Ohio Department of Commerce

Division of State Fire Marshal
Bureau of Underground Storage Tank Regulations
8895 East Main Street P.O. Box 687
Reynoldsburg, OH 43068
(614) 752-7938 FAX (614) 752-7942

George V. Voinovich
Governor

Donna Owens
Director

October 11, 1996

RAVENNA ARMY AMMUNITION PLANT
8451 STATE ROUTE 5
BUILDING 590A
RAVENNA OH 44266

SITE: RAVENNA ARMY
AMMUNITION PLANT
ST RT 5 BLDG 590A
RAVENNA OH
PORTAGE COUNTY
INCIDENT #679298-15

RE: NO FURTHER ACTION STATUS REGARDING CLOSURE REQUIREMENTS

Dear Sir or Madam:

The Bureau of Underground Storage Tank Regulations (BUSTR) has reviewed all information submitted for this incident number. Based on this information, BUSTR requires no further action involving closure under Ohio Administrative Code rule 1301:7-9-12.

If you feel that you are entitled to reimbursement you should contact the Petroleum Underground Storage Tank Release Compensation Board (PUSTRCB) at P.O. Box 163188, Columbus, Ohio 43216, (614) 752-8963 or (800) 224-4659. PUSTRCB administers Ohio's assurance fund and is a separate entity apart from BUSTR.

Thank you for your cooperation. If you have any questions, please contact our office at (614) 752-7938.

Sincerely,

Kevin W. Hodnett
Corrective Action Supervisor

KWH:DT:cah

xc: Site File
Chief Larry A. Shafer, Ravenna Fire Department
DuWayne Porter, Portage County Health District

UST File 403

Ohio Department of Commerce

Division of State Fire Marshal
Bureau of Underground Storage Tank Regulations
8895 East Main Street P.O. Box 687
Reynoldsburg, OH 43068
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George V. Voinovich
Governor

Donna Owens
Director

CONTRACT
Info
Comm
appr
Reply

October 11, 1996

TO 10/15/96
CR-COR
PROP ADM
LAND MGR
CONTRACTOR
RETURN FOR

RAVENNA ARMY AMMUNITION PLANT
8451 STATE ROUTE 5
BUILDING 590A
RAVENNA OH 44266

SITE: RAVENNA ARMY
AMMUNITION PLANT
ST RT 5 BLDG 590A
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Kevin W. Hodnett
Corrective Action Supervisor

KWH:DT:cah

xc: Site File
Chief Larry A. Shafer, Ravenna Fire Department
DuWayne Porter, Portage County Health District

OCT 15 1996

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
WRIGHT-PATTERSON AREA OFFICE
P.O. BOX 31039, AIRWAY FINANCE POST OFC.
DAYTON, OHIO 45437-0039

TO	9/19/96
CE-COR	
PROP ADM	
LAND MGR	
CONTRACTOR	
RETURN FOR FILE	

WBT

CEORL-CD-W-W

16 September 1996

MEMORANDUM FOR Ravenna Army Ammunition Plant, ATTN: SMCRV-CR (John Cicero), 8451 State Route 5, Ravenna, Ohio 44266-9297

SUBJECT: DACA27-93-D-0017, Delivery Order No. 16, Case T-BT, UST Removal Ravenna AAP - Closure Report

1. Enclosed are 2 copies of the Closure Report for the removal of the underground storage tank removed under subject Delivery Order No. 16. Please sign the Closure Report Checklist Form as the Owner/Operator and forward 1 copy to BUSTR at the following address:

Division of State Fire Marshall
Bureau of Underground Storage Tank Regulations
8895 East Main Street
P.O. Box 687
Reynoldsburg, Ohio 43068-0687

copy mailed 19 Sept 96

CONTRACTOR FWD FOR
☐ Information
☒ Compliance as applicable
☐ Reply NLT _____

file

2. The other copy is for your records. Please call me at 513-255-2977 if there are any questions.

Renato Leonardi

RENATO LEONARDI, P.E.
Project Engineer

Encls
as

SEP 2 0 1996
By _____

DIVISION OF STATE FIRE MARSHAL
BUREAU OF UNDERGROUND STORAGE TANK REGULATIONS

CLOSURE REPORT CHECKLIST FORM

Ownership of Tanks	Location of Tanks
Ravenna Army Ammunition Plant Ravenna, Ohio	Ravenna Army Ammunition Plant Building No. 950A Ravenna, Ohio 44266

I. FILING INSTRUCTIONS

A. In the column on the left side of the form, place either the page number or appendix designation where each item on the checklist can be found in the closure report or "N/A" (Not Applicable) for items that do not apply to your closure report. If "N/A" is indicated, you must also indicate the page number accordingly.

B. UST owner must sign where indicated on page 2 of this form and attach it to the Closure Report. Deficient closure reports submitted to our office will be returned to the UST owner for completion. Send the closure report checklist form and the closure report to the address as indicated on the enclosed cover letter.

II. UST SYSTEM OWNER, OPERATOR, AND FACILITY DATA

Pg. 2 UST Owner (name, address, ZIP Code, county, phone no.)
Pg. 2 UST Operator (name, address, ZIP Code, county, phone no.)
Pg. 2 UST Facility Location (name, address, ZIP Code, county, phone no.)
Pg. 2 UST Facility Owner (name, address, ZIP Code, county, phone no.)

III. UST SYSTEM DATA

Pg. 3 UST System(s) Age (years)
Pg. 3 UST(s) Capacity (gallons)
Pg. 3 UST System(s) Construction (i.e., steel, fiberglass, etc.)
Pg. 3 Date UST System(s) Last Used
Pg. 3 Person(s) Who Last Used UST System
Pg. 3 Substance(s) Stored in UST(s) Both Past and Present (i.e., gasoline, diesel fuel, used oil, etc.)
Pg. 3 UST System Use (i.e., retail sales, residential, farm, business, etc.)
Pg. 3 UST(s) System Status (permanently removed or abandoned-in-place)
Pg. 3 Relocation of UST(s) System
Pg. 3 Disposal of UST(s) System

IV. WASTE DISPOSAL DATA

Pg. 4 Final Location of Excavated Soil(s) and Backfill Materials
Pg. 4 Amount of Soils and Backfill Excavated (cubic yards)
Pg. 4 Disposal and Final Location of any Liquids from UST System or UST System Excavation

V. SAMPLING DATA

(Groundwater sampling data only required if groundwater encountered during closure activities)

Pg. 5	Soil and/or Groundwater Sample Collection Procedures
Pg. 5	Type of Sample Containers and Sample Preservation Techniques Used for Soil and/or Groundwater Samples
Pg. 5	Labeling Number of Designation of Soil and/or Groundwater Sample(s) Used
Pg. 5	Type of Sampling Equipment Used (i.e., split spoon, shelby tube, etc.)
Pg. 5,6	Field Screening Methodology Used for each Soil and/or Groundwater Samples Obtained
Pg. 6	Type of Field Screening Instrument Used
Table 1.0	Listing of Field Screening Readings for each Soil and/or Groundwater Sample Obtained
Pg. 6	Calibration Methodology Used for Field Screening Instrument
Table 1.0	Locations and Depths of all Soil and/or Groundwater Samples Obtained
App. A	Copy of Chain of Custody Documentation for Soil and/or Groundwater Samples Submitted to Laboratory
Pg. 6	Sample Collector(s) Name and Company Affiliation

VI. LABORATORY DATA

(Groundwater laboratory data only required of groundwater encountered during closure activities)

