

**THE COMMONWEALTH OF MASSACHUSETTS
GOVERNMENT LAND BANK
Devens Commerce Center
Devens, Massachusetts**

**UNDERGROUND STORAGE TANK
CLOSURE REPORT**

UST NO. 3596

SEPTEMBER 1996

**Prepared by:
S E A CONSULTANTS INC.
Science/Engineering/Architecture
Cambridge, Massachusetts
Rocky Hill, Connecticut
Londonderry, New Hampshire
Rochester, New York**

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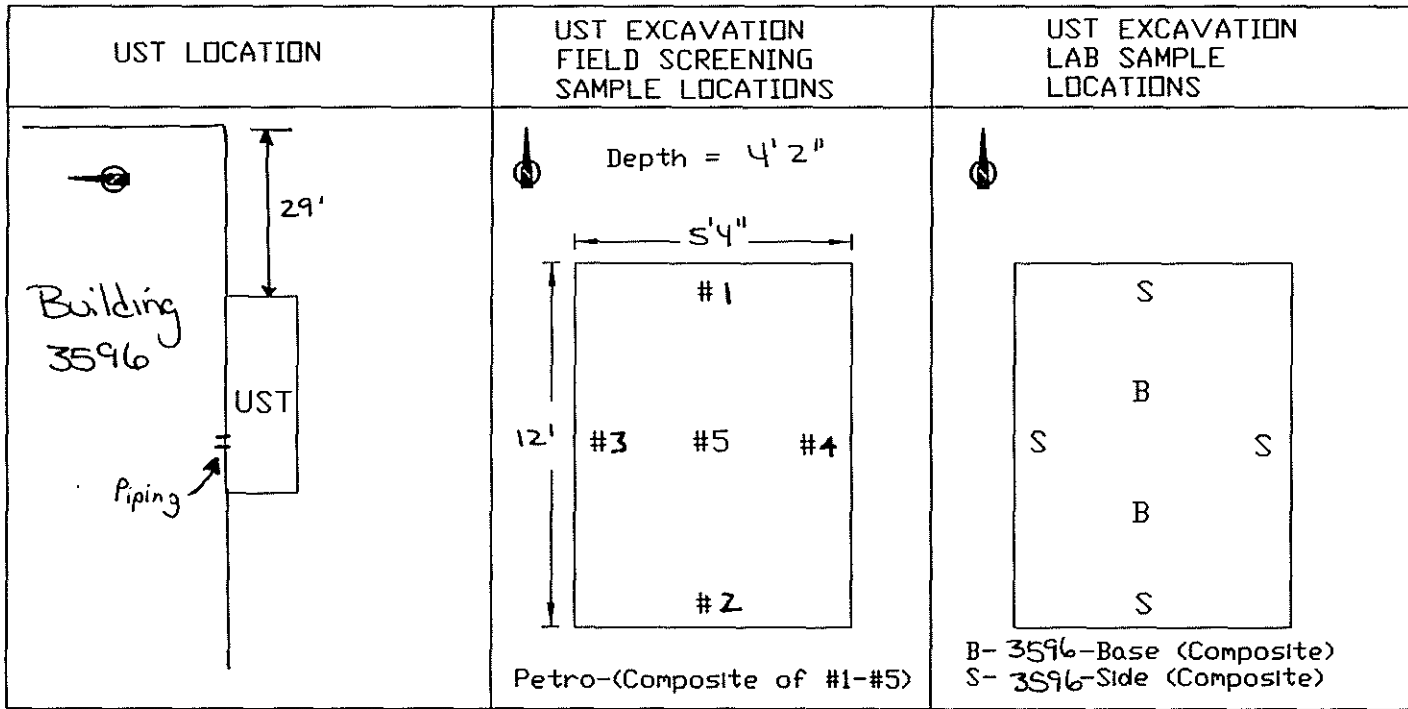
1.0 INTRODUCTION

This Underground Storage Tank (UST) Closure Report has been completed in accordance with the Commonwealth of Massachusetts Underground Storage Tank Closure Assessment Manual, dated April 9, 1996, and the Devens Commerce Center's (DCC) "*Underground Storage Tank Closure Protocol*" (Addendum to a DEP-approved Tier 1A permit), dated June 14, 1996. The 1,000-gallon UST was located at Building 3596, Dakota Street, Devens, Massachusetts (north/east [North American Datum, 1983] coordinates 3022576/627103). The former location of this UST is shown on Figure 1.

The 1,000-gallon steel UST, storing No. 2 heating oil, was removed on May 29, 1996. Headspace and Petroflag field screening on soil adjacent to the UST and associated piping indicated minimal impact to the soils from the UST/piping. Laboratory tests within the UST excavation confirmed contaminant levels below applicable regulatory levels outlined in the Massachusetts Contingency Plan (MCP) [310 CMR 40.0000]. Following review of the laboratory data, the excavated hole was backfilled.

