Providence, Rhode Island.

Chain-of-custody forms were completed and included in the shipment.

Laboratory analytical results revealed no detectable concentrations of TPH in the groundwater samples collected from MW-1 and MW-2. Laboratory analytical results revealed a TPH concentration of 12.0 ppm in the groundwater sample MW-3.

Analytical results of groundwater samples collected during the site investigation are depicted in Table 4.6 - Summary of Groundwater Analyses.

TABLE 4.6 - SUMMARY OF GROUNDWATER ANALYSES

SAMPLE NUMBER	ТРН (ррт)
MW-1	N.D.
MW-2	N.D.
MW-3	12.0

N.D. - Not detected

#### 4.4 BACKFILL

The excavation was lined with polyethylene plastic sheeting and backfilled with approximately 158.3 cubic yards of uncontaminated fill material on August 5, 1992. Backfilling was conducted with the approval of the Contracting Officer's Representative.

#### 4.5 SITE RESTORATION

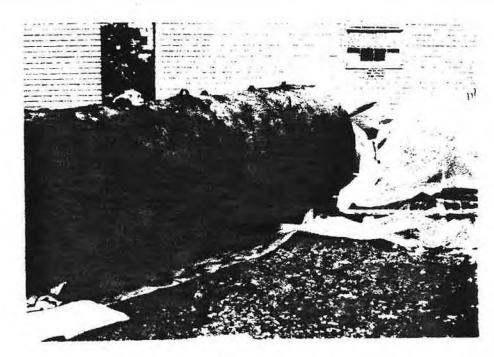
Following backfill of the excavation, approximately 338 square feet of loam was distributed over the excavated area. Seed was then distributed over the disturbed area.

## 4.6 PHOTOGRAPHIC DOCUMENTATION

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

- A-1: One side of removed tank.
- A-2: Opposite side of removed tank.
- A-3: Photograph not available.
- A-4: Photograph not available
- A-5: Post-remedial excavation as viewed from south, facing north.
- A-6: Post-remedial excavation as viewed from north, facing south.

A-1



A-2

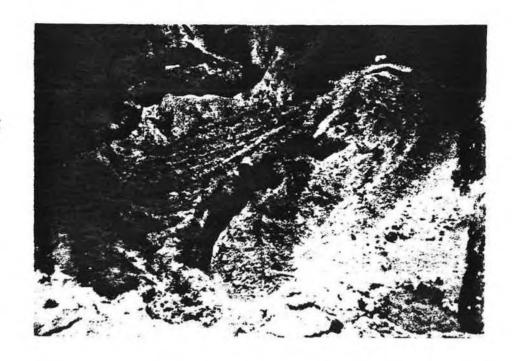


# PHOTO DOCUMENTATION

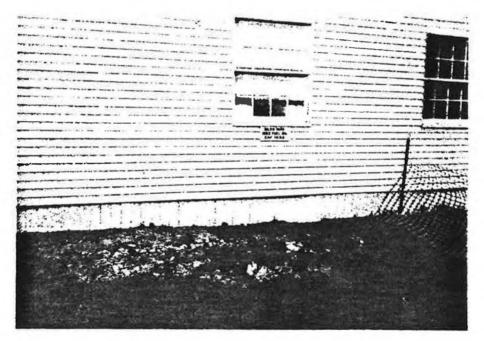
1,000 gallon UST excavation at: Building 1666 Fort Devens, Massachusetts PROJECT: 37.07.91.07451



A-5



A-6



# PHOTO DOCUMENTATION

1,000 gallon UST excavation at:
Building 1666
Fort Devens, Massachusetts

PROJECT: 37.07.91.07451

UST-26



## 4.8 OCMA 220 DATA SHEETS

The following information was organized from the data collected from the Non-dispersive Infrared Analyzer.

- SS-1 to SS-10, Stock-1 and Stock-2: Soil samples obtained from original excavation.
- MW-1.1 to MW-1.3, MW-2.1 to MW-2.3, MW-3.1 to MW-3.3: Soil samples obtained from monitoring wells.

OCMA Data Sheet
Operator Name: Richard

Date: 14 Jung

EBI Project Number: 30 A51

Calibration

	First Reading		Se	Second Reading		hird Reading
	Initial	Final	Initial	Final	Initial	Final
Zero Calibration · Span Calibration	1-3.9	10:0	1-1.7	10.0	1-0-1	10.0
	136.3	140.0	147.6	140,0	140.7	140.0
Zero Calibration	16.60	10.0	1-6.8	10.0	1-0.8	10.0
						Span Check: Z7-7

# Testing

Sample ID#	Weight		First Approach F-113 Sample		Second Approach F-113 Sample			Readings	
	Gross	Tare	F-113	Sample	F-113	Sample	First	Second	Third
STRICT	181.2	75-0		1 320			14.3	5.0	15.5
200CZ	183.7	175.9 1	•	1 .			1117	12.2	12.2
1	177,5	179.21		1	1		1 64	1.4	
2	182.9	174-41		l .	1		1.5	1.3	
. 3	179.1	174.31		1194			13.3	13.6	
. A.	177.7	174.71			A		1.4	1.5	-
,5	104.3	174.8 1		1			1.3	1.3	_
6	18/18	175.21					1.7	1.3	1-
.7 .	1831.0	174.61					1.7	1.7	-
- A	185.5	174.21		1	1		104	1.4	_
1. 3.	180.5	74.31					131.0	130.8	_
15.	179.6	174.5					2.2	1 -5	
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#### 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 28

DATE: Nov 4, 1992

OPERATOR: David G. Pannuto

## CALIBRATION DATA

TYPE	FIRST REA	ADING	SECOND READING THIRD R		THIRD READING		SPAN
CALIBRATION	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	CHECK
ZERO:	1,9	0.0	-2,4	0.0	-0.1	0.0	30.1
SPAN:	39.3	40.0	39.7	40.0	40.1	40.0	
ZERO:	-0.5	0.0	-0.3	0.0	-0.1	0.0	

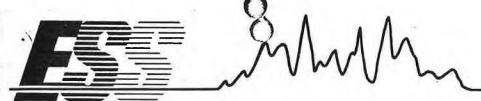
### ANALYTICAL DATA

SAMPLE	WEIGH	IT (g)	1st DILUTIO	ON RATIO (ml)	2nd DILUTIO	ON RATIO (ml)	INSTRUME	NT RESULTS	(ppm)	_ CONCENTRATION
NUMBER	GROSS	TARE	F-113	SAMPLE	F-113	SAMPLE	1st	2nd	3rd	mg/l
MW -1,1	83.9	78.6	17.5	3.0			1.7	0.7		27.1
MW -1.2	83.9	78.7	17.5	3.0			0.4	0.3		11,8
MW -1,3	84.5	77.9	17.5	3.0			1,1	1,2		37.3
MW -2.1	84.8	77.1	17.5	3.0			0.7	0.7		18.6
MW -2.2	84.5	78.9	17.5	3.0			0.4	0.5		18,3
MW -2,3	89.2	80.4	17.5	3.0			0.3	0,5	-	11,6
MW -3,1	85.5	80	17.5	3.0		-	0.6	0.7	44	26.1
MW -3.2	86.5	78.3	17.5	3.0			0,4	0.4		10.0
MW -3.3	84.6	78.0	17.5	3,0			45.9	44.3		1376,0

#### 4.8 LABORATORY ANALYTICAL RESULTS

The following laboratory analytical reports are associated with the removal, remedial excavation, and stockpiled soil. These reports were organized and provided by Environmental Science Services, Inc. (ESS).

