

Box 29

RAVENNA ARSENAL INC.

Box 23

REQUIREMENTS FOR

UNDERGROUND STORAGE TANK REMOVAL

JULY 1989  
HAVENS AND EMERSON INC.  
CONSULTING ENGINEERS  
CLEVELAND, OHIO

REVISED JANUARY 1991

## SUMMARY

## 22 USTS FOR REMOVAL

TANK NO.	LOCATION	CAPACITY (GAL)	KNOWN CONTENTS	DWG NO.
20	DB27 (LL2)	15000	#2 F.O.	37-01-01
21	DB27 (LL2)	15000	#2 F.O.	SHT. 56
46	Bolton House	1500	#2 F.O.	N/A
50	Water Works 4	1000	#2 F.O.	26-04-06
*55	PH 1 (LL1)	20000	#5 F.O. SW-18, M-68&70	
*56	PH 1 (LL1)	20000	#5 F.O.	304.301
*57	PH 2 (LL2)	15000	#5 F.O.	304.302
*58	PH 2 (LL2)	15000	#5 F.O.	
*59	PH 4 (near LL5)	20000	#5 F.O.	609.301
*60	PH 4 (near LL5)	20000	#5 F.O.	
*61	PH 5 (near LL10)	20000	#5 F.O.	610.301
*62	PH 5 (near LL10)	20000	#5 F.O.	
*63	PH 7 (LL4)	20000	#5 F.O.	404.301
*64	PH 7 (LL4)	20000	#5 F.O.	
80	George Rd Gas Stat	12000	Gasoline	1007.301&402
81	Bldg 1047	10000	Gasoline	N/A
82	Bldg 1047	10000	Gasoline	
83	Bldg 1047	10000	Gasoline	
86	Telephone Bldg (North)	1000	Unknown	N/A
87	Telephone Bldg (North-East)	1000	Unknown	N/A
88	Fire Station #2	1000	#2 F.O.	N/A
89	Geo. Rd. S.T.P.	1000	Unknown	N/A

\*Indicates tanks cleaned and ready for removal/disposal.

:usttnk

**RAVENNA ARMY AMMUNITION PLANT**

**SECTION A**

**SCOPE OF WORK**

**FOR**

**REMOVAL OF UNDERGROUND STORAGE TANKS (USTs) TANK NUMBERS**

46  
50  
59  
60  
61  
62  
80  
81  
82  
83  
86  
87  
88  
89

## TABLE OF CONTENTS

	<u>PAGE</u>
1. INTRODUCTION .....	1
2. GENERAL REQUIREMENTS .....	1
3. TANK REMOVAL SPECIFICATIONS .....	4
3.1 Disposal of Tank Contents .....	4
3.2 Tank Removal Procedures .....	4
3.3 Tank Venting .....	6
3.4 Tank Cleaning .....	7
3.5 Tank Disposal .....	7
3.6 Sludge Sampling .....	7
3.7 Sludge Disposal .....	7
3.8 Soil Screening and Stockpiling .....	7
3.9 Excavation Sampling Procedures .....	9
3.10 Background Soil Sampling .....	10
3.11 Excavation Spoils Sampling .....	11
3.12 Excavation Spoils Disposal .....	11
3.13 Site Restoration .....	11
3.14 Corrective Action Requirements .....	12
3.15 Documentation Requirements .....	13
3.16 Certification Statement .....	13
3.17 Additional Items .....	14
4. INSTRUCTIONS TO BIDDERS .....	14

**TANK REMOVAL REQUIREMENTS  
RAVENNA ARSENAL  
RAVENNA, OHIO**

**1. INTRODUCTION**

The following Plan sets forth the requirements for the removal of fourteen underground storage tanks at the Ravenna Arsenal located in Ravenna, Ohio. This work is to be performed for the Ravenna Arsenal, Inc. (RAI), operator of the facility. The Plan provides for the removal of the tanks and their associated contents and for the restoration of tank locations following removal. Should field evidence indicate that a release has occurred, the Plan also details initial abatement measures, as required under Article 36, Section (C) of the Ohio Fire Code.

All work is to be conducted in accordance with applicable provisions of 40 CFR Part 280, "EPA Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks;" Articles 28, 35 and 36 of the Ohio Fire Code (1301:7-7-28, 1301:7-7-35 and 1301:7-7-36 of the Ohio Administrative Code); Ohio Department of Commerce, Division of State Fire Marshal, Petroleum Underground Storage Tank Closure Assessment Requirements (Ohio Closure Assessment Requirements) and American Petroleum Institute (API) Bulletin No. 1604, "Recommended Practice for Abandonment or Removal of Used Underground Service Station Tanks." In addition, the Contractor(s) must comply with the safety and security regulations as stipulated in the RAI pamphlet "Safety and Security Rules," dated 1986. Copies of these regulations and guidelines are provided in Appendix A. The Ohio Closure Assessment Requirements are to be updated in the fall of 1989. The Contractor shall comply with all applicable provisions of the most current version of the above regulations and guidelines.

The fourteen tanks are located in nine separate locations and formerly contained No. 2 fuel oil, No. 5 fuel oil or gasoline. The tanks are believed to be steel construction. The tanks were associated with former fueling areas, facility buildings and boiler houses. The tanks were taken out of service approximately 15 years ago. Most product was removed and the tanks were filled with a water base corrosion inhibitor. A summary of the tank sizes and locations is provided in Table 1; RAI plans illustrating the features for the various tank areas are also included. A characterization of the tanks is also provided in Section 3.2.1 to 3.2.6, inclusive.

**2. GENERAL REQUIREMENTS**

In performing the tasks associated with the tank removal project, the Contractor must accept the following requirements:

**RAVENNA ARMY AMMUNITION PLANT**

**SECTION B**

**SCOPE OF WORK**

**FOR**

**REMOVAL OF UNDERGROUND STORAGE TANKS (USTs) TANK NUMBERS**

20

21

55

56

57

58

63

64

## TABLE OF CONTENTS

### PAGE

1.	INTRODUCTION .....	1
2.	GENERAL REQUIREMENTS .....	1
3.	TANK REMOVAL SPECIFICATIONS .....	4
3.1	Disposal of Tank Contents .....	4
3.2	Tank Removal Procedures .....	4
3.3	Tank Venting .....	6
3.4	Tank Cleaning .....	6
3.5	Tank Disposal .....	6
3.6	Sludge Sampling .....	6
3.7	Sludge Disposal .....	7
3.8	Soil Screening and Stockpiling .....	7
3.9	Excavation Sampling Procedures .....	8
3.10	Background Soil Sampling .....	10
3.11	Excavation Spoils Sampling .....	10
3.12	Excavation Spoils Disposal .....	10
3.13	Site Restoration .....	10
3.14	Corrective Action Requirements .....	11
3.15	Documentation Requirements .....	12
3.16	Certification Statement .....	12
3.17	Additional Items .....	13
4.	INSTRUCTIONS TO BIDDERS .....	13

**TANK REMOVAL REQUIREMENTS  
RAVENNA ARSENAL  
RAVENNA, OHIO**

**1. INTRODUCTION**

The following Plan sets forth the requirements for the removal of eight underground storage tanks at the Ravenna Arsenal located in Ravenna, Ohio. This work is to be performed for the Ravenna Arsenal, Inc. (RAI), operator of the facility. The Plan provides for the removal of the tanks and their associated contents and for the restoration of tank locations following removal. Should field evidence indicate that a release has occurred, the Plan also details initial abatement measures, as required under Article 36, Section (C) of the Ohio Fire Code.

All work is to be conducted in accordance with applicable provisions of 40 CFR Part 280, "EPA Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks;" Articles 28, 35 and 36 of the Ohio Fire Code (1301:7-7-28, 1301:7-7-35 and 1301:7-7-36 of the Ohio Administrative Code); Ohio Department of Commerce, Division of State Fire Marshal, Petroleum Underground Storage Tank Closure Assessment Requirements (Ohio Closure Assessment Requirements) and American Petroleum Institute (API) Bulletin No. 1604, "Recommended Practice for Abandonment or Removal of Used Underground Service Station Tanks." In addition, the Contractor(s) must comply with the safety and security regulations as stipulated in the RAI pamphlet "Safety and Security Rules," dated 1986. Copies of these regulations and guidelines are provided in Appendix A. The Ohio Closure Assessment Requirements are to be updated in the fall of 1989. The Contractor shall comply with all applicable provisions of the most current version of the above regulations and guidelines.

The eight tanks are located in four separate locations and formerly contained No. 2 fuel oil, and No. 5 fuel oil. The tanks are believed to be steel construction. The tanks were associated with former boiler houses. The tanks were taken out of service approximately 15 years ago. Most product was removed and the tanks were filled with a water base corrosion inhibitor. A summary of the tank sizes and locations is provided in Table 1; RAI plans illustrating the features for the various tank areas are also included. A characterization of the tanks is also provided in Section 3.2.1 to 3.2.6, inclusive.

**2. GENERAL REQUIREMENTS**

In performing the tasks associated with the tank removal project, the Contractor must accept the following requirements:



**RAVENNA ARMY AMMUNITION PLANT**

**SECTION A**

**SCOPE OF WORK**

**FOR**

**REMOVAL OF UNDERGROUND STORAGE TANKS (USTs) TANK NUMBERS**

46

50

59

60

61

62

80

81

82

83

86

87

88

89

## TABLE OF CONTENTS

	<u>PAGE</u>
1. INTRODUCTION .....	1
2. GENERAL REQUIREMENTS .....	1
3. TANK REMOVAL SPECIFICATIONS .....	4
3.1 Disposal of Tank Contents .....	4
3.2 Tank Removal Procedures .....	4
3.3 Tank Venting .....	6
3.4 Tank Cleaning .....	7
3.5 Tank Disposal .....	7
3.6 Sludge Sampling .....	7
3.7 Sludge Disposal .....	7
3.8 Soil Screening and Stockpiling .....	7
3.9 Excavation Sampling Procedures .....	9
3.10 Background Soil Sampling .....	10
3.11 Excavation Spoils Sampling .....	11
3.12 Excavation Spoils Disposal .....	11
3.13 Site Restoration .....	11
3.14 Corrective Action Requirements .....	12
3.15 Documentation Requirements .....	13
3.16 Certification Statement .....	13
3.17 Additional Items .....	14
4. INSTRUCTIONS TO BIDDERS .....	14

**TANK REMOVAL REQUIREMENTS  
RAVENNA ARSENAL  
RAVENNA, OHIO**

**1. INTRODUCTION**

The following Plan sets forth the requirements for the removal of fourteen underground storage tanks at the Ravenna Arsenal located in Ravenna, Ohio. This work is to be performed for the Ravenna Arsenal, Inc. (RAI), operator of the facility. The Plan provides for the removal of the tanks and their associated contents and for the restoration of tank locations following removal. Should field evidence indicate that a release has occurred, the Plan also details initial abatement measures, as required under Article 36, Section (C) of the Ohio Fire Code.