App. A	Copies of Laboratory Sample Analysis Data Sheets for Soil and/or Groundwater Samples
App. A	Date Soil and/or Groundwater Samples Collected
App. A	Date Soil and/or Groundwater Samples Received by Laboratory
App. A	Date Soil and/or Groundwater Samples Analyzed by Laboratory and Type of Matrix Analyzed (soil or water)
Pg. 7	Name, Address, and Phone No. of Laboratory and Name of Sample Analyst
Pg. 8	Analytical Test Methods Used for Soil and/or Groundwater Samples
Pg. 8	Detection/Quantitation Limits Used for Laboratory Test Methods
Pg. 8	Laboratory Instrument Calibration Used

VII. MISCELLANEOUS DATA

Fig. 1	Site Map Accurately Depicting Dimensions of Facility Property Boundaries, Above Ground Structures, Adjacent Street Locations, and UST Systems (No. of tanks and product lines)
Fig. 1	Mapped Locations of Known Private Wells, Public Water Wells, or Monitoring Wells on Facility
Fig. 2	Mapped Locations of Any Utilities Exposed During UST System Excavation
Pg. 9	Description of Native Soils Encountered During UST System Excavation (i.e., sands, gravel, clays, etc.)
Fig. 2	Mapped Depths and Locations of All Soil and/or Groundwater Samples taken from Excavation
Pg. 9	Visual Site Evaluation
N/A	Mapped Locations of UST(s) Recently or Historically Removed, Abandoned-In-Place, or have Undergone a Change in Service
N/A	Mapped Locations of Other UST Still in Service
Fig. 2	Mapped Length of UST(s) and Product Line(s)
Fig. 2	Mapped Excavation Limits
Pg. 9	Certified Fire Safety Inspector Name and Certification Number
App. C	Local Fire Department (name, address, ZIP Code, county, phone) with Jurisdiction over UST Site
App. C	Copy of 30 Day Closure Notification and Closure Permit

UST(s) Owner Signature: _____ Date: 19 Sept 96

DIVISION USE ONLY

Reviewed By: _____ Date: _____

TOLTEST, INC.

CLOSURE REPORT
RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO

CASE NO. T-BT
DELIVERY ORDER NO. 0016
CONTRACT NO. DACA27-93-D-0017

August 1996

TOLTEST, INC.

CLOSURE REPORT
RAVENNA ARMY AMMUNITION PLANT
BUILDING NO. 950A
RAVENNA, OHIO

CASE NO. T-BT
DELIVERY ORDER NO. 0016
CONTRACT NO. DACA27-93-D-0017

FOR

U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
600 DR. MARTIN LUTHER KING, JR. PLACE, ROOM 821
LOUISVILLE, KENTUCKY 40202-2230

SUBMITTED

August 21, 1996
TOLTEST PROJECT NO. 31935.01

TOLTEST, INC.
1915 NORTH 12TH STREET
P.O. BOX 2186
TOLEDO, OHIO 43603
(419) 241-7175

TOLTEST, INC.

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Executive Summary

TolTest, Inc. (TolTest) was retained by U.S. Army Corps of Engineers (USACE) for the removal of one underground storage tank (UST) and to prepare a Closure Report for the Closure Assessments conducted at the Ravenna Army Ammunition Plant. The excavating contractor was Clay Construction Company from Attica, Ohio. Figure 1 depicts the Site Location Map.

Closures involved collecting and analyzing soil samples associated with the excavation of one 285-gallon steel UST and all associated appurtenances. The UST was used to store gasoline for fueling a stand-by generator.

A total of three soil samples, were analyzed for the presence of benzene, toluene, ethylbenzene and xylene (BTEX) by U.S. Environmental Protection Agency (U.S. EPA) Method 8020 and for total petroleum hydrocarbons (TPH) by U.S. EPA Method 418.1. All sample results were below detection limits.

As per Ohio Administrative Code (OAC) 1301:7-9-13, the project site was scored using the Site Feature Scoring System. The total score for the site is 70, which corresponds to Category 3.

Authorization to complete this work was granted by the USACE through Contract No. DACA27-93-D-0017 and Delivery Order Number 0016. The information contained in this report was prepared for the USACE.

1.0 Site Description

The Ravenna Army Ammunition Plant is located at Building 950A off of Route 5 in Ravenna, Ohio. The underground storage tank (UST) located at the Army Ammunition Plant was used for the storage of gasoline for fueling a stand-by generator.

The site is located in an area of level topography. The site is located to the north of Building 950A at the Ravenna Army Ammunition Plant, Ravenna, Ohio. The UST was covered with gravel at grade.

2.0 UST System Owner, Operator, and Facility Data

UST Facility/Owner's Name:	Ravenna Army Ammunition Plant
Address:	8451 State Route 5
	Ravenna, Ohio 44266
Telephone:	(216)-358-7414
County:	Portage

UST Operator:	Ravenna Army Ammunition Plant
Address:	8451 State Route 5
	Ravenna, Ohio 44266
Telephone:	(216)-296-6486
County:	Portage

UST Facility:	Ravenna Army Ammunition Plant
Address:	8451 State Route 5, Building 950A
	Ravenna, Ohio 44266
Telephone:	(216)-296-6486
County:	Portage

3.0 UST System Data

UST System Age:	18 Years
UST Capacities:	285 Gallons s/n H 240650
UST System Construction:	Steel
Date UST Systems Last Used:	Removed from Service July 1996
Person Who Last Used UST System:	Army Ammunition Plant Dayton, Ohio
Substance Stored in UST:	Gasoline
UST Systems Use:	Stand-by Generator
UST Systems Status:	Permanently Removed
Relocation of UST Systems:	Clay Construction Company Attica, Ohio
Disposal of UST System:	Gene's Recycling Attica, Ohio

4.0 Waste Disposal Data

4.1 Final Location of Excavated Soils and Backfill Material

Excavated soils and imported 304's were used as backfill for the tank cavity after the tank system was removed. Copies of the analytical results for the stockpile samples are located in Appendix A, Laboratory Reports and Chain-of-Custody Forms. Field screening results are located in Table 1.0, Sample Log and Analytical Results, and Figure 2.0, Tank Cavity Closure Samples.

4.2 Amount of Soils and Backfill Excavated

Approximately 20 cubic yards of backfill and native soils were excavated from the tank cavity. No impacted soils were encountered.

4.3 Disposal and Final Location of Liquids from UST Systems

Approximately 140 gallons of gasoline was removed from the 285 gallon UST at the site and was disposed of at D.I.S.C. Environmental located at 151 Andrus Road, Northwood, Ohio.

4.4 Location of Soil Samples Collected from Stockpiled Soil

Soil samples were collected from the stockpiled material prior to backfilling the tank cavities. These samples were collected per Ohio Administrative Code (OAC) 1301:7-9-17 and the results of field head space screening and laboratory analysis are presented in Table 1.0, Sample Log and Analytical Results, and Appendix A, Laboratory Reports and Chain-of-Custody Forms.

5.0 Sampling Data

5.1 Soil Sample Collection Procedure

All closure soil samples were collected by a TolTest representative wearing clean latex gloves. After selecting the proposed sampling locations based on guidelines specified in OAC 1301:7-9-12(K), a backhoe bucket was used to obtain a sample from the native soils. After removing the superficial one to two inches of native soil that had been exposed to the backhoe bucket, an effort was made to collect an undisturbed sample. Once collected, the soil was placed immediately in the approved sample container. Refer to Figure 2.0, Tank Cavity Closures Samples, for approximate locations.