- LSS-1, LSS-2, and LSS-3: Soil samples obtained from original excavation and the soil stockpile. Laboratory analyzed for TPH.
- LRS-1 to LRS-6: Soil samples obtained from post-remedial excavation. Laboratory analyzed for TPH. LRS-4 and LRS-6 were additionally analyzed for VOCs and 13 TCLP Metals. Please note that the analytical laboratory states that LRS-5 and LRS-6 were obtained from Building 2980. This is a laboratory typographic error. This can be confirmed by reviewing the Chain of Custody forms.
- LSP-28: Soil sample obtained from stockpiled soil for disposal classification.
   Laboratory analyzed for VOCs, semi-volatiles, Flashpoint, PCBs, Reactive Cyanide, Reactive Sulfide, Corrosivity (pH), and 13 TCLP Metals.
- MW-1.1 to MW-1.3, MW-2.1 to MW-2.3, MW-3.1 to MW-3.3: Soil samples obtained from monitoring wells. Laboratory analyzed for TPH.



## CERTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants

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

Client Sample ID: LSP-28 ESS Sample ID: 921528-01

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

Parameter	1	Results	Units	MRL	Method
pH (Corrosivity)		8.3	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.
Semivolatile Organics		ND	ug/Kg	Attached	8270
<b>Volatile Organics</b>		ND	ug/Kg	Attached	8240
Toxicity Characteristic Leachi Metals	ng Pro	ocedure			1311
Lead		0.4	mg/L	Attached	6010
Copper		0.06	mg/L	Attached	6010
Nickel		0.04	mg/L	Attached	6010
Zinc		0.20	mg/L	Attached	6010

N/A = Not Applicable

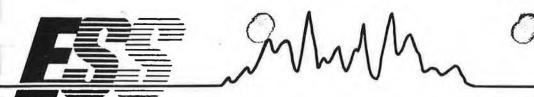
ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

Bavid Bickinson

Laboratory Director

Date:



## CERTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants

Client Project ID: UST 28 Bldg.2980,

UST 29 Bldg.2996

Client Sample ID: LRS-1, UST 28

Date Sample Received: 8/7/92

ESS Project ID: 922057

ESS Sample ID: 922057-01

Date Reported: 8/14/92

Parameter	Results	Units	MRL	Method
Percent Solids	93	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	81	mg/Kg	. 11	418.1

TPHIR reported on a dry weight basis

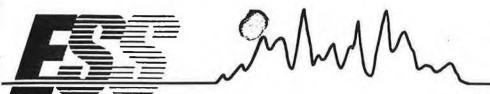
MRL = Method Reporting Limit

Approved by:

ckinson Laboratory Director

Date: 14/ /mg 51





## CERTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants

Client Project ID: UST 28 Bldg.2980,

UST 29 Bldg.2996

Client Sample ID: LRS-2, UST 28

Date Sample Received:

ESS Project ID: 922057

ESS Sample ID: 922057-02

Date Reported: 8/14/92

Parameter	Results	Units	MRL	Method
Percent Solids	92	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	135	mg/Kg	11	418.1

TPHIR reported on a dry weight basis

MRL = Method Reporting Limit

Approved by:

Laboratory Director

Date:\_





## **CERTIFICATE OF ANALYSIS**

Client: ATEC Environmental Consultants

Client Project ID: UST 28 Bldg.2980,

UST 29 Bldg.2996

Client Sample ID: LRS-3, UST 28

Date Sample Received: 8/7/92

ESS Project ID: 922057

ESS Sample ID: 922057-03

Date Reported: 8/14/92

Parameter	Results	Units	MRL	Method
Percent Solids	94	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	112	mg/Kg	11	418.1

TPHIR reported on a dry weight basis

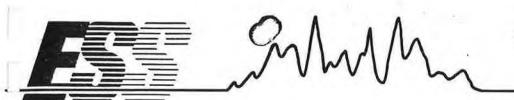
MRL = Method Reporting Limit

Approved by: \_/

David Dickinson Laboratory Director Date:

14/Aug 12





## **CERTIFICATE OF ANALYSIS**

Client: ATEC Environmental Consultants

Client Project ID: UST 28 Bldg. 2980,

UST 29 Bldg. 2966

Client Sample ID: LRS-4, UST 28

Date Sample Received: 8/7/92

ESS Project ID: 922057

ESS Sample ID: 922057-04

Date Reported: 8/14/92

Parameter	Results	Units	MRL	Method
Percent Solids	96	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	125	mg/Kg	10	418.1
Volatile Organics	ND	ug/Kg	Attached	8240
Toxicity Characteristic Leaching Metals	Procedure ND	mg/L	Attached	1311 6010

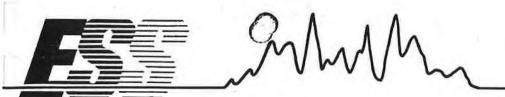
TPHIR reported on dry weight basis

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

Approved by:

Laboratory Director

Environmental Science Services



## **CERTIFICATE OF ANALYSIS**

Client: ATEC Environmental Consultants

Client Project ID: UST 28 Bldg.2980,

UST 29 Bldg.2996

Client Sample ID: LRS-5, UST 28

Date Sample Received: 8/7/92

ESS Project ID: 922057

ESS Sample ID: 922057-05

Date Reported: 8/14/92

Parameter	Results	Units	MRL	Method
Percent Solids	87	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	4,840	mg/Kg	115	418.1

TPHIR reported on a dry weight basis

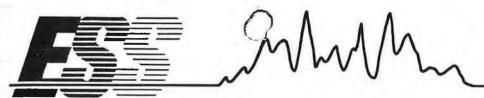
MRL = Method Reporting Limit

Approved by:

Devid Dickinson

Laboratory Director





## CERTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants

UST 28 Bldg. 2980, UST 29 Bldg. 2966 Client Project ID:

Client Sample ID: LRS-6, UST 28

Date Sample Received:

ESS Project ID: 922057

ESS Sample ID: 922057-06

Date Reported: 8/14/92

Parameter	Results	Units	MRL	Method
Percent Solids	89	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	4,030	mg/Kg	112	418.1
<b>Volatile Organics</b> Ethyl Benzene	30	ug/Kg	Attached	8240
Toxicity Characteristic Leaching	Procedure			1311
Metals Zinc	0.38	mg/L	Attached	6010

TPHIR reported on dry weight basis

MRL = Method Reporting Limit

Approved by:

Laboratory Director

Date: 14 Buy 5 2





## CERTIFICATE OF ANALYSIS

### TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

#### METALS

#### EPA METHOD 1311

Client: ATEC Environmental Consultants .

