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# **U.S. Army Corps of Engineers New England Division**

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**FINAL  
NO FURTHER ACTION DECISION UNDER CERCLA  
STUDY AREA 49  
BUILDING 3602 LUST SITE**

**FORT DEVENS, MASSACHUSETTS**

**CONTRACT NO DACA33-91-D-0006  
DELIVERY ORDER NO. 21**

**OCTOBER 1996**

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**ABB** ABB Environmental  
Services, Inc.

27 96101 ABBN



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UNDER CERCLA**

**STUDY AREA 49  
BUILDING 3602 LUST SITE  
FORT DEVENS, MASSACHUSETTS**

*Prepared for:*

U.S. Army Corps of Engineers  
New England Division  
Waltham, Massachusetts

*Prepared by:*

ABB Environmental Services, Inc.  
Wakefield, Massachusetts  
Project No. 07147.00

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**EXECUTIVE SUMMARY**

Investigations of Study Area 49 (Building 3602 Leaking Underground Storage Tank Site) at Fort Devens, Massachusetts, have resulted in the decision that no further hazardous waste studies or remediation are required at this site. Study Area 49 was identified in the Federal Facilities Agreement between the U.S. Environmental Protection Agency and the U.S. Department of Defense as a potential site of contamination.

On December 21, 1989, Fort Devens was placed on the National Priorities List under the Comprehensive Environmental Response, Compensation and Liability Act as amended by the Superfund Amendments and Reauthorization Act. In addition, under Public Law 101-510, the Defense Base Realignment and Closure Act of 1990, Fort Devens was selected for cessation of operations and closure. In accordance with these acts, numerous studies, including a Master Environmental Plan, an Enhanced Preliminary Assessment, a Site Investigation, a Supplemental Site Investigation, and a soil removal action have been conducted at Study Area 49.

Study Area 49, Building 3602 Leaking Underground Storage Tank Site, is one of seven original Group 2 Study Areas located on the Main Post of Fort Devens. The Building 3602 Leaking Underground Storage Tank Site is located in the southern portion of the Main Post on Sheridan Road in Harvard, Massachusetts. Building 3602 was originally a gasoline-dispensing station which had two 5,000-gallon underground storage tanks. The tanks were used from 1942 to 1975 to store gasoline. More recently, the tanks were used to store diesel fuel and No. 2 fuel oil. The tanks and approximately 250 cubic yards of surrounding soil were removed in December 1989. During development of the Master Environmental Plan and the Enhanced Preliminary Assessment, Study Area 49 was identified as one of the historic gas station sites that were potential sources of petroleum contamination.

A Site Investigation conducted in 1993 at Study Area 49 focused on investigating the presence or absence of groundwater contamination resulting from residual petroleum in soil at the water table. A Supplemental Site Investigation field program was subsequently conducted in 1994 to define the extent of petroleum-contaminated soil and to reassess groundwater quality. Human health risks associated with exposure to soils at Study Area 49 were evaluated in the preliminary risk evaluation conducted during the site investigation and the supplemental site investigation. Removal action cleanup objectives were developed to address the



## EXECUTIVE SUMMARY

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1 potential human health risks associated with petroleum hydrocarbons, which were  
2 detected in soil at concentrations in excess of human health guidelines.

3  
4 In July and August 1994, OHM Remediation Services Corporation removed  
5 approximately 452 tons of petroleum-contaminated soil at Study Area 49. Soil  
6 containing total petroleum hydrocarbons above the target cleanup levels was  
7 excavated and transported to Moore Army Airfield located at the North Post of  
8 Fort Devens after characterization results indicated that the concentrations of soil  
9 contaminants were below Massachusetts Contingency Plan Method 1 S-1 soil  
10 standards. Field screening and confirmation laboratory analytical results indicated  
11 that the soil containing these compounds in excess of target cleanup levels had been  
12 removed from the study area.

13  
14 With the removal of contaminated soil from the Building 3602 Leaking  
15 Underground Storage Tank Site and a determination of no residual risk, there is no  
16 evidence or reason to conclude that residual hazardous waste contamination due to  
17 the former underground storage tanks has caused significant environmental  
18 contamination or poses a threat to human health or the environment. The decision  
19 has been made to remove Study Area 49 from further consideration in the  
20 Installation Restoration Program process.

## 1.0 INTRODUCTION

This decision document has been prepared to support a no further action decision at Study Area 49 - Building 3602 Leaking Underground Storage Tank (LUST) Site (SA 49) at Fort Devens, Massachusetts. The report was prepared as part of the U.S. Department of Defense (DOD) Base Realignment and Closure (BRAC) program to assess the nature and extent of contamination associated with site operations at Fort Devens.

In conjunction with the Army's Installation Restoration Program (IRP), Fort Devens and the U.S. Army Environmental Center (USAEC; formerly the U.S. Army Toxic and Hazardous Materials Agency) initiated a Master Environmental Plan (MEP) in 1988. The MEP consists of assessments of the environmental status of SAs, specifies necessary investigations, and provides recommendations for response actions with the objective of identifying priorities for environmental restoration at Fort Devens. SA 49 was identified as a potential source of contamination in the MEP. On December 21, 1989, Fort Devens was placed on the National Priorities List under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act.

An Enhanced Preliminary Assessment (PA) was also performed at Fort Devens to address areas not normally included in the CERCLA process, but requiring review prior to closure. A final version of the PA report was completed in April 1992. In 1992, DOD, through USAEC, also initiated a Site Investigation (SI) for SA 49 along with the other 12 SAs in SA Groups 2 and 7 at Fort Devens. The SI was conducted by ABB Environmental Services, Inc. (ABB-ES).

Under Public Law 101-510, the Defense Base Realignment and Closure Act of 1990, Fort Devens has been selected for cessation of operations and closure. An important aspect of BRAC actions is to determine environmental restoration requirements before property transfer can be considered. Studies at SA 49 were conducted to support this overall mission.

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## 2.0 BACKGROUND AND PHYSICAL SETTING

### 2.1 DESCRIPTION AND LAND USE

Fort Devens is located approximately 35 miles northwest of Boston, Massachusetts, adjacent to the town of Ayer and within Middlesex and Worcester counties. The installation consists of approximately 9,280 acres and includes portions of the towns of Ayer, Harvard, Lancaster and Shirley. Cities in the vicinity include Fitchburg, Leominster and Lowell. Land surfaces range from about 200 feet (ft) above mean sea level (MSL) along the Nashua River in the northern portion of the installation to 450 ft above MSL in the southern portion of the installation.

Fort Devens was established in 1917 as Camp Devens, a temporary training camp for soldiers from the New England area. In 1931, the camp became a permanent installation and was redesignated as Fort Devens. Throughout its history, Fort Devens has served as a training and induction center for military personnel and a unit mobilization and demobilization site. All or portions of this function occurred during World Wars I and II, the Korean and Vietnam conflicts, and operations Desert Shield and Desert Storm. The most recent mission of Fort Devens was to command and train its assigned units and support various tenant activities. Fort Devens closed in 1996, in accordance with the Defense Base Realignment and Closure Act.

Fort Devens currently consists of three major land use areas: Main Post, South Post, and North Post (Figure 2-1).

The majority of the facilities on Fort Devens are located in the Main Post area, north of Massachusetts Highway 2. The Nashua River intersects the Main Post along its western edge. The Main Post provides all of the on-post housing, including over 1,700 family units and 9,800 bachelor units (barracks and unaccompanied officer's quarters). Other facilities on the Main Post include community support activities (such as a cafeteria, post exchange, commissary, bowling alley, and golf course), administrative buildings, classrooms and training facilities, maintenance facilities, and ammunition storage facilities. SA 49 is located on the Main Post.



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The South Post is located south of Massachusetts Highway 2 and contains individual training areas designated for troop training, range activities, and a parachute drop zone where air training exercises are performed. The Nashua River bounds the South Post on the northeast side.

The North Post is directly north of the Main Post. The principal activities on the North Post are the Douglas E. Moore Army Airfield, and the installation Waste Water Treatment Plant.

The primary mission of Fort Devens was to command, train, and provide logistical support for non-divisional troop units. The installation also supported that portion of the U.S. Army Intelligence School located at Fort Devens, for the Army Readiness Region, for Reserve Components, and for Army Reserve and National Guard in the New England area.

### 2.2 REGIONAL GEOLOGY

Fort Devens is near the western boundary of the Seaboard Lowland Section of the New England-Maritime Physiographic province (Jahns, 1953). It is adjacent to the Worcester County Plateau of the Central Uplands province and part of the installation lies within the province (Koteff, 1966). The land surface is almost completely covered with unconsolidated glacial outwash deposits, resulting in few bedrock outcrops. The surficial deposits are underlain by a highly complex assemblage of intensely folded and faulted metasedimentary rocks with occasional igneous intrusions. The geomorphology of the region is dominated by glacial features such as outwash plains, kames, kame terraces, drumlins, and eskers.

### 2.3 REGIONAL HYDROGEOLOGY

Groundwater at Fort Devens occurs largely in the permeable glacial-deltaic outwash deposits of sand, gravel, and boulders. Well yields within these sediments are dependent upon the hydraulic characteristics of the aquifer and can range from 2 to over 300 gallons per minute (gpm). Small amounts of groundwater can be obtained from fractured bedrock with yields ranging from 2 to 10 gpm. Minor amounts of groundwater may be found in thin, permeable glacial lenses elsewhere on the installation. The primary hydrogeologic feature at Fort Devens is the Nashua River, which flows through the installation in a south to north direction, with an average discharge rate of 55 cubic feet per second. In addition to the Nashua River, the

1 terrain is dissected by numerous brooks that are associated with attendant wetlands.  
2 There are also several kettle ponds and one kettle lake located within the  
3 installation.  
4

#### 5 **2.4 STUDY AREA DESCRIPTION AND HISTORY**

6  
7 SA 49, Building 3602 LUST Site, is one of seven original Group 2 SAs located on  
8 the Main Post. Residual petroleum contamination in soil from previously removed  
9 underground storage tanks (USTs) was the focus of the MEP's recommendation to  
10 investigate SA 49. Building 3602 is located in the southern portion of the Main  
11 Post on Sheridan Road in Harvard, Massachusetts (Figure 2-1). Building 3602 was  
12 originally a gasoline-dispensing station of the same design and age as numerous  
13 other historic gas stations at Fort Devens. Building 3602 may have been the  
14 original pumphouse. The historic gas station had two 5,000-gallon USTs that were  
15 used from 1942 to 1975 to store gasoline. More recently, the tanks were used to  
16 store diesel fuel and No. 2 fuel oil (Biang, et al., 1992). The motor pool was most  
17 recently under the control of an Army Reserve unit and was used by the 10th  
18 Special Forces Headquarters Support Group for vehicle storage. SA 49 is within a  
19 parcel of land on which the Federal Bureau of Prisons is constructing a Federal  
20 Prison/Medical Complex. This complex will provide medical facilities for inmates.  
21 The motor pool is paved except for the former UST location, and is surrounded by  
22 a chain-link fence with a locked gate.  
23

24 It became apparent that petroleum had contaminated the surrounding soil when the  
25 tanks were removed. The tanks and approximately 250 cubic yards of surrounding  
26 soil were removed in December 1989 by Franklin Environmental Services, Inc. of  
27 Wrentham, Massachusetts. Tank removal was monitored by Kurz Associates, Inc. of  
28 Bridgewater, Massachusetts. Petroleum contamination was identified from 6 ft  
29 below ground surface (bgs) to a depth of 12 to 13 ft bgs (Kurz Associates, Inc.,  
30 1991). Although elevated photoionization detector readings for total volatile  
31 organic compounds (VOCs) were obtained by headspace screening, the excavation  
32 was backfilled with clean fill and four monitoring wells were installed (Kurz  
33 Associates, Inc., 1991). Monitoring well locations are shown on Figure 2-2. These  
34 monitoring wells were not sampled prior to the SI. Subsurface explorations were  
35 conducted during the Supplemental SI to identify additional soils requiring removal.

### 3.0 RELATED INVESTIGATIONS

#### 3.1 MASTER ENVIRONMENTAL PLAN

The Building 3602 LUST Site was identified as a possible source for release of contaminants into the environment from the former USTs. The MEP recommended that the site be investigated for potential contaminant migration. The recommended sampling program entailed collecting groundwater samples from the monitoring wells and analyzing them for total petroleum hydrocarbons (TPH) and VOCs at least twice. The MEP recommended further investigation if elevated levels of contaminants were detected in the wells (Biang, et al., 1992).