5.2 Type of Sample Containers and Preservation Techniques

All sample containers were certified clean, EPA-approved, laboratory-prepared glass sample jars with Teflon®-lined lids. All samples were filled with an effort to minimize both headspace in the jar and disturbance to the sample. After each sample was placed into a sample jar, the jar was capped, wiped clean, labeled, put in an ice-filled cooler, and chilled to approximately 4° Celsius.

5.3 Labeling/Designation of Soil Samples

An effort was made to label samples with a prefix that indicates the general location from which the samples were collected. Following are examples of the labeling procedure:

Bottom Sample No. 1 = B1
Stock Pile Sample No. 2 = SP2

5.4 Type of Sampling Equipment Used

A backhoe bucket was used to collected undisturbed soil samples from the UST cavities. A clean pair of latex gloves was used for each sample.

5.5 Field Screening Methodology

A photoionization detector (PID) headspace analysis was performed for each soil sample collected. An additional amount of soil from each sampling location was placed into a sealable plastic bag. Sample bags were allowed to warm for at least 30 minutes. The procedure for headspace analysis consisted of opening the bag and inserting the tip of a

PID into the bag. The instrument was held in place for approximately ten seconds and peak readings were recorded. After all the soil samples were collected and scanned for headspace, samples with the highest PID readings were selected for laboratory analysis. Sample locations, collected depths, and PID readings are reported in Table 1.0, Sample Log and Analytical Results.

5.6 Type of Field Screening Instrument Used

A Photovac PID Model 2000 equipped with a 10.2 eV lamp was used for field screening.

5.7 Field Screening Readings for Soil Samples

Refer to Table 1.0, Sample Log and Analytical Results, for field screening reading for soil samples. Refer to Figure 2.0, Tank Cavity Closure Samples, for a listing of the field screening readings.

5.8 Field Screening Equipment Calibration

Prior to field use, the PID was calibrated with a mixture of 102 parts per million isobutylene span gas.

5.9 Locations and Depths of Soil Samples

Approximate depth ~~to the pad is 14 to 16 feet~~ is 8.5' below grade. Refer to Table 1.0, Sample Log and Analytical Results, for sample log and analytical data. Refer to Figure 2.0, Tank Cavity Closure Samples, for the approximate locations and depths of soil samples.

5.10 Chain-of-Custody Documentation for Soil Samples

Refer to Appendix A, Laboratory Reports and Chain-of-Custody Forms, for chain-of-custody documentation.

5.11 Sample Collector's Name and Company Affiliation

Gary L. Vogelsong of TolTest's Toledo office collected the closure soil samples on July 9, 1996.

6.0 Laboratory Data

6.1 Laboratory Sample Analysis Data Sheets

A summary of the analytical results are provided in Table 1.0, Sample Log and Analytical Results. The complete set of laboratory sample analysis data sheets for the soil samples are presented in Appendix A, Laboratory Reports and Chain-of-Custody Forms.

6.2 Date Soil Samples Collected

Sampling activities were conducted on ~~December~~ JULY 9, 1996. These dates are documented on the chain-of-custody forms in Appendix A, Laboratory Reports and Chain-of-Custody Forms.

6.3 Date Soil Samples Were Received and Analyzed by the Laboratory

Samples were received on July 10, 1996 and analyzed July 10, 1996. Exact dates of laboratory analyses are indicated on the laboratory reports located in Appendix A, Laboratory Reports and Chain-of-Custody Forms.

6.4 Name, Address, and Phone Number of the Analytical Laboratory

Samples were analyzed by:

Toledo Testing Laboratory
Division of TolTest, Inc.
1810 North 12th Street
Toledo, Ohio 43603
(419) 241-7175

Names of individual sample analysts are listed for each sample analyzed on the laboratory report located in Appendix A, Laboratory Reports and Chain-of-Custody Forms.

6.5 Analytical Test Methods

The analytical methods utilized for the Closure Assessment are in accordance with those specified in OAC 1301:7-9-13(D). The methods utilized for each sample are dependent on the nature of the petroleum hydrocarbons being evaluated. The following is a list of the analytical methods utilized at the referenced site.

Building Nos. 26 and 66 Closure Samples		
Product	Analytical Method	Method Number (Soil)
Gasoline	BTEX TPH	8020 418.1

6.6 Detection/Quantitation Limits of Analytical Methods

The detection/quantitation limits of analytical methods for each sample are listed in the sample analysis data sheets provided in Appendix A, Laboratory Reports and Chain-of-Custody Forms.

6.7 Laboratory Instrument Calibration

Data is provided by the laboratory and can be found in Appendix A, Laboratory Reports and Chain-of-Custody Forms.

7.0 Miscellaneous Data

7.1 Site Maps

A site map depicting aboveground structures and adjacent street locations is provided on Figure 1.0, Site Location Map.

7.2 Wells Known to Exist at the Facility

No wells are known to exist at this facility.

7.3 Utilities Exposed During Excavation

No utilities were exposed during excavation.

7.4 Native Soil Description

The native soil at the site consisted of brown silty clay.

7.5 Mapped Depths and Locations of Soil Samples

The depths and locations of soil samples are shown on Table 1.0, Sample Log and Analytical Results, and on Figure 2.0, Tank Cavity Closure Samples.

7.6 Visual Site Evaluation

A TolTest representative performed a visual site evaluation to identify evidence of past or present operational problems. No stressed vegetation or soil staining was noted.

7.7 Certified Fire Safety Inspector

The Certified Fire Safety Inspector for the tank closure was Larry Shaffer, City of Ravenna Fire Inspector delegated authority.

7.8 Closure/Installation Permits

The closure and installation permit request forms are contained in Appendix C.

7.9 Site Feature Scoring System

As per OAC 1301:7-9-13, the project site was scored using the Site Feature Scoring System (SFSS). The total score for the site is 70, which corresponds to Category 3. This site is located in an area of Portage County which has not been designated as a sensitive area per the OAC 1301:7-9-09. The scoring tables are presented in Appendix D, Site Feature Scoring System.

7.10 Site Photographs

Photographs of the subject sites taken before and during the UST removals are contained in Appendix E, Photographic Documentation.

8.0 Summary

A Closure Assessment was performed at Ravenna Army Ammunition Plant from July 9 through July 10, 1996. Soil samples were collected from the excavated cavities, product lines, and stockpiled soil. Laboratory analyses were conducted to determine whether a release of gasoline to the environment had occurred.

A total of three samples were analyzed for the presence of benzene, toluene, ethylbenzene and xylene (BTEX) by United States Environmental Protection Agency (U.S. EPA) Method 8020 and for total petroleum hydrocarbons (TPH) by U.S. EPA Method 418.1. All sample results were below detection limits.

As per OAC 1301:7-9-13, the project site was scored using the SFSS. The total score for the site is 70, which corresponds to Category 3.