All work is to be conducted in accordance with applicable provisions of 40 CFR Part 280, "EPA Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks;" Articles 28, 35 and 36 of the Ohio Fire Code (1301:7-7-28, 1301:7-7-35 and 1301:7-7-36 of the Ohio Administrative Code); Ohio Department of Commerce, Division of State Fire Marshal, Petroleum Underground Storage Tank Closure Assessment Requirements (Ohio Closure Assessment Requirements) and American Petroleum Institute (API) Bulletin No. 1604, "Recommended Practice for Abandonment or Removal of Used Underground Service Station Tanks." In addition, the Contractor(s) must comply with the safety and security regulations as stipulated in the RAI pamphlet "Safety and Security Rules," dated 1986. Copies of these regulations and guidelines are provided in Appendix A. The Ohio Closure Assessment Requirements are to be updated in the fall of 1989. The Contractor shall comply with all applicable provisions of the most current version of the above regulations and guidelines.

The fourteen tanks are located in nine separate locations and formerly contained No. 2 fuel oil, No. 5 fuel oil or gasoline. The tanks are believed to be steel construction. The tanks were associated with former fueling areas, facility buildings and boiler houses. The tanks were taken out of service approximately 15 years ago. Most product was removed and the tanks were filled with a water base corrosion inhibitor. A summary of the tank sizes and locations is provided in Table 1; RAI plans illustrating the features for the various tank areas are also included. A characterization of the tanks is also provided in Section 3.2.1 to 3.2.6, inclusive.

**2. GENERAL REQUIREMENTS**

In performing the tasks associated with the tank removal project, the Contractor must accept the following requirements:

- 2.1 With his bid, the Contractor will state, in writing, the number of men he intends to use on the job, and his starting and estimated completion dates (subject to change only because of weather or conditions beyond his control).
- 2.2 The Contractor shall maintain a qualified field representative on-site during all tank removal and restoration activities.
- 2.3 The Contractor shall empty and clean each of the tanks.
- 2.4 The Contractor shall utilize means and methods in excavating the ground surrounding the tanks and in removing each tank from the ground that maintain the physical integrity of the sealed tank.
- 2.5 The Contractor is responsible for disposal of the contents of the tanks, and the tanks, piping and appurtenances.
  - a. Title to all materials and equipment to be demolished is vested in the Contractor upon receipt of notice to proceed. The Government will not be responsible for the condition, loss or damage to such property after notice to proceed.
  - b. Material for Subcontractor Salvage - Material for salvage shall be stored as approved by the RAI Engineering Division. Salvage materials shall be removed from Government property before completion of the Contract. Material for salvage shall not be sold on the site.
  - c. Unsalvageable Materials - Nonsalvageable materials other than concrete permitted to remain in place shall be disposed off of the installation.
  - d. A DA Form 1818 - Individual Property Pass - shall be completed for all materials to be removed from Government Property Passes shall be signed by the Plant or Supervisory Engineer.
- 2.6 The Contractor is responsible for site restoration. In the event that site restoration cannot be performed immediately after tank removal, Contractor shall take appropriate measures to stabilize excavations and prevent surface water inflow.

- 2.7 The Contractor is responsible for initial abatement activities for any release of tank contents, including both prior releases and releases which occur during implementation of the Plan. Contractor shall be liable for any remedial actions resultant from his negligence or actions not in accordance with the Plan.
- 2.8 Contractor is not to interfere with the daily operations of the Ravenna Arsenal without the expressed prior approval of RAI.
- 2.9 Contractor must acquaint himself with the work areas and the location of utilities and structures that may affect the removal operation. Contractor shall cease work and notify RAI if field conditions indicate a potential for damage to identified utilities and structures.
- 2.10 The Contractor is responsible for means and methods and is solely responsible for job site safety.
- 2.11 Contractor is responsible for his personnel, materials and equipment and must take appropriate measures to reduce the potential for damage or theft.
- 2.12 Contractor shall keep work areas neat and orderly at all times. Debris shall be removed, disposed off the installation and transported in a manner as to prevent spillage on installation streets and adjacent areas. The use of burning at the project site for the disposal of refuse and debris will not be permitted.
- 2.13 Electrical power is not available in the work areas. Contractor is to provide for generation of power as required to implement the Plan.
- 2.14 Water is available on-site. Arrangements shall be made with RAI regarding the use of this water. The Contractor shall be responsible for conveying water to the work area. Contractor shall minimize the amount of water used to implement the Plan.
- 2.15 Contractor is to comply with all safety and security regulations as stipulated in the RAI pamphlet "Safety and Security Regulations", dated 1986. A copy of this pamphlet is provided in Appendix A.
- 2.16 Normal working hours shall be between 8:00 a.m. and 4:30 p.m. (7:00 a.m. and 3:30 p.m. in summer), Monday through Friday, excluding designated plant holidays. Arrangements to work other than normal hours must be approved in advance by RAI.

### 3. TANK REMOVAL SPECIFICATIONS

#### 3.1 Disposal of Tank Contents

Liquid samples from each tank shall be collected in a 5 ft. long stainless steel bailer. The sample shall include portions of liquid from the free surface, near the center of the tank and near the bottom of the tank.

Samples shall be analyzed for oil and grease, total suspended solids, total and volatile chlorine, RCRA metals, flash point, PH, chemical oxygen demand (COD), viscosity, odor and any other analysis that is required by the disposal facility.

Contractor shall identify a prime and an alternate facility that can transport and/or dispose of the tank contents in accordance with any applicable Federal, State and local regulations. All manifesting and documentation requirements shall be the responsibility of Ravenna Army Ammunition Plant. If an alternate disposal contractor is selected, it may be necessary to resample the tank contents. Resampling shall be at the discretion of the Contractor, who shall be responsible for performing the resampling at no additional cost to RAI.

Prior to removal of the tank contents, the removal contractor shall drain and flush the tank piping back to the tanks to remove any product that may have accumulated in low spots in the piping. Flushing may be performed using either compressed air and appropriate pipe fittings, water or other suitable methods.

Contractor shall evaluate whether the tank is level or if material is pooled at one end of the tank. Upon completion of flushing, the disposal contractor shall pump each tank of liquid and sludge as much as practically possible before excavation is begun.

#### 3.2 Tank Removal Procedures

All tank removal procedures are to be conducted in accordance with the general provisions of Section 3 of API Bulletin No. 1604. A copy of this document is provided in Appendix A. These provisions are discussed below with additional items that the Contractor must consider to perform this particular removal project.

The Contractor shall excavate down to the top of the tank. Care shall be taken to maintain the physical integrity of the tank and its external piping. If possible, the tank shall be vented (see Section 3.3) and cleaned (see Section 3.4) before removal. After

completion of the venting and cleaning procedures, excavation shall proceed to the base of the tank along both sidewalls. Tank installations consisting of concrete pad and hold down straps shall have said anchor strap disconnected or removed prior to tank removal.

If venting and cleaning are not performed prior to removal of the tank from the ground, the Contractor shall take all necessary precautions in response to the explosive hazard that removal of such a tank presents. Tanks not fully vented and cleaned shall be temporarily plugged to prevent spillage and venting of potentially explosive gases during removal. The tanks shall only be plugged for as long as necessary for the removal procedure. Tanks not fully vented and cleaned prior to removal shall have these procedures performed immediately after removal.

Tanks are to be removed by lifting and pulling on straps or cables attached to the lifting lugs on the tank. Following removal, the Contractor shall paint the number of the tank on the side of the tank.

The following subsections discuss items that the Contractor must consider for specific tank areas on the Arsenal property.

#### 3.2.1 Building EE-102 (Bolton House)

This location consists of one (1) 1500 gal. #2 fuel oil tank (No. 46). Fill ports, piping appurtenances, and vent line piping shall be removed.

#### 3.2.2 Building Water Works 4

This location consists of one (1) 1000 gal. #2 fuel oil tank (No. 50). All fill ports, piping appurtenances, and vent line piping shall be removed.

#### 3.2.3 Building Powerhouse 4 (Near LL-5)

This location consists of two (2) 20000 gal. #5 fuel oil tanks (Nos. 59 and 60). All fill ports, piping appurtenances, vent line piping and concrete vault shall be removed.

3.2.4 Building Powerhouse 5 (Near LL-10)

This location consists of two (2) 20000 gal. #5 fuel oil tanks (Nos. 61 and 62). All fill ports, piping appurtenances, vent line piping and concrete vault shall be removed.

3.2.5 Building George Road Gas Station

This location consists of one (1) 12000 gal. gasoline tank (No. 80). The tank is already abandoned with sand fill. Any remaining piping appurtenances shall be removed.

3.2.6. Building 1047

This location consists of three (3) 10000 gal. gasoline tanks (Nos. 81, 82 and 83). All fill ports, piping appurtenances, vent line piping and concrete islands shall be removed.

3.2.7 Building Telephone (North and Northeast)

This location consists of two (2) estimated 1000 gal. tanks (Nos. 86 and 87). The contents of these tanks is unknown. All fill ports, piping appurtenances and vent line piping shall be removed.

3.2.8 Building Fire Station #2

This location consists of one (1) estimated 1000 gal. #2 fuel oil tank (No. 88). All fill ports, piping appurtenances and vent line piping shall be removed.

3.2.9 Building George Road STP (Near S. Service Road)

This location consists of one (1) estimated 1000 gal. tank (No. 89). The tank contents is unknown. All fill ports, piping appurtenances and vent line piping shall be removed.

3.3 Tank Venting

In order to safely clean and transport the tank, the tanks must be purged of potentially explosive vapors. Purging is to be performed as described in Section 3.1.6 of API Bulletin No. 1604, Methods 2 or 3. These methods utilize compressed air or dry ice to purge the tank of vapors. Method 1, filling of the tank with water to dispose vapors, is not acceptable.