Date Sampled: 8/6/92

Client Project ID: UST# 28, 29

Date TCLP Performed: 8/10/92

Client Sample ID: LRS-6, UST 28

Date Leachate Extracted: 8/11/92

ESS Sample ID: 922057-06

Date Extract Analyzed: 8/11/92

	Act	ual	Adjusted*		
Target Analyte	Sample Result (mg/L)	Method Reporting Limit	Sample Result (mg/L)	Method Reporting Limit	
Antimony	ND	0.2	ND	0.3	
Arsenic	ND	0.2	ND	0.2	
Cadmium	ND	0.02	ND	0.02	
Chromium	ND	0.05	ND	0.07	
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	0.36	0.02	0.38	0.03	
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: 1464592





# CERTIFICATE OF ANALYSIS TCL VOLATILE ORGANICS Method 8240

Client: ATEC Environmental Consultants

Client Project ID: UST 28, 29

ESS Project ID: 922057

Client Sample ID: LRS-6, UST 28

ESS Sample ID: 922057-06

Date Sample Received: 8/7/92

Date Reported: 8/14/92

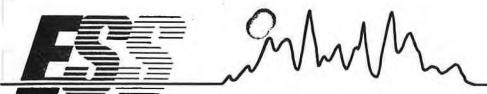
Parameter	Result (ug/Kg)	MRL
Methylene Chloride	ND	5
1,1-Dichloroethane	ND	
Chloroform	ND	5
Carbon Tetrachloride	ND -	5
1,2-Dichloropropane	ND	5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Tetrachloroethene	ND	5
Chlorobenzene	ND	5
1,2-Dichloroethane	ND	5 5 5 5 5 5 5 5 5
1,1,1-Trichloroethane	ND	5
Bromodichloromethane	ND	
Trans-1,3-Dichloropropene	ND	5 5 5 5 5
Bromoform	ND	5
1,1,2,2-Tetrachloroethane	ND	5
Benzene	ND	5
Toluene	ND	5
Ethyl Benzene	30	
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 5
Trichloroethene	ND	
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: Mavid Dickinson

Laboratory Director

Date: 14/105/12



## **CERTIFICATE OF ANALYSIS**

#### TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

#### **METALS**

#### EPA METHOD 1311

Client: ATEC Environmental Consultants

Client Sample ID: LRS-4, UST 28

Client Project ID: UST# 28, 29

ESS Sample ID: 922057-04

Date Sampled: 8/6/92

Date TCLP Performed: 8/10/92

Date Leachate Extracted: 8/11/92

Date Extract Analyzed: 8/11/92

	Act	ual	Adjusted*	
Target Analyte	Sample Result (mg/L)	Method Reporting Limit	Sample Result (mg/L)	Method Reporting Limit
Antimony	ND	0.2	ND	0.3
Arsenic	ND	0.2	ND	0.2
Cadmium	ND	0.02	ND	0.02
Chromium	ND	0.05	ND	0.07
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	ND	0.02	ND	0.03
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:\_\_\_

Laboratory Director

Date:

I mhh

In Response To The Future

# ALYSIS TCL VOLATILE ORGANICS Method 8240

Environmental Consultants

t ID: UST 28, 29

e ID: LRS-4, UST 28

Received: 8/7/92

ESS Project ID: 922057

ESS Sample ID: 922057-04

Date Reported: 8/14/92

Received. 0/1/32		Da	ce Reported.	0/14/32
e Chloride loroethane	Result (ug/	Kg)		MRL
Chloride	ND			5
loroethane	ND			5
brm	ND			5
Tetrachloride	ND			5
chloropropane	ND			5
mochloromethane	ND			5 5 5 5 5 5 5 5
2-Trichloroethane	ND	300		5
achloroethene	ND			5
brobenzene	ND			5
-Dichloroethane	ND			5
1,1-Trichloroethane	ND			5
gromodichloromethane	ND			5
25-1.3-Dichloropropene	ND			5 5 5 5 5 5 5 5 5 5
BIOMOIOIM	ND			5
1,1,2,2-Tetrachloroethane	ND			5
	ND			5
Toluene	ND			5
Ethyl Benzene	ND			5
- THE COMPANY	ND			
DI OMOMA LANG	ND			10
VINYI Chloria	ND			10
Chioloethane	ND			10
1,1-Dichloroethene	ND			10
1/2-Dichloroethene (mot-1)	ND			5 5
TITUTOEthene	ND			5
Acetone	ND			5
Carbon Disulfide	ND			10
2-Butanone	ND			5
Cis-1,3-Dichloropropene	ND			10
Methyl-Z-Pentanone	ND			5
z-nexanone				10
Styrene	ND			10
Xylenes (Total)	ND			5
	ND			10

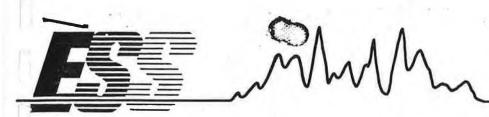
ND	=	Not.	Detected	ahorra	W			
			Detected	avove	method	Reporting	Limit	(MRT.

Approved by: David Dickinson

Laboratory Director

Date: 14/1/1959L





## **CERTIFICATE OF ANALYSIS**

Date: 1/17/92 Job: 99

Account: 95659

Received: 1/13/92

Project: TANK 28

ATEC ENVIRONMENTAL CO.

62 Accord Park Drive Norwell, MA 02061

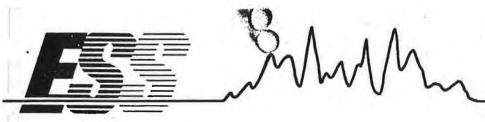
ttn: Mr. Mark Baldi

:0:

Method Number	Parameter	Result	Unit	Sample Description
EPA-160.3 EPA-418.1	Total Solids TPH/IR (Dry Wt.)	88 17	% mg/kg	LSS-1
EPA-160.3 EPA-418.1	Total Solids TPH/IR (Dry Wt.)	76 2350	% mg/kg	LSS-2
EPA-160.3 EPA-418.1	Total Solids TPH/IR (Dry Wt.)	91 216	% mg/kg	LSS-3
	Number 	Number Parameter  EPA-160.3 Total Solids EPA-418.1 TPH/IR (Dry Wt.)  EPA-160.3 Total Solids EPA-418.1 TPH/IR (Dry Wt.)  EPA-160.3 Total Solids EPA-160.3 Total Solids	Number Parameter Result  EPA-160.3 Total Solids 88 EPA-418.1 TPH/IR (Dry Wt.) 17  EPA-160.3 Total Solids 76 EPA-418.1 TPH/IR (Dry Wt.) 2350  EPA-160.3 Total Solids 91	Number Parameter Result Unit  EPA-160.3 Total Solids 88 % EPA-418.1 TPH/IR (Dry Wt.) 17 mg/kg  EPA-160.3 Total Solids 76 % EPA-418.1 TPH/IR (Dry Wt.) 2350 mg/kg  EPA-160.3 Total Solids 91 %

David Dickinson Laboratory Manager

Page:



## **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-28 ESS Sample ID: 921528-01

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

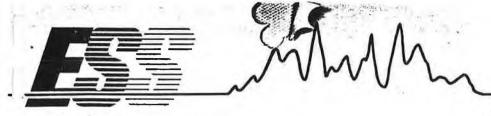
Parameter	Result (mg/Kg)	MRL
Arochlor 1016	ND	0.1
Arochlor 1221	ND	0.1
Arochlor 1232	ND	0.1
Arochlor 1242	ND	0.1
Arochlor 1248	ND	0.1
Arochlor 1254	ND	0.2
Arochlor 1260	ND	0.2

ND = Not Detected above Method Reporting Limit (MRL)

Surrogate Recovery Data	% Recovery	QC Limit
Dibutylchlorendate	90%	50 - 150%

Approved by:

Bavid Wickinson Laboratory Director Date:



## 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-28 ESS Sample ID: 921528-01

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 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

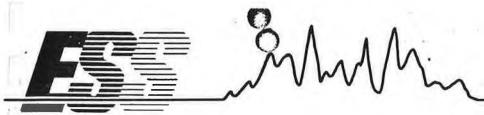
ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson

Laboratory Director

Date:





## **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-28 ESS Sample ID: 921528-01

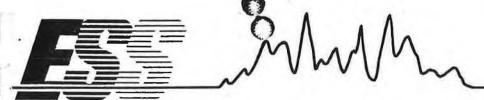
Date Sample Received: 6/9/92 Date Reported: 7/1/92