2.0 BACKGROUND

The UST at Building 3596 was originally installed in 1966 by the U.S. Army to store No. 2 heating oil for Building 3596. Upon the closure of Fort Devens, the UST's ownership was transferred from the U.S. Army to the DCC. As part of the DCC's goal to develop Fort Devens, a number of USTs, including this UST at Building 3596, were removed. This steel UST had a diameter of four (4) feet and a length of eleven (11) feet. The associated piping was copper tubing.



FIELD SCREENING				
SAMPLE #	DEPTH	TPH SCREEN	HEAD SPACE	LAB ANAL METHOD
#1			0.3	
#2			0.2	
#3			0.4	
#4			0.1	
#5			1.5	
PETRO		182		
3596-BASE				64.2
3596-SIDE				176

Figure 1
UST and Sample Locations
Massachusetts Land Bank
Devens, Massachusetts

3.0 UST REMOVAL

On May 29, 1996, D&C Construction Co., Inc. of Rockland, Massachusetts, as part of its UST removal contract with the DCC, removed product from the UST with a vacuum truck. Later, soil above the UST and its associated piping were removed with an excavator and hand shovel. The UST was then tilted by the excavator to allow the remaining product to pool at the UST's bottom corner. A two-foot by two-foot access hole was then cut in the UST after it had been tested for combustible gases and oxygen. A laborer then made entry into the tank, and, using squeegee wipers, rags and a vacuum hose, cleaned out the remaining product from the tank. All product was transported off-site as hazardous waste. The manifests are in Appendix A. On May 29, 1996, the UST was removed and transported off-site. Transfer documentation (Forms FP290R and 291) is in Appendix B. A total of four (4) cubic yards of soil were excavated as part of the UST removal. Contaminant levels within the stockpile were later found to be below applicable regulatory thresholds.

4.0 FIELD OBSERVATIONS AND ASSESSMENT

Upon removal of the UST, it was observed to be intact with very little rust. There was no visual or olfactory evidence of impacted soil within the excavation and groundwater was not observed.

Soil was then collected for Jar Headspace measurements using a Photoionization Detector (PID), and Total Petroleum Hydrocarbons (TPH) readings were measured using a Petroflag Hydrocarbon Analyzer. PID readings ranged from 0.1 to 1.5 ppmv. A composite sample collected from the sidewalls and base of the excavation measured 182 ppm of TPH using the Petroflag Hydrocarbon Analyzer. Results and sampling locations are shown in Figure 1. Due to the low levels of these field readings, no further excavation was conducted and samples were collected from the excavation and associated soil stockpile for laboratory

analysis. The sidewalls and base of the excavation were analyzed for TPH [Method 418.1], and the associated stockpile was analyzed for TPH [Method 418.1], Polynuclear Aromatic Hydrocarbons (PAHs) [Method 8270], and Volatile Organic Compounds (VOCs) [Method 8260]. All samples were below the applicable MCP "RCS-1 Reportable Concentrations". Results and sampling locations are shown in Table 1 and Figure 1, respectively. The laboratory analytical data package is contained in Appendix C.

After receipt of the laboratory data, the stockpiled soil was backfilled into the excavation. Off-site fill was then added and compacted to bring the excavation back to grade. Compaction documentation is contained in Appendix D.

TABLE 1
SUMMARY OF LABORATORY ANALYTICAL RESULTS

SAMPLE I.D. NUMBER	ANALYTE	LABORATORY RESULT (PPM)	RCS-1* (PPM)
3596-Base	TPH	64.2	500
3596-Side	TPH	176	500
3596-Stock	TPH	163	500
3596-Stock	Fluorene	ND	400
3596-Stock	Phenanthrene	ND	100
3596-Stock	Anthracene	ND	1,000
3596-Stock	Fluoranthene	ND	600
3596-Stock	Pyrene	ND	500
3596-Stock	Benzo(a)anthracene	ND	0.7
3596-Stock	Chrysene	ND	7
3596-Stock	Benzo(b)fluoranthene	ND	0.7
3596-Stock	Benzo(a)pyrene	ND	0.7
3596-Stock	Indeno(1,2,3-cd)pyrene	ND	0.7
3596-Stock	Toluene	ND	90
3596-Stock	Ethyl Benzene	ND	80
3596-Stock	Xylenes	ND	500

*Applicable Reportable Concentration (310 CMR 40.1600).
ND = Not Detected above laboratory detection limits.

APPENDIX A

UNIFORM HAZARDOUS WASTE MANIFESTS



DEPARTMENT OF ENVIRONMENTAL PROTECTION
 DIVISION OF HAZARDOUS MATERIALS
 One Winter Street
 Boston, Massachusetts 02108

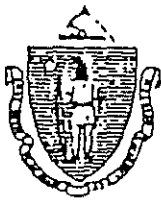
se print or type. (Form designed for use on elite (12-pitch) typewriter.)