TABLES

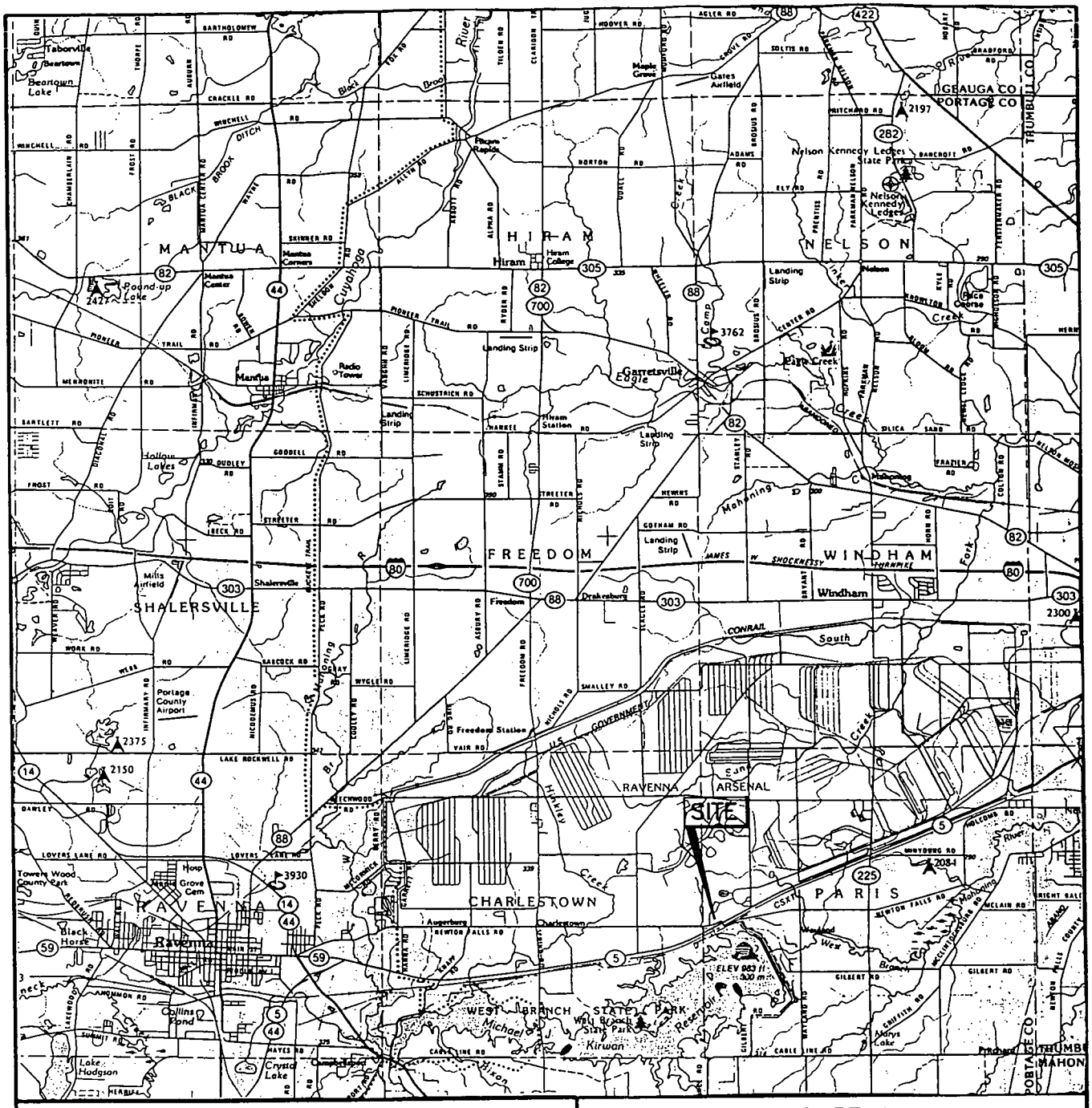
Table 1.0
Sample Log and Analytical Results
Ravenna Army Ammunition Plant
Building No. 950A
(Gasoline)

SOIL							
Sample Identification	Depth (feet)	PID Result (ppm)	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylene (ppm)	TPH
B1	8.5	0.0	<0.005	<0.005	<0.005	<0.005	<10.0
B2	8.5	0.0	N/A	N/A	N/A	N/A	N/A
SP1	N/A	0.0	<0.005	<0.005	<0.005	<0.005	16.6
SP2	N/A	2.0	<0.005	<0.005	<0.005	<0.005	14.2

NOTES:

1. ppm = parts per million
2. TPH = total petroleum hydrocarbons (Method No. 418.1)

FIGURES



APPROXIMATE SCALE – FEET

0 12500 25000

N

OHIO

REFERENCE
OHIO ATLAS & GAZETTEER
DATED 1995
SCALE 1 : 150,000

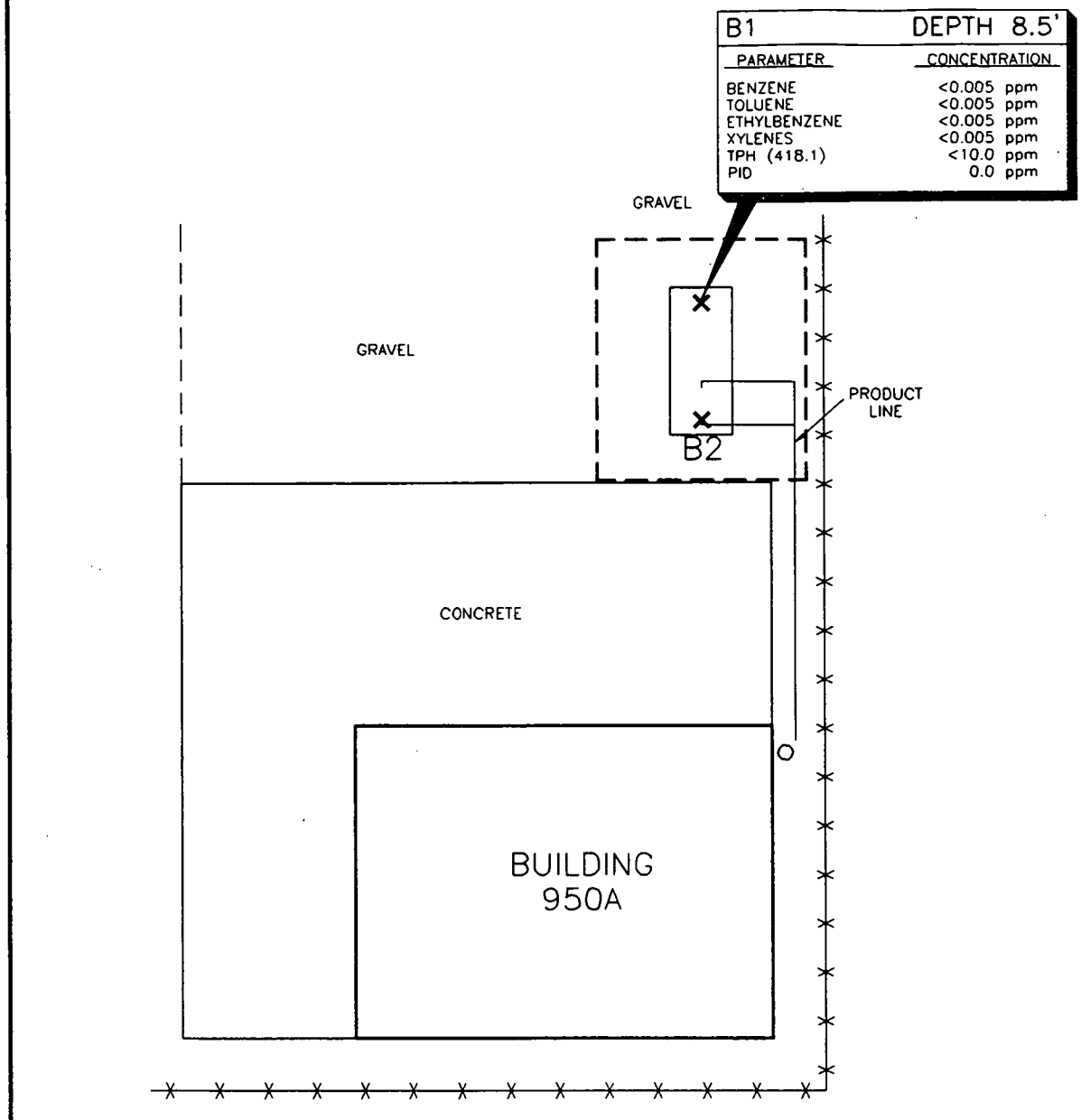
FIGURE 1
SITE LOCATION MAP

RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO

PREPARED FOR

U.S. ARMY CORPS OF ENGINEERS
LOUISVILLE DISTRICT

DRAWN MRC\8-20-96	CHECKED GW
REVISED	APPROVED GW
JOB NO. 31935.01	
DRAWING NUMBER 319351	TOLTEST, INC.