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
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Approved by: / Milesty

David Dickinson Laboratory Director Date:



## **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-28 ESS Sample ID: 921528-01

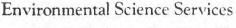
Date Sample Received: 6/9/92 Date Reported: 7/1/92

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

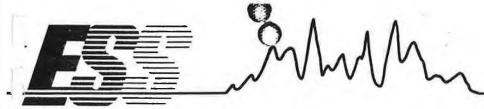
ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

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-28 Matrix Spike ESS Sample ID: 921528-01MS

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

Parameter	Result (ug/Kg)	MRL
2-Chlorophenol	18,000*	1,670
2-Nitrophenol	ND	1,670
Phenol	16,700*	1,670
2,4-Dimethylphenol	ND	1,670
2,4-Dichlorophenol	ND	1,670
2,4-Dinitrophenol	ND	8,350
Pentachlorophenol	14,700*	8,350
4-Nitrophenol	14,000*	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	14,300*	1,670
4,6-Dinitro-2-Methylphenol	ND	8,350

\* Matrix Spike compound

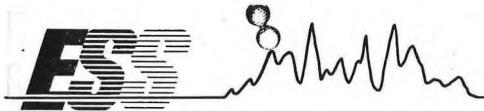
ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson

Laboratory Director

Date:



## **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-28 Matrix Spike ESS Sample ID: 921528-01MS

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

Parameter	Result (ug/Kg)		MRL
Acenaphthylene	ND		1,670
1,2,4-Trichlorobenzene	9,170*		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	7,670*		1,670
3,3-Dichlorobenzidine	ND		3,340
2,4-Dinitrotoluene	7,170*		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	7,830*		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

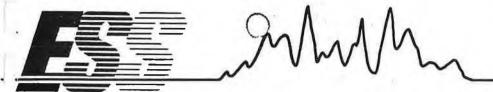
\* Matrix Spike compound

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson Laboratory Director Date:

2 Jul 992



## 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-28 Matrix Spike ESS Sample ID: 921528-01MS

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	13,300*	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	11,300*	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

\* Matrix Spike compound

ND = Not Detected above Method Reporting Limit (MRL)

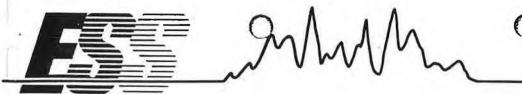
Approved by:

pavid Bickinson Laboratory Director

008

**Environmental Science Services** 





## 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-28 Matrix Spike Dup.

ESS Sample ID: 921528-01MSD

Date Sample Received: 6/9/92

Date Reported: 7/1/92

Parameter	Result (ug/Kg)	MRL
2-Chlorophenol	18,300*	1,670
2-Nitrophenol	ND	1,670
Phenol	16,700*	1,670
2,4-Dimethylphenol	ND	1,670
2,4-Dichlorophenol	ND	1,670
2,4-Dinitrophenol	ND	8,350
Pentachlorophenol	16,700*	8,350
4-Nitrophenol	17,300*	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	14,300*	1,670
4,6-Dinitro-2-Methylphenol	ND	8,350

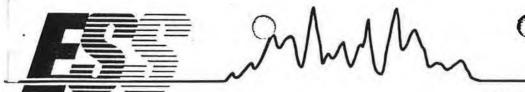
<sup>\*</sup> Matrix Spike compound

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

Laboratory Director

Date:



## 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-28 Matrix Spike Dup.

ESS Sample ID: 921528-01MSD

Date Sample Received: 6/9/92

Date Reported: 7/1/92

Parameter	Result (ug/Kg)	MRL
Acenaphthylene	ND	1,670
1,2,4-Trichlorobenzene	9,170*	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	7,670*	1,670
3,3-Dichlorobenzidine	ND	3,340
2,4-Dinitrotoluene	8,330*	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	7,500*	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

\* Matrix Spike compound

ND = Not Detected above Method Reporting Limit (MRL)

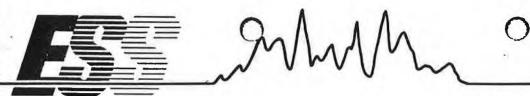
Approved by:

Laboratory Director

010

**Environmental Science Services** 





## **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-28 Matrix Spike Dup.

ESS Sample ID: 921528-01MSD

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	13,000*	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	8,000*	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

\* Matrix Spike compound

ND = Not Detected above Method Reporting Limit (MRL)

Approved by

David Dickinson

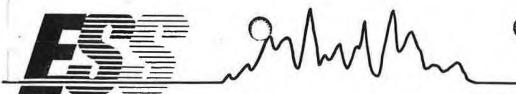
Laboratory Director

**Environmental Science Services** 

532 Atwells Avenue, Providence, Rhode Island 02909 (401) 421-0398 Fax. (401) 421-5731

101 D. D. J. W. W. W. Com W. W. 06490 (2011) 221 222 L. (2011) 231 222 L.





## **CERTIFICATE OF ANALYSIS**

#### SEMI-VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Client: ATEC Environmental Consultants

Client Project ID: Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-28 ESS Sample ID: 921528-01 MS/MSD

Date Sampled: 6/9/92 Date Analyzed: 6/19/92

Compound	Sample oncentration (ug/L)	Spike Added	MS Concentration	MS % Rec#	QC Limits REC
Phenol	ND	33,300	16,670	51	26-90
2-Chlorophenol	ND	23,300	18,000	54	25-102
1,4-Dichlorobenzene	ND	16,670	7,670	46	28-104
N-Nitroso-di-n-prop. (	L) ND	16,670	7,830	47	41-126
1,2,4-Trichlorobenzene	ND	16,670	9,170	55	38-107
4-Chloro-3-methylpheno	L ND	33,300	14,300	43	26-103
Acenaphthene	ND	16,670	13,330	80	31-137
4-Nitrophenol	ND	33,300	14,000	42	11-114
2,4-Dinitrotoluene	ND	16,670	7,170	43	28-89
Pentachlorophenol	ND	33,000	14,700	45	17-109
Pyrene	ND	16,670	11,330	68	35-142

Compound	Spike Added	MSD Concentration	MSD % Rec#	% RPD#	QC RPD	Limits REC
Phenol	33,300	16,670	50	2	35	26-90
2-Chlorophenol	33,300	18,300	55	2	50	25-102
1,4-Dichlorobenzene	16,670	7,670	46	0	27	28-104
N-Nitroso-di-n-prop. (1)	16,670	7,500	45	4	38	41-126
1,2,4-Trichlorobenzene	16,670	9,170	55	0	23	38-107
4-Chloro-3-methylphenol	33,300	14,330	43	0	33	26-103
Acenaphthene	16,670	13,000	78	3	19	31-137
4-Nitrophenol	33,300	17,330	52	21	50	11-114
2,4-Dinitrotoluene	16,670	8,330	50	15	47	28-89
Pentachlorophenol	33,000	16,670	50	11	47	17-109
Pyrene	16,670	8,000	48	34	36	35-142

# Column to be used to flag recovery and RPD values with an asterisk

\* Values outside of QC Limits

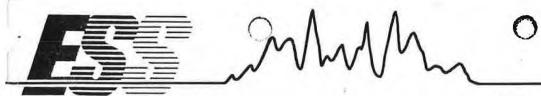
Approved by: David Dickinson

Laboratory Director

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**Environmental Science Services** 



Date Reported: 7/1/92

## **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-28 ESS Sample ID: 921528-01

Date Sample Received: 6/29/92

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
Frans-1,3-Dichloropropene	ND	1,000
Bromoform	ND	1,000
1,1,2,2-Tetrachloroethane	ND	1,000
Benzene	ND	1,000
<b>Toluene</b>	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