### 3.4 Tank Cleaning

All sludges are to be removed from the tanks and containerized in Department of Transportation (DOT) Type 17H open head drums. Tanks shall be cleaned as appropriate to gain acceptance for off-site disposal as scrap. Contractor shall take appropriate measures to contain all cleaning fluids. Contractor shall be responsible for disposal of soils contaminated as a result of the tank cleaning operation. Contractor shall minimize the amount of water and cleaning solution utilized to clean the tanks. Containers shall be labelled with the facility name, date of container filling and the tank number. As discussed in Section 3.6, samples of sludge are to be collected for disposal characterization purposes.

### 3.5 Tank Disposal

Tanks shall be disposed as scrap metal. Tanks are not to be salvaged for resale.

### 3.6 Sludge Sampling

Contractor shall collect an appropriate number of samples to characterize for disposal purposes the sludge generated during tank cleaning. A minimum of three (3) sludge samples shall be collected, one (1) sample from the tanks known to have contained only No. 2 fuel oil, one (1) sample from No. 5 fuel oil, and one (1) sample from those tanks that contained gasoline during their operational lives. Samples shall be collected from the open head drum containers. The type of analyses required to characterize the sludge may be specified by the disposal facility.

### 3.7 Sludge Disposal

Contractor shall identify a prime and an alternate facility that may dispose of the tank sludge in accordance with any applicable Federal, State and local regulations. All manifesting and documentation requirements shall be the responsibility of Ravenna Arsenal, Inc.

### 3.8 Soil Screening and Stockpiling

All soils removed from tank excavations are to be stockpiled in areas that are not prone to the accumulation of surface water. Contaminated soils, as defined below, are to be stockpiled on plastic sheeting. During excavation, spoils are to be screened using an Organic Vapor Analyzer (OVA), and HNu Photoionization

Detector (PID), or equivalent. Persons operating the monitoring equipment shall have completed a 40-hour, OSHA-approved, health and safety training course.

Soil screening shall take place away from any operating equipment.

Soil samples selected for screening shall be placed in sealed glass jars, shaken vigorously, then the jar shall be opened just enough to insert the instrument probe into the headspace of the jar.

Background levels of volatile contaminants in air may be considered to be zero. Soils displaying headspace screening values above background levels are considered to be contaminated and shall be stockpiled separately from those that do not display elevated headspace readings. In assessing whether soils are contaminated, the instrument operator shall consider the sensitivity of the PID to soil and atmospheric moisture.

During excavation, headspace screening data may define areas of contamination within the excavation. Excavation shall continue laterally away from the excavation to remove those soils displaying headspace readings above ten (10) parts per million (ppm). Excavation shall be discontinued if soils with elevated readings are found beyond five feet from the original excavation and a significant decrease in headspace readings is not noted. Contractor shall use his best judgment to assess whether additional excavation in localized areas beyond the five-foot zone would result in removal of contaminated soils. Beyond five feet from the original excavation, contamination problems will likely be addressed through measures other than soil excavation. These measures are beyond this scope of work.

In the event that a release is detected and contamination is believed to remain beyond the five-foot-zone, the excavation shall remain open pending the receipt of analytical data from the excavation. Excavations that remain open shall be surrounded by an earthen berm to reduce potential surface water inflow and, if feasible, shall be covered to reduce direct precipitation into the excavation. Excavation samples shall be analyzed by quick turnaround to expedite excavation closure should additional excavation in localized areas be required.

Piles of contaminated soil shall be covered with plastic sheeting to minimize the influx of surface water and precipitation. This sheeting shall be appropriately weighted down to assure that it remains in place.

### 3.9 Excavation Sampling Procedures

Analytical soil samples are to be collected from the tank excavations. These analytical soil samples are to be collected from each finished excavation, whether there is evidence of contamination or not. All analytical soil samples collected are to be analyzed for total petroleum hydrocarbons (U.S. EPA Extraction Procedure 9071 and Analytical Method 418.1); benzene, ethylbenzene, toluene, xylenes (BETX, U.S. EPA Method 8020) and total lead (U.S. EPA Method 7420) and total chromium (U.S. EPA Method 7190). The analytical methodologies are detailed in the U.S. EPA Publication SW-846, "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods."

Due to the potential for excavation collapse, samples shall be collected from the backhoe bucket, not directly from the excavation. Soil that is collected for analysis shall not be in contact with the backhoe bucket. Contractor shall take appropriate cleaning measures to reduce the potential for cross-contamination of samples via contaminated sampling equipment.

Sampling location and methodology are specified in the Ohio Closure Assessment Requirements. Samples shall be collected from discrete locations and shall not be composited. Samples shall be collected in the native soil material, or if the entire site is fill material, samples may be collected from the original fill (as opposed to the tank cavity fill material). Of all the samples collected from a tank area during closure, only two (2) from each tank area must be sent to a laboratory for analysis. Based on field conditions, Contractor shall collect a sufficient number of samples to assess the presence of fuel residuals following the removal of the tanks, piping and appurtenances and soils believed to be contaminated.

Soil samples shall be taken at the following locations:

1. At points where strong odors or soil discolorations indicate the presence of contamination;
2. From the floor of the excavation at both ends of each tank;
3. Underneath each pump island on the supply line sides;
4. Every 20 feet, or segment thereof, along piping runs, or, if piping will be exposed, under

swing joints, pipe elbows, and flex connectors;

5. Beneath piping section where leaks are known or suspected to have occurred; (a minimum of two samples along the piping are required-one at the island and one along the piping run).
6. If the groundwater table is found within the tank or piping excavations, a sample of groundwater must be collected and analyzed in addition to soil sampling. Where the groundwater table exists in the excavation area(s) soil samples shall be collected just above the water table surface at the locations described above.

Field instruments including photoionization detectors (PIDs), flame ionization detectors (FIDs) and portable gas chromatographs (GCs) may be used for field screening of soil samples and to choose samples to be tested at a laboratory. The three soil samples from each tank area with the "highest" readings on the field instrument must be sent to a laboratory for analysis.

If the field instrument shows non-detectable readings, three samples from each tank area must still be sent for analysis. In the cases where there are non-detectable readings, the three samples include one from the tank area, one from the piping run and the third sample at the dispenser/island if one is present. If there is no dispenser/island, the third sample shall be taken along the piping run.

Samples must be sealed in appropriate containers (glass jars with teflon lids are recommended) and cooled to 4 degrees celsius (placed on ice) as soon as possible after sampling. Samples shall not be allowed to warm up, and not be left open to the air while awaiting screening.

Contractor shall utilize an analytical laboratory that is acceptable to the Bureau of Underground Storage Tank Regulations to perform the required analyses. Appropriate chain-of-custody documentation and sample preservation techniques shall be observed.

### 3.10 Background Soil Sampling

In order to establish background levels of lead and total petroleum hydrocarbons in the site soils, Contractor is to collect a minimum of one (1) background soil sample. This sample is to be analyzed for total lead (Method 7420), total chromium (Method 7190) and total petroleum hydrocarbons (Method 418.1). Samples are to be collected

in areas not known to have been disturbed by human activities. In order to characterize fill soils from the RAI-designated borrow areas, background samples shall be selected from the proposed clay and sand borrow areas. Borrow areas are discussed in Section 3.13.

Contractor shall utilize an analytical laboratory that is qualified to perform these analyses. Appropriate chain-of-custody documentation and sample presentation shall be observed.

### 3.11 Excavation Spoils Sampling

The Contractor shall collect a sufficient number of samples to characterize the stockpiled contaminated soil (see Section 3.8) for disposal purposes. The number of samples and the type of analyses required may be determined by the disposal facility.

### 3.12 Excavation Spoils Disposal

Contractor shall identify a prime and an alternate facility that may dispose of the excavation spoils in accordance with any applicable Federal, State and local regulations. All manifesting and documentation requirements shall be the responsibility of Ravenna Arsenal, Inc.

### 3.13 Site Restoration

RAI shall designate borrow areas for excavation fill materials. Contractor shall be responsible for restoring tank excavations and piping trenches to grade and contouring borrow areas to approximate their original condition. The upper most one foot of soil (topsoil) in borrow areas shall be stockpiled for future use in site restoration and shall not be used for fill material.

Tank excavations and piping trenches shall be filled with sand and/or gravel to within approximately two feet of the ground surface. A minimum one-foot-thick layer of clay fill shall be emplaced above the sand in six-inch lifts. Clay fill shall be compacted with a minimum of two passes with the backhoe in each of two perpendicular directions. Stockpiled topsoil shall be placed above the clay to restore the excavation to grade. Excavation spoils that are believed to be non-contaminated, based on field screening, may be backfilled as appropriate. Tank excavation areas and piping trenches shall be seeded in accordance with Ohio Department of Transportation (ODOT) Construction and Material Specifications, Items 659, 667 and 842. A copy of these items is provided in Appendix B.

Borrow areas shall be contoured so as not to exceed a 1:5 slope and such that surface water drainage is away from the borrow area. A minimum six-inch-thick layer of topsoil shall be emplaced over the borrow soil. Contractor shall seed borrow areas in accordance with Ohio Department of Transportation (ODOT) Construction and Material Specifications, Item 659, 667 and 842. A copy of these items is provided in Appendix B.

### 3.14 Corrective Action Requirements

Contractor shall be prepared to implement any initial abatement requirements or procedures in the event of a release, as defined in 1301:7-7-35, paragraph (B) of the Ohio Administrative Code. Contractor shall confirm any suspected release in accordance with 1301:7-7-28, paragraph (K) of the Ohio Administrative Code and provide immediate verbal and 24-hour written notification to RAI personnel. Contractor shall inform RAI personnel, as the owner/operator of the tanks, of the release reporting requirements pursuant to 1301:7-7-28, paragraph (K). Contractor shall be prepared to implement any of the initial abatement procedures as defined in 1301:7-7-36, paragraphs (C), (2), (D) and (E) of the Ohio Administrative Code. Copies of the cited portions of the Ohio Administrative Code are provided in Appendix A.