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator US EPA ID No. <u>M P 50 9 772 (34) 4818</u>	Manifest Document No. <u>4818</u>	2. Page 1 of 1	Information in the shaded areas is not required by Federal law.
3. Generator's Name and Mailing Address DEVENS COMMERCE CENTER 43 BUENA VISTA ST. P-12 FORT DEVENS, MA 01433		6. US EPA ID Number <u>MA 01433</u>		A. State Manifest Document Number <u>MA J14B181</u>	
4. Generator's Phone (<u>508 772-6340</u>)		7. Transporter 1 Company Name <u>ENVIRONMENTAL PRODUCTS & SERVICES, INC</u>		B. State Gen. ID <u>SAME</u>	
5. Transporter 1 Company Name		6. US EPA ID Number <u>MA 01433</u>		C. State Trans. ID <u>13870ACT</u>	
7. Transporter 2 Company Name		8. US EPA ID Number		D. Transporter's Phone (<u>315 471-0503</u>)	
9. Designated Facility Name and Site Address OLSENS GREENHOUSES 590 SOUTH STREET EAST RAYNHAM, MA 02767		10. US EPA ID Number <u>MA D059730008</u>		E. State Trans. ID	
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)		12. Containers		F. Transporter's Phone	
a. FUEL OIL MIXTURE, COMBUSTIBLE LIQUID, NA1993, PGI II		No. Type		G. State Facility's ID <u>Not Required</u>	
b.		13. Total Quantity		H. Facility's Phone (<u>508 822-1151</u>)	
c.		14. Unit Wt/Vol		14. Waste No.	
d.		14. Unit Wt/Vol		14. Waste No.	
J. Additional Descriptions for Materials Listed Above (include physical state and hazard code.)		K. Handling Codes for Wastes Listed Above			
a. <u>12 OIL, WATER</u>		a. <u>D 8 Y</u>			
b.		b.			
b.		c.			
b.		d.			
15. Special Handling Instructions and Additional Information Job #: E0653 PO #: Emergency #: (315)471-0503 ERG A. 27 <i>BURWEN FOR ENEMY</i>					
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.					
Printed/Typed Name <u>RONALD J. OSTROWSKI</u>		Signature <i>R J Ostrowski</i>		Date <u>05/29/96</u>	
17. Transporter 1 Acknowledgement of Receipt of Materials		Signature <i>Philip Pike Jr</i>		Date <u>05/29/96</u>	
Printed/Typed Name <u>Philip Pike Jr</u>		Signature		Date	
18. Transporter 2 Acknowledgement of Receipt of Materials		Signature		Date	
Printed/Typed Name		Signature		Date	
19. Discrepancy Indication Space					
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest, except as noted in Item 19.					
Printed/Typed Name <u>Philip Pike Jr</u>		Signature <i>Philip Pike Jr</i>		Date <u>05/29/96</u>	

MA J14B181 COPY>3: FACILITY MAILS TO GENERATOR

APPENDIX B

TANK MANIFESTS AND RECEIPTS



The Commonwealth of Massachusetts

Department of Public Safety—Division of Fire Prevention

APPLICATION FOR PERMIT FOR REMOVAL AND TRANSPORTATION TO APPROVED TANK YARD

29 MAY 1996

C.82 S.40 M.G.L. DIG SAFE NUMBER 961907225 Start Date MAY 96

#0055596 To: HEAD OF FIRE DEPARTMENT CHIEF PARENTEAU City or Town #0063596

In accordance with the provisions of Chapter 148, G.L. as provided in Section 38A Application is hereby made by JIM MORRIS (Name of Person, Firm or Corporation)

9 TOTAL 2687, 2688, 2637, 2979 1431, 1437, 1468, 1602, 3596 (BLDG #'S) 248 RIVER ST. NORWELL, MA 02061 Address

For permission to remove and transport underground steel storage tank(s) from: DEVENTS COMMERCE CENTER Street address (city or town) FT. DEVENTS, MA 01733

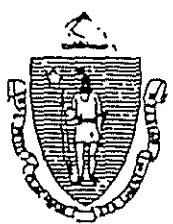
FDID# 17919 to approved Tank Yard# 008

State clearly type of Inert gas used in steel storage tank CO2 Type of inert gas used

Name of Person, Firm, Corporation disposing tank J GRANT READING, MA.