#### 3.2 ENHANCED PRELIMINARY ASSESSMENT

The Enhanced PA included a review of the study and recommendations presented in the MEP and considered other areas that might require evaluation due to the closure of Fort Devens. No additional findings or recommendations for SA 49 were provided in the Enhanced PA.

#### 3.3 SITE INVESTIGATION REPORT

An SI was initiated in June 1992 and included 13 of the Groups 2 and 7 SAs listed in the MEP.

- SA 13 Landfill No. 9
- SA 43 Historic Gas Stations (19 Sites)
- SA 45 Lake George Street Vehicle Wash Area
- SA 49 **Building 3602 LUST Site**
- SA 56 Building 2417 LUST Site
- SA 57 Building 3713 Fuel Oil Spill
- SA 58 Building 2648/2650 Fuel Oil Spills
- SA 12 Landfill No. 8
- SA 14 Landfill No. 10
- SA 27 Waste Explosive Detonation Range (Hotel)
- SA 28 Waste Explosive Detonation Range (Training Area 14)
- SA 41 Unauthorized Dumping Area (Site A)

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## SECTION 3

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### ● SA 42 Popping Furnace

The purpose of the SI, which was conducted by ABB-ES under contract with the USAEC, was to verify the presence or absence of environmental contamination and to determine whether further investigation or remediation was warranted. The Final Site Investigation Report was issued May 1993 (ABB-ES, 1993). The objective of sampling at SA 49 was to investigate the potential for groundwater contamination caused by the release of petroleum from former USTs at Building 3602.

The 1992 SI field program included installing a monitoring well (49M-92-01X) to assess groundwater quality downgradient of the site, collecting two rounds of groundwater samples from the five wells, and submitting the samples for VOCs, TPH, lead, anions, and cations. Monitoring well 49M-92-01X was installed north and outside of the motor pool (Figure 2-2). The boring at this location encountered silty and occasionally gravelly fine sand to a depth of approximately 10 ft bgs. Below 10 ft, the soil consisted of gravelly silt. The material appeared to be glacial till. Bedrock was not encountered in this boring (ABB-ES, 1993).

The water table was encountered at the site at depths ranging from 5.6 to 11.4 ft bgs. Groundwater flows generally northward across the site toward a drainage swale north of the site (ABB-ES, 1993).

### 3.4 SUPPLEMENTAL SITE INVESTIGATION

Based on the SI results, it was determined that the source of groundwater contamination had not been adequately characterized. A supplemental investigation was therefore recommended to determine the presence or absence of residual soil contamination in the former UST location.

The Supplemental SI field program conducted by ABB-ES in 1993 included collecting 27 subsurface soil samples from 15 TerraProbe points, and analyzing the samples on site for benzene, toluene, ethylbenzene, xylenes (referred to collectively as BTEX) and TPH as indicators of petroleum contamination (Figure 3-1). In addition, a third round of groundwater samples was collected from the five wells. Groundwater samples were submitted for laboratory analysis for VOCs, TPH, lead and total suspended solids (TSS).

The existing monitoring wells were included in the November 8, 1993 synoptic groundwater-level round. The results indicated that groundwater flow is to the north-northwest (Figure 3-2).

### 3.5 PRELIMINARY RISK EVALUATION

A preliminary risk evaluation (PRE) was performed as part of the SI to help establish whether environmental contamination at SA 49 required further investigation or remediation. The PRE was subsequently revised during the Supplemental SI to incorporate new data and updated standards and guidelines. This section presents the general approach employed for the PRE; details of the human health PRE for SA 49 are presented in Section 5.0.

The human health PRE for SA 49 evaluated contamination in subsurface soils and groundwater. Contamination at this study area is in subsurface soils at the water table, which are not accessible to ecological receptors. Therefore, an ecological PRE was not conducted.

#### 3.5.1 Human Health Preliminary Risk Evaluation Methodology

The human health PRE at SA 49 included the following elements:

**Current and Future Land Use:** Current and foreseeable future land uses are particularly relevant with respect to the applicability of soil screening values used in the PRE. At the time the PRE was conducted, the area was used as a motor pool. Contaminated soils are at a depth of 12 to 13 ft bgs. Therefore, the U.S. Environmental Protection Agency (USEPA) Region III risk-based concentrations for commercial/industrial soil and Method 1 S-2/GW-1 standards from the Revised Massachusetts Contingency Plan (MCP) were used in the Supplemental SI PRE. Future use at this area, according to the recent *Devens Reuse Plan*, is Transitional Use: Federal Bureau of Prisons Medical Center (Vanassee Hangen Brustlin, Inc., 1994).

**Comparison to Public Health Standards and Guidelines:** For soil and groundwater, human health standards and/or guidelines were used as screening criteria to evaluate the significance of the sampling data. To evaluate the concentrations of compounds detected in groundwater, federal and Massachusetts drinking water standards and guidelines were used. The USEPA's Region III risk-based

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1 concentrations and the MCP Method 1 standards were used to evaluate the results  
2 of the soil sampling program. The basis and applicability of these standards and  
3 guidelines are discussed below.  
4

5 **USEPA Drinking Water Regulations.** Federal drinking water standards (both  
6 final and proposed) are used to evaluate the significance of the groundwater  
7 sampling data. These standards were extracted at the time of the SI from  
8 the USEPA Office of Water's "Drinking Water Regulations and Health  
9 Advisories", November 1992.  
10

11 **Massachusetts Drinking Water Standards and Guidelines.** For some  
12 compounds, the Massachusetts Department of Environmental Protection  
13 (MADEP) has promulgated drinking water standards that are more stringent  
14 than the federal drinking water standards. MADEP has also developed  
15 drinking water guidelines for compounds for which no federal standards exist.  
16

17 **Office of Solid Waste and Emergency Response (OSWER) Lead Guidance**  
18 **(OSWER Directive: 9355.4-02).** USEPA has set forth an interim soil cleanup  
19 level for total lead which is protective for direct contact exposure at  
20 residential settings. The interim guidance was published in September 1989.  
21 Further guidance will be developed after the USEPA has developed a  
22 verified Cancer Potency Factor and/or a Reference Dose for lead.  
23

24 **USEPA Region III Risk-Based Concentration Table.** This table is used by  
25 USEPA Region III toxicologists as a risk-based screening tool for Superfund  
26 sites, as a benchmark for evaluating preliminary site investigation data and  
27 preliminary remediation goals. Although it has no official status either as  
28 regulation or guidance, it is useful as a screening tool. The table is updated  
29 quarterly and therefore regularly incorporates new USEPA toxicity constants  
30 as they are developed. The First Quarter, 1993 was the current update used  
31 in the Supplemental SI PRE.  
32

33 For the SA 49 human health PRE, Region III risk-based concentrations for  
34 tap water and commercial/industrial soil were used. Risk-based  
35 concentrations for tap water assume daily consumption of two liters of water  
36 for a residential lifetime of 30 years; these also assume exposure from the  
37 inhalation of volatiles from household water uses (including showering,  
38 laundering, and dish washing).

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1 For soil, Region III risk-based concentrations have been developed for  
2 commercial/industrial soil exposure. Risk-based concentrations for  
3 commercial/industrial soil assume that a worker ingests soil 250 days per  
4 year for 25 years, at an ingestion rate of 100 mg/day.  
5

6 **Massachusetts Contingency Plan Method 1 Soil Standards.** Categories of  
7 health-protective soil standards were established by the MADEP for use in  
8 characterization of risk posed by disposal sites (MADEP, 1993). Subsurface  
9 soil concentrations are compared to the S-2/GW-1 category. The S-2  
10 category indicates high adult use of the area, and minimal use of the area by  
11 children. The GW-1 category additionally assumes the potential use of  
12 groundwater as a drinking water source. For chemicals with no Method 1  
13 standards, reportable concentrations published in the MCP were used.  
14 Although Method 1 standards were used for screening purposes in the PRE,  
15 Method 1 is strictly applicable to a disposal site if there is a standard for  
16 each oil and hazardous material of concern, and if the oil or hazardous  
17 material is present in and will foreseeably migrate only within groundwater  
18 and soil.

## 4.0 CONTAMINATION ASSESSMENT

The SA 49 SI and Supplemental SI laboratory analytical results are discussed in the following subsections. A detailed discussion of the analytical results are included in the SI Report (ABB-ES, 1993) and the Supplemental SI Data Package (ABB-ES, 1994a).

### 4.1 SITE INVESTIGATION

Soil and groundwater sampling were not conducted during the UST removal in 1989; however, four groundwater monitoring wells were installed. The MEP recommended groundwater sampling to determine whether petroleum contamination had migrated from the site.

The SI field program included installing a monitoring well (49M-92-01X) to assess groundwater quality downgradient of the site, collecting two rounds of groundwater samples from the five wells, and submitting the samples for VOCs, TPH, lead, anions, and cations. Analytical results for groundwater are presented in Table 4-1 and shown in Figure 4-1.

VOCs (ethylbenzene and xylenes) were detected in two of the five groundwater monitoring wells (3602W-02 and 3602W-03) during the first round of groundwater sampling. Lead was detected above the background concentration for Fort Devens groundwater in four of the five wells. Calcium, potassium, and magnesium concentrations were also elevated above background levels. Round Two groundwater sampling showed similar results. Toluene, ethylbenzene, and xylenes were detected in monitoring wells 3602W-02 and 3602W-03. TPH was also detected in 3602W-02, at a concentration of 213 micrograms per liter ( $\mu\text{g/L}$ ). Lead was detected in Round Two groundwater samples, but was not detected in a filtered groundwater sample collected from 3602W-04. The unfiltered sample from the same well contained lead at a concentration of 42.2  $\mu\text{g/L}$ . TSS concentrations in groundwater at the site ranged from 129  $\mu\text{g/L}$  to 1,820  $\mu\text{g/L}$ . The SI concluded that elevated lead concentrations were attributable to suspended solids in the groundwater samples, and not from contaminants released from SA 49 (ABB-ES, 1993).

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## SECTION 4

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### 4.2 SUPPLEMENTAL SITE INVESTIGATION

The Supplemental SI field program conducted by ABB-ES in 1993 included collecting 27 subsurface soil samples from 15 TerraProbe points (Figure 4-2), and analyzing the samples on site for BTEX and TPH (Table 4-2). In addition, a third round of groundwater samples was collected from the five wells. Groundwater samples were submitted for laboratory analysis for VOCs, TPH, lead and TSS (see Table 4-1 and Figure 4-3).

Results of field screening of subsurface soil indicated that residual fuel contamination was present at the water table and also in the capillary zone above the water table. Benzene was not detected in any of the soil samples. Toluene, ethylbenzene, and xylenes were detected from 1.9 parts per billion (ppb) (TP-12) to 56.4 ppb (TP-08) at a depth of 12 ft, and 32.4 ppb (TP-14) to 311,000 ppb (TP-09) at a depth of 13 ft (water table). TPH was detected once at the 12-ft sampling interval at 120 parts per million (ppm). TPH concentrations ranged from 61 ppm to 15,000 ppm at 13 ft. Residual soil contamination is primarily located in the central portion and eastern side of the former UST excavation (ABB-ES, 1994a).

The results of Round Three groundwater sampling were consistent with Rounds One and Two, collected during the SI. Toluene, ethylbenzene, and xylenes were detected in monitoring wells 3602W-02 and 3602W-03. TPH was not detected in any of the Round Three samples. Lead was detected above the Fort Devens background groundwater concentration in four of the five unfiltered groundwater samples and one filtered sample in Round Three (ABB-ES, 1994a). The highest concentration was detected in the groundwater sample from an upgradient well.

The VOCs detected in soil and in the downgradient groundwater monitoring wells (3602W-02 and 3602W-03) likely resulted from releases from the former USTs. Lead and other inorganic analytes, by their distribution, are not likely the result of releases from the former USTs (ABB-ES, 1994a).

### 4.3 SOIL REMOVAL ACTION

Based on the elevated TPH concentrations detected in the subsurface soil at the Building 3602 LUST Site, it was determined that residual petroleum-contaminated soil be removed to minimize human health risks associated with TPH. The Army's

1 decision to conduct a removal action was documented in the Action Memoranda for  
2 Various Sites (ABB-ES, 1994b).