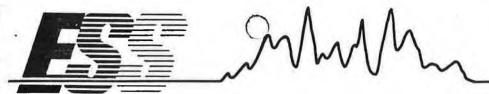
ND = Not Detected above Method Reporting Limit (MRL)

Approved by: /

David Dickinson Laboratory Director Date:

2/1/92

**Environmental Science Services** 



## 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-28 Matrix Spike ESS Sample ID: 921528-01MS

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	51*	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	58*	1,000
Toluene	50*	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	53*	1,000
1,2-Dichloroethene (Total)	ND	1,000
Trichloroethene	51*	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)

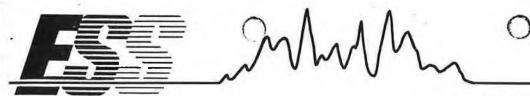
\* Matrix Spike compound

Approved by:

David Dickinson Laboratory Director Date:

2 Jul 99 L

**Environmental Science Services** 



## **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-28 Matrix Spike Dup.

Date Sample Received: 6/29/92

ESS Sample ID: 921528-01MSD

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	51*	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	54*	1,000
Toluene	47*	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	53*	1,000
1,2-Dichloroethene (Total)	ND	1,000
Trichloroethene	50*	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	<b>N</b> D	1,000
Styrene	ND	1,000
Xylenes (Total)	ND	1,000

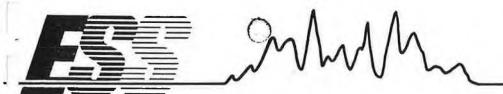
ND = Not Detected above Method Reporting Limit (MRL)

\* Matrix Spike compound

Approved by:

David Dickinson Laboratory Director

**Environmental Science Services** 



## CERTIFICATE OF ANALYSIS

#### VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Client: ATEC Environmental Consultants

Client Project ID: Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-28 MS/MSD ESS Sample ID: 921528-01 MS/MSD

Date Sampled: 6/26/92 Date Analyzed: 6/29/92

	Sample Concentration	Spike	MS	MS %	QC Limits
Compound	(ug/L)	Added	Concentration	Rec#	REC
				L W	I. Arriva
1,1-Dichloroether	ne ND	50	53	106	61-145
Trichloroethene	ND	50	51	102	71-120
Benzene	ND	50	58	116	76-127
Toluene	ND	50	50	100	76-125
Chlorobenzene	ND	50	51	102	75-130

	Spike	MSD	MSD %		QC I	imits
Compound	Added	Concentration	Rec#	RPD#	RPD	REC
1,1-Dichloroethene	50	53	106	0	22	61-145
Trichloroethene	50	50	100	2	24	71-120
Benzene	50	54	108	7	21	76-127
Toluene	50	47	94	6	21	76-125
Chlorobenzene	50	51	102	0	21	75-130

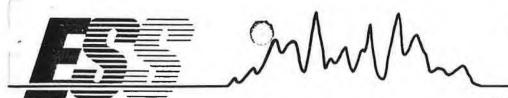
\* Values outside of QC Limits

Approved by:

David Dickinson

Laboratory Director

<sup>#</sup> Column to be used to flag recovery and RPD values with an asterisk



## CERTIFICATE OF ANALYSIS

#### TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

#### **METALS**

#### FPA METHOD 1311

Client: ATEC Environmental Consultants

Client Project ID: Stockpiled Soils

Client Sample ID: LSP-28

ESS Sample ID: 921528-01

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	0.005
Selenium	ND	0.3	ND	0.3
Silver	ND	0.05	ND	0.09
Copper	0.05	0.02	0.06	0.03
Nickel	0.04	0.04	0.04	0.04
Zinc	0.20	0.02	0.20	0.02
Beryllium	ND	0.02	ND	0.04
Thallium	ND	0.05	ND	0.09

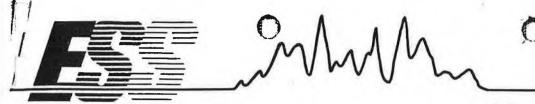
<sup>\*</sup> Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

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: US Army UST 28 Bldg 2290 ESS Project ID: 923028

Date Samples Received: 11/5/92 Date Reported: 11/9/92

Client ID	Lab ID	Results	Units	MRL
MW-1	923028-01	ND	mg/L	1
MW-2	923028-02	ND	mg/L	1
MW-3	923028-03	12	mg/L	1

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

Bylle Stall

Date: 11/9/92

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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. Please refer to the analytical reports for date and time of analysis.

47-12:

PROJ. NO.	PROJE	37. CT NAM	07. E U	9t	760	3 B	1dg	22	9 <i>0</i>	AIN OF C	USTO		PROJ.		7	LAB	ORAT	TORY	ANAL	.YSIS	/ , /
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																					Environmentai Consultants Division of ATEC Associates, Inc. 62 Accord Park Drive Norwell, MA 02061 (617) 878-6200
Relinquished I	oy: (Signal	rure)	uli	Date	/ Tim	ne	Recety	ed by	: (Signa	ture)	F	Reling	uished	by: (S	Signatu	re)	D	ate /	Time	Receive	d by: (Signature)
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SAMPLERS:	CLIENT Signature)			/	BLD	6. 2	296	, us	7"2	<u>8,-1</u>	LAG			/§	8/		ORATO	//		//	S. A. J. W.
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LRS-6	4					λ		-	X		3		×	X	-		X			1	Environi Consult Consult Division of ATEC Ass 62 Accord Park Drive Norwell, MA 02061 (617) 878-6200
LRS-1	8-64					x			X				x	X			x		157 BLDG	296	nvironmental consultants consultants vision of ATEC Associates, Inc. Accord Park Drive nwell, MA 02061 7) 878-6200
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CHAIN OF CUSTODY RECORD PROJECT NAME Ft. Devers - 5 tockpiled soils UST #15 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43 PROJ. NO. LAB PROJ. NO. Sylvensk 10/20/3/2018 37.07.45 CLIENT YOLONG SORONOS BULL SAMPLERS: (Signature) POTAL HOROCARBONS E. TONG METALS 1074 WETA 15/8) SAMPLING METHOD NUMBER OF CONTAINERS Cours Source COMPOSITE Gras/Composite ACIDIFIED FILTERED LAB I.D. NUMBER GRAB ICED SOIL SAMPLE DATE TIME I.D. NO. 6/26/92 5.28 5-30 LS-32 nvironmental onsultants -5-33 LS-36 0 2 LS-38 2 2519 L5-39 2520 LS-40 L5-42 3,573 6/29/42 Relinquished by: (Signature) Received by: (Signature) Relinquished by: (Signature) Date / Time Date / Time Received by: (Signature) Garles Langenhager 6/27 11:45 92 Received for Laboratory by: Date / Time Project Manager / Phone #: Relinquished by: (Signature) Date / Time (Signature)