APPROXIMATE SCALE - FEET

0 10 20

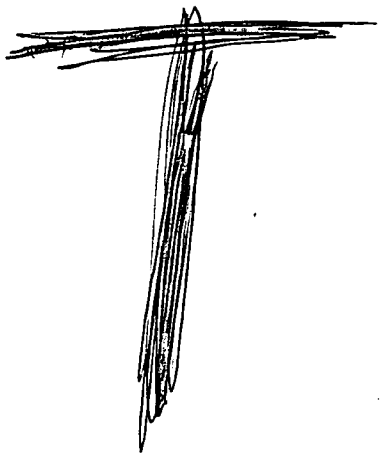
N

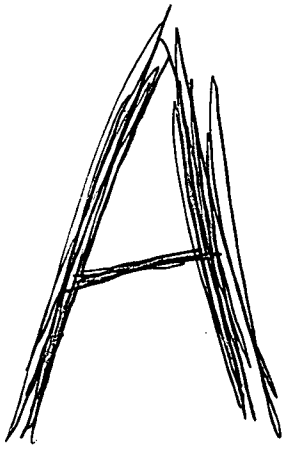
FIGURE 2
TANK CAVITY CLOSURE SAMPLES

RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO

PREPARED FOR
U.S. ARMY CORPS OF ENGINEERS
LOUISVILLE DISTRICT

DRAWN MRC\8-20-96	CHECKED GW
REVISED	APPROVED GW
JOB NO. 31935.01	
DRAWING NUMBER 319351	TOLTEST, INC.





APPENDIX A

Laboratory Reports and Chain-of-Custody Forms

TOLTEST, INC.

Founded in 1927
Toledo, Ohio • Detroit, Michigan • Monroe, Michigan • Pittsburgh, Pennsylvania

TEST REPORT

CLIENT: TolTest, Inc.
1915 N. 12th Street
Toledo, Ohio 43603

DATE: July 16, 1996

ATTN: Mr. Gary Vogelsong

Job No.: 31935.01

Lab Receiving No.: 9607000068

Date Received: July 10, 1996

Date Sampled: July 9, 1996

Project Location: USACOE - Ravenna
Ravenna AAD

Sample Point(s): B1, SP1, SP2

Analysis Performed: BTEX, TPH (418.1)

Reviewed and
Approved by: _____ Date: 7/16/96

Jeffrey J. Fesko
Manager, Analytical Services

ANALYTICAL NARRATIVE

The note(s) below pertain to the sample(s) and analytical data reported herein:

The sample(s) received by the laboratory under chain of custody met EPA guidelines for container type, labeling and preservation technique.

The laboratory is accredited or approved by the following agencies:

State of Ohio; Certification No.: 7016
American Industrial Hygiene Association
Food and Drug Administration
U.S. Army Corps of Engineers
City of Toledo

AROMATIC VOLATILE ORGANICS by GC
ANALYTICAL RESULTS

JOB NUMBER:	31935.01	**UNITS:**	mg/kg
METHOD No.:	8020	**BATCH No.:**	2GCV020796

SAMPLE ID:	METHOD BLANK	B1	SP1	SP2				
SAMPLE No.:		36025	36027	36028				
Benzene	<0.005	<0.005	<0.005	<0.005				
Toluene	<0.005	<0.005	<0.005	<0.005				
Ethylbenzene	<0.005	<0.005	<0.005	<0.005				
Xylenes	<0.005	<0.005	<0.005	<0.005				

GENERAL CHEMISTRY
ANALYTICAL RESULTS

JOB NUMBER:	31935.01	**UNITS:**	mg/kg
METHOD No.:	418.1	**BATCH No.:**	2CVC042296

SAMPLE ID:	**METHOD BLANK**	**B1**	**SP1**	**SP2**				
SAMPLE No.:		36025	36027	36028				
Total Petroleum Hydrocarbons	<10.0	<10.0	16.6	14.2				

REPORT KEY

BTU/lb	=	British Thermal Units per pound
CV	=	Conventionals
Deg. C	=	Degrees Celsius
EP TOX	=	Extraction Procedure Toxicity
GC	=	Gas Chromatograph Instrument
GC/MS	=	Gas Chromatography/Mass Spectrometer Instrument
gm/cc	=	grams per cubic centimeter
IR	=	Infrared Instrument
mE/100grams	=	milliequivalant/100 grams soil
mg/m^3	=	milligram per 1000 liters of air
mg/kg	=	milligram per kilogram (ppm)
mg/L	=	milligram per liter (ppm)
mg/W	=	milligram per wipe
MTM	=	Michigan Test Method
mV	=	milliVolts
n/a	=	not applicable
PCB	=	Polychlorinated Biphenyls (PCBs)
pCi/L	=	picocurie per liter
ppb	=	parts per billion
ppm	=	parts per million
RCRA	=	Resource Conservation and Recovery Act
SM	=	Standard Method, 17th Edition
std	=	result is relative to standard pH units
TCLP	=	Toxicity Characteristic Leaching Procedure
SPLP	=	Synthetic Precipitation Leaching Procedure
µg/kg	=	microgram per kilogram (ppb)
µg/L	=	microgram per liter (ppb)
µg/S	=	microgram per sample
µg/W	=	microgram per wipe
>	=	greater than
<	=	less than
%	=	percent

EA	=	Elaine Ault
AAI	=	Analytical Associates, Inc.
OHM	=	OHM Corporation
ATE	=	Aqua Tech Environmental Laboratories, Inc.
BEC	=	Biological Environmental Control Laboratories, Inc.
JF	=	Jeff Fesko
BG	=	Barb Gould
PM	=	Patricia McElroy
SP	=	Susan Pellitieri
RR	=	Ron Recknagel
TMA	=	Thermo Analytical, Inc.
LW	=	Lorene Watts
TH	=	Tracy Howard
DG	=	Diann Gillette
MH	=	Matt Harold

SURROGATE SUMMARY

	PESTICIDES/PCBs Method 8080 Batch No.		HERBICIDES Method 8150 Batch No.	PNAs Method 8100 Batch No.	BTEX Method 8020 Batch No. 2GCV020796
Surrogate:	Tetrachloro-m-xylene	Decachlorobiphenyl	2,4-D	2-Fluorobiphenyl	α, α, α-Trifluorotoluene
METHOD BLANK					92
METHOD SPIKE					94
MATRIX SPIKE					104
MATRIX SPIKE DUPLICATE					97
36025					95
36027					93
36028					95
SURROGATE CONTROL LIMITS:	30-130%	30-130%	30-130%	50-114%	70-118%