3  
4 Fort Devens tasked the New England Division of the U.S. Army Corps of Engineers  
5 to initiate a response action at the Building 3602 LUST Site. The Corps of  
6 Engineers contracted OHM Remediation Services Corporation (OHM) of  
7 Hopkinton, Massachusetts, to perform removal actions at SA 49 and at several other  
8 sites.

9  
10 The following provides a summary of the soil removal action. Further details and  
11 documentation are provided in the Final Closure Report (OHM, 1996), included in  
12 Appendix A.

#### 13 14 **4.3.1 Removal Action Objectives**

15  
16 MCP Method 1 S-1/GW-1 soil standards were used as risk-based guidelines to  
17 establish target cleanup levels for the removal action at the Building 3602 LUST  
18 Site. The MADEP revised the MCP in 1993 and promulgated Method 1 soil  
19 standards (MADEP, 1993). For a Method 1 Risk Characterization under the MCP,  
20 compliance with these soil standards constitutes a demonstration of no significant  
21 health risk from exposure to oil or hazardous material in soil. Category S-1 soil has  
22 the greatest potential for exposure. For TPH, the S-1 soil standard is 500  
23 micrograms per gram ( $\mu\text{g/g}$ ). For benzene, toluene, ethylbenzene, and xylene, the S-  
24 1 soil standards are 10  $\mu\text{g/g}$ , 90  $\mu\text{g/g}$ , 80  $\mu\text{g/g}$ , and 500  $\mu\text{g/g}$ , respectively. These  
25 values, which have not changed since the 1993 MCP, were selected as the target  
26 cleanup goals for the SA 49 removal action.

#### 27 28 **4.3.2 Field Observations and Screening Results**

29  
30 On July 20, 1994, OHM began the soil removal action in the area where petroleum  
31 contamination was identified during the SI. Two water samples, collected from the  
32 groundwater in the bottom of the excavation and screened on site for TPH by  
33 infrared spectroscopy, had concentrations of 31,000  $\mu\text{g/L}$  and 85,000  $\mu\text{g/L}$ ,  
34 respectively. A vacuum tanker was used to remove approximately 3,500 gallons of  
35 water from the excavation. All water removed was processed through OHM's  
36 permitted water treatment facility at the OHM staging area on Fort Devens and was  
37 discharged on site (OHM, 1996).



## SECTION 4

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To access the contaminated soil near the water table, uncontaminated soil was removed from the surface and stockpiled separately for later use as backfill material. A photoionization detector (PID) was used to screen this "clean" soil and to identify the depth at which the excavation reached contaminated soil. Once contamination was encountered, all additional soil removed was stockpiled in temporary staging cells. Soil samples were continually collected from the excavation walls and floor for field screening for TPH by infrared spectroscopy. Field screening results, shown on Table 4-3, were used to direct the excavation. The removal action continued until screening results indicated that TPH concentrations in residual soils did not exceed 500  $\mu\text{g/g}$  (OHM, 1996). Soil samples below the TPH action level of 500  $\mu\text{g/g}$  were also analyzed on site for BTEX by gas chromatography to determine if the site action level for these compounds had been satisfied. A total of 452 tons of contaminated soil were removed; the final excavation limit is shown on Figure 4-4. The upper (areal) limits of excavation were sloped extensively to achieve the minimum angles required to support the excavation. As a result, three of the existing monitoring wells were sacrificed.

Ten confirmation soil samples were collected from the base and walls of the excavation and were submitted to the contract laboratory for TPH, polycyclic aromatic hydrocarbons (PAHs) - naphthalene, 2-methylnaphthalene, and phenanthrene, and BTEX analyses. Confirmation sample locations are shown on Figure 4-4. Analytical results, presented on Table 4-4, confirm that residual TPH and BTEX in soil is below the target cleanup levels established for SA 49. Petroleum contamination at SA 49 has been characterized and removed. (OHM, 1996).

### 4.3.3 Waste Characterization and Disposal

Excavated soil was temporarily stockpiled by OHM in discrete staging cells which were double-lined with polyethylene sheeting and bounded by sand berms. Soil believed to be uncontaminated was stored separately from soil considered contaminated.

A composite soil sample was collected from the "clean" stockpiled soil. On-site screening indicated that the sample contained TPH at a concentration below the target cleanup level of 500  $\mu\text{g/g}$ . The SA 49 excavation was then backfilled using this uncontaminated material as well as additional clean fill provided by an offsite supplier (OHM, 1996).

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1 Waste characterization samples were collected from the contaminated soil stockpiles  
2 and were analyzed for TPH, Toxicity Characteristic Leaching Procedure (TCLP)  
3 inorganics, TCLP organics, Resource Conservation and Recovery Act (RCRA)  
4 characteristics, and BTEX. All contaminated soil was transferred to Moore Army  
5 Airfield at the North Post for ultimate reuse as Category B1 soils. Category B1  
6 soils can be reused at Fort Devens in designated areas where future land is to be  
7 used for commercial/industrial purposes. Complete waste characterization results,  
8 as well as transportation and disposal documentation, are provided in Appendix A  
9 (OHM, 1996).

## 5.0 PRELIMINARY HUMAN HEALTH RISK EVALUATION

This area was recently used as a motor pool. Future use at this area, according to the recent *Devens Reuse Plan*, is Transitional Use: Federal Bureau of Prisons Medical Center (Vanasse Hangen Brustlin, Inc., 1994). Tables 5-1 and 5-2 present the statistics and human health standards and guidelines used in the human health PRE for SA 49 which is summarized below.

### 5.1 SOILS

The PRE, performed as part of the SI, considered all soils between 3 and 15 ft bgs as subsurface soil. Detected contaminant concentrations were compared to Region III risk-based concentrations for commercial/industrial exposure and the Revised MCP Method 1 S-2/GW-1 standards.

Table 5-1 presents summary statistics from the field analytical subsurface soil sampling program at SA 49 conducted during the SI and Supplemental SI and human health standards and guidelines for comparison. Toluene, ethylbenzene, and xylenes were detected in the soil but at concentrations less than both the USEPA Region III commercial/industrial soil concentrations and the MCP Method 1 S-2/GW-1 soil standards for these compounds. TPH was detected in 15 of 27 samples. Although the average detected concentration ( $1,141 \mu\text{g/g}$ ) did not exceed the Method 1 S-2/GW-1 soil standard of  $2,500 \mu\text{g/g}$ , the maximum detected concentration ( $15,000 \mu\text{g/g}$ ) and concentrations detected at some locations were above human health guidelines. Therefore, exposure to subsurface soil at SA 49 could pose a significant risk to human health.

### 5.2 GROUNDWATER

Table 5-2 presents summary statistics on groundwater associated with SA 49 and drinking water standards and guidelines for comparison. Monitoring well locations 3602W-01 through 3602W-04 and 49M-92-01X were established to define the groundwater quality in the vicinity of the former USTs. It should be noted that only data from unfiltered samples were used in the PRE. The maximum detected concentrations of toluene, ethylbenzene, and xylenes were below the drinking water standards and guidelines for these compounds. Concentrations of lead, magnesium,

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## SECTION 5

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potassium, and calcium exceeded statistical background concentrations for groundwater at Fort Devens. However, drinking water standards are not available for magnesium, potassium, and calcium. Both the maximum and average concentrations of lead at SA 49 exceeded the USEPA lead action level of 15  $\mu\text{g/L}$ . A comparison of unfiltered and filtered groundwater samples shows that the concentrations of lead are significantly lower in the filtered samples. The concentrations of lead in filtered samples are below the action level.

### 5.3 QUALITATIVE EVALUATION OF RESIDUAL RISK

Cleanup standards for the soil removal action at SA 49 were established using the MCP Method 1 S-1/GW-1 soil standards. Soil with BTEX and TPH concentrations exceeding the Method 1 standards was removed during the soil removal action in July and August 1994. The maximum detected TPH concentration in confirmation soil samples (153  $\mu\text{g/g}$ ) is below the 500  $\mu\text{g/g}$  standard. The maximum detected BTEX concentrations in confirmation samples (benzene: 4.4  $\mu\text{g/g}$ , toluene: non-detect, ethylbenzene, non-detect, xylenes: non-detect) are also below their respective standards (10  $\mu\text{g/g}$ , 90  $\mu\text{g/g}$ , 80  $\mu\text{g/g}$ , and 500  $\mu\text{g/g}$ ). The VOC contamination is below drinking water standards. The concentrations of lead in filtered groundwater samples are below the action level. Furthermore, the distribution of lead in both upgradient and downgradient wells suggests the lead concentrations are the result of natural conditions and not petroleum-related releases. The low residual contaminant concentrations in soil and groundwater suggest that no significant risks to human health exist at the Building 3602 LUST Site.



## 6.0 CONCLUSIONS

No further action is recommended for SA 49. This recommendation is based on historical site use as confirmed by physical observations, sampling, and chemical analysis. It is also based on the results of a human health PRE and the completed removal actions.

The objective of the SI and Supplemental SI sampling programs was to investigate the potential for soil and groundwater contamination caused by the release of petroleum from former USTs at Building 3602. Soil and groundwater samples were collected for laboratory analysis to determine whether the historical use of SA 49 had adversely impacted the soil and groundwater quality at the site.

Although results of the SI sampling program indicated the presence of petroleum-related organic compounds and lead in groundwater at SA 49, the concentrations of benzene and other VOCs detected are below drinking water standards. Elevated lead concentrations are attributable to suspended solids in the groundwater samples and are below the action level in filtered groundwater samples. TPH were not detected in groundwater at well 49M-92-01X, which is downgradient of the former USTs. The maximum detected concentrations of TPH, toluene, ethylbenzene, and xylenes are each below their respective drinking water standards. Exposure to groundwater at SA 49 does not pose a significant risk to human health.

Petroleum-related compounds were detected by field screening in soils at the water table, primarily in the central portion and eastern side of the former UST excavation. Maximum concentrations of TPH were detected in excess of the MCP Method 1 S-2/GW-1 soil standard. Based on these findings, a soil removal action was recommended to address potential human health risks in the area of TPH-contaminated soil.

The cleanup levels for TPH and BTEX were established using the MCP Method 1 S-1/GW-1 soil standards of 500  $\mu\text{g/g}$ , 10  $\mu\text{g/g}$ , 90  $\mu\text{g/g}$ , 80  $\mu\text{g/g}$ , and 500  $\mu\text{g/g}$ , respectively. Soil with contaminant concentrations exceeding the cleanup levels was removed during the soil removal action. Excavation was continued until confirmation sample analyses indicated that TPH concentrations were below the cleanup level. The maximum detected TPH concentration in confirmation soil

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## SECTION 6

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1 samples (153  $\mu\text{g/g}$ ) is below the 500  $\mu\text{g/g}$  standard. The low residual  
2 concentrations of TPH and other petroleum-related compounds suggest that no  
3 residual risks to human health exist at SA 49.

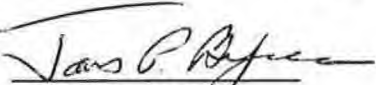
## 7.0 DECISION

With the removal of contaminated soil from the Building 3602 LUST Site and a determination of no residual risk, there is no evidence or reason to conclude that residual hazardous waste contamination due to the former USTs at Building 3602 has caused significant environmental contamination or poses a threat to human health or the environment. The decision has been made to remove SA 49 from further consideration in the IRP process. In accordance with CERCLA 120 (h) (3), all remedial actions necessary have taken place, and the USEPA and MADEP signatures constitute concurrence in accordance with the same.