PROJ. NO. 37. 07. 45	PROJEC UST CLIENT	CI NAM #5 28	E F 3, 29	T. 130,	31,	32, 2,	33, 3°	TULK 1, 35,	36, S	5 501L 37, 38,	.5	LAB	PRO	J. NO	/3	PI PI	.AB	OR	АТО	RY A	NAL	YSIS OF	/ of /
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LSP - 30°	11		X			X			1	3		1	λ		X		X	X	X	X	11	2401	
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LSP - 32	-11		X			X			x	3		X	X		λ		X	x	X	X	fo g	2439	Environmenta Consultants Consultants Division of ATEC Associates, Inc. 62 Accord Park Drive Norwell, MA 02061 (617) 878-6200
LSP - 33	- q		X			x			X	3		x	X		1		X	X	x	X	11	2434	Nironment onsultants ion of ATEC Associates, Inc. ccord Park Drive vell, MA 02061 ) 878-6200
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LSP-40.	.,		X			X			x	3		X	X		X		X	x	X	X	10	2686	1
LSP-41	11		X			X			x	3		V	χ		X	_	X	X	X	λ	H	2732	
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Relinquished		/		Date			Receiv	ed by	(Signa	ature)	F	I Relinq	L uishe	ed by	(Sign	ature)			Date	Tir	ne	Received	by: (Signature)
Relinquished				Date					Kapor	ratory by:		Da	te / T	ime	P	roject	Ма	nage	r / P	hone	#:		

**CHAIN OF CUSTODY RECORD** 

PROJ. NO.	PROJEC	CT NAM	E 7	an	h	28								LAB	PROJ	. NO.	/								
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																									A P
<i>(552</i>	110/92					×						1				X		-						_	0
2553	1/10/92		X			X						1			-	7	+	+	+						Divis 62 A Norw (617)
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#### **CHAIN OF CUSTODY RECORD**

PROJ. NO.	PROJEC	CT NAM	E -	1.	1.	23		131	119	7	770	9		LAB	PRO	J. NO	. /	/				200		1	/	
021151	CLIENT																/	•	LABC	PAT	ORY	ANA	LYSIS	/	The state of the s	/
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1353	110/2	ii.	+			X						1)				1				+	+	15%	1,4	(617) 878-6200	Consultants Division of ATEC Associates, Inc. 62 Accord Park Drive Norwell, MA 02061	2
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#### 4.10 HAZARDOUS WASTE MANIFEST

UST No. 0028 was estimated to contain 14 gallons of number 2 fuel oil. The fuel oil was removed on January 6, 1992, and transported to a licensed T.S.D.F. (Beede Waste Oil Corporation, Plaistow, New Hampshire).

The following Hazardous Waste Manifest was generated from residual tank materials during the vacuum process and cleaning process. The manifest dated January 6, 1992 is associated with vacuumed product of several USTs. Therefore, the total quantity (2,200 gallons) is much greater than the 14 gallons which were removed from UST 0028.



PRESS HARD - YOU

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

RE WOMEN THROUGH EIGHT COPIES. S

One Winter Street Boston, Massachusetts 02108

UNIFORM HAZARDOUS  1. Generator U	S EPA ID No.	Manifest // Document No.	2. Page 1		in the shade	
	10013151/151		PASSES AND AND ADDRESS OF THE PASSES AND ADDRESS AND ADDRE	anife at Docum		25G3 500
3. Generator's Name and Mailing Address HOS FORT AFZD DEC	Box 10	F0600.		R35363	THE PERSON NAMED IN COLUMN	
Tat Deve	us, ma ory	3			37.0	
4. Generator's Phone (5081-796-3002 2 5. Transporter 1 Company Name	4 HR 508-7	Number	KO STATE		64-000	1
						303
Beede Waste Oil Corp	NIHIDI AIRO		TO TROUB	decs Phone	9-11-2	17.
2. transporter 2 Company Name	111111		ESSURE L	ene Die		
8. Designated Facility Name and Site Address	10. US EPAID	_انابالل				
Beede Waste Oil Corp.	•		for Transpo	tora Phoons	THOUGH S	256.72
Kelley Road PO Box 127	Perceia	11116	SCISTAGE.		Nor Be	guiced (A)
Plaistow, NH 03865	N H D 0189	8140 12 Con	tainers	13. 603	1,82	2000
11. US DOT Description (Including Proper Shipping Name, Hezard	Class, and ID Number).	No.	1	Total Quantity	Unit Wt/Vol	
WASTE PETROLEUM OILS N.O.S.		13	TT T	22.50	G	MAO
COMBUSTIBLE LIQUID NA1270			111.	2299		APPROXIMATION OF THE PERSON OF
		1.0	1.1.			
				4111		READ POLICE
			te .			
		32 4 1 1	1110	1011		
		1.1.	1.0			X2.90%
			0 120			
		- 1.1.1	1111	1111		國被翻
SACTIONAL DE CRIPTION FOR MOTORISTS LESTE ADOLO FINANCIO PAR	calsinio and hatera code		EXPLINATION OF	Collegia W	sjas (Isteo)	Above Komb
			Handows In	1921 (C.24)		STATES
		constant in	<b>尼班京文</b> [6	是五数的	经过的	都常認
5. Special Handling Instructions and Additional Information						
				1.		
To be Recycled		, i		Recyc.	le	
6. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this co- graper shipping name and are classified, packed, marked, and labeled, and a	nsignment are fully and accur are in all respects in proper con	ately described above b dition for transport by h	y* iohway			
according to applicable international and national government regulations.			7			
If I am a large quantity generator, I cartify that I have a program in place to re	duce the volume and toxicity	of waste generated to th	ne degree ( have o	determined to be	economically	practicable
and that I have selected the practicable method of treatment, storage, or dis ment OR, KI am a small quantity generator, I have made a good faith effort	posal currently available to my to minimize my weste general	which minimizes the p ion and select the best t	resent and luture	int method that i	is evellable to r	ne and that i
can afford.		,	,			Date
Printed/Typed/Name /	Signature /	20 //			Month	Day, Yea
Mark BoseR	91	and Br		~	10/	06196
7. Transporter 1 Acknowledgement of Receipt of Materials		- V			121	Date
Printed/Typed Name	Signyturgy	1 :0 :-	1	, 1	Month	Day Year
ibert D. Wherphy Jr.	Caher	1. W. 7	land	21.	011	01451
8. Transporter 2 Acknowledgement of Receipt of Materials			1	1		Date
Printed/Typed Name	Signature	4. 0	4		Month	Day Yea
9. Discrepancy Indication Space		7				
3		4.7				
O. Facility Owner or Operator: Cartification of receipt of hazardous	materials covered by this	manifest except as	noted in Item	19.	-	15.
						Date
Printed/Typed Name	Signature				Month	Day Year

#### 4.11 WEIGHT RECEIPTS AND BILLS OF LADING

The following weight receipt documents the disposal of contaminated soil associated with UST 0028. The corresponding Bill of Lading is not available.