BATCH QC SUMMARY

BATCH No.	DATE EXTRACTED	DATE ANALYZED	ANALYST	BTEX PARAMETERS	% RECOVERY METHOD SPIKE	MATRIX SPIKE	MATRIX DUPLICATE	% RPD
2GCV020796	--------	07/11/96	JF	Benzene	105	115	109	5
				Toluene	104	111	106	5
				Ethylbenzene	104	106	104	2
				Xylenes	104	106	104	2

BATCH No.	DATE EXTRACTED	DATE ANALYZED	ANALYST	GENERAL CHEMISTRY PARAMETERS	% RECOVERY METHOD SPIKE	MATRIX SPIKE	MATRIX DUPLICATE	% RPD
2CVC042296	07/09/96	07/10/96	MH	TPH (Total Petroleum Hydrocarbons)	95	72	73	1

TOLTEST, INC. 1810 N. 12th St., P.O. Box 2186, Toledo, OH 43603; Phone (419) 241-7175; FAX (419) 241-1808

Chain of Custody Record

№ 13434 Page 1 of 1

Job No.: 31935.01	Client: USACOE - Ravenna
P.O. No.:	Project/Location: Ravenna AAD
Project Mgr.: Gary L. Vogelsong	Sampler's Name: Gary L. Vogelsong
Phone No.: 419-241-0164	TAT: 24hrs Sampler's Signature: Gary L Vogelsong

Item No.	Sample I.D.	Date Sampled	Time Sampled	Type	Matrix	Sample Location	Total No. of Containers	Parameters: TPH 8015		BTEX 8020						Preserved Yes/No	Remarks
1	B1	9 July	1022	G	Soil	Bottom North End	1	X		X							36075
2	B2	9 July	1022	G	Soil	Bottom South End	1										Hold 36026
3	SP1	9 July	0940	G	Soil	Stockpile - Cover over tank	1	X		X						N	36077
4	SP2	9 July	1022	G	Soil	Stockpile - Fill from cavity	1	X		X		7/10/96					36028
5																	
6																	
7																	
8																	
9																	
10																	

Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
1-2-3	G Vogelsong	10 July 96 / 0917		7/10/96 / 0917
	Relinquished By:	Date / Time	Received By:	Date / Time
	Relinquished By:	Date / Time	Received By:	Date / Time
	Relinquished By:	Date / Time	Received By:	Date / Time

LAB USE ONLY

Were samples delivered: ✓ in person ___ by courier

Were samples preserved: ___ in field ___ in lab ✓ N/A

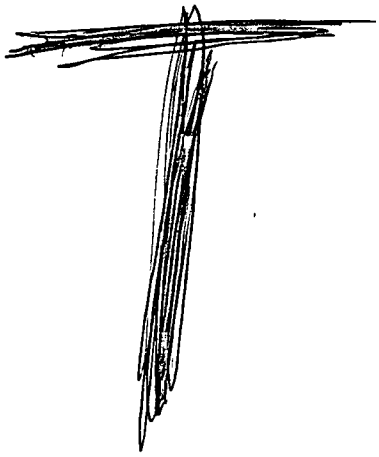
Temp inside cooler: 5 °C

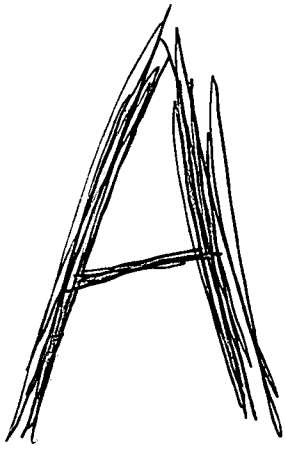
Did samples arrive intact and sealed? ✓ yes ___ no ___ N/A

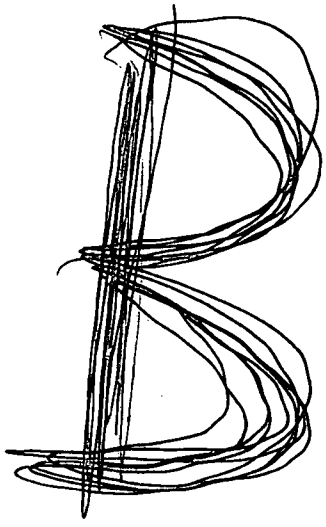
Were proper containers used? ___ yes ___ no

Comments: _____

Distribution: Original plus one accompanies shipment (white and yellow); copy to coordinator field files (pink)







APPENDIX B

UST Disposal Ticket

Copies

RA INTERNATIONAL
R. #1 Box 23
ATTICA, OHIO 44807

CHUCK THOMPSON - MANAGER

Customer: Ravenna Arsenal Removal

Driver: ☐ ON ☐ OFF

Product: 1 - 300 gal & Scrap

Weighed By:

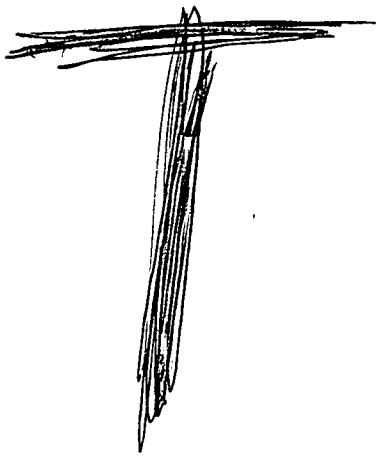
Analysis: 7-9-96

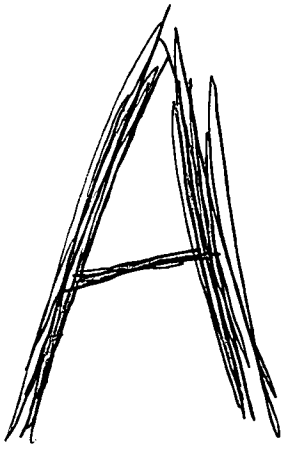
GROSS WEIGHT: 48820 LB OR 02:49 PM 07/09/96

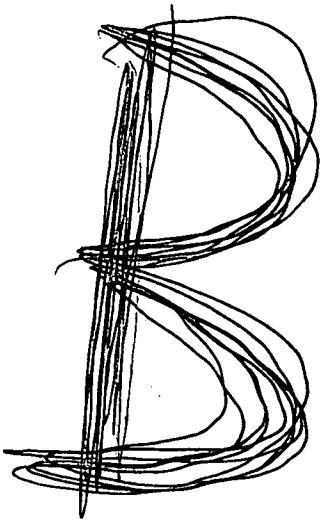
TARE WEIGHT:

NET WEIGHT: 47800 LB OR 03:14 PM 07/09/96

1020







APPENDIX C

Closure/Installation Permits

CLAY CONSTRUCTION CO.
DIVISION OF CLAY DISTRIBUTING CO.
15025 EAST U.S. 224
P.O. BOX 581
ATTICA, OH 44807
419-426-3051
800-472-2591
FAX 419-426-7325

30 DAY LETTER NOTIFICATION

DATE: 06/27/96

STATE FIRE MARSHAL-BUSTR
PERMIT APPLICATION SECTION
8895 EAST MAIN STREET
P O BOX 687
REYNOLDSBURG, OH 43068-0687

TO WHOM IT MAY CONCERN:

THIS IS TO INFORM YOU THAT WE HAVE APPLIED FOR AN UNDERGROUND TANK PERMIT. TANK LOCATION IS:

Ravenna Army Ammunition Plant

Ravenna, Ohio

Portage County

SINCERELY,
CLAY CONSTRUCTION CO.