  
JAMES C. CHAMBERS  
BRAC Environmental Coordinator

20996  
Date

## U.S. ENVIRONMENTAL PROTECTION AGENCY

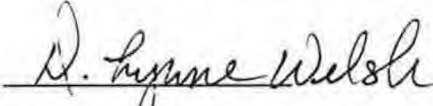
  
JAMES P. BYRNE  
Fort Devens Remedial Project Manager

10/2/96  
Date

☒ Concur

☐ Non-concur (Please provide reasons for non-concurrence in writing)

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

  
D. LYNNE WELSH  
Section Chief, Federal Facilities - CERO

10/2/96  
Date

☒ Concur

☐ Non-concur (Please provide reasons for non-concurrence in writing)

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## **GLOSSARY OF ACRONYMS AND ABBREVIATIONS**

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ABB-ES	ABB Environmental Services, Inc.
bgs	below ground surface
BRAC	Defense Base Realignment and Closure Act of 1990
BTEX	benzene, toluene, ethylbenzene, and xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOD	U.S. Department of Defense
ft	foot or feet
gpm	gallons per minute
IRP	Installation Restoration Program
LUST	leaking underground storage tank
MADEP	Massachusetts Department of Environmental Protection
MCP	Massachusetts Contingency Plan
MEP	Master Environmental Plan
MSL	mean sea level
OHM	OHM Remediation Services Corporation
OSWER	Office of Solid Waste and Emergency Response
PA	Enhanced Preliminary Assessment
PAH	polycyclic aromatic hydrocarbon
PID	photoionization detector
ppb	parts per billion
ppm	parts per million
PRE	Preliminary Risk Evaluation
RCRA	Resource Conservation and Recovery Act
SA	Study Area
SI	site investigation

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## **GLOSSARY OF ACRONYMS AND ABBREVIATIONS**

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TCLP	Toxicity Characteristic Leaching Procedure
TPH	total petroleum hydrocarbons
TSS	total suspended solids
$\mu\text{g/g}$	micrograms per gram
$\mu\text{g/L}$	micrograms per liter
USAEC	U.S. Army Environmental Center
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

## REFERENCES

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- ABB Environmental Services, Inc. (ABB-ES), 1993. "Final Site Investigation Report - Groups 2, 7, & Historic Gas Stations, Fort Devens, Massachusetts"; Data Item A009; prepared for the U.S. Army Environmental Center by ABB Environmental Services, Inc., Portland, ME; May.
- ABB Environmental Services, Inc. (ABB-ES), 1994a. "Supplemental Site Investigation Data Package - Groups 2, 7, & Historic Gas Stations, Fort Devens, Massachusetts"; Data Item A009; prepared for the U.S. Army Environmental Center by ABB Environmental Services, Inc., Portland, ME; January.
- ABB Environmental Services, Inc. (ABB-ES), 1994b. "Final Action Memoranda, Various Sites, Fort Devens, Massachusetts"; prepared for the U.S. Army Corps of Engineers by ABB Environmental Services, Inc., Wakefield, MA; June.
- Biang, C.A., R.W. Peters, R.H. Pearl, and S.Y. Tsai, 1992. "Master Environmental Plan for Fort Devens, Massachusetts"; prepared for U.S. Army Toxic and Hazardous Materials Agency; prepared by Argonne National Laboratory, Environmental Assessment and Information Sciences Division; Argonne, IL; Final, April.
- Jahns, R.H., 1953. "Surficial Geology of the Ayer Quadrangle, Massachusetts"; Scale 1:31,680; U.S. Geological Survey.
- Koteff, C., 1966. "Surficial Geologic Map of the Clinton Quadrangle, Worcester County, Massachusetts;" U.S. Geological Survey Map GQ-567.
- Massachusetts Department of Environmental Protection (MADEP), 1993. Revised Massachusetts Contingency Plan, 310 CMR 4.00 *et seq.*
- OHM Remediation Services Corporation, 1996. "Final Closure Report, Study Area 49, Fort Devens, Massachusetts"; prepared for the U.S. Army Corps of Engineers, Waltham, MA; Hopkinton, MA; March 4.
- U.S. Environmental Protection Agency (USEPA), 1989. "Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites"; OSWER Directive #9355.4-02; September 7.

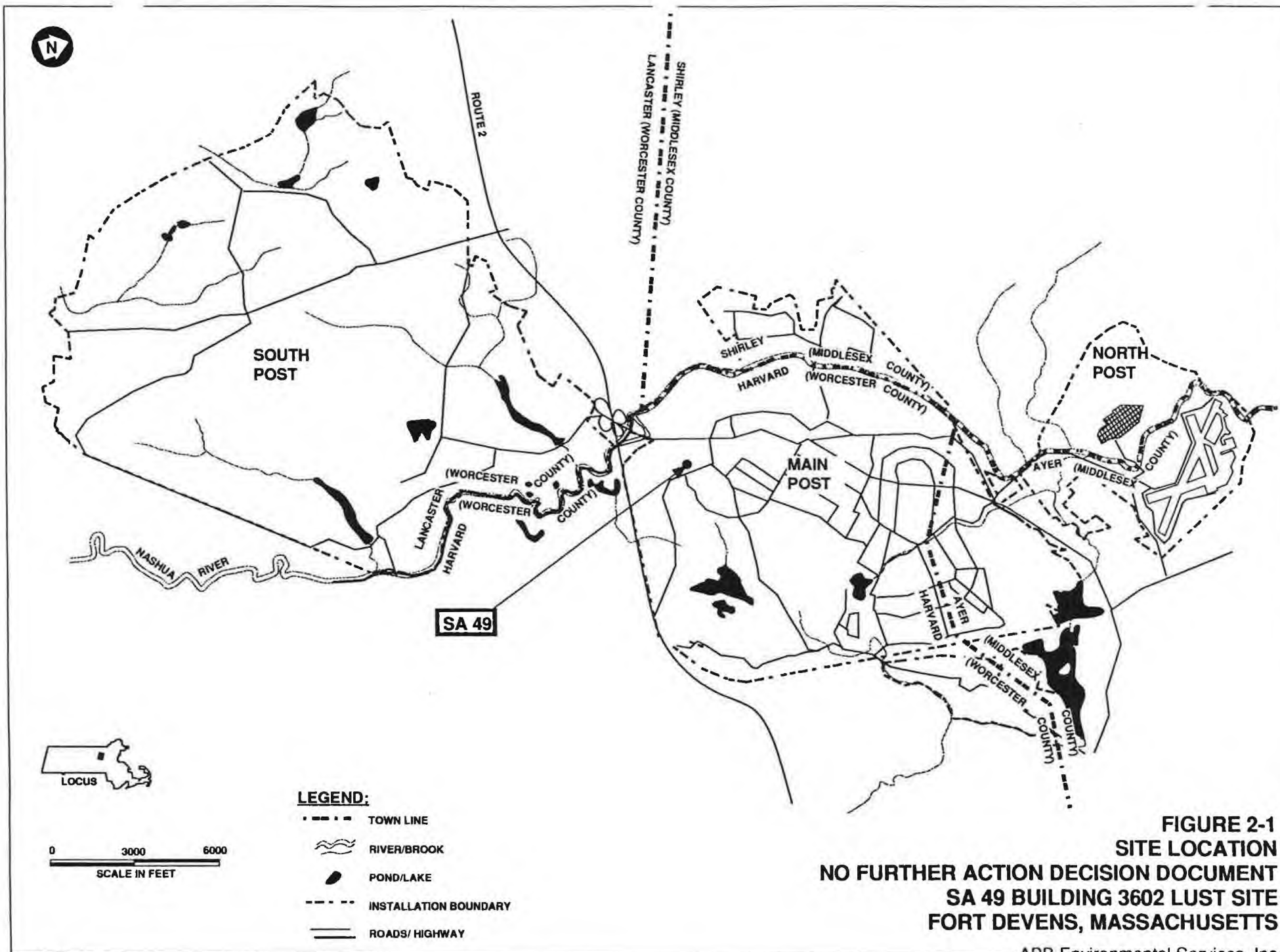
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**ABB Environmental Services, Inc.**