WAIN OFFICE: ANVERS 750-4200	5 CH DANV SHRE 651 LAH SHRE	FUMINOUS PRO JERRY DRIV P.O. BOX 2089 ERS, MA 01923-5 WSBURY DIVIS E STREET AT RT WSBURY, MA 019 81-1430 PLANT 78	E 089 ION E. 20 545	M	MN RRÍVE EFT	GI HEOK #	ash  HECKED B	C	ARRIER	1
	OFFICE	or Dail A		: :		1	ICKET	#.K		3231
Customer # ATEOO1 ATEC ASSOC. 62 ACCORD PARK DRIV BORWELL, MA 02061 617-878-6200 Time 3:34:58 Cost/Ton Perce	E B FO P Tare 39600	BLDGFD GARMY LDG ZZ 9 O. TO DET DEVENS, MA 37.04.72053  Ret 59500  Cost Amount	Gross 99100	2	#76 otal 29.75	HIK HAME OI	L SOIL	1	TRUCK® 9	
Loads	Job Total		me & Date	Fob/Del						v. <sup>A</sup>
y	249.23	- 3:34:36 p	n Aug 7, 199	<i>z</i> r	Ŷ	RECE	IVED BY .	SPONSIBLE BY TRUCK	PANY WILL NO E FOR DAMAG S DELIVERING TREET PAVEN	E CAUSED MATERIAL
MAIN OFFICE: DANVERS 750-4200	DANV SHRE 651 LAK SHRE	PROJECT OF THE PROJEC	089 ION E. 20	IVII	RRIVED JOE EFT JOB CH	HECK #	ash  HECKED B	CA	ARRIER	3230
Customer # ATEO01		# BLDGFD		MIX #	<b>*</b> 76	MIX NAME OI	L SOIL		TRUCK# 9	
ATEC ASSOC. 2 ACCORD PARK DELVORWELL, MA 02061 617-878-6200	E BI	ARMY DG ZZ90 T RT DEVENS, MA ( 37.04.72053						,		1 **
Time 3:11:20	Tare 39600	Net 58380	Gross 97980		otal 9.19					
Cost/Ton Percer	nt Tax Load	Cost Amount 1	'ax Dest Char	ge To	tal Cost					i.
Load#	Job Total 219.48		me & Date Aug 7, 1992	Fab/Del					PANY WILL NO	
	4.							BY TRUCKS	DELIVERING TREET PAVEM	MATERIAL

10

RECEIVED BY \_

#### 4.12 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. This disposal receipt has the correct building number but the incorrect UST number. This is a typographical error.



### 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 G.L. as provided in Section 38A 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. 1 40

State clearly type of inert gas used in steel storage tank

Fee paid \$ N/A

steel tank! Dry 109

Name and address of contractor disposing tank ATEC. Associates 62 Accord Park Dr., Norwell Location to which tank will be transported

This permit will expire31100 1992

Sprature of official granting permit(TimLE)
(Head of Fire Dept.)

DIG SAFE NUMBER

6101 Bell . ma

1

1

RECEIPTION DISPOSAL OF UNDER	GROUND STERM STORAGE TANK	
NAME AND ADDRESS JOHN	C TOMBARBLO & SONS	(2)
OF - '?'	ACTIVICA SIL	
APPROVED TANK YARD 'V	EPICE MASS. 0184	
PPROVED TANK YARD NO 1	4901	
eank Yard Ledger 502 CMR 3.0		1 1 3
certify under penalty of law I hav	e personally examined the underground st d" by fixm, corporation or partnership /	ATER EACH MANAGER ACAL.
and acc	epted same in conformance with Massachus	etts Fire Prevention
egulation 502 CMR 3.00 Provisions f	or Approving Underground Steel Storage T	ank dismentling yards.
his tank to this yard.	Head of Fire Department FDID# 1 7 G	1 d to transport
	tank yard owner or owners authorized ren	resentative:
Danie Maranto	<u> </u>	8-92
C SHEWATURE	TITLE DATE SIG	NED
his signed receipt of disposal must	be returned to the local head of the fir	re department
OTD# 1 7 9 1 9 pursuant to 502	CMR 3:00. (EACH TANK MUST HAVE A RECEIP	T OF DISPOSAL)
ORM F.P. 291 (rev. 9/88)	(OVER) MASSACHU	SETTS STATE FIRE MARSHAL'S OFFIC
the same processing the same		
4" ( ", "		
1 to 1		
There is a second to the		
· 1		
	25 06-50	
DIMENSIONS	Tank Removed From	#2290
DIMENSTONS		106 # 2000 tune#30
Width Length	ET. DEVENS B	TOG-45 10 1010
	(no. street)	
Tank 1 48" x 10'8"		
Tank 1 X	AYER	
3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	(city or town)	
Tank 2 X	(2,0) 0, 00,00	
Tank 3 X	Fire Department n	nna -listade
	Permit L F	
Tank 4 X	(if ap	opiicable)
	· *	N
Tank 5 X	- G. F.	1873-178 (17)
(feet) (feet)	TAX/6	I DU GLOI
(1000)	,	
		1.
	ATTN.	Mark

#### 4.13 UST CLOSURE CHECKLIST

The following closure checklist was produced by ATEC Associates Inc., to ensure quality control of the proper abandonment of a UST.

UST-CLOSURE O/C CHECK LIST	Tank	28 1	1dg 2290	Fort Dever	<u> </u>
UST-CLOSURE O/C CHECK LIST  /º º º G G No. ?  DEFINABLE FEATURE	Fred				
DEFINABLE FEATURE	DATE	TIME	MEASUREMENTS		NOTES
Calibrate PID & LEL/O2 meters	1/10/72	8:00			Site Topography: /evel,
					gently downgradient 75'
Drain & flush piping & pumps	1/9/92	2:30			Site Topography: level.  gently de magnatient 75' to south of UST
	1				
Excavate to top of tank	1/9/92	3:00			Depth to tank: /, 5
Vent tank note LEL/O2 levels & times			LEL	O2	
	1/10/97	T1: 10: 00	1-	10.8	
		T2: 10:15	1	70,8	
		T3: /0:30	0	70.9	
		T4: 10:115	G	70.9	
		T5:			
		T6:			
		T7:			
		T8:			
		T9:		5	
		T10:			
		T11:			
		T12:			
Pump & clean tank:	1/7/92	1:45	gal liquid		Tank Dimensions: 4×
Note quantities liquid (gal) & sludge (lbs)			lbs. sludge		no heles serforations some sufficial rust
					some sufficial rust
Remove all tank connections, and cap openings	1/9/92	3:00			
				······································	
Excavate soils to free tank	1/9/52	3:15		***************************************	
Segregate stained soils: Note PID readings	1/9/92	1	PID (ppm)	NDIR (ppm)	none visibly conformated
(if >10 ppm NDIR also)					stock-1
					stack-2
				······································	
	1		1		
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*				
DEFINABLE FEATURE	DATE	TIME	MEASUREMENTS	NOTES
Remove tank, piping, pumps, and hardware.	1/10/12	10:00	Photographic Descriptions:	Soil Description: 10 to med brown
Photograph excavation; note descriptions.	1	1	Photo 1: + ~ 4	fine silt & sand w/some
Sketch Schematic			Photo 2: 10-4	11. ed - cocrse 21 evel
			Photo 3:	
			Photo 4: ex car	
			Photo 5:	Depth to Groundwater/Conditions: ///A
			Photo 6:	
Place tank at safe distance from excavation	1/11/92	10:00		Depth of Excavation: 5
Secure tanks transport off-site	1/10/97	10:30		
Obtain 10 soil samples from	1/10/92	10:00	PID (ppm) NDIR (ppm)	Sample locations: 75 - 3.6
excavation walls/bottom: Note PID/NDIR			SS1: 8.7	5 wall
readings and sample locations.			SS2: //. o	( wall
			SS3: /3. 7	wal
			SS4: 3,0	Wurd
			SS5: 1.5	1 wal
			SS6: 9,4	N wall
			SS7: // ?	Ewall
			SS8: /o.c	Ewall
			SS9: //. \$	40 + for
			SS10: 7.0	botton
Obtain 2 soil samples & 1 water samples	1/10/97	10:00		Sample Locations:
for laboratory analysis. Note sample locations.		-		LSS1: - 358
		-		LSS2: - 55 9)
		-		LWS1:
				LSS3: stockpite composition