The initial abatement measures specified under the Code consists of:

1. Stopping of any further release from the tank system;
2. Mitigation of all fire, explosion and safety hazards;
3. Removal and disposal of all visibly contaminated soil and any associated groundwater from the excavation zone;
4. Investigation to determine the possible presence of free product and initiation of removal of any free product found as soon as practicable;
5. Reporting of all initial corrective action taken pursuant to 1301:7-7-36 paragraph (C) (2) of the Ohio Administrative Code. This report shall be submitted to the State Fire Marshal within twenty days of discovery of the release.

### 3.15 Documentation Requirements

Upon completion of the tank removal and site restoration activities, Contractor shall prepare a tank closure report for submittal to the State Fire Marshal. The contents of this report shall include, but not to be limited to:

1. Discussion of the disposition of the tank contents and contaminated soils;
2. Discussion of the disposition of the tanks;
3. Discussion of the sample locations (identified on a site map), sampling equipment and technique, sample preservation, and the name and affiliation of sampling personnel.
4. Presentation and discussion of analytical findings including copies of data, chain-of-custody documentation, and laboratory quality assurance/quality control protocols, and the name, address and telephone number of the laboratory.
5. Name, address and telephone number of any persons inspecting the tank closure on behalf of the Office of the State Fire Marshal or the Bureau of Underground Storage Tank Regulations.
6. Photographic documentation of the removal and decommissioning of each tank;
7. Discussion of all corrective action taken pursuant to 1301:7-7-36, paragraphs (C) (2), (D) and (E) of the Ohio Administrative Code.

### 3.16 Certification Statement

Upon completion of the tank removal and site restoration project, the closure must be certified by a Professional engineer registered in the State of Ohio. The certification statement shall read as follows:

I CERTIFY THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE REQUIREMENTS FOR UNDERGROUND STORAGE TANK REMOVAL," AS PREPARED FOR THE RAVENNA ARSENAL, INCORPORATED AT THE DIRECTION OF AND ON THE BEHALF OF THE U.S. ARMY. ALL REMOVAL ABATEMENT, RESTORATION AND REPORTING ACTIVITIES WERE CONDUCTED IN ACCORDANCE WITH THE "REQUIREMENTS FOR UNDERGROUND STORAGE TANK REMOVAL" AND APPLICABLE PROVISIONS OF 40 CFR PART ~~20180~~ EPA TECHNICAL STANDARDS AND CORRECTIVE ACTION REQUIREMENTS FOR OWNERS AND OPERATORS OF UNDERGROUND STORAGE TANKS;"

ARTICLES 28, 35 AND 36 OF THE OHIO ADMINISTRATIVE CODE;  
AND AMERICAN PETROLEUM INSTITUTE (API) BULLETIN NO. 1604.  
"RECOMMENDED PRACTICE FOR ABANDONMENT OR REMOVAL OF USED  
UNDERGROUND SERVICE STATION TANKS."

### 3.17 Additional Items

In addition to the above items, Contractor must comply with any and all applicable requirements of the Occupational Safety and Health Administration (OSHA), including, but not limited to, air monitoring, excavation stabilization, barricading of work areas and health and safety training for site workers. Contractor shall take all due precaution to minimize and monitor explosion hazards. As discussed in Section 2, Contractor is also to abide by the RAI "Safety and Security Rules", a copy of which is provided in Appendix A.

## 4. INSTRUCTIONS TO BIDDERS

Prospective bidders on tank removal project described herein shall provide Ravenna Arsenal, Inc., with the following information:

1. A firm cost for the transportation and disposal of the tank contents. An estimated total volume of 5,000 gallons.
2. A firm cost for the accessing, removal, cleaning and disposal of the fourteen (14) identified tanks and associated piping and appurtenances. (only 10 USTs required cleaning)
3. A firm cost for backfilling, grading and seeding of tank excavations, piping trenches and borrow areas.
4. A firm cost for the collection and analysis of:
  - a. Twenty eight (28) tank excavation samples analyzed by the methods listed in Section 3.9. (2 samples/tank)
  - b. One (1) background soil sample analyzed by the methods listed in Section 3.10;
  - c. Unit costs for additional soil analysis shall also be provided. These additional soil analyses shall not be included in the lump sum, firm cost;
  - d. Unit costs for groundwater analyses shall be provided. Groundwater analyses shall not be included in the lump sum, firm cost.



5. Contractor shall supply the following costs for transportation and disposal of the tank sludges and cleaning fluids.
  - a. Alternative A - A firm cost for transportation and disposal of the tank sludges and cleaning fluids.
  - b. Alternative B - A unit cost, per pound, for transportation and disposal of sludges and the cleaning fluids. Contractor shall be responsible for verification of the weight of each shipment off-site.
6. A firm cost for excavation spoils characterization sampling necessary to coordinate disposal.
7. Contractor shall supply the following costs for transportation and disposal of the contaminated excavation spoils.
  - a. Alternative A - A firm cost for transportation and disposal of contaminated soil not to exceed five (5) feet beyond the tank excavation in both the horizontal and vertical directions. Cost shall include the replacement of excavated materials with clean borrow from on-site.
  - b. Alternative B - A unit cost, per ton, for transportation and disposal of contaminated soil and the replacement of excavated materials with clean borrow from on-site. Contractor shall be responsible for verification of the weight of each shipment off-site.
8. A firm cost for preparation of a tank closure report for submittal to the Office of the State Fire Marshal.
9. Submission of a list of potential treatment, storage and disposal facilities (TSD's) and transporters for all of the wastes generated during implementation of this project. Contractor shall identify prime and an alternate TSD and transporter for all of the project wastes. Non-acceptance of a proposed TSD or transporter may be grounds for dismissal of a bid.
10. Submission of costs for both alternatives under Item Nos. 5 and 7 above. Bids would be awarded in the best interest of Ravenna Arsenal, Inc.
11. For items of work with potential significant cost changes (i.e., disposal of hazardous vs. non-hazardous project wastes), cost shall be provided for each of the potential changes.

12. Contractor is responsible for determining that all costs provided are for services that are in accordance with the Plan and that costs have been provided for all items included in the Plan. Contractor shall be responsible for items that are not in accordance with the Plan and for items that are included in the Plan that are omitted from his costs.



**RAVENNA ARMY AMMUNITION PLANT**

**SECTION B**

**SCOPE OF WORK**

**FOR**

**REMOVAL OF UNDERGROUND STORAGE TANKS (USTs) TANK NUMBERS**

20

21

55

56

57

58

63

64

## TABLE OF CONTENTS

	<u>PAGE</u>
1. INTRODUCTION .....	1
2. GENERAL REQUIREMENTS .....	1
3. TANK REMOVAL SPECIFICATIONS .....	4
3.1 Disposal of Tank Contents .....	4
3.2 Tank Removal Procedures .....	4
3.3 Tank Venting .....	6
3.4 Tank Cleaning .....	6
3.5 Tank Disposal .....	6
3.6 Sludge Sampling .....	6
3.7 Sludge Disposal .....	7
3.8 Soil Screening and Stockpiling .....	7
3.9 Excavation Sampling Procedures .....	8
3.10 Background Soil Sampling .....	10
3.11 Excavation Spoils Sampling .....	10
3.12 Excavation Spoils Disposal .....	10
3.13 Site Restoration .....	10
3.14 Corrective Action Requirements .....	11
3.15 Documentation Requirements .....	12
3.16 Certification Statement .....	12
3.17 Additional Items .....	13
4. INSTRUCTIONS TO BIDDERS .....	13

**TANK REMOVAL REQUIREMENTS  
RAVENNA ARSENAL  
RAVENNA, OHIO**

**1. INTRODUCTION**

The following Plan sets forth the requirements for the removal of eight underground storage tanks at the Ravenna Arsenal located in Ravenna, Ohio. This work is to be performed for the Ravenna Arsenal, Inc. (RAI), operator of the facility. The Plan provides for the removal of the tanks and their associated contents and for the restoration of tank locations following removal. Should field evidence indicate that a release has occurred, the Plan also details initial abatement measures, as required under Article 36, Section (C) of the Ohio Fire Code.

All work is to be conducted in accordance with applicable provisions of 40 CFR Part 280, "EPA Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks;" Articles 28, 35 and 36 of the Ohio Fire Code (1301:7-7-28, 1301:7-7-35 and 1301:7-7-36 of the Ohio Administrative Code); Ohio Department of Commerce, Division of State Fire Marshal, Petroleum Underground Storage Tank Closure Assessment Requirements (Ohio Closure Assessment Requirements) and American Petroleum Institute (API) Bulletin No. 1604, "Recommended Practice for Abandonment or Removal of Used Underground Service Station Tanks." In addition, the Contractor(s) must comply with the safety and security regulations as stipulated in the RAI pamphlet "Safety and Security Rules," dated 1986. Copies of these regulations and guidelines are provided in Appendix A. The Ohio Closure Assessment Requirements are to be updated in the fall of 1989. The Contractor shall comply with all applicable provisions of the most current version of the above regulations and guidelines.

The eight tanks are located in four separate locations and formerly contained No. 2 fuel oil, and No. 5 fuel oil. The tanks are believed to be steel construction. The tanks were associated with former boiler houses. The tanks were taken out of service approximately 15 years ago. Most product was removed and the tanks were filled with a water base corrosion inhibitor. A summary of the tank sizes and locations is provided in Table 1; RAI plans illustrating the features for the various tank areas are also included. A characterization of the tanks is also provided in Section 3.2.1 to 3.2.6, inclusive.

**2. GENERAL REQUIREMENTS**

In performing the tasks associated with the tank removal project, the Contractor must accept the following requirements:

- 2.1 With his bid, the Contractor will state, in writing, the number of men he intends to use on the job, and his starting and estimated completion dates (subject to change only because of weather or conditions beyond his control).
- 2.2 The Contractor shall maintain a qualified field representative on-site during all tank removal and restoration activities.
- 2.3 The Contractor shall empty and clean each of the tanks.
- 2.4 The Contractor shall utilize means and methods in excavating the ground surrounding the tanks and in removing each tank from the ground that maintain the physical integrity of the sealed tank.
- 2.5 The Contractor is responsible for disposal of the contents of the tanks, and the tanks, piping and appurtenances.
  - a. Title to all materials and equipment to be demolished is vested in the Contractor upon receipt of notice to proceed. The Government will not be responsible for the condition, loss or damage to such property after notice to proceed.
  - b. Material for Subcontractor Salvage - Material for salvage shall be stored as approved by the RAI Engineering Division. Salvage materials shall be removed from Government property before completion of the Contract. Material for salvage shall not be sold on the site.
  - c. Unsalvageable Materials - Nonsalvageable materials other than concrete permitted to remain in place shall be disposed off of the installation.
  - d. A DA Form 1818 - Individual Property Pass - shall be completed for all materials to be removed from Government Property Passes shall be signed by the Plant or Supervisory Engineer.
- 2.6 The Contractor is responsible for site restoration. In the event that site restoration cannot be performed immediately after tank removal, Contractor shall take appropriate measures to stabilize excavations and prevent surface water inflow.