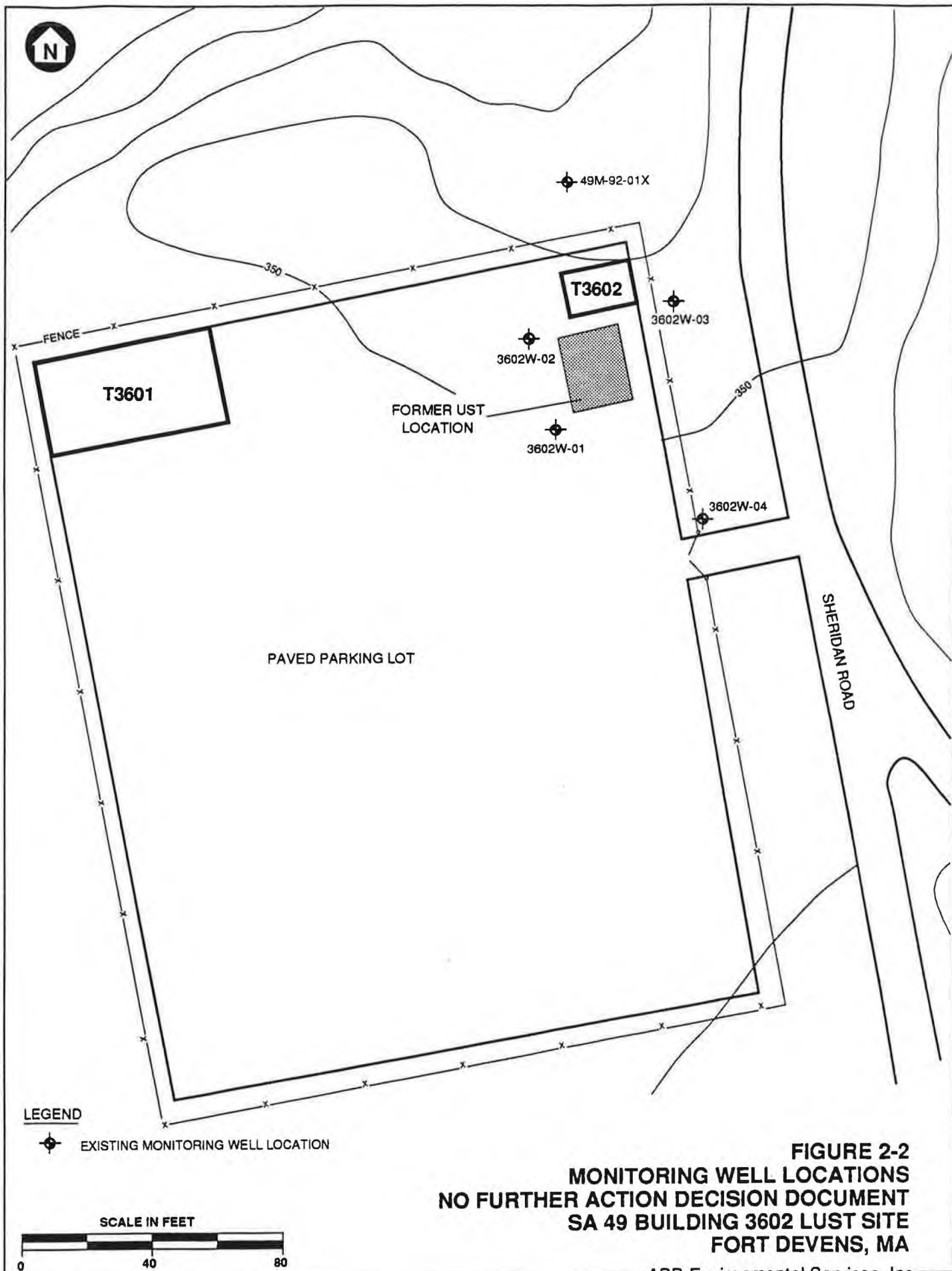
## **REFERENCES**

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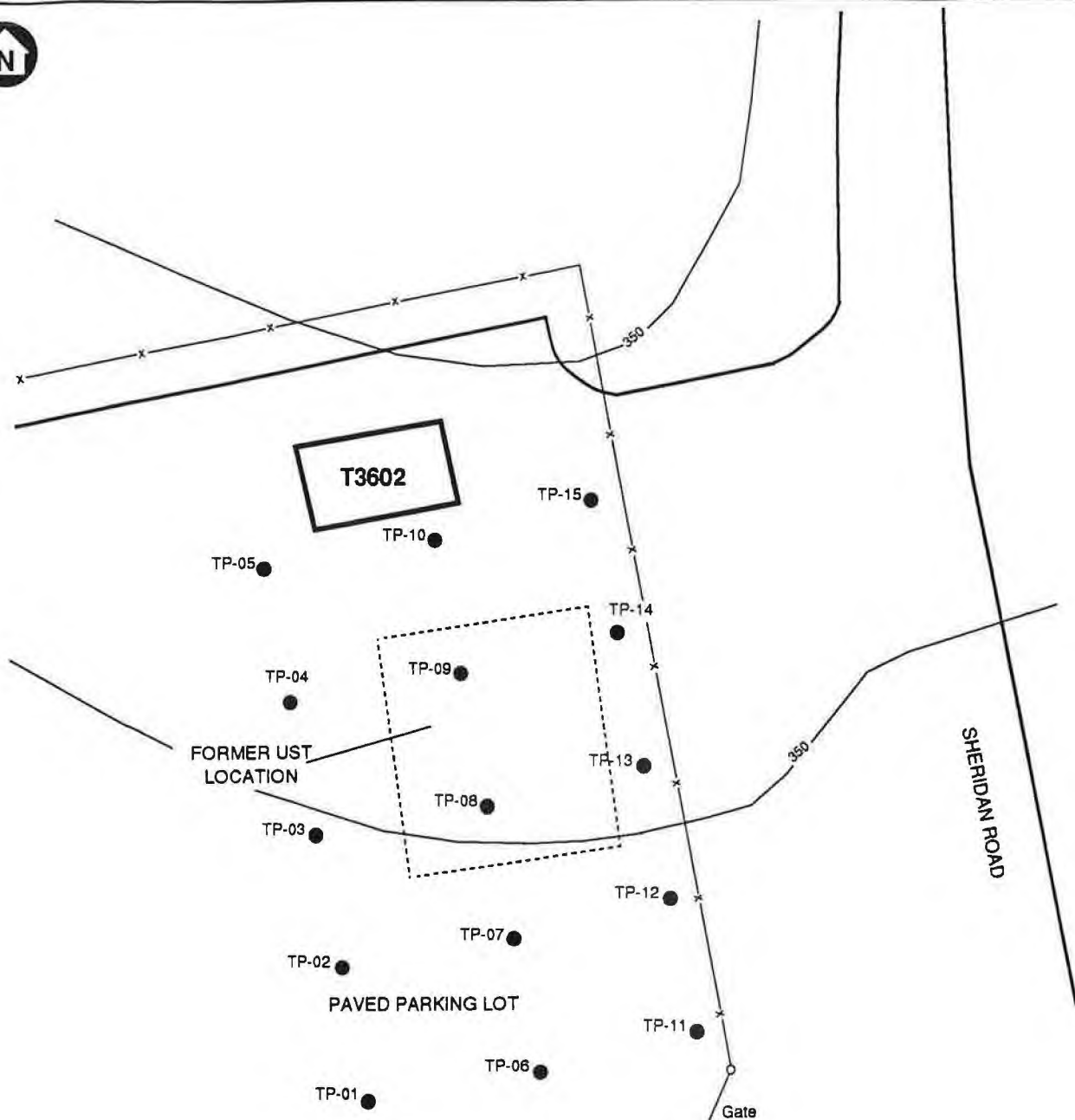
- U.S. Environmental Protection Agency (USEPA), 1992. "Drinking Water Regulations and Health Advisories"; Office of Water; Washington, D.C.; April.
- U.S. Environmental Protection Agency (USEPA) Region III, 1993. "Risk-Based Concentration Table", Memo from Roy L. Smith, EPA Region III, to RBC mailing list; First Quarter 1993.







**FIGURE 2-2**  
**MONITORING WELL LOCATIONS**  
**NO FURTHER ACTION DECISION DOCUMENT**  
**SA 49 BUILDING 3602 LUST SITE**  
**FORT DEVENS, MA**