Note amount & type of backfill  Close open excavation (if applicable)  Restore surface and rope off  Remove rubbish/debris  Transport hazardous material off-site:  Note amount/classification  Make copies of manifests, permits,	UST.CLOSURE O/C CHECK LIST					•
Lons of backfill Backfill excavation (if clean): Note amount & type of backfill Close open excavation (if applicable) Restore surface and rope off Remove rubbish/debris Transport hazardous material off-site: Note amount/classification Make copies of manifests, permits,	DEFINABLE FEATURE	DATE	TIME	MEASUREMENTS	NOTES	***************************************
Backfill excavation (if clean):  Note amount & type of backfill  Close open excavation (if applicable)  Restore surface and rope off  Remove rubbish/debris  Transport hazardous material off-site:  Note amount/classification  Make copies of manifests, permits,  Backfill description:  Backfill description:  Amount Classification						11
Note amount & type of backfill  Close open excavation (if applicable)  Restore surface and rope off  Remove rubbish/debris  Transport hazardous material off-site:  Note amount/classification  Make copies of manifests, permits,	Backfill excavation (if clean):					***************************************
Note amount/classification  Make copies of manifests, permits,	Note amount & type of backfill					
Restore surface and rope off  Remove rubbish/debris  Transport hazardous material off-site:  Note amount/classification  Make copies of manifests, permits,						
Remove rubbish/debris  Transport hazardous material off-site:  Note amount/classification  Make copies of manifests, permits,	Close open excavation (if applicable)					•••••
Transport hazardous material off-site:  Note amount/classification  Make copies of manifests, permits,  Amount Classification	Restore surface and rope off					
Note amount/classification  Make copies of manifests, permits,	Remove rubbish/debris					
Make copies of manifests, permits,	Transport hazardous material off-site:				Amount	Classification
	Note amount/classification					
	Make copies of manifests, permits,					
and disposal receipts.	and disposal receipts.					

#### 4.14 INSTALLATIONS

The installation of a replacement UST No. 0028 was not performed.

#### 4.15 BORING LOGS

The following boring logs were completed during the installation of groundwater monitoring wells (MW-1 to MW-3), located at Building 2290, Fort Devens, Massachusetts.



PROJECT NAME: FT. DEVENS

PROJECT LOCATION: UST# 28; BLDG 2290 BORING LOCATION: SEE SITE SCHEMATIC

## GROUND WATER MONITORING WELL BORING/INSTALLATION LOG

LOG OF BORINGWELL: MW. -1

MST# 28; BLD6 2290

FOREMAN: MATT BOVENZI INSPECTOR: C. TROMBLY

DATE: 9-30-92

SOIL/ROCK DESCRIPTION	DEPTH FEET	SAMP. NO.	S.P.T.		Surface Elevation Flush u
FINE SAND COLUR: TAN CONSISTENLY: MERY LOOK NOTE: NO PETRO. ODOR PIA: N. D.	0'-2'	MW 1.1	TFF		Length of Riser Above Surface Elevation 2" B_G. Surface Elevation GRADE  Type/Thickness of Surface Seal 1.0' CONCRETE
FINE TO CORRSE SAND OLDR: TAN-GREY OUNSISTENCY: MED. DENSE NOTE: NO PETRUL OBOR PID: MD.	4'-6'	MW 1,2	9.8.7.12	<b>-</b>	ID/Type of Protect, Casing  Depth Bottom of Casing 2.0 BELOW GRADE  ID/OD/ Type Riser Z.0" - PVC
SILT/CLAY  COLOR: GREY/GREEN  CONSISTENCY: STIFF  NOTES - NO PETRO, OPOR	9'-11'	14 W Z.3	7-11-9-8	* <b>*</b>	Diameter of Borehole 8.0"  Type of Backfill  @ RiserNATIVE
PIL: NID, 12.5	- BEDROC	×			Depth/Type Bottom Seal_BENTANITE
· .					Depth Top of Screen 2.5
					ID/OD/Type 2.0" Screen PUC 10. StoT
					Type Backfill @ Screen SILMA /SAND
					Depth Bottom of Screen/2.6
					Type of Backfill Below Screen BEDROCK



PROJECT NAME: FT DEVENS

PROJECT LOCATION: UST# 28; BLDG 2290 BORING LOCATION: SEE SITE SCHEMATIC

## GROUND WATER MONITORING WELL BORING/INSTALLATION LOG

LOG OF BORINGWELL: MW-2

457#28; BLDG 2290

POREMAN: MATTBOVENZI INSPECTOR: C. TROMBLY

DATE: 9-30-92

SOIL/ROCK DESCRIPTION	DEPTH	SAMP.	S.P.T.	Length of Casing Above Surface Elevation
FINE SAND COLOR: BLACK	0'-2'	MW	TFF	Length of Riser Above Surface Elevation
RONSISTENCY: VERY LOUSE NOTES: NO PETRO. OLOR		2. /		Surface Elevation GCADE  Type/Thickness
PID: N.D.				of Surface Seal 1-0'-CONCRETE
FINE TO COARSE SAND AND GRAVEL COLOR: LIGHT BROWN	4'-6'	MW 2.2	16-13-15-15	ID/Type of Protect. Casing
CONSISTENCY: MED. DENSE NOTES: NO PETRO OLOR				Depth Bottom 2.0' BELOWI GRA.
71DL N.D.				Type Riser Z.O" PVC
SAND/CLAY COLOR: BROWN/GREY CONSISTENCY: STIFF	9-11	MW. 2.3	25.21-13.13	Diameter of 8.0
NOTES: NO PETED. 040R				Type of Backfill  @ Riser_ NATIVE
- H20				[日 日
H <sub>2</sub> 0	· · · · · · · · · · · · · · · · · · ·		- 115	DeptivType Bottom Seal_ BENTONITE
BED ROCK	15.0			Depth Top 5.0'
				ID/OD/Type2-0"
161				Screen PVC - 10-SLOT
				Type Backfill @ Screen SILICA
				Depth Bottom of Screen 15.0
****				Type of Backfili Below Screen BEURDEK

# ATEC ENVIRONMENTAL CONSULTANTS

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

PROJECT LOCATION: UST 28: BLDO. 1290

BORING LOCATION: SEE SCHEMATIC

## GROUND WATER MONITORING WELL BORING/INSTALLATION LOG

LOG OF BORINGWELL: M.W. 73

45T# 28; BLOG 2290

FOREMAN: MATT BOVENZI INSPECTOR: C. TROMBLY

DATE: 9-30-92

SOIL/ROCK DESCRIPTION	DEPTH	SAMP.	S.P.T.		Length of Casing Above Surface Elevation FLUSH
MED COHRSE SAND COLUE: BROWN	0'-2'	M W 3.1	TFF		- Length of Riser Above Surface Elevation 2.0' β. ε.
CONSISTENCY: VERY LOWE NOTES: NO PETRO DEDR		3.1			- Type/Thickness of Surface Seal 1.0'-Commerti
P10: 10.0.					Protect, Casing 6.
SAND/SILT COLOQ: BCOWN/GREY	4.'-6.'	MW 3.2	4.5.4.4		of Casing Z.D' £.6.
CONSISTENCY! LOOSE NOTES! NO PETRO. OLOIC					Type Riser_ 2, 11 Pvc
12: N.D.					Borehole 8.
SILT COLOR: GREY/BLUE CONSISTEIXY: VERY STIFF			9.6.5.12	- A 100 A 1	@ Riser
OFFICE STOPS HYDROTALES OFFICE OF THE STOP	3			45.55 W	- Depth/Type Bettom Seal
1120					- Depth Top 4,0
BEDROCK	14.0				- ID/OD/Type 2. Screen PVL - 10 5207
				*	Type Backfill @ Screen 51LICA
					Depth Bottom of Screen
				-	Type of Backfill Below Screen ZEAR OLK

#### **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)