- 2.7 The Contractor is responsible for initial abatement activities for any release of tank contents, including both prior releases and releases which occur during implementation of the Plan. Contractor shall be liable for any remedial actions resultant from his negligence or actions not in accordance with the Plan.
- 2.8 Contractor is not to interfere with the daily operations of the Ravenna Arsenal without the expressed prior approval of RAI.
- 2.9 Contractor must acquaint himself with the work areas and the location of utilities and structures that may affect the removal operation. Contractor shall cease work and notify RAI if field conditions indicate a potential for damage to identified utilities and structures.
- 2.10 The Contractor is responsible for means and methods and is solely responsible for job site safety.
- 2.11 Contractor is responsible for his personnel, materials and equipment and must take appropriate measures to reduce the potential for damage or theft.
- 2.12 Contractor shall keep work areas neat and orderly at all times. Debris shall be removed, disposed off the installation and transported in a manner as to prevent spillage on installation streets and adjacent areas. The use of burning at the project site for the disposal of refuse and debris will not be permitted.
- 2.13 Electrical power is not available in the work areas. Contractor is to provide for generation of power as required to implement the Plan.
- 2.14 Water is available on-site. Arrangements shall be made with RAI regarding the use of this water. The Contractor shall be responsible for conveying water to the work area. Contractor shall minimize the amount of water used to implement the Plan.
- 2.15 Contractor is to comply with all safety and security regulations as stipulated in the RAI pamphlet "Safety and Security Regulations", dated 1986. A copy of this pamphlet is provided in Appendix A.
- 2.16 Normal working hours shall be between 8:00 a.m. and 4:30 p.m. (7:00 a.m. and 3:30 p.m. in summer), Monday through Friday, excluding designated plant holidays. Arrangements to work other than normal hours must be approved in advance by RAI.



### 3. TANK REMOVAL SPECIFICATIONS

#### 3.1 Disposal of Tank Contents

Liquid samples from each tank shall be collected in a 5 ft. long stainless steel bailer. The sample shall include portions of liquid from the free surface, near the center of the tank and near the bottom of the tank.

Samples shall be analyzed for oil and grease, total suspended soils, total and volatile chlorine, RCRA metals, flash point, PH, chemical oxygen demand (COD), viscosity, odor and any other analysis that is required by the disposal facility.

Contractor shall identify a prime and an alternate facility that can transport and/or dispose of the tank contents in accordance with any applicable Federal, State and local regulations. All manifesting and documentation requirements shall be the responsibility of Ravenna Army Ammunition Plant. If an alternate disposal contractor is selected, it may be necessary to resample the tank contents. Resampling shall be at the discretion of the Contractor, who shall be responsible for performing the resampling at no additional cost to RAI.

Prior to removal of the tank contents, the removal contractor shall drain and flush the tank piping back to the tanks to remove any product that may have accumulated in low spots in the piping. Flushing may be performed using either compressed air and appropriate pipe fittings, water or other suitable methods.

Contractor shall evaluate whether the tank is level or if material is pooled at one end of the tank. Upon completion of flushing, the disposal contractor shall pump each tank of liquid and sludge as much as practically possible before excavation is begun.

#### 3.2 Tank Removal Procedures

All tank removal procedures are to be conducted in accordance with the general provisions of Section 3 of API Bulletin No. 1604. A copy of this document is provided in Appendix A. These provisions are discussed below with additional items that the Contractor must consider to perform this particular removal project.

The Contractor shall excavate down to the top of the tank. Care shall be taken to maintain the physical integrity of the tank and its external piping. If possible, the tank shall be vented (see Section 3.3) and cleaned (see Section 3.4) before removal. After

completion of the venting and cleaning procedures, excavation shall proceed to the base of the tank along both sidewalls. Tank installations consisting of concrete pad and hold down straps shall have said anchor strap disconnected or removed prior to tank removal.

If venting and cleaning are not performed prior to removal of the tank from the ground, the Contractor shall take all necessary precautions in response to the explosive hazard that removal of such a tank presents. Tanks not fully vented and cleaned shall be temporarily plugged to prevent spillage and venting of potentially explosive gases during removal. The tanks shall only be plugged for as long as necessary for the removal procedure. Tanks not fully vented and cleaned prior to removal shall have these procedures performed immediately after removal.

Tanks are to be removed by lifting and pulling on straps or cables attached to the lifting lugs on the tank. Following removal, the Contractor shall paint the number of the tank on the side of the tank.

The following subsections discuss items that the Contractor must consider for specific tank areas on the Arsenal property.

#### 3.2.1 Building DB-27 (LL-2)

This location consists of two (2) 15000 gal. #2 fuel oil tanks (Nos. 20 and 21). Fill ports, piping appurtenances and vent line piping shall be removed.

#### 3.2.2 Building Powerhouse 1 (LL-1)

This location consists of two (2) 20000 gal. #5 fuel oil tanks (Nos. 55 and 56). Fill ports, piping appurtenances, vent line piping and concrete vault shall be removed.

#### 3.2.3 Building Powerhouse 2 (LL-2)

This location consists of two (2) 15000 gal. #5 fuel oil tanks (Nos. 57 and 58). Fill ports, piping appurtenances, vent line piping and concrete vault shall be removed.

#### 3.2.4 Building Powerhouse 7 (LL-4)

This location consists of two (2) 20000 gal. #5 fuel oil tanks (Nos. 63 and 64). All fill ports, piping appurtenances, vent line piping and concrete vault shall be removed.

#### 3.3 Tank Venting

In order to safely clean and transport the tank, the tanks must be purged of potentially explosive vapors. Purging is to be performed as described in Section 3.1.6 of API Bulletin No. 1604, Methods 2 or 3. These methods utilize compressed air or dry ice to purge the tank of vapors. Method 1, filling of the tank with water to dispose vapors, is not acceptable.

#### 3.4 Tank Cleaning

All sludges are to be removed from the tanks and containerized in Department of Transportation (DOT) Type 17H open head drums. Tanks shall be cleaned as appropriate to gain acceptance for off-site disposal as scrap. Contractor shall take appropriate measures to contain all cleaning fluids. Contractor shall be responsible for disposal of soils contaminated as a result of the tank cleaning operation. Contractor shall minimize the amount of water and cleaning solution utilized to clean the tanks. Containers shall be labelled with the facility name, date of container filling and the tank number. As discussed in Section 3.6, samples of sludge are to be collected for disposal characterization purposes.

#### 3.5 Tank Disposal

Tanks shall be disposed as scrap metal. Tanks are not to be salvaged for resale.

#### 3.6 Sludge Sampling

Contractor shall collect an appropriate number of samples to characterize for disposal purposes the sludge generated during tank cleaning. A minimum of two (2) sludge samples shall be collected, one (1) sample from the tanks known to have contained only No. 2 fuel oil, and one (1) sample from those tanks that contained No. 5 fuel oil during their operational lives. Samples shall be collected from the open head drum containers. The type of analyses required to characterize the sludge may be specified by the disposal facility.

### 3.7 Sludge Disposal

Contractor shall identify a prime and an alternate facility that may dispose of the tank sludge in accordance with any applicable Federal, State and local regulations. All manifesting and documentation requirements shall be the responsibility of Ravenna Arsenal, Inc.

### 3.8 Soil Screening and Stockpiling

All soils removed from tank excavations are to be stockpiled in areas that are not prone to the accumulation of surface water. Contaminated soils, as defined below, are to be stockpiled on plastic sheeting. During excavation, spoils are to be screened using an Organic Vapor Analyzer (OVA), and HNu Photoionization Detector (PID), or equivalent. Persons operating the monitoring equipment shall have completed a 40-hour, OSHA-approved, health and safety training course.

Soil screening shall take place away from any operating equipment.

Soil samples selected for screening shall be placed in sealed glass jars, shaken vigorously, then the jar shall be opened just enough to insert the instrument probe into the headspace of the jar.

Background levels of volatile contaminants in air may be considered to be zero. Soils displaying headspace screening values above background levels are considered to be contaminated and shall be stockpiled separately from those that do not display elevated headspace readings. In assessing whether soils are contaminated, the instrument operator shall consider the sensitivity of the PID to soil and atmospheric moisture.

During excavation, headspace screening data may define areas of contamination within the excavation. Excavation shall continue laterally away from the excavation to remove those soils displaying headspace readings above ten (10) parts per million (ppm). Excavation shall be discontinued if soils with elevated readings are found beyond five feet from the original excavation and a significant decrease in headspace readings is not noted. Contractor shall use his best judgment to assess whether additional excavation in localized areas beyond the five-foot zone would result in removal of contaminated soils. Beyond five feet from the original excavation, contamination problems will likely be addressed through measures other than soil excavation. These measures are beyond this scope of work.

In the event that a release is detected and contamination is believed to remain beyond the five-foot-zone, the excavation shall remain open pending the receipt of analytical data from the excavation. Excavations that remain open shall be surrounded by an earthen berm to reduce potential surface water inflow and, if feasible, shall be covered to reduce direct precipitation into the excavation. Excavation samples shall be analyzed by quick turnaround to expedite excavation closure should additional excavation in localized areas be required.

Piles of contaminated soil shall be covered with plastic sheeting to minimize the influx of surface water and precipitation. This sheeting shall be appropriately weighted down to assure that it remains in place.

### 3.9 Excavation Sampling Procedures

Analytical soil samples are to be collected from the tank excavations. These analytical soil samples are to be collected from each finished excavation, whether there is evidence of contamination or not. All analytical soil samples collected are to be analyzed for total petroleum hydrocarbons (U.S. EPA Extraction Procedure 9071 and Analytical Method 418.1); benzene, ethylbenzene, toluene, xylenes (BETX, U.S. EPA Method 8020) and total lead (U.S. EPA Method 7420) and total chromium (U.S. EPA Method 7190). The analytical methodologies are detailed in the U.S. EPA Publication SW-846, "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods."