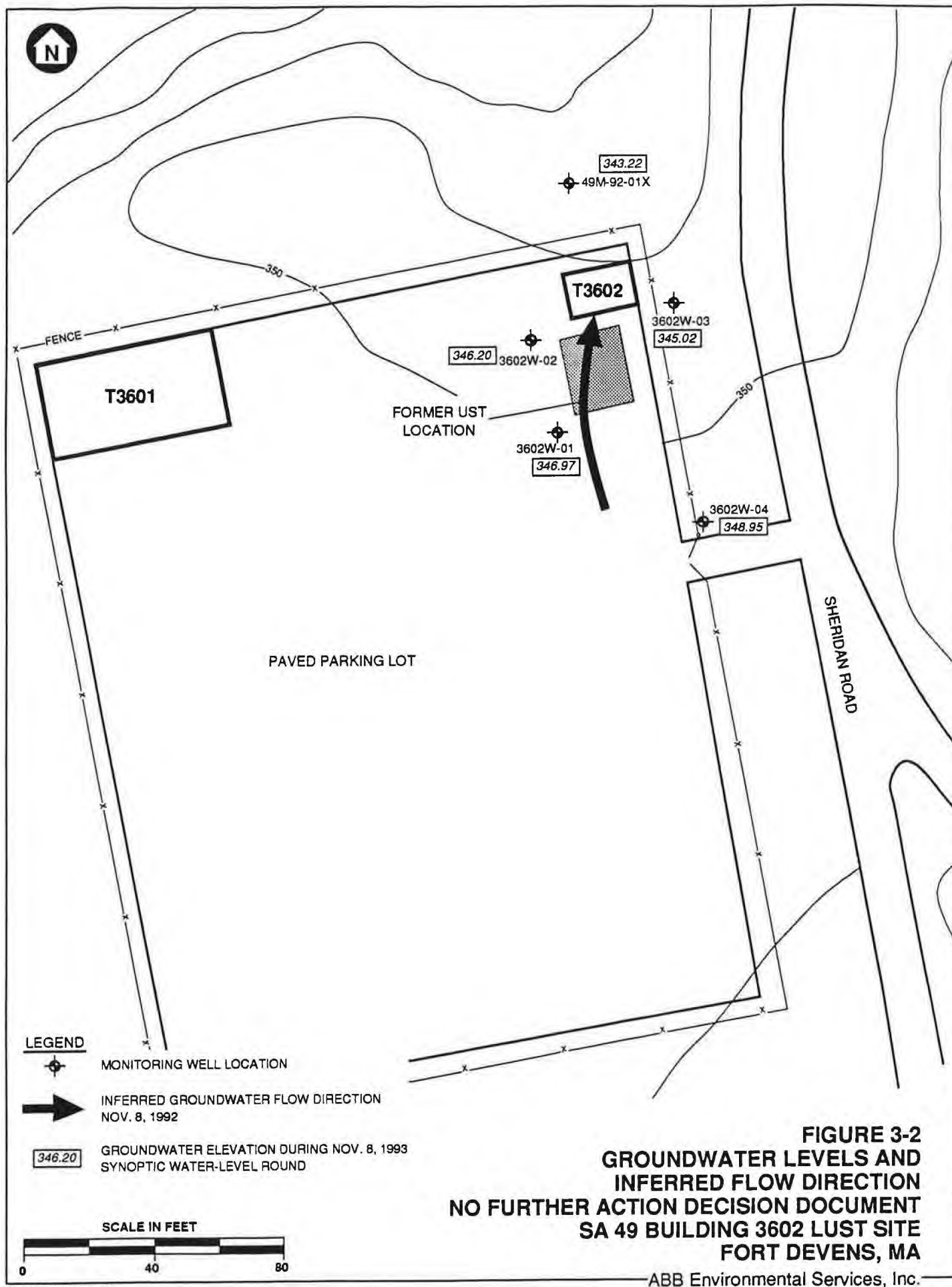


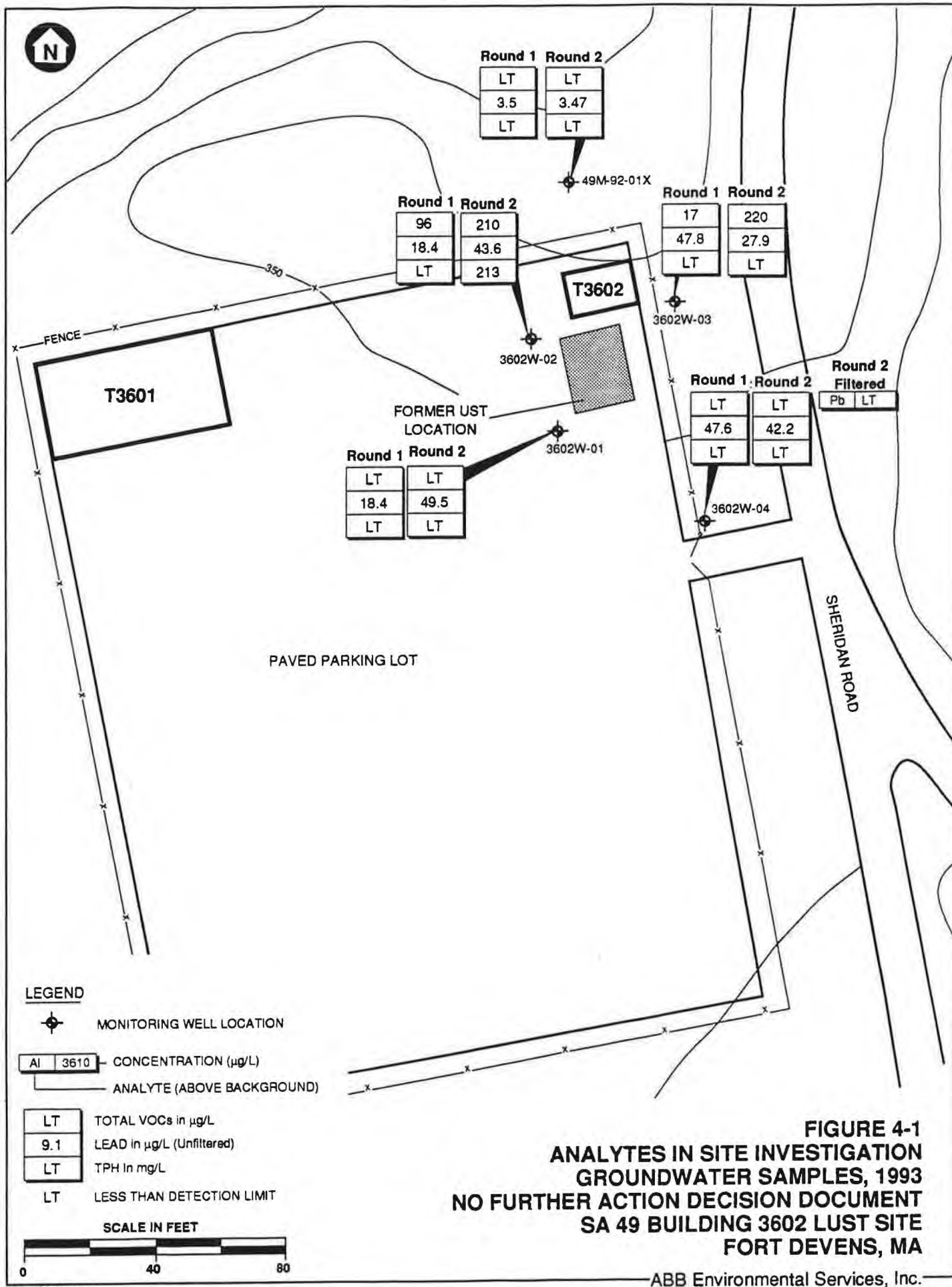
**LEGEND**

- EXISTING TERRAPROBE LOCATION

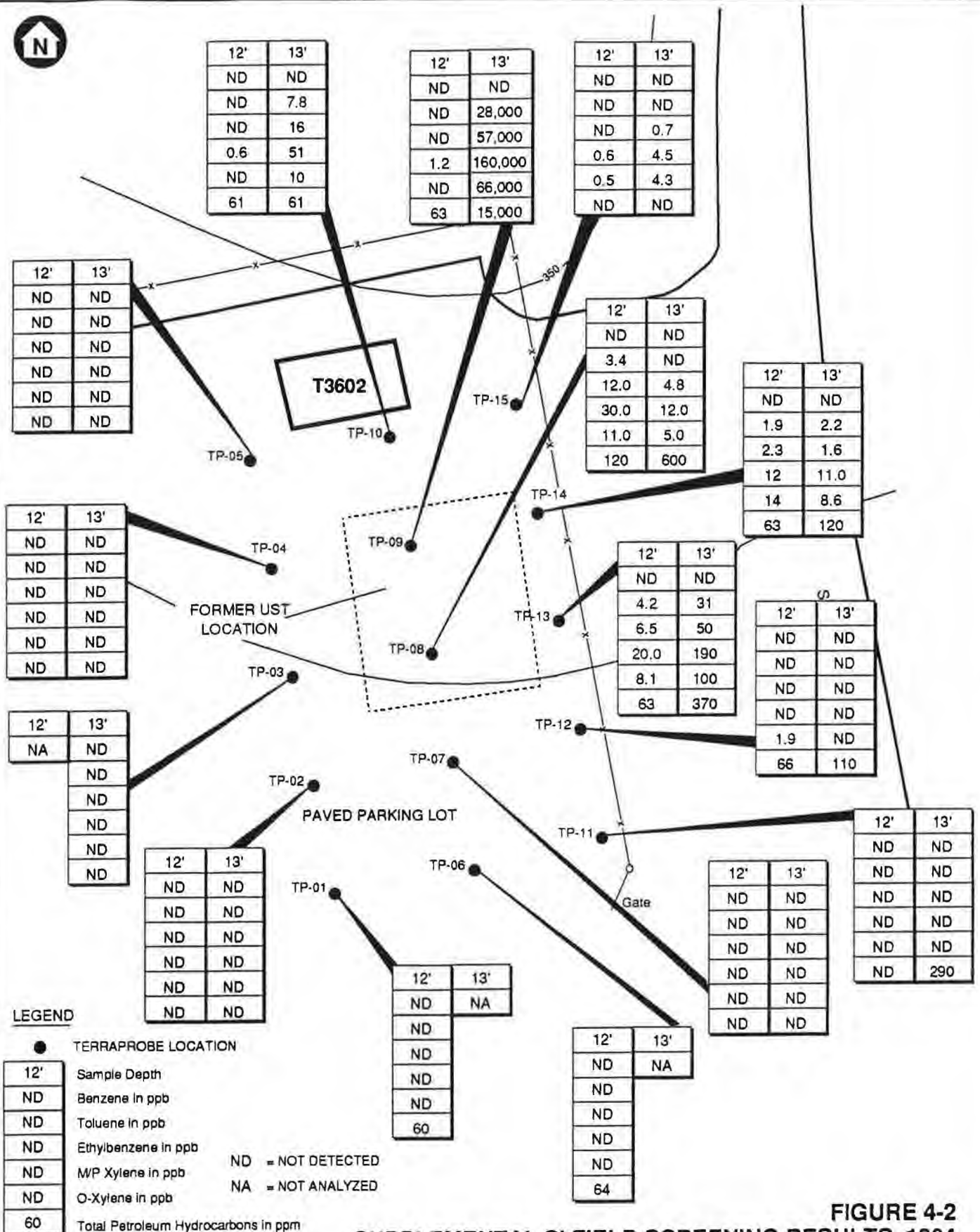


**FIGURE 3-1**  
**SUPPLEMENTAL SI SAMPLE LOCATIONS**  
**NO FURTHER ACTION DECISION DOCUMENT**  
**SA 49 BUILDING 3602 LUST SITE**  
**FORT DEVENS, MA**



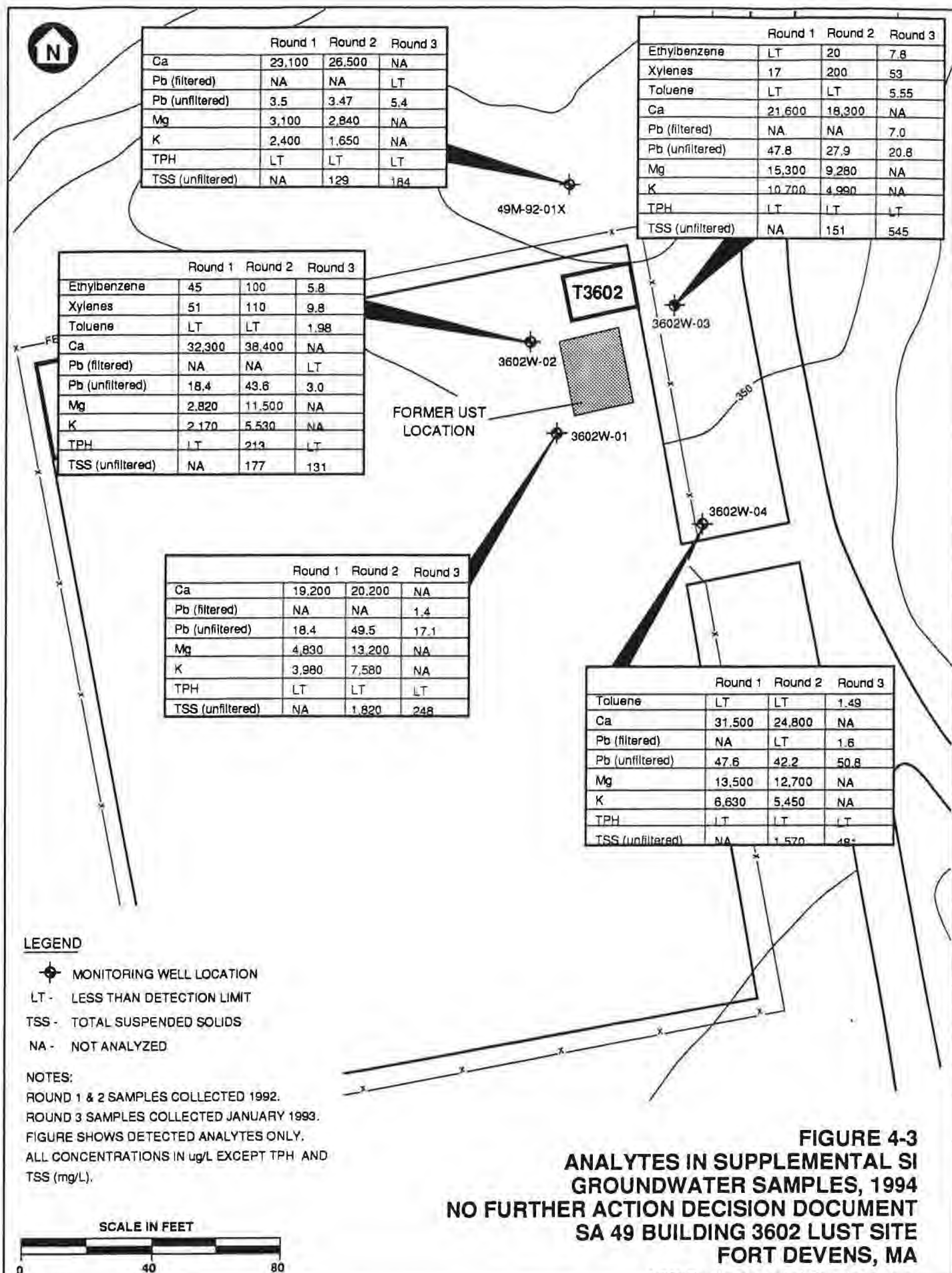


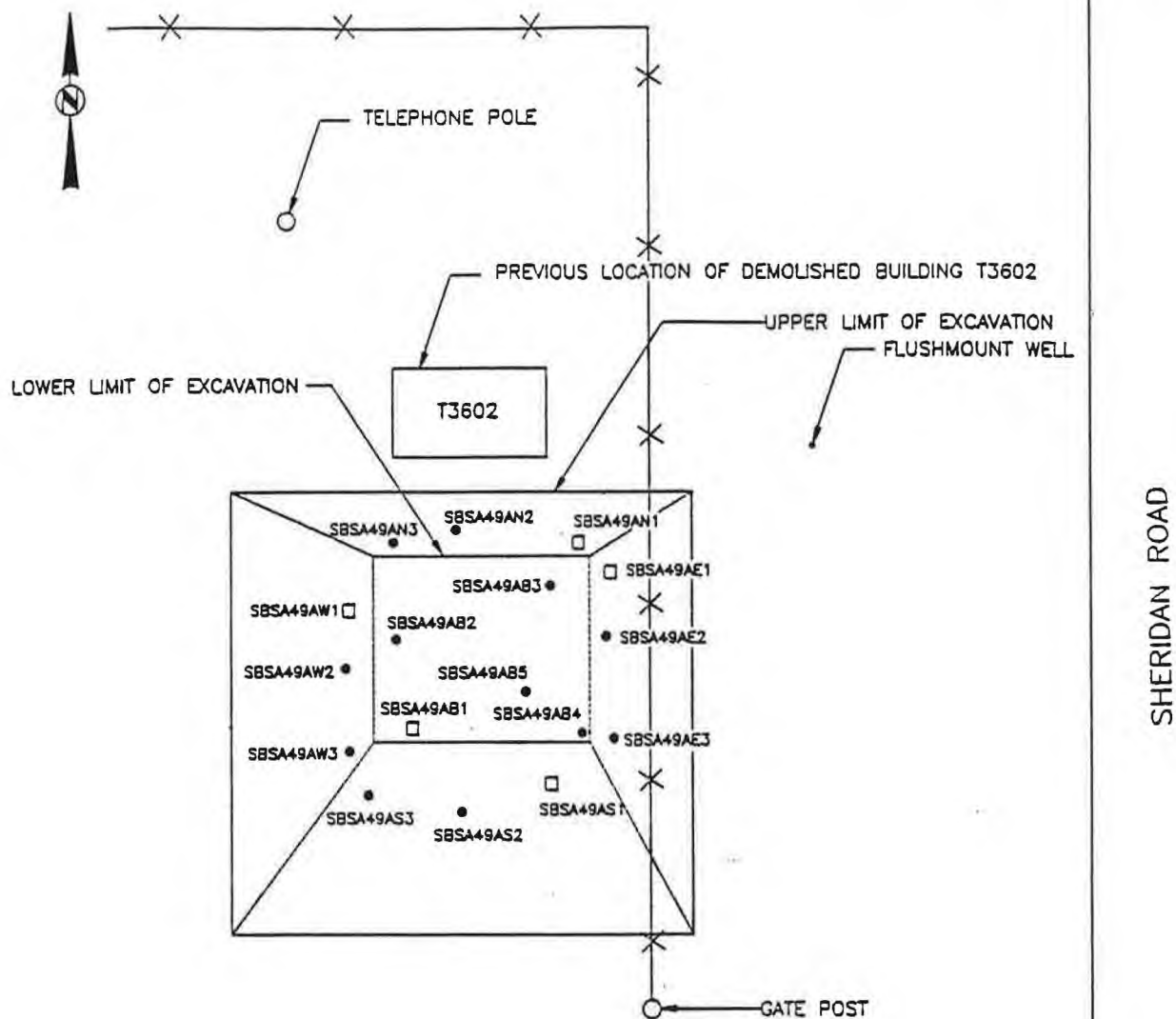




**FIGURE 4-2**  
**SUPPLEMENTAL SI FIELD SCREENING RESULTS, 1994**  
**NO FURTHER ACTION DECISION DOCUMENT**  
**SA 49 BUILDING 3602 LUST SITE**  
**FORT DEVENS, MA**

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CONFIRMATORY COMPOSITE SAMPLE NUMBERS	DISCRETE SAMPLE LOCATIONS
SBSA49SNC	SBSA49AN1 SBSA49AN2 SBSA49AN3
SBSA49AWC	SBSA49AW1 SBSA49AW2 SBSA49AW3
SBSA49ASC	SBSA49AS1 SBSA49AS2 SBSA49AS3
SBSA49AEC	SBSA49AE1 SBSA49AE2 SBSA49AE3
SBSA49ABC	SBSA49AB1 SBSA49AB2 SBSA49AB3 SBSA49AB4 SBSA49AB5

0 10 20  
SCALE IN FEET

#### LEGEND

- DISCRETE SAMPLES ALSO COLLECTED FROM THESE LOCATIONS FOR BTEX ANALYSES
- DISCRETE SAMPLE LOCATIONS THAT MAKE UP COMPOSITE SAMPLES

APPROXIMATE DEPTH OF EXCAVATION = 14 FEET

**FIGURE 4-4**  
**FINAL EXCAVATION LIMIT AND**  
**CONFIRMATION SAMPLE LOCATIONS**  
**NO FURTHER ACTION DECISION DOCUMENT**  
**SA 49 BUILDING 3602 LUST SITE**  
**FORT DEVENS, MA**

SOURCE: OHM REMEDIATION SERVICES CORP., 1996

ABB Environmental Services, Inc.