Date issued - rejected 19 By: J.G. Morris Signature of Applicant Date of expiration 19 paid/due

REC'D TOTAL 225.00 Fee 25.00 PER (MGL C-148, S-10A)



The Commonwealth of Massachusetts

DEPARTMENT OF PUBLIC SAFETY—DIVISION OF FIRE PREVENTION

PERMIT

FOR REMOVAL AND TRANSPORTATION TO APPROVED TANK YARD

C.82 S.40 M.G.L. DIG SAFE NUMBER

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

Full name of person, firm or Corporation To transport underground steel storage tank(s) to Approved tank yard#

State clearly type of Inert gas used in steel storage tank steel tank: method

FDID# 17919 Name and address of contractor disposing tank Fee paid \$ Location to which tank will be transported

This permit will expire 19

Approved tank yard# Signature of official granting permit (TITLE) (Head of Fire Dept.)

RECEIPT OF DISPOSAL OF UNDERGROUND STEEL STORAGE TANK

NAME AND ADDRESS JAMES G. GRANT CO., INC.
OF R. 28 WOLCOTT ST.
APPROVED TANK YARD READVILLE, MA 02137
APPROVED TANK YARD NO.



Tank Yard Ledger 502 CMR 3.03(4) Number: 2222368

I certify under penalty of law I have personally examined the underground steel storage tank delivered to this "approved tank yard" by firm, corporation or partnership Jim Monnis - D+C and accepted same in conformance with Massachusetts Fire Prevention

Regulation 502 CMR 3.00 Provisions for Approving Underground Steel Storage Tank dismantling yards.

A valid permit was issued by LOCAL Head of Fire Department FDID# 17919 to transport this tank to this yard.

Name and official title of approved tank yard owner or owners authorized representative:

[Signature] [Title] 5-29-96
SIGNATURE TITLE DATE SIGNED

This signed receipt of disposal must be returned to the local head of the fire department FDID# 17919 pursuant to 502 CMR 3:00. (EACH TANK MUST HAVE A RECEIPT OF DISPOSAL)

Tank Data

Gallons 1,000

Previous Contents #2FO

Diameter _____ Length _____

Date Received 5-29-96

Serial # (if available) _____

Tank I.D. # (Form FP-290) _____

Tank Removed From:

1 DEVENIS COMPANY CT5
(No. and Street)

FT DEVENIS
(City or Town)

Fire Dept. Permit # 1/11

Owner/Operator to mail revised copy of Notification Form (FP-290, or FP-290R) to: UST Compliance, Office of the State Fire Marshal, 1010 Commonwealth Avenue, Boston, Ma. 02215.

APPENDIX C

LABORATORY ANALYTICAL RESULTS

SAMPLE IDENTIFICATION

- 27 1676-STOCK
- 28 1676-BASE
- 29 1676-SIDE
- 30 3596-STOCK
- 31 3596-BASE
- 32 3596-SIDE
- 33 1468-BASE
- 34 1468-SIDE
- 35 2729-BASE

SAMPLE ID 1676-BASE SAMPLE # 28 FRACTIONS: A
Date & Time Collected 05/29/96 15:30:00 Category SOIL

TPH_IR 144
mg/kg DL=40.0

SAMPLE ID 1676-SIDE SAMPLE # 29 FRACTIONS: A
Date & Time Collected 05/29/96 15:30:00 Category SOIL

TPH_IR 101
mg/kg DL=40.0

SAMPLE ID 3596-STOCK SAMPLE # 30 FRACTIONS: A
Date & Time Collected 05/30/96 13:17:00 Category SOIL

TPH_IR 163
mg/kg DL=40.0

Received: 05/30/96

Results by Sample

SAMPLE ID 3596-STOCKFRACTION 30ATEST CODE 8260NAME PURGEABLE ORGANICS VOADate & Time Collected 05/30/96 13:17:00Category SOILEPA 8260 PURGEABLE ORGANICS