Due to the potential for excavation collapse, samples shall be collected from the backhoe bucket, not directly from the excavation. Soil that is collected for analysis shall not be in contact with the backhoe bucket. Contractor shall take appropriate cleaning measures to reduce the potential for cross-contamination of samples via contaminated sampling equipment.

Sampling location and methodology are specified in the Ohio Closure Assessment Requirements. Samples shall be collected from discrete locations and shall not be composited. Samples shall be collected in the native soil material, or if the entire site is fill material, samples may be collected from the original fill (as opposed to the tank cavity fill material). Of all the samples collected from a tank area during closure, only two (2) from each tank area must be sent to a laboratory for analysis.

Based on field conditions, Contractor shall collect a sufficient number of samples to assess the presence of fuel residuals following the removal of the tanks, piping and appurtenances and soils believed to be contaminated.

Soil samples shall be taken at the following locations:

1. At points where strong odors or soil discolorations indicate the presence of contamination;
2. From the floor of the excavation at both ends of each tank;
3. Underneath each pump island on the supply line side;
4. Every 20 feet, or segment thereof, along piping runs, or, if piping will be exposed, under swing joints, pipe elbows, and flex connectors;
5. Beneath piping section where leaks are known or suspected to have occurred; (a minimum of two samples along the piping are required-one at the island and one along the piping run).
6. If the groundwater table is found within the tank or piping excavations, a sample of groundwater must be collected and analyzed in addition to soil sampling. Where the groundwater table exists in the excavation area(s) soil samples shall be collected just above the water table surface at the locations described above.

Field instruments including photoionization detectors (PIDs), flame ionization detectors (FIDs) and portable gas chromatographs (GCs) may be used for field screening of soil samples and to choose samples to be tested at a laboratory. The three soil samples from each tank area with the "highest" readings on the field instrument must be sent to a laboratory for analysis.

If the field instrument shows non-detectable readings, three samples from each tank area must still be sent for analysis. In the cases where there are non-detectable readings, the three samples include one from the tank area, and one from the piping run and the third sample at the dispenser/island if one is present. If there is no dispenser/island, the third sample shall be taken along the piping run.

Samples must be sealed in appropriate containers (glass jars with teflon lids are recommended) and cooled to 4° degrees Celsius (placed on ice) as soon as possible after sampling. Samples shall not be allowed to warm up, and shall not be left open to the air while awaiting screening.

Contractor shall utilize an analytical laboratory that is acceptable to the Bureau of Underground Storage Tank Regulations to perform the required analyses. Appropriate chain-of-custody documentation and sample preservation techniques shall be observed.

### 3.10 Background Soil Sampling

In order to establish background levels of lead and total petroleum hydrocarbons in the site soils, Contractor is to collect a minimum of one (1) background soil sample. This sample is to be analyzed for total lead (Method 7420), total chromium (Method 7190) and total petroleum hydrocarbons (Method 418.1). Samples are to be collected in areas not known to have been distributed by human activities. In order to characterize fill soils from the RAI-designated borrow areas, background samples shall be selected from the proposed clay and sand borrow areas. Borrow areas are discussed in Section 3.13.

Contractor shall utilize an analytical laboratory that is qualified to perform these analyses. Appropriate chain-of-custody documentation and sample presentation shall be observed.

### 3.11 Excavation Spoils Sampling

The Contractor shall collect a sufficient number of samples to characterize the stockpiled contaminated soil (see Section 3.8) for disposal purposes. The number of samples and the type of analyses required may be determined by the disposal facility.

### 3.12 Excavation Spoils Disposal

Contractor shall identify a prime and an alternate facility that may dispose of the excavation spoils in accordance with any applicable Federal, State and local regulations. All manifesting and documentation requirements shall be the responsibility of Ravenna Arsenal, Inc.

### 3.13 Site Restoration

RAI shall designate borrow areas for excavation fill materials. Contractor shall be responsible for restoring tank excavations and piping trenches to grade and contouring borrow areas to approximate their original condition. The upper most one foot of soil (topsoil) in borrow areas shall be stockpiled for future use in site restoration and shall not be used for fill material.

Tank excavations and piping trenches shall be filled with sand and/or gravel to within approximately two feet of the ground surface. A minimum one-foot thick layer of clay fill shall be emplaced above the sand in six-inch lifts. Clay fill shall be compacted with a minimum of two passes with the backhoe in each of two perpendicular directions. Stockpiled topsoil shall be placed above the clay to restore the excavation to grade. Excavation spoils that are believed to be non-contaminated, based on field screening, may be backfilled as appropriate. Tank excavation areas and piping trenches shall be seeded in accordance with Ohio Department of Transportation (ODOT) Construction and Material Specifications, Items 659 and 667. A copy of these items is provided in Appendix B.

Borrow areas shall be contoured so as not to exceed a 1.5 slope and such that surface water drainage is away from the borrow area. A minimum six-inch-thick layer of topsoil shall be emplaced over the borrow soil. Contractor shall seed borrow areas in accordance with Ohio Department of Transportation (ODOT) Construction and Material Specifications, Items 659, 667 and 842. A copy of these items is provided in Appendix B.

### 3.14 Corrective Action Requirements

Contractor shall be prepared to implement any initial abatement requirements or procedures in the event of a release, as defined in 1301:7-7-35, paragraph (B) of the Ohio Administrative Code. Contractor shall confirm any suspected release in accordance with 1301:7-7-28, paragraph (K) of the Ohio Administrative Code and provide immediate verbal and 24 hour written notification to RAI personnel. Contractor shall conform RAI personnel, as the owner/operator of the tanks, of the release reporting requirements pursuant to 1301:7-7-28, Paragraph (K). Contractor shall be prepared to implement any of the initial abatement procedures as defined in 1301:7-7-36, paragraph (C)(2), (D) and (E) of the Ohio Administrative Code. Copies of the cited portions of the Ohio Administrative Code are provided in Appendix A.

The initial abatement measures specified under the code consist of:

1. Stopping of any further release from the tank system;
2. Mitigation of all fire, explosion and safety hazards;
3. Removal and disposal of all visibly contaminated soil and any associated groundwater from the excavation zone;



registered in the State of Ohio. The certification statement shall read as follows:

I CERTIFY THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE REQUIREMENTS FOR UNDERGROUND STORAGE TANK REMOVAL," AS PREPARED FOR THE RAVENNA ARSENAL, INCORPORATED AT THE DIRECTION OF AND ON THE BEHALF OF THE U.S. ARMY. ALL REMOVAL ABATEMENT, RESTORATION AND REPORTING ACTIVITIES WERE CONDUCTED IN ACCORDANCE WITH THE "REQUIREMENTS FOR UNDERGROUND STORAGE TANK REMOVAL" AND APPLICABLE PROVISIONS OF 40 CFR PART 20, "EPA TECHNICAL STANDARDS AND CORRECTIVE ACTION REQUIREMENTS FOR OWNERS AND OPERATORS OF UNDERGROUND STORAGE TANKS;" ARTICLES 28, 35 AND 36 OF THE OHIO ADMINISTRATIVE CODE; AND AMERICAN PETROLEUM INSTITUTE (API) BULLETIN NO. 1604. "RECOMMENDED PRACTICE FOR ABANDONMENT OR REMOVAL OF USED UNDERGROUND SERVICE STATION TANKS."

### 3.17 Additional Items

In addition to the above items, Contractor must comply with any and all applicable requirements of the Occupational Safety and Health Administration (OSHA), including, but not limited to, air monitoring, excavation stabilization, barricading of work areas and health and safety training for site workers. Contractor shall take all due precaution to minimize and monitor explosion hazards. As discussed in Section 2, Contractor is also to abide by the RAI "Safety and Security Rules", a copy of which is provided in Appendix A.

## 4. INSTRUCTIONS TO BIDDERS

Prospective bidders on tank removal project described herein shall provide Ravenna Arsenal, Inc., with the following information:

1. A firm cost for the transportation and disposal of the tank contents. An estimated total volume of 5,300 gallons.
2. A firm cost for the accessing, removal, cleaning and disposal of the eight (8) identified tanks and associated piping and appurtenances. (Only 2 USTs required cleaning)
3. A firm cost for backfilling, grading and seeding of tank excavations, piping trenches and borrow areas.
4. A firm cost for the collection and analysis of:
  - a. Sixteen (16) tank excavation samples analyzed by the methods listed in Section 3.9. (2 samples/tank)

- b. One (1) background soil sample analyzed by the methods listed in Section 3.10;
  - c. Unit costs for additional soil analysis shall also be provided. These additional soil analyses shall not be included in the lump sum, firm cost;
  - d. Unit costs for groundwater analyses shall be provided. Groundwater analyses shall not be included in the lump sum, firm cost.
5. Contractor shall supply the following costs for transportation and disposal of the tank sludges and cleaning fluids.
- a. Alternative A - A firm cost for transportation and disposal of the tank sludges and cleaning fluids.
  - b. Alternative B - A unit cost, per pound, for transportation and disposal sludge and cleaning fluids. Contractor shall be responsible for verification of the weight of each shipment off-site.
6. A firm cost for excavation spoils characterization sampling necessary to coordinate disposal.
7. Contractor shall supply the following costs for transportation and disposal of the contaminated excavation spoils.
- a. Alternative A - A firm cost for transportation and disposal of contaminated soil not to exceed five (5) feet beyond the tank excavation in both the horizontal and vertical directions. Cost shall include the replacement of excavated materials with clean borrow from on-site.
  - b. Alternative B - A unit cost, per ton, for transportation and disposal of contaminated soil and the replacement of excavated materials with clean borrow from on-site. Contractor shall be responsible for verification of the weight of each shipment off-site.
8. A firm cost for preparation of a tank closure report for submittal to the Office of the State Fire Marshal.
9. Submission of a list of potential treatment, storage and disposal facilities (TSD's) and transporters for all of the wastes generated during implementation of this project. Contractor shall identify prime and an alternate TSD and transporter for all of the project wastes. Non-acceptance of a proposed TSD or transporter

may be grounds for dismissal of a bid.