**TABLE 4-1**  
**ANALYTES IN GROUNDWATER:**  
**SITE INVESTIGATION AND SUPPLEMENTAL SI**  
**SA 49 - BUILDING 3602 LUST SITE**  
**NO FURTHER ACTION DECISION DOCUMENT**  
**FORT DEVENS, MA**

ANALYTE	BACK- GROUND	ROUND 1 3602W-01	ROUND 2 3602W-01	ROUND 3 3602W-01	ROUND 3 3602W-01 FILTERED	ROUND 1 3602W-02	ROUND 2 3602W-02
<b>ORGANICS (µg/L)</b>							
ETHYLBENZENE		< 0.5	< 0.5	< 0.5	NA	45.0	100.0
XYLENES		< 0.8	< 0.84	< 0.84	NA	51.0	110.0
TOLUENE		< 0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5
<b>INORGANICS (µg/L)</b>							
CALCIUM	14700.0	19200.0	20200.0	NA	NA	32300.0	38400.0
LEAD	4.25	18.4	49.5	17.1	1.4	18.4	43.6
MAGNESIUM	3480.0	4830.0	13200.0	NA	NA	2820.0	11500.0
POTASSIUM	2370.0	3980.0	7580.0	NA	NA	2170.0	5530.0
<b>ANIONS/CATIONS (µg/L)</b>							
NITRATE/NITRITE		4000.0	3600.0	NA	NA	840.0	690.0
CHLORIDE		12400.0	11100.0	NA	NA	< 2120.0	< 2120.0
SULFATE		< 10000	< 10000.0	NA	NA	13300.0	11400.0
BICARBONATE		47600.0	46300.0	NA	NA	86600.0	85400.0
<b>OTHER (mg/L)</b>							
TOTAL PETROLEUM HYDROCARBONS		< 27.9	< 27.7	< 27.7	NA	< 26.9	213.0
TOTAL SUSPENDED SOLIDS		NA	1820.0	248	NA	NA	177.0

**Notes:**

Table lists detected analytes only.

< = Less than detection limit shown.

NA = Not analyzed

Shaded values exceed background limit.

ug/L = micrograms per liter

mg/L = milligrams per liter

**TABLE 4-1, continued**  
**ANALYTES IN GROUNDWATER:**  
**SITE INVESTIGATION AND SUPPLEMENTAL SI**  
**SA 49 - BUILDING 3602 LUST SITE**  
**NO FURTHER ACTION DECISION DOCUMENT**  
**FORT DEVENS, MA**

ANALYTE	BACK- GROUND	ROUND 3 3602W-02	ROUND 3 3602W-02 FILTERED	ROUND 1 3602W-03	ROUND 2 3602W-03	ROUND 3 3602W-03	ROUND 3 3602W-03 FILTERED
<b>ORGANICS (µg/L)</b>							
ETHYLBENZENE		5.8	NA	< 0.5	20.0	7.8	NA
XYLENES		9.8	NA	17.0	200.0	53	NA
TOLUENE		1.98	NA	< 0.5	< 0.5	5.55	NA
<b>INORGANICS (µg/L)</b>							
CALCIUM	14700.0	NA	NA	21600.0	18300.0	NA	NA
LEAD	4.25	3.0	< 1.26	47.8	27.9	20.8	7.0
MAGNESIUM	3480.0	NA	NA	15300.0	9280.0	NA	NA
POTASSIUM	2370.0	NA	NA	10700.0	4990.0	NA	NA
<b>ANIONS/CATIONS (µg/L)</b>							
NITRATE/NITRITE		NA	NA	108.0	27000.0	NA	NA
CHLORIDE		NA	NA	24800.0	21100.0	NA	NA
SULFATE		NA	NA	< 10000	< 10000.0	NA	NA
BICARBONATE		NA	NA	30500.0	23200.0	NA	NA
<b>OTHER (mg/L)</b>							
TOTAL PETROLEUM HYDROCARBONS		< 27.7	NA	< 27.9	< 27.9	< 27.9	NA
TOTAL SUSPENDED SOLIDS		131	NA	NA	151.0	545	NA

**Notes:**

Table lists detected analytes only.

< = Less than detection limit shown.

NA = Not analyzed

Shaded values exceed background limit.

ug/L = micrograms per liter

mg/L = milligrams per liter



**TABLE 4-1, continued**  
**ANALYTES IN GROUNDWATER:**  
**SITE INVESTIGATION AND SUPPLEMENTAL SI**  
**SA 49 - BUILDING 3602 LUST SITE**  
**NO FURTHER ACTION DECISION DOCUMENT**  
**FORT DEVENS, MA**

ANALYTE	BACK- GROUND	ROUND 1 3602W-04	ROUND 2 3602W-04	ROUND 2 3602W-04 FILTERED	ROUND 3 3602W-04	ROUND 3 3602W-04 FILTERED	ROUND 1 49M-92-01X
<b>ORGANICS (µg/L)</b>							
ETHYLBENZENE		< 0.5	< 0.5	NA	< 0.5	NA	< 0.5
XYLENES		< 0.8	< 0.8	NA	< 0.8	NA	< 0.8
TOLUENE		< 0.5	< 0.5	NA	1.49	NA	< 0.5
<b>INORGANICS (µg/L)</b>							
CALCIUM	14700.0	31500.0	24800.0	NA	NA	NA	23100.0
LEAD	4.25	47.6	42.2	< 1.26	50.8	1.6	3.5
MAGNESIUM	3480.0	13500.0	12700.0	NA	NA	NA	3100.0
POTASSIUM	2370.0	6630.0	5450.0	NA	NA	NA	2400.0
<b>ANIONS/CATIONS (µg/L)</b>							
NITRATE/NITRITE		1300.0	1100.0	NA	NA	NA	29.7
CHLORIDE		48000.0	28800.0	NA	NA	NA	33000.0
SULFATE		< 10000	< 10000.0	NA	NA	NA	13900.0
BICARBONATE		67100.0	96300.0	NA	NA	NA	57300.0
<b>OTHER (mg/L)</b>							
TOTAL PETROLEUM HYDROCARBONS		< 27.9	< 27.9	NA	< 27.9	NA	< 27.9
TOTAL SUSPENDED SOLIDS		NA	1570.0	NA	481	NA	NA

**Notes:**

Table lists detected analytes only.

< = Less than detection limit shown.

NA = Not analyzed

Shaded values exceed background limit.

ug/L = micrograms per liter

mg/L = milligrams per liter

**TABLE 4-1, continued**  
**ANALYTES IN GROUNDWATER:**  
**SITE INVESTIGATION AND SUPPLEMENTAL SI**  
**SA 49 – BUILDING 3602 LUST SITE**  
**NO FURTHER ACTION DECISION DOCUMENT**  
**FORT DEVENS, MA**

		ROUND 2	ROUND 3	ROUND 3
ANALYTE	BACK – GROUND	49M-92-01X	49M-92-01X	49M-92-01X FILTERED
ORGANICS (µg/L)				
ETHYLBENZENE		< 0.5	< 0.5	NA
XYLENES		< 0.8	< 0.8	NA
TOLUENE		< 0.5	< 0.5	NA
INORGANICS (µg/L)				
CALCIUM	14700.0	26500.0	NA	NA
LEAD	4.25	3.47	5.4	< 1.26
MAGNESIUM	3480.0	2840.0	NA	NA
POTASSIUM	2370.0	1650.0	NA	NA
ANIONS/CATIONS (µg/L)				
NITRATE/NITRITE		15.4	NA	NA
CHLORIDE		27100.0	NA	NA
SULFATE		21700.0	NA	NA
BICARBONATE		65800.0	NA	NA
OTHER (mg/L)				
TOTAL PETROLEUM HYDROCARBONS		< 27.9	< 27.9	NA
TOTAL SUSPENDED SOLIDS		129.0	184.0	NA

**Notes:**

Table lists detected analytes only.

< = Less than detection limit shown.

NA = Not analyzed

Shaded values exceed background limit.

ug/L = micrograms per liter

mg/L = milligrams per liter

**TABLE 4-2  
ANALYTES IN SOIL:  
SUPPLEMENTAL SITE INVESTIGATION  
SA 49 – BUILDING 3602 LUST SITE**

**NO FURTHER ACTION DECISION DOCUMENT  
FORT DEVENS, MA**

	TP-01	TP-02	TP-02	TP-03	TP-04	TP-04	TP-05	TP-05	TP-06
ANALYTE	TS90112F	TS90212F	TS90213F	TS90313F	TS90412F	TS90413F	TS90512F	TS90513F	TS90611F
ORGANICS (ppb)	12 FT	12 FT	13 FT	13 FT	12 FT	13 FT	12 FT	13 FT	11 FT
BENZENE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TOLUENE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
ETHYLBENZENE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
m/p-XYLENE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
o-XYLENE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
OTHER (ppm)									
TOTAL PETROLEUM HYDROCARBONS	60	< 57	< 57	< 56	< 56	< 56	< 59	< 63	64

Notes:

< = Less than detection limit shown

ppb = parts per billion

ppm = parts per million

TABLE 4-2, continued  
ANALYTES IN SOIL:  
SUPPLEMENTAL SITE INVESTIGATION  
SA 49 - BUILDING 3602 LUST SITE

NO FURTHER ACTION DECISION DOCUMENT  
FORT DEVENS, MA

	TP-07	TP-07	TP-08	TP-08	TP-09	TP-09	TP-10	TP-10	TP-11
ANALYTE	TS90712F	TS90713F	TS90812F	TS90813F	TS90912F	TS90913F	TS91012F	TS91013F	TS91112F
ORGANICS (ppb)	12 FT	13 FT	12 FT	13 FT	12 FT	13 FT	12 FT	13 FT	12 FT
BENZENE	< 0.1	< 0.1	< 0.1	< 0.6	< 0.1	< 150	< 0.1	< 0.1	< 0.1
TOLUENE	< 0.1	< 0.1	3.4	< 0.6	< 0.1	28000	< 0.1	7.8	< 0.1
ETHYLBENZENE	< 0.1	< 0.1	12	4.8	< 0.1	57000	< 0.1	16	< 0.1
m/p-XYLENE	< 0.1	< 0.1	30	12	1.2	160000	0.6	51	< 0.1
o-XYLENE	< 0.1	< 0.1	11	5.0	< 0.1	66000	< 0.1	10	< 0.1
OTHER (ppm)									
TOTAL PETROLEUM HYDROCARBONS	< 58	< 59	120	600	63	15000	61	61	< 54

Notes:

< = Less than detection limit shown

ppb = parts per billion

ppm = parts per million

**TABLE 4-2, continued**  
**ANALYTES IN SOIL:**  
**SUPPLEMENTAL SITE INVESTIGATION**  
**SA 49 – BUILDING 3602 LUST SITE**

**NO FURTHER ACTION DECISION DOCUMENT**  
**FORT DEVENS, MA**

	TP-11	TP-12	TP-12	TP-13	TP-13	TP-14	TP-14	TP-15	TP-15
ANALYTE	TS91113F	TS91212F	TS91213F	TS91312F	TS91313F	TS91412F	TS91413F	TS91512F	TS91513F
ORGANICS (ppb)	13 FT	12 FT	13 FT	12 FT	13 FT	12 FT	13 FT	12 FT	13 FT
BENZENE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.6	< 0.1	< 0.1	< 0.1	< 0.1
TOLUENE	< 0.1	< 0.1	< 0.1	4.2	31	1.9	2.2	< 0.1	< 0.1
ETHYLBENZENE	< 0.1	< 0.1	< 0.1	6.5	50	2.3	1.6	< 0.1	0.7
m/p-XYLENE	< 0.1	< 0.1	< 0.1	20	190	12	11	0.6	4.5
o-XYLENE	< 0.1	1.9	< 0.1	8.1	100	14	8.6	0.5	4.3
<b>OTHER (ppm)</b>									
TOTAL PETROLEUM HYDROCARBONS	290	66	110	63	370	63	120	< 59	< 61

Notes:

< = Less than detection limit shown

ppb = parts per billion

ppm = parts per million



TABLE 4-3  
FIELD SCREENING RESULTS: SOIL REMOVAL ACTION  
SA 49 - BUILDING 3602 LUST SITE  
NO FURTHER ACTION DECISION DOCUMENT  
FORT DEVENS, MA

Sample ID	Date Collected	Sample Location	Sample Depth (feet)	TPH (mg/kg)
SBSA49001	22-July-94	NW section sidewall	14	ND(42)
SBSA49002	22-July-94	NW section sidewall	14	2J
SBSA49003	22-July-94	NE section sidewall	14	828
SBSA49004	22-July-94	NE section sidewall	14	774
SBSA49005	22-July-94	N section bottom	14	18J
SBSA49005A	22-July-94	N section bottom	15	21J
SBSA49003A	25-July-94	NE section sidewall	6	54
SBSA49004A	25-July-94	NE section sidewall	6	ND(42)
SBSA49006	25-July-94	SE section bottom	14	829
SBSA49007	25-July-94	SE section bottom	14	755
SBSA49003B	26-July-94	NE section sidewall	10	246
SBSA49003C	26-July-94	NE section sidewall	12	854
SBSA49004B	26-July-94	NE section sidewall	10	782
SBSA49004C	26-July-94	NE section sidewall	12	715
SBSA49008A	26-July-94	SE section sidewall	6	ND(42)
SBSA49008B	26-July-94	SE section sidewall	10	ND(42)
SBSA49008C	26-July-94	SE section sidewall	12	315
SBSA49004D	26-July-94	NE section sidewall	11	ND(42)
SBSA49008D	26-July-94	SE section sidewall	11	ND(42)
SBSA49004E	27-July-94	NE section sidewall	14	ND(42)

NOTES:

TPH = total petroleum hydrocarbons

mg/kg = milligrams per kilogram, which is equivalent to micrograms per gram.