	RESULT	LIMIT		RESULT	LIMIT
Chloromethane	ND	10	o-Xylene	ND	5.0
Bromomethane	ND	10	m-Xylene	ND	5.0
Vinyl Chloride	ND	2.0	p-Xylene	ND	5.0
Chloroethane	ND	10	1,2-Dichlorobenzene	ND	5.0
Methylene Chloride	ND	10	1,3-Dichlorobenzene	ND	5.0
1,1-Dichloroethene	ND	5.0	1,4-Dichlorobenzene	ND	5.0
Trichlorofluoromethane	ND	10	Naphthalene	ND	10
1,1-Dichloroethane	ND	5.0	n-Propylbenzene	ND	10
Trans-1,2-Dichloroethene	ND	5.0	Bromobenzene	ND	5.0
Chloroform	ND	5.0	Bromochloromethane	ND	5.0
1,2-Dichloroethane	ND	5.0	n-Butylbenzene	ND	10
1,1,1-Trichloroethane	ND	5.0	sec-Butylbenzene	ND	10
Carbon Tetrachloride	ND	5.0	tert-Butylbenzene	ND	10
Bromodichloromethane	ND	5.0	2-Chlorotoluene	ND	5.0
1,2-Dichloropropane	ND	5.0	4-Chlorotoluene	ND	5.0
Trichloroethene	ND	5.0	1,2-Dibromo-3-chloropropane	ND	5.0
Dibromochloromethane	ND	5.0	1,2-Dibromomethane	ND	5.0
1,1,2-Trichloroethane	ND	5.0	Dibromomethane	ND	5.0
Benzene	ND	5.0	Dichlorodifluoromethane	ND	10
1,1-Dichloropropene	ND	5.0	cis-1,2-Dichloroethene	ND	5.0
2,2-Dichloropropane	ND	5.0	1,3-Dichloropropane	ND	5.0
Bromoform	ND	5.0	1,1,1,2-Tetrachloroethane	ND	5.0
Hexachlorobutadiene	ND	10	1,2,3-Trichlorobenzene	ND	5.0
Isopropylbenzene	ND	10	1,1,2,2-Tetrachloroethane	ND	5.0
Tetrachloroethene	ND	5.0	1,2,4-Trichlorobenzene	ND	5.0
Methyl tertiary butyl ether	ND	5.0	1,2,3-Trichloropropane	ND	5.0
Toluene	ND	5.0	1,2,4-Trimethylbenzene	ND	10
Chlorobenzene	ND	5.0	1,3,5-Trimethylbenzene	ND	10
Ethyl Benzene	ND	5.0			
p-Isopropyltoluene	ND	10			

Notes and definitions for this report:

DATE RUN 06/07/96
 ANALYST CM
 INSTRUMENT _____ B
 DIL. FACTOR 1
 UNITS ug/Kg
 COMMENTS _____

ND = Not detected at detection limit

Received: 05/30/96

Results by Sample

SAMPLE ID 3596-STOCKFRACTION 30ATEST CODE 827PAHNAME 8270 PAH ONLYDate & Time Collected 05/30/96 13:17:00Category SOIL

BASE NEUTRAL EXTRACTABLES

	RESULT	LIMIT
Naphthalene	<u>ND</u>	<u>370</u>
Acenaphthylene	<u>ND</u>	<u>370</u>
Acenaphthene	<u>ND</u>	<u>370</u>
Fluorene	<u>ND</u>	<u>370</u>
Phenanthrene	<u>ND</u>	<u>370</u>
Anthracene	<u>ND</u>	<u>370</u>
Fluoranthene	<u>ND</u>	<u>370</u>
Pyrene	<u>ND</u>	<u>370</u>
Benzo (a) anthracene	<u>ND</u>	<u>370</u>
Chrysene	<u>ND</u>	<u>370</u>
Benzo(b)fluoranthene	<u>ND</u>	<u>370</u>
Benzo(k)fluoranthene	<u>ND</u>	<u>370</u>
Benzo(a)pyrene	<u>ND</u>	<u>370</u>
Indeno(1,2,3-cd)pyrene	<u>ND</u>	<u>370</u>
Dibenz(a,h)anthracene	<u>ND</u>	<u>370</u>
Benzo(g,h,i)perylene	<u>ND</u>	<u>370</u>
2-Methylnaphthalene	<u>ND</u>	<u>370</u>

Notes and Definitions for this Report:

UNITS: ug/KgEXTRACTED: 06/06/96DATE RUN: 06/06/96ANALYST: PACINSTRUMENT: FDIL. FACTOR: 1

ND = not detected at detection limit

Received: 05/30/96

Results by Sample

SAMPLE ID <u>3596-BASE</u>	SAMPLE # <u>31</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>05/30/96 13:17:00</u> Category <u>SOIL</u>
TPH_IR <u>64.2</u>	
mg/kg DL=40.0	

SAMPLE ID <u>3596-SIDE</u>	SAMPLE # <u>32</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>05/30/96 13:17:00</u> Category <u>SOIL</u>
TPH_IR <u>176</u>	
mg/kg DL=40.0	

SAMPLE ID <u>1468-BASE</u>	SAMPLE # <u>33</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>05/30/96 13:25:00</u> Category <u>SOIL</u>
TPH_IR <u>181</u>	
mg/kg DL=40.0	

SAMPLE ID <u>1468-SIDE</u>	SAMPLE # <u>34</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>05/30/96 13:25:00</u> Category <u>SOIL</u>
TPH_IR <u>461</u>	
mg/kg DL=40.0	

SAMPLE ID <u>2729-BASE</u>	SAMPLE # <u>35</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>05/30/96 13:00:00</u> Category <u>SOIL</u>
TPH_IR <u>352</u>	
mg/kg DL=40.0	

D & C CONSTRUCTION
 JUL 16 1996
 RECEIVED

TEST CODE 8260 NAME PURGEABLE ORGANICS VOA

EPA METHOD: 8260: Gas Chromatography/Mass Spectrometry for Volatile Organics.