10. Submission of costs for both alternatives under Item Nos. 5 and 7 above. Bids would be awarded in the best interest of Ravenna Arsenal, Inc.
11. For items of work with potential significant cost changes (i.e., disposal of hazardous vs. non-hazardous project wastes), cost shall be provided for each of the potential changes.
12. Contractor is responsible for determining that all costs provided are for services that are in accordance with the Plan and that costs have been provided for all items included in the Plan. Contractor shall be responsible for items that are not in accordance with the Plan and for items that are included in the Plan that are omitted from his costs.

TABLES

# SUMMARY

## 22 USTS FOR REMOVAL

TANK NO.	LOCATION	CAPACITY (GAL)	KNOWN CONTENTS	DWG NO.
20	DB27 (LL2)	15000	#2 F.O.	37-01-01
21	DB27 (LL2)	15000	#2 F.O.	SHT. 56
46	Bolton House	1500	#2 F.O.	N/A
50	Water Works 4	1000	#2 F.O.	26-04-06
*55	PH 1 (LL1)	20000	#5 F.O. SW-18, M-68&70	
*56	PH 1 (LL1)	20000	#5 F.O.	304.301
*57	PH 2 (LL2)	15000	#5 F.O.	304.302
*58	PH 2 (LL2)	15000	#5 F.O.	
*59	PH 4 (near LL5)	20000	#5 F.O.	609.301
*60	PH 4 (near LL5)	20000	#5 F.O.	
*61	PH 5 (near LL10)	20000	#5 F.O.	610.301
*62	PH 5 (near LL10)	20000	#5 F.O.	
*63	PH 7 (LL4)	20000	#5 F.O.	404.301
*64	PH 7 (LL4)	20000	#5 F.O.	
80	George Rd Gas Stat	12000	Gasoline	1007.301&402
81	Bldg 1047	10000	Gasoline	N/A
82	Bldg 1047	10000	Gasoline	
83	Bldg 1047	10000	Gasoline	
86	Telephone Bldg (North)	1000	Unknown	N/A
87	Telephone Bldg (North-East)	1000	Unknown	N/A
88	Fire Station #2	1000	#2 F.O.	N/A
89	Geo. Rd. S.T.P.	1000	Unknown	N/A

\*Indicates tanks cleaned and ready for removal/disposal.

:usttnk



GMS	RWK	TAT
LJP	RBB	TWF
JLB	FGF	GP
JDS	RS	HB
KLZ	BCW	JVL
	RGA	TDS
RTM	HB	FO

OHIO DEPARTMENT OF COMMERCE  
DIVISION OF STATE FIRE MARSHAL  
PETROLEUM UNDERGROUND STORAGE TANK CLOSURE  
ASSESSMENT REQUIREMENTS  
TABLE OF CONTENTS

6/89

- I. WHEN CLOSURE ASSESSMENTS MUST BE DONE
- II. RESPONSIBILITY FOR THE CLOSURE ASSESSMENT
- III. PRE-ASSESSMENT STEPS
  - A. Notify the State Fire Marshal
  - B. Obtain a Written Permit
  - C. Plan the Closure Activities
- IV. PROCEDURES FOR TANK REMOVAL AND ABANDONMENT IN PLACE
  - A. Removal and Abandonment Requirements
  - B. Liquid and Solid Waste Disposal Requirements
  - C. Closure Records
- V. PROCEDURES FOR CLOSURE ASSESSMENT
  - A. Visual Site Evaluation
  - B. Soil Sampling Locations
  - C. Variances to Sampling Requirements
  - D. Use of Field Instruments in Selecting Laboratory Samples
  - E. Who May Collect Soil Samples for Analysis
- VI. SAMPLING QUALITY ASSURANCE, PARAMETERS AND DOCUMENTATION
  - A. Sample Collection Methods
  - B. Sample Containers
  - C. Record Keeping/Documentation
  - D. Sample Parameters
  - E. Laboratory Detection/Quantitation Limits
- VII. RELEASE REPORTING
- VIII. REPORTING OF TANK CLOSURE RESULTS

**RECEIVED**  
JUL 21 1989  
HAVENS & EMERSON, INC.  
CLEVELAND

---

The purpose of this guidance is to describe what must be done to comply with the federal (USEPA) closure regulations (40 CFR 280). These regulations are in effect today. In the fall of 1989 the State Fire Marshal will revise Ohio's underground storage tank regulations to better reflect the new federal requirements as well as issues specific to Ohio. As a result some requirements and procedures described in this document may be changed. In addition, this document may be changed prior to fall 1989 as a result of new information received. Therefore, the owner/operator should make sure he/she has the latest copy of the guidance.

OHIO DEPARTMENT OF COMMERCE  
DIVISION OF STATE FIRE MARSHAL  
PETROLEUM UNDERGROUND STORAGE TANK CLOSURE  
ASSESSMENT REQUIREMENTS

6/89

I. WHEN CLOSURE ASSESSMENTS MUST BE DONE

The purpose of the closure assessment is to check for the presence of spilled or leaked petroleum products where it is most likely to be found at the site. Under the new federal tank rules, a closure assessment must be completed when the UST system is permanently closed by removal or abandonment in place or before a change in service is completed. A closure assessment must also be conducted before a request is made to extend, beyond twelve months, the temporary closure of a tank which does not meet the performance standards for new USTs or the upgrade requirements (except for spill and overfill protection).

Because a closure assessment requires taking soil samples for laboratory analysis, the best (and least expensive) approach is to conduct the assessment during the tank closure when the soil is exposed. If the tank is being abandoned in place, it will be necessary to take samples by using a soil drilling rig prior to the completion of the abandonment-in-place.

A site assessment is not required if vapor or groundwater monitoring release detection methods (see 40 CFR 280.43(e) and (f)) are operating at the time of closure and indicate no release has occurred. (Methods used must have been installed and operated in compliance with the new Federal EPA rules).

II. RESPONSIBILITY FOR THE SITE ASSESSMENT

It is the responsibility of the UST system owner and/or operator to complete the closure assessment according to the procedures outlined below. A closure assessment is currently required for only federally regulated USTs. If your tank is not covered by the EPA regulations, a closure assessment is not required but some kind of investigation could be required by the state or local fire official or the Ohio Environmental Protection Agency.

III. PRE-ASSESSMENT STEPS

A. *Notify The State Fire Marshal*

The owner/operator must notify the State Fire Marshal at least 30 days before beginning permanent closure or a change-in-service, of intent to permanently close or make a change-in-service of an underground storage tank. The notification must be in writing. Send the notification to the following address:

RELEASE PREVENTION SUPERVISOR  
Division of State Fire Marshal  
Bureau of Underground Storage Tank Regulations  
7510 East Main Street  
P.O. Box 525  
Reynoldsburg, Ohio 43068-3395



B. *Obtain A Written Permit*

The owner/operator must obtain a written permit from the local fire official and arrange for an inspector to be on site during tank and piping removal. If a written permit and inspector cannot be supplied by the local officials the owner will need to contact the State Fire Marshal, Inspection Bureau, at (800) 282-1927 to obtain the permit and schedule an inspector. The Inspection Bureau will need a minimum of three weeks notice to schedule an inspection.

C. *Plan The Closure Activities*

A plan for each closure assessment and other removal/abandonment activities should be developed which addresses each item in this guidance. Planning the UST system closure and closure assessment will save time and money. For example, if proper sample equipment is not available when the tank is being removed, you may have to keep the excavation open longer than planned or even re-excavate to the base of the tank until such equipment is obtained. Pre-closure soil sampling, such as soil borings, may be advisable if soil contamination is suspected so that soil disposal arrangements are completed when excavation begins.

IV. PROCEDURES FOR TANK REMOVAL AND ABANDONMENT IN PLACE

A. *Removal and Abandonment Requirements*

The tank(s) shall be removed from the property in accordance with American Petroleum Institute (API) 1604 and the site restored to an approved condition. When the fire official determines that the removal of the tank(s) is not necessary, he may permit the tank(s) to be abandoned in place in accordance with API 1604. To obtain a copy of API 1604, please call or write to:

API -- American Petroleum Institute  
1220 L Street N.W.  
Washington, DC 20005  
(202) 682-8000

When tanks are to be abandoned in place, soil sampling must still be performed (see section V, B, 6).

B. *Liquid and Solid Waste Disposal*

Water, product or other liquids, sludges and tank bottoms removed from the tank and the excavation zones must be tested and disposed of in accordance with state and local requirements. No discharge of liquid to a storm sewer, ditch or other surface water or groundwater is permitted without the expressed approval of the Ohio Environmental Protection Agency. Discharge of liquids to the sanitary sewer is not allowed without the permission of the local sanitary sewer district. Soil and other

contaminated solid waste materials must be tested and treated and/or disposed of in accordance with state and local requirements. To obtain more information on disposal of liquids, sludges, soils, etc., the owner/operator should contact the appropriate Ohio Environmental Protection Agency, District Office for your county. The map, telephone numbers and addresses for the District Offices can be found on page 9.

#### C. *Closure Records*

Owners and operators must maintain records that are capable of demonstrating compliance with closure requirements. These records must be maintained for at least three years after completion in one of the following ways:

1. By the owners and operators who took the UST system out of service;
2. By the current owners and operators of the UST system site; or
3. By mailing these records to the implementing agency if they cannot be maintained at the closed facility.

These records should include copies of the following:

1. The 30-day letter to the State Fire Marshal's office;
2. Permit from local or state officials;
3. Closure Assessment Report (see section VI, C)
4. Records indicating the methods of disposal and locations of disposal for tanks, soil, liquids, sludges and other contaminated waste materials generated during closure.

When tanks are to be abandoned in place, the owner and/or operator must also maintain the Registration Permit Application for Underground Storage Tanks. Copies of the closure records shall be submitted to the State Fire Marshal as noted in section VIII of this guidance.

#### V. PROCEDURES FOR SITE ASSESSMENTS

##### A. *Visual Site Evaluation*

As an initial step to any closure, the owner/operator should perform a visual walk-over of the site looking for obvious signs of past or present operational problems (i.e., concrete patchwork, surface staining, and areas where piping and pump islands used to be). The observations shall be recorded and documented in the Closure Assessment Report. Soil and water samples should be collected from these areas and screened with field instruments for contamination. These samples shall be included with those being evaluated for laboratory analysis.