DIVISION OF STATE FIRE MARSHAL – BUSTR
8895 East Main Street, P.O. Box 687
Reynoldsburg, OH 43068-0687

DELEGATED PERMIT FOR UNDERGROUND STORAGE TANKS

Permit No.: 01690
Issue Date:

I. Ownership of Tanks — Owner No: 11595

Owner/Operator Name: Ravena Army Amunition Plant
Address: Bldg 590A
City: Ravena | State: Ohio | Zip Code: 44266
Attn.: (Contact Person) | Area Code – Phone:

II. Location of Tanks — Facility No: 670501

Facility Name: Same
Address:
City | State | Zip Code:
Area Code – Phone: 216/296-6486 | County: Portage

III. Contractor

Contractor's Name: Clay Construction
Contact Person: Robert Nicolls | Area Code – Phone: 419/426-3051
Address: P.O. Box 581
City: Attica | State: Ohio | Zip Code: 44807

IV. Local Fire Department

Fire Department Name: Ravenna City Fire Dept
Address: 214 Park Lane
City: Ravenna | State: OH | Zip Code: 44266

V. Permit Issued For: See Below

(Note: Owner's Copy of Permit must be available on job site.)

Removals/Abandoments:
[101] Tank(s): | [102] Piping: | [103] Total Systems: 1

Installations:
[201] Tank(s): | [202] Piping: | [203] Total Systems:

Replacement:
[301] Tank(s): | [302] Piping: | [303] Total Systems:

Repairs:
[401] Tank(s): | [402] Piping:

Upgrades:
[501] Tank(s): | [502] Piping: | [503] Leak Detection:

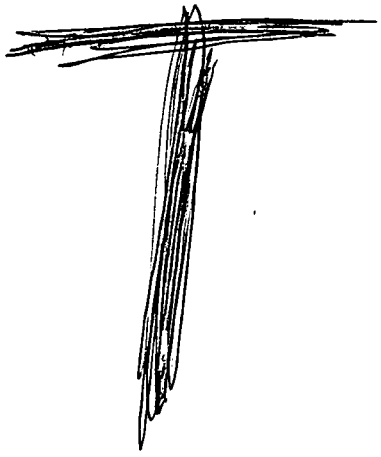
Change in Service/Temporary Closure:
[601] Systems:

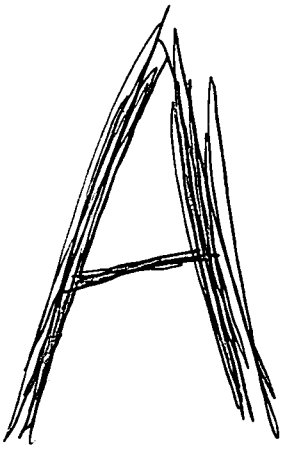
FIRE DEPARTMENT USE ONLY

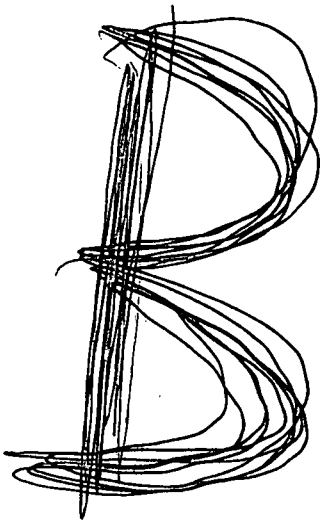
Certified Installer: Randy Jett | ID No: 10-89-0083
Inspector's Signature: Barry A. Rhyfer | Date: 7-2-96

COM 5210 (Rev. 12/93)

Distribution: White Copy - Tank Owner; Canary Copy - State Fire Marshal; Pink Copy - Fire Department







APPENDIX D

Site Feature Scoring System

Site Feature Scoring System

Per

Section 1301:7-9-13 of the
Ohio Administrative Code

Site feature 1 shall be measured from the edge of the portion of the UST system closest to the drinking water supply well or intake. A drinking water supply well or intake includes an area upstream from a public surface water supply intake, a public drinking water well, a private drinking water well, or a reservoir or lake greater than five acres in surface area.

Site feature 2 shall calculate the average depth of ground water utilizing readily accessible public documents and/or site-specific investigations, such as local drilling logs within one-quarter mile of the site, Ohio Department of Natural Resources (ODNR) records, Ohio Department of Transportation (ODOT) records, soil boring logs, site checks and site assessments. The depth should be calculated from the ground surface and not from the bottom of the tank excavation. If the depth to ground water cannot be determined, then the score from column C of the site feature scoring system must be utilized.

Site feature 3 shall select a substratum type which best represents the soil and/or bedrock under the UST site or is most typical of the area utilizing readily accessible public documents and/or site specific investigations, such as local drilling logs within one-quarter mile of the site, geologic maps, ODNR records, ODOT records, soil boring logs, site checks and site assessments.

Site feature 4 shall be scored using the site Feature Number 4 Worksheet and in accordance with procedures established by the fire marshal.

Action level table
Action levels shall be determined for the UST site by applying the total score calculated for the UST site.

Site Feature Scoring System Explanation Sheet

This attachment indicates in detail the data and references used to score the site and the date(s) that such information was obtained. A detailed drawing is included with the geographic location of site feature 4 elements within the search radius.

SITE FEATURE SCORING SYSTEM

Project No. 31935.01

Address: Army Ammunition Plant, Ravenna, Ohio

SITE FEATURES	COLUMN A		COLUMN B		COLUMN C		COLUMN D	
	SCORE 20 IF TRUE	SCORE	SCORE 15 IF TRUE	SCORE	SCORE 10 IF TRUE	SCORE	SCORE 5 IF TRUE	SCORE
1. Distance of UST system from closest drinking water supply well or intake currently in use.	>1,000 feet	20	301-1,000 feet		<301 feet		Inside of designated sensitive area	
2. Average depth to ground water	>50 feet		31-50 feet		15-30 feet or unknown	10	<15 feet	
3. Predominant soil type of substratum	Clay or shale	20	Silt or Clayey Sands or Fine Sandstone		Silty Sand or Fine Sand or Sandstone or Unknown		Clean Sand or Gravel or Conglom-erate	
4. Natural and/or manmade conduits or receptors	<8	20	8-10		11-13		>13	
Subtotal:		60				10		

Total Score = 70

SITE FEATURE NUMBER 4 WORKSHEET

Basements or subsurface foundations within one hundred feet of UST system	4 points	0
Storm sewer within fifty feet of UST system	4 points	0
Sanitary sewer within fifty feet of UST system	4 points	0
Septic system leach field within fifty feet of UST system	2 points	0
Water line main within fifty feet of UST system	1 point	0
Natural gas line main within fifty feet of UST system	1 point	0
Bedrock area prone to dissolution along joints of fractures (i.e., caves & sinkholes) within one hundred feet of UST system	1 point	0
Faults or known fractures within one hundred feet of UST system	1 point	0
Buried telephone/television cable main within fifty feet of UST system	1 point	0
Buried electrical cable main within fifty feet of UST system	1 point	0
TOTAL POINTS FOR SITE FEATURE NUMBER 4		0

Site Feature Scoring System Explanation Sheet

Site Feature 1

- Water source: On-site water supply well
- Actual location: Approximately two miles northeast of site
- Reference: Facilities Supervisor, Ravenna Army Ammunition Plant
- Reference date: July 9, 1996

Site Feature 2

- Actual ground-water depth: 65 to 225 feet
- Reference(s): Ground Water Resources of Portage County
- Date ground-water depth was determined: August 20,1996