Reference: Test Methods for Evaluating Solid Wastes: Physical/Chemical Methods.
EPA SW-846 (Third Edition) 1986. Office of Solid Waste, USEPA.

RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

TEST CODE 827PAH NAME 8270 PAH ONLY

EPA METHOD: 8270 GAS CHROMATOGRAPHY / MASS SPECTROMETRY FOR SEMIVOLATILE
ORGAINCS; CAPILLARY COLUM TECHNIQUE. BASE NEUTRAL ONLY.

REFERENCE: TEST METHODS FOR EVALUATING SOLID WASTES: PHYSICAL/CHEMICAL METHODS.
EPA SW-846 (THIRD EDITION) 1986. OFFICE OF SOLID WASTE, USEPA.

RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

TEST CODE TPH IR NAME TPH BY IR

EPA METHOD: 418.1 for water sample.

Reference: Methods for Chemical Analysis of Water and Wastes.
EPA 600/4-79-020 (Revised, March 1983). EPA/EMSL, Cincinnati, OH.

EPA METHOD: 9071/9073

Reference: Test Methods for Evaluating Solid Waste: Physical/Chemical Methods.
EPA SW-846 (Third Edition) 1986. Office of Solid Waste, USEPA.



15 Wiggins Ave., Bedford, MA 01730
 Telephone: (617) 275-3330
 Fax: (617) 271-1136

CHAIN OF CUSTODY RECORD

DUE DATE : 6-6-96

COMPANY: D+C
 ADDRESS: 415 VFW DR
Rockland MA 01870
 PHONE #: (617) 871-0332 FAX #: (617) 871-1029
 P.O. #: _____
 PROJECT MANAGER: W.H. Taylor
 PROJECT ID/LOCATION: DEVENS

SAMPLE TYPE CONTAINER TYPE
 1. WASTEWATER P - PLASTIC
 2. SOIL G - GLASS
 3. SLUDGE V - VOA
 4. OIL
 5. DRINKING WATER
 6. WATER (GW/MM/SW)
 7. OTHER (SPECIFY)

ANALYSES

IKON #	SAMPLE IDENTIFICATION	SAMPLE TYPE	CONTAINER			SAMPLING		PRESERVATIVE	ANALYSES										SPECIAL INSTRUCTIONS/COMMENTS							
			SIZE	TYPE	#	DATE	TIME		TPH (418.1)	VOCs (8260)	SVOCs (8270)															
7	1676-stock	Soil	250/2oz	Glass	1	5/29/96	1537	-	X	X	X															
8	1676-base	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓															
9	1676-side	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓															
10	3596-stock	soil	250/2oz	↓	2	5/30/96	1317																			
11	3596-base	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓															
12	3596-side	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓															
13	1468-base	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓															
14	1468-side	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓															
	1468-stock	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓															
	2688-base	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓															
	2688-side	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓															
	2688-stock	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓															
15	2729-base	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓															

APPLIED BY: <u>CCF</u>	DATE: <u>5-29-96</u>	QUOTATION #:
INQUIRED BY: <u>[Signature]</u>	DATE: <u>5-30-96</u>	RECEIVED BY: <u>[Signature]</u>
INQUIRED BY:	DATE:	RECEIVED FOR LAB BY:
DATE:	DATE:	DATE:
TIME:	TIME:	TIME:
TIME:	TIME:	TIME:
METHOD OF SHIPMENT	COOLER TEMPERATURE	

RUSH ... BUSINESS DAY TURN AROUND
 ROUTINE
 Sample disposal information
 Are there any other known or suspected contaminants in these samples other than those listed above?
 Yes ___ No ___ If Yes, 1st Known _____

APPENDIX D

COMPACTION TESTS



Briggs Associates
 400 Hingham Street
 Rockland, MA 02370
 A Tundra Corporation Company

SOILS COMPACTION REPORT

PROJECT: Fort Devens, Ayer
 PROJECT #: 60904
 DATE: June 13, 1996
 INSPECTOR: John Vogel

EMP.#: 236	REPORT #:	CODE:	LAB #:
ARR. TIME: 7:15	JOB HOURS: 9.25	T.T.:	MILEAGE:
TEMP.: H L	WIND: H L	HUMID.: H L	SUNNY CLOUDY

MAXIMUM DRY DENSITY: 130.8 // 118.3

OPTIMUM MOISTURE CONTENT: 8.3 // 9.5

METHOD OF TESTING (CHECK ONE): SAND CONE: NUCLEAR DENSOMETER:

Test No:	Location	Estimated Area Tested	Elevation Depth	Test Results % compaction	Min. % Comp. Req.	Moist. Content %	Optimum Moisture %
1	Building 1673	one 1.0 ft	2.5 ft	96.3% 125.9	95%	9.1	8.3
2	1		grade	98.5 116.5		4.9	9.5
3	1674		2 ft	96.8 126.6		9.1	8.3
4	1665		grade	97.1 114.8		7.2	9.5
5	1674		grade	97.4 115.2		5.6	9.5
6	233		4 ft	96.7 126.4		8.7	8.3
7	"		2 ft	95.4 120.7		7.5	"
8	"		grade	98.1 116.0		8.1	9.5
9	2687		2 ft	95.2 120.5		9.7	8.3
10	"		grade	98.2 116.2		7.5	9.5
11	2688		4 ft	97.3 123.2		7.7	8.3
12	"		2 ft	95.1 128.3		8.1	"
13	"		grade	96.3 113.9		7.2	9.5
14	1438		2 ft	96.5 126.2		9.5	8.3
15	"		grade	96.7 114.4		8.2	9.5
16	3596		2 ft	95.4 124.7		8.3	8.3
17	"		grade	96.3 113.9		9.1	9.5
18	1675		4 ft	92.1 122.0		7.8	8.3
19	"		2 ft	98.2 116.2		7.6	9.5
20	"		grade	96.5 114.2		6.4	9.5

Tests not meeting requirements: none

Who notified: Bob (D.E.C. Construction)

Recommendations: none at this time

REMARKS: Done at this time

TECHNICIAN: 
 APPROVED: ROBERT A. BONICA, P.E.



Tundra Corporation

D & C Construction / Ft. Devens
Briggs # 60904
Tested: 6-5-96

1. Sample No. *M-956* *Keating Sand + Gravel Fitchburg.* Description Gravelly Sand with silt Source Site

2. Sieve Analysis (ASTM C 136, and ASTM C 117)

<u>Sieve Size</u>	<u>Results</u> { % Passing by Wt. }	<u>Specs.</u>
4"	100	
3"	100	
2-1/2"	100	
2"	100	
1-1/2"	86	
1"	86	
3/4"	75	
1/2"	71	
3/8"	67	
#4	55	
#10	45	
#20	36	
#40	30	
#80	23	
#100	20	
#200	17.8	

3. No specifications provided.

4. Proctor Density (four point procedure - ASTM D 1557 Method C, and ASTM D 4718).

	<u>Results</u>
Maximum Dry Unit Weight (pcf)	130.8
Optimum Moisture Content (%)	8.3

400 Mingham Street, Rockland, Massachusetts 02370

Tel (617) 871-6040 • Fax (617) 871-7982

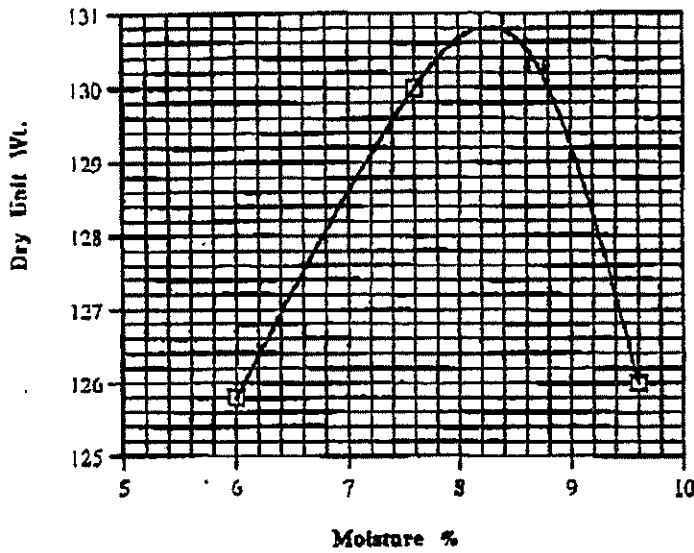
Offices located throughout the United States and Canada