B. *Soil Sampling Locations:*

Samples should be collected in the native soil material, or if the entire site is fill material, samples may be collected from the original fill (as opposed to the tank cavity fill material). Of all the samples collected during closure, only three (3) must be sent to a laboratory for analysis (see section V, D).

Soil samples should be taken at the following locations:

1. At points where strong odors or soil discolorations indicate the presence of contamination;
2. If tanks are being removed, from the floor of the excavation at both ends of each tank;
3. Underneath each pump island on the supply line side;
4. Every 20 feet, or segment thereof, along piping runs, or, if piping will be exposed, under swing joints, pipe elbows, and flex connectors;
5. Beneath piping section where leaks are known or suspected to have occurred; (a minimum of two samples along the piping are required--one at the island and one along the piping run).
6. When tanks are to be abandoned in place, soil sampling must still be performed. This may be accomplished in two ways:
  - a. If the tanks(s) can be safely entered, and holes can be cut in the bottom, the soil beneath the tank(s) may be sampled through the holes using a hand soil sampling tool (see section VI, A). The holes shall be located near each end of each tank.
  - b. If the tank cannot be entered, then soil borings should be installed using a drill rig and split tube or thin walled tube samplers. The borings shall be located as close as possible (less than 3 feet) from each end of each tank. Soil borings along piping runs and pump islands shall be located immediately adjacent to these structures.

Samples from each soil boring shall be collected at three (3) foot intervals starting at approximately two (2) feet below the ground surface and ending at approximately twenty (20) feet in depth or auger refusal. If ground water is encountered above the twenty foot depth, then the last sample collected in the boring(s) shall be from the last several inches above the saturated zone.

All core samples must be field screened in accordance with Sections (V)(D) and (VI)(C). These samples will then be included with those being evaluated for laboratory analysis. All soil borings must be logged in accordance with the Ohio Department of Natural Resources requirements.

If site conditions interfere with collection of samples the owner/operator must contact the State Fire Marshal, Bureau of Underground Storage Tank Regulations to determine alternate sampling protocols. The owner/operator must take precautions to avoid cross-contamination of aquifer zones.

C. *Variances to Sampling Requirements:*

1. Redundant samples need not be taken. For example, if the dispenser is directly above the tank, a single sample from beneath the dispenser on the supply side will meet requirements (B) 3 and 4 above.
2. If free product, heavily saturated soils or other conditions make it obvious that a release has occurred, a closure assessment with soil sampling need not be completed provided that the State Fire Marshal's office Bureau of Underground Storage Tank Regulations (BUSTR) and local fire officials are immediately notified and apprised of site conditions. At that time the owner/operator shall immediately begin corrective actions pursuant to OAC 1301:7-7-36.

(Note: site investigations under OAC 1301:7-7-36 always include soil sampling so it may still be advisable to collect samples when the tank excavation is open and soils are accessible).

3. If the groundwater table is found within the tank or piping excavations, a sample of groundwater must be collected and analyzed in addition to soil sampling. Where the groundwater table exists in the excavation area(s) soil samples shall be collected just above the water table surface at the locations described in B above.

D. *Use of Field Instruments in Selecting Laboratory Samples:*

Field instruments including photoionization detectors (PIDs), flame ionization detectors (FIDs) and portable gas chromatographs (GCs) may be used for field screening of soil samples and to choose samples to be tested at a laboratory. The three soil samples with the "highest" readings on the field instrument must be sent to a laboratory for analysis.

If the field instrument shows non-detectable readings, three samples must still be sent for analysis. In the cases where there are non-detectable readings, the three samples should include one from the tank area, one from the piping run and the third sample at the dispenser/island if one is present. If there is no dispenser/island, the third sample should be taken along the piping run.

Samples must be sealed in appropriate containers (see section VI, B) and cooled to 4° Celsius (put them on ice) as soon as possible after sampling. Samples should not be allowed to warm up, and should not be left open to the air while awaiting screening.

E. *Who May Collect Soil Samples for Analysis:*

Samples may be collected by any individual trained and experienced in the sampling and record keeping techniques described under Sections V and VI. This individual may include the contractor hired to remove the UST or install soil borings, or an environmental consultant. It is preferred that samples be collected in the presence of a "neutral third party" if available. A "neutral third party" includes a local fire official, a field employee of the State Fire Marshal's Inspection Bureau, Hazardous Materials Bureau, and Bureau of Underground Storage Tank Regulations.

VI. SAMPLING QUALITY ASSURANCE, PARAMETERS, AND DOCUMENTATION

A. *Sample Collection Methods:*

Due to the volatile nature of petroleum products, sampling should be performed in a manner which disturbs the sample as little as possible. Split tube (split spoon) and thin walled tube (Shelby tube) samplers are devices which allow sampling at established depths with minimum physical disturbance to the samples. Composite sampling is not acceptable since samples are mixed together which allows volatilization of contaminants. If samples are collected by hand a device such as a soil (tube) sampler which collects the sample as a soil "core" may be used. Just prior to collecting a soil sample by hand the first several inches (3 to 4 inches) of soil must be scraped away so that the sample is collected from a previously unexposed soil area.

Liquid and water samples shall also be collected in a manner which does not aerate the sample. If wells are to be sampled, precautions must be taken to purge the well prior to sampling. At least three (3) well volumes of water must be removed from the well prior to sampling.

B. *Sample Containers:*

Samples should be placed in containers which will not distort, rupture or leak due to chemical reactions with the sample. Since volatile compounds are being sampled, the containers should have air tight seals and the container walls should be of adequate thickness to withstand handling during sample collection and transport to the laboratory. Glass jars with teflon lids are recommended. The owner/operator should check with the laboratory of their choice, many of which supply sampling containers. Immediately following sample collection, samples should be cooled to 4 degrees Celsius (put them on ice) until the laboratory receives them for analysis. Be sure that laboratory holding times are not exceeded.

C. *Record Keeping/Documentation:*

Documentation of sample collection and analysis is required in order for the State Fire Marshal to consider the analytical results valid. Closure Assessment Reports submitted to the State Fire Marshal shall be signed by the owner/operator or the representative overseeing the closure activities, and shall include:

- results of the visual site evaluation
- details of sample collection procedures
- description of sampling equipment and containers
- sample locations (also identified on a site map)
- sample dates
- sample preservation techniques
- chain-of-custody
- name and affiliation of person(s) collecting the samples
- name and affiliation of neutral third party
- name, address, and telephone number of the laboratory analyzing the samples
- name, address, and telephone number of the Fire Inspector
- date(s) of tank system removal

If field instruments are used, the instrument calibration procedures must be described, including calibration frequency. Instrument settings (such as span and potential for a photoionization meter) must be documented. The field instrument readings and sample locations must be identified as well as the sample procedure, i.e., holding the probe over the sample or head space sampling.

#### D. *Sample Parameters*

All soil and water samples must be analyzed for the parameters listed in the table below:

<u>Parameters Tested For</u>	<u>Test Method</u>	<u>USEPA Document</u>
BTEX (benzene, toluene, ethylbenzene, xylene)	8020	SW846
TPH (total petroleum hydrocarbons)	418.1 <sup>a</sup>	600/4-79-020
TPH (total petroleum hydrocarbons)	9071 <sup>b</sup>	SW846

a-For liquid samples use 418.1 protocols for extraction, clean-up and analysis.

b-For soil samples use 9071 protocols for extraction, then use 418.1 for clean-up and analysis.

When there are indications of existing or potential contamination by constituents other than those listed above, additional testing will be required. The additional testing may include using other USEPA test

methods such as 8240 (GC/MS for semivolatile organics).

Soil and water sampling and analysis should be performed by the procedures described in the U.S. EPA documents entitled "Test Methods for Evaluating Solid Wastes-Physical/Chemical Methods" SW-846, and "Manual for Chemical Analysis of Water and Wastes", 600/4-79-020. The laboratory Quality Assurance/Quality Control documentation should conform to USEPA protocols and be immediately available upon request by the State Fire Marshal. The owner/operator is not required to use a USEPA Contract Laboratory Program (CLP) laboratory unless otherwise directed by the State Fire Marshal.

E. *Laboratory Detection/Quantitation Limits*

The owner/operator shall have samples analyzed by a laboratory capable of analyzing samples in accordance with method protocols described in the SW846 and 600/4-79-020 manuals. The laboratory quantitation limits achieved shall be those listed in these manuals. A sample with "non-detectable" results shall have been analyzed using the lowest possible quantitation limit listed for the sample matrix (i.e., soil, water, etc.).

VII. RELEASE REPORTING

If a release is confirmed during the tank closure, closure assessment, or by subsequent sample analysis, the owner/operator must contact BUSTR and the local fire official within 24 hours to report the release. The necessary actions after reporting will vary with several factors including the degree of contamination, the depth to groundwater, and the nature of surrounding land use. BUSTR staff will work with the owner/operator and their consultants to develop an investigation and corrective action plan appropriate to conditions at the site.

VIII. REPORTING OF TANK CLOSURES

Unless otherwise instructed, all closure activities exclusive of laboratory analysis must be completed within 30 days of receiving a permit to close. Copies of all closure records (described in Section IV, C of this guidance) must be submitted to the State Fire Marshal, BUSTR, within three days of the owner/operator receiving sample results. The report must include all laboratory results and the documentation described in section V. The reports shall be sent to:

Release Prevention Supervisor  
Division of State Fire Marshal  
Bureau of Underground Storage Tank Regulations  
7510 East Main Street  
P.O. Box 525  
Reynoldsburg, Ohio 43068-3395

The State Fire Marshal will review the reports and determine what additional actions, if any, are required.

\*\*\* THESE REQUIREMENTS MAY CHANGE IN RESPONSE TO NEW INFORMATION AND CHANGES IN REGULATIONS. \*\*\*



## Ohio EPA DISTRICT OFFICES

Central District Office  
P.O. Box 1049  
1800 WaterMark Dr.  
Columbus, Ohio 43266-0149  
1-800-686-2330

Southeast District Office  
2195 Front St.  
Logan, Ohio 43138  
1-800-686-7330

Northeast District Office  
2110 E. Aurora Road  
Twinsburg, Ohio 44087  
1-800-686-6330

Southwest District Office  
40 South Main St.  
Dayton, Ohio 45402  
1-800-686-8930

Northwest District Office  
1035 Devlac Grove Drive  
Bowling Green, Ohio 43402  
1-800-686-6930