Site Feature 3

- Soil or bedrock classification: Clay
- Explanation of classification: Visual observation of native soil
- Reference(s): Gary L. Vogelsong
- Reference date: July 9, 1996

Site Feature 4

- Presence of basements, subsurface foundations or septic system determined by: visual evaluation, anecdotal information.
  Date: July 9, 1996
- Presence of utilities determined by: utility company marks, line markers/signs, evidence of shutoffs/valves, hydrants, manholes, catch basins, anecdotal information.
  Date: July 9, 1996
- Reference for geological information (dissolution joints, faults, fractures): None

ACTION LEVEL TABLE

Project No. 31935.01

Address: Army Ammunition Plant, Ravenna, Ohio

	CATEGORY 4	**CATEGORY 3**	CATEGORY 2	CATEGORY 1
TOTAL SCORE	>71	**70-51**	50-31	<31
Constituents level in soil:				
Benzene	0.500 PPM	**0.335 PPM**	0.170 PPM	0.006 PPM
Toluene	12 PPM	**9 PPM**	7 PPM	4 PPM
Ethylbenzene	18 PPM	**14 PPM**	10 PPM	6 PPM
Total Xylene	85 PPM	**67 PPM**	47 PPM	28 PPM
Constituents level in ground water:				
Benzene	0.005 PPM	**0.005 PPM**	0.005 PPM	0.005 PPM
Toluene	1 PPM	**1 PPM**	1 PPM	1 PPM
Ethylbenzene	0.700 PPM	**0.700 PPM**	0.700 PPM	0.700 PPM
Total Xylene	10 PPM	**10 PPM**	10 PPM	10 PPM
TPH level in soil:				
Analytical Group No. 1	600 PPM	**450 PPM**	300 PPM	105 PPM
Analytical Group Nos. 2, 3 and 4	1,156 PPM	**904 PPM**	642 PPM	380 PPM

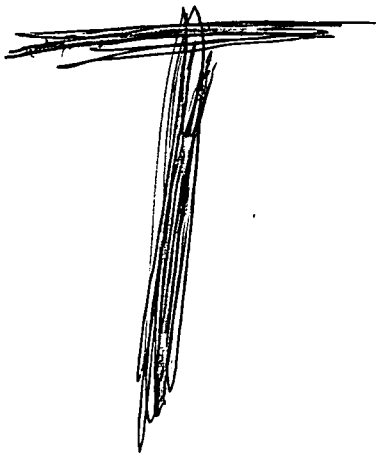
Total Score = 70

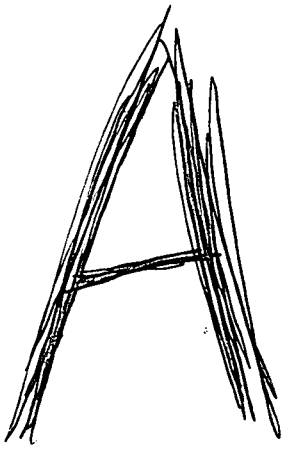
Category = 3

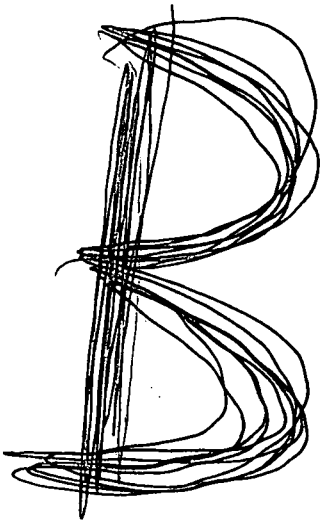
Completed by: Mary L. Vogelsang
TolTest, Inc.

Date: 20 Aug 96

TOLTEST, INC.







APPENDIX E

Photographic Documentation

Project No.
31935.01

Contract No.
DACA27-93-D-0017

Location
Contractor/Photographer
Army Ammunition Plant, Ravenna, Ohio
TolTest/Gary L. Vogelsong

Photograph No.
1

Date/Time
July 9, 1996 / 0800 Hours

Description/Direction of View
Pre-construction site with barricade/Southeast

Project No.
31935.01

Contract No.
DACA27-93-D-0017

Location
Contractor/Photographer
Army Ammunition Plant, Ravenna, Ohio
TolTest/Gary L. Vogelsong

Photograph No.
2

Date/Time
July 9, 1996 / 0945 Hours

Description/Direction of View
Tank uncovered/North

Project No.
31935.01

Contract No.
DACA27-93-D-0017

Location
Contractor/Photographer
Army Ammunition Plant, Ravenna, Ohio
TolTest/Gary L. Vogelsong

Photograph No.
3

Date/Time
July 9, 1996 1010 Hours

Description/Direction of View
Tank removed from excavation/North

Project No.
31935.01

Contract No.
DACA27-93-D-0017

Location
Contractor/Photographer
Army Ammunition Plant, Ravenna, Ohio
TolTest/Gary L. Vogelsong

Photograph No.
4

Date/Time
July 9, 1996 / 1015 Hours

Description/Direction of View
Tank staged and inspected/North

Project No.
31935.01

Contract No.
DACA27-93-D-0017

Location
Contractor/Photographer
Army Ammunition Plant, Ravenna, Ohio
TolTest/Gary L. Vogelsong

Photograph No.
5

Date/Time
July 9, 1996 / 1030 Hours

Description/Direction of View
Staged soil pile/North

Project No.
31935.01

Contract No.
DACA27-93-D-0017

Location
Contractor/Photographer
Army Ammunition Plant, Ravenna, Ohio
TolTest/Gary L. Vogelsong

Photograph No.
6

Date/Time
July 9, 1996 / 1130 Hours

Description/Direction of View
Post-construction site/Southeast

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

Form Approved. OMB No. 2050-0039 Expires 9-30-94

WASTE MANIFEST

1. Generator's US EPA ID No.: NON RCRA Regulated
Manifest Document No.: 96 27 8
2. Page 1 of 1
Information in the shaded areas is not required by Federal law

3. Generator's Name and Mailing Address
Ravenna Arsenal
8451 SR 5
Ravenna, OH 44266
ATTN: Bob Nichols

4. Generator's Phone ( )

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: Research Transportation Company
6. US EPA ID Number: OHD004178612
C. State Transporter's ID
D. Transporter's Phone: (216)623-8383

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
Research Oil Company
2655 Transport Road
Cleveland, OH 44115
10. US EPA ID Number: OHD004178612
G. State Facility's ID
H. Facility's Phone: (216)623-8383

	11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number) HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.	Flammable Liquid, U.O.S., (Gasoline), 3, UN1993, PGII ERG#27	003	DM	00165	G	NONE
b.						
c.						
d.	22178-15					

[redacted] Listed Above

15. Special Handling Instructions and Additional Information
EMERGENCY RESPONSE # 1-800-969-9252

ALL SPILLS MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER AT (800) 424-8802. 24 HOURS PER DAY

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: ROBERT E. NICOLLS
Signature: Robert E Nicolls
Month 8 Day 29 Year 96

TRANSPORTER

17. Transporter 1 Acknowledgment of Receipt of Materials
Printed/Typed Name: JOHN SCHERMER
Signature: John Schermer
Date: Month 08 Day 29 Year 96

18. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name
Signature
Date: Month Day Year

19. Discrepancy Indication Space
[redacted] waste covered by this manifest except as noted in Item 19
Date

Sec. 20 Jack Pekarek

RECEIVED
SEP 13 1996
By

Generator 08 29 96