Briggs Associates
A Tundra Corporation Company

Project: D & C Construction / Ft. Devens
Sample no. M-956 **Date:** 6/5/96

Proctor



Max. Dry Density
130.8 pcf

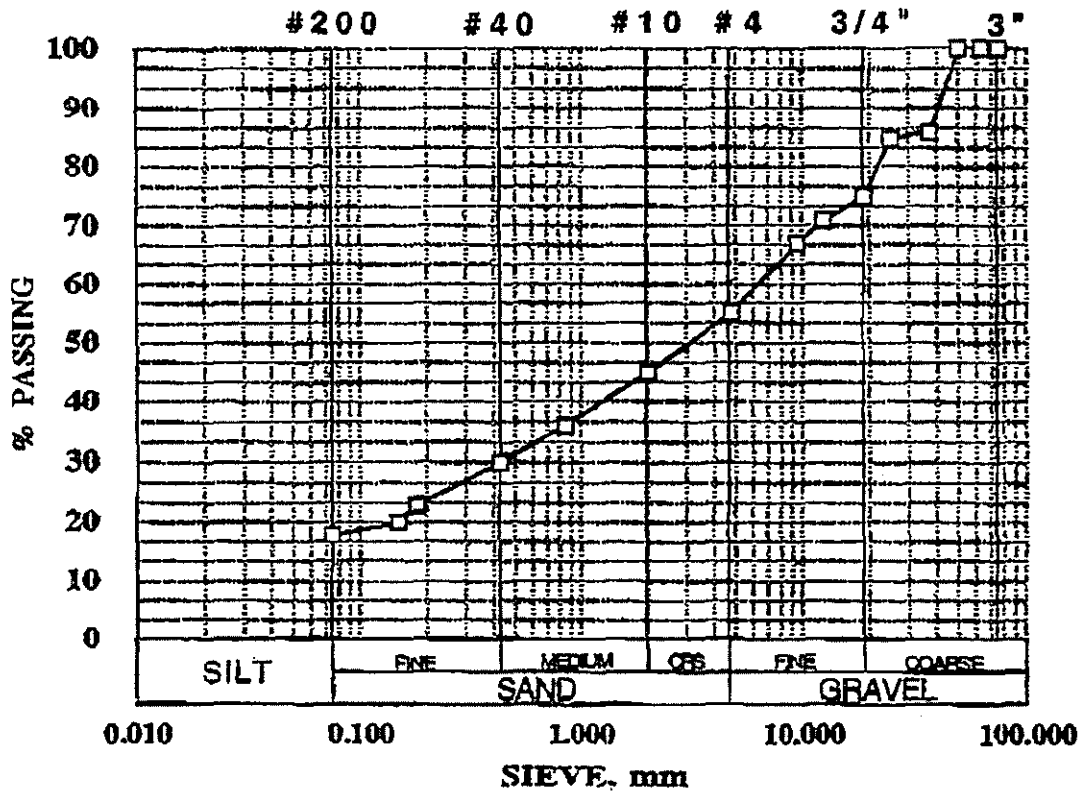
Optimum
Moisture
8.3 %



Briggs Associates
A Tundra Corporation Company

Project: D & C Construction / Ft. Devens
Sample No. M-956 **Date:** 6/3/96

SIEVE





Tundra Corporation

D & C Construction / Ft. Devens
Briggs # 60904
Tested: 6-5-96

1. Sample No. Description Source
M-957 Gravelly Sand Site

2. Sieve Analysis {ASTM C 136, and ASTM C 117}

<u>Sieve Size</u>	<u>Results</u> (% Passing by Wt.)	<u>Specs.</u>
4"	100	
3"	100	
2-1/2"	100	
2"	100	
1-1/2"	100	
1"	100	
3/4"	98	
1/2"	96	
3/8"	95	
#4	90	
#10	85	
#20	70	
#40	38	
#80	11	
#100	9	
#200	5.4	

3. No specifications provided.

4. Proctor Density {four point procedure - ASTM D 1557 Method C, and ASTM D 4718}.

	<u>Results</u>
Maximum Dry Unit Weight (pcf)	118.3
Optimum Moisture Content (%)	9.5

400 Elingham Street, Rockland, Massachusetts 02370

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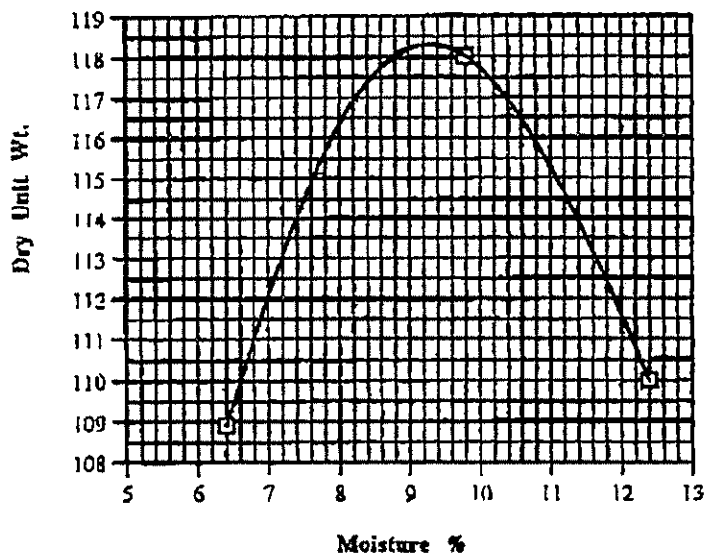
Offices located throughout the United States and Canada



Briggs Associates
A Tundra Corporation Company

Project: D & C Construction / Ft. Devens
Sample no. M-957 **Date:** 6/5/96

Proctor



Max. Dry Density
118.3 pcf

Optimum
Moisture
9.5 %



Briggs Associates
A Tundra Corporation Company

Project: D & C Construction / Ft. Devens

Sample No. M-957

Date: 6/3/96

SIEVE