ND = TPH was not detected above the method detection limit shown.

J = estimated concentration below the practical quantitation limit.

SOURCE: OHM Remediation Services Corp., 1996.

TABLE 4-3 (continued)  
FIELD SCREENING RESULTS: SOIL REMOVAL ACTION  
SA 49 - BUILDING 3602 LUST SITE  
NO FURTHER ACTION DECISION DOCUMENT  
FORT DEVENS, MA

Sample ID	Date Collected	Sample Location	Sample Depth (feet)	TPH (mg/kg)
SBSA49008E	27-July-94	SE section sidewall	14	ND(42)
SBSA49003D	27-July-94	NE section sidewall	14	ND(42)
SBSA49010	27-July-94	SE section sidewall	14	ND(42)
SBSA49010A	29-July-94	SE section sidewall	12.5	ND(42)
SBSA49011	29-July-94	SW section sidewall	12.5	ND(42)
SBSA49012	29-July-94	SW section sidewall	12.5	ND(42)
SBSA49001F	29-July-94	NW section sidewall	12.5	ND(42)
SBSA49002F	29-July-94	NW section sidewall	12.5	75
SBSA49002G	29-July-94	NW section sidewall	12.5	ND(42)
SBSA49B3A	01-Aug-94	SW section bottom	15	118
SBSA49B4A	01-Aug-94	NW section bottom	15	110
SBSA49B6	01-Aug-94	W section bottom	14	950
SBSA49003E	01-Aug-94	Excavation sidewall	11	91
SBSA49B1	01-Aug-94	NE section bottom	13	>629
SBSA49B2	01-Aug-94	SE section bottom	12	28J
SBSA49B3	01-Aug-94	SW section bottom	13	16J
SBSA49B4	01-Aug-94	NW section bottom	13	25J
SBSA49B5	01-Aug-94	center bottom	13	118
SBSA49B1A	02-Aug-94	NE section bottom	15	6J
SBSA49B2A	02-Aug-94	SE section bottom	15	39J
SBSA49B7	02-Aug-94	E section bottom	15	10J

NOTES:

TPH = total petroleum hydrocarbons

mg/kg = milligrams per kilogram, which is equivalent to micrograms per gram.

ND = TPH was not detected above the method detection limit shown.

J = estimated concentration below the practical quantitation limit.

SOURCE: OHM Remediation Services Corp., 1996.

**TABLE 4-4**  
**CONFIRMATION SAMPLE RESULTS: SOIL REMOVAL ACTION**  
**SA 49 – BUILDING 3602 LUST SITE**  
**NO FURTHER ACTION DECISION DOCUMENT**  
**FORT DEVENS, MA**

**COMPOSITE CONFIRMATION SAMPLES:**

Sample ID	Date Collected	Sample Location	TPH Field Screening (mg/kg)	Naphthalene (mg/kg)	2-methyl naphthalene (mg/kg)	Phenanthrene (mg/kg)
SBSA49ANC	02-Aug-94	N sidewall	128	<0.385	<0.385	<0.385
SBSA49ASC	02-Aug-94	S sidewall	<13.1	<0.442	<0.442	<0.442
SBSA49AWC	02-Aug-94	W sidewall	153	<0.415	<0.415	<0.415
SBSA49AEC	02-Aug-94	E sidewall	17.4	<0.415	<0.415	<0.415
SBSA49ABC	02-Aug-94	Bottom	77.6	<0.417	<0.417	<0.417
SBSA49DUP2	02-Aug-94	S sidewall	<12.5	<0.413	<0.413	<0.413

**DISCRETE CONFIRMATION SAMPLES:**

Sample ID	Date Collected	Sample Location	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)
SBSA49AN1	02-Aug-94	N sidewall	<0.001	<0.001	<0.001	0.002
SBSA49AS1	02-Aug-94	S sidewall	<0.001	<0.001	<0.001	0.005
SBSA49AW1	02-Aug-94	W sidewall	<0.001	<0.001	<0.001	<0.001
SBSA49AE1	02-Aug-94	E sidewall	<0.001	<0.001	<0.001	<0.001
SBSA49AB1	02-Aug-94	Bottom	<0.006	0.031	0.045	0.108
SBSA49DUP1	02-Aug-94	S sidewall	<0.001	0.002	0.001	0.008

**NOTES:**

TPH = total petroleum hydrocarbons

mg/kg = milligrams per kilograms, which is equivalent to micrograms per gram.

**SOURCE:** OHM Remediation Services Corp., 1996.

**TABLE 5-1**  
**HUMAN HEALTH PRE EVALUATION OF SUBSURFACE SOIL**  
**SA 49 - BUILDING 3602 LUST SITE**  
**NO FURTHER ACTION DECISION DOCUMENT**  
**FORT DEVENS, MA**

ANALYTE	FREQUENCY OF DETECTION	DETECTED CONCENTRATION [a]		REGION III COMMERCIAL/INDUSTRIAL	MCP S-2	MAXIMUM EXCEEDS GUIDELINE
		AVERAGE	MAXIMUM	SOIL CONCENTRATION	STANDARD	CONCENTRATION?
ORGANICS(ug/kg)						
TOLUENE	7/27	4000	28000	200,000,000	90000	NO
ETHYLBENZENE	9/27	6300	57000	100,000,000	80000	NO
m/p-XYLENE	12/27	13400	160000	1,000,000,000	800000	NO
o-XYLENE	10/27	6600	66000	1,000,000,000	800000	NO
OTHER (mg/kg)						
TOTAL PETROLEUM HYDROCARBONS	15/27	1,141	15,000	NA	2,500	YES

**NOTES:**

[a] Field analytical subsurface soil sampling locations TP-01 to TP-15; at some locations, samples were collected at more than one depth.

NA = not available

ug/kg = micrograms per kilogram; mg/kg = milligrams per kilogram

MCP = Massachusetts Contingency Plan

Shaded analytes exceed standard or guidelines

**TABLE 4-2, continued**  
**ANALYTES IN SOIL:**  
**SUPPLEMENTAL SITE INVESTIGATION**  
**SA 49 - BUILDING 3602 LUST SITE**

**NO FURTHER ACTION DECISION DOCUMENT**  
**FORT DEVENS, MA**

	TP-11	TP-12	TP-12	TP-13	TP-13	TP-14	TP-14	TP-15	TP-15
ANALYTE	TS91113F	TS91212F	TS91213F	TS91312F	TS91313F	TS91412F	TS91413F	TS91512F	TS91513F
ORGANICS (ppb)	13 FT	12 FT	13 FT	12 FT	13 FT	12 FT	13 FT	12 FT	13 FT
BENZENE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.6	< 0.1	< 0.1	< 0.1	< 0.1
TOLUENE	< 0.1	< 0.1	< 0.1	4.2	31	1.9	2.2	< 0.1	< 0.1
ETHYLBENZENE	< 0.1	< 0.1	< 0.1	6.5	50	2.3	1.6	< 0.1	0.7
m/p-XYLENE	< 0.1	< 0.1	< 0.1	20	190	12	11	0.6	4.5
o-XYLENE	< 0.1	1.9	< 0.1	8.1	100	14	8.6	0.5	4.3
OTHER (ppm)									
TOTAL PETROLEUM HYDROCARBONS	290	66	110	63	370	63	120	< 59	< 61

Notes:

< = Less than detection limit shown

ppb = parts per billion

ppm = parts per million



**Responses to USEPA Comments On**  
**SA 49 Draft Final Closure Report**  
**Various Sites - Fort Devens, MA**

**Comment:** One down gradient monitoring well (49M-92-01X) is not sufficient to assess the impact on groundwater quality from the USTs. Further, no results from this well are discussed. Additionally, there is no final determination on whether the groundwater was impacted by the leaking USTs. Is more investigation planned ? It seems appropriate.

**Response:** Additional detail will be provided by ABB in the NFADD. The focus of this closure report was the removal action performed by OHM.

**Responses to MADEP Comments On  
SA 49 Draft Final Closure Report  
Various Sites - Fort Devens, MA**

**Comment:** Disposition of Excavated Contaminated Soils/Wastes: Documentation of the transportation and disposal of contaminated soil must be submitted in the final closure report.

**Response:** Documentation will be provided in the final report.

**Comment:** Residual Groundwater Contamination: Groundwater sample data collected from the excavation during the dewatering operations must be included in the closure report.

**Response:** Ground water sample data will be included in the final report.

**Comment:** Residual Groundwater Contamination: Inclusion of the most recent ground water analytical results from the five on-site monitoring wells in the final closure report would accelerate review of the draft No Further Action Decision document.

**Response:** ABB will include ground water analytical results in the No Further Action Decision document.

**Comment:** Residual Soil Contamination: Laboratory analytical reports for confirmation soil samples taken from the bottom and sidewall area of the excavation must be provided in the closure report.

**Response:** Laboratory analytical reports for confirmation soil samples will be included in the final report.

**Comment:** Unresolved or pending issues: MADEP requires the pending documentation be provided for review and comment in the final closure report for SA 49.

**Response:** All pending documentation will be provided in the final report.

**Responses to BRAC Comments On**  
**SA 49 Draft Final Closure Report**  
**Various Sites - Fort Devens, MA**

**Comment:** The “proprietary and confidential” footer should be changed to “permission of the U.S. Army.”

**Response:** “Proprietary and confidential” statements will be eliminated from all closure reports.

**Comment:** Section 1.3 title should be changed to “Previous Investigation Activities”

**Response:** Section 1.3 will be changed accordingly.

**Comment:** Could use a site diagram for Table 2.1

**Response:** A diagram is not required here as instructed by the USACE.

**Comment:** In addition to having all Appendix items added in the Final, all disposal documentation must be added.

**Response:** All Appendix items and disposal documentation will be added to the final report.



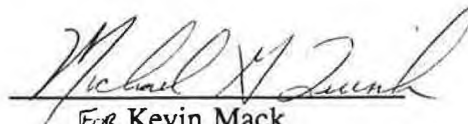
FINAL CLOSURE REPORT  
STUDY AREA 49  
FORT DEVENS, MASSACHUSETTS

Prepared for:

U.S. Army Corps of Engineers  
New England Division  
Waltham, Massachusetts  
Contract Number DACW45-89-D-0506

Prepared by:

OHM Remediation Services Corp.  
Hopkinton, Massachusetts

  
FOR Kevin Mack  
Project Manager

March 4, 1996  
OHM Job 16208

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#### Appendices

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E	Transportation & Disposal Documentation
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## LIST OF ACRONYMS AND ABBREVIATIONS

ABB	ABB Environmental Services, Inc.
BGS	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, and Xylene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EMO	Fort Devens Environmental Management Office
IR	Infrared Spectroscopy
MADEP	Massachusetts Department of Environmental Protection
MCP	Massachusetts Contingency Plan
MEP	Master Environmental Plan
NED	US Army Corps of Engineers New England Division
NPL	National Priorities List
PAH	Polycyclic Aromatic Hydrocarbons
PID	Photoionization Detector
QA/QC	Quality Assurance/Quality Control
SA	Study Area
SARA	Superfund Amendments and Reauthorization Act
SI	Site Investigation
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
USAEC	U.S. Army Environmental Center
USACE	United States Army Corps of Engineers
UST	Underground Storage Tank
VOC	Volatile Organic Compounds

## EXECUTIVE SUMMARY

Fort Devens was placed on the National Priority List (NPL) on December 21, 1989, under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, Superfund Act) as amended by the Superfund Amendments and Reauthorization Act (SARA). Subsequently, under Public Law 101-510, the Defense Base Realignment and Closure Act of 1990, Fort Devens was selected for cessation of operations and closure. In accordance with these acts, several studies have been conducted that address Study Area (SA) 49, which was identified in the Federal Facilities Agreement between the U.S. Environmental Protection Agency and the U.S. Department of Defense as a potential site of contamination. The information gathered through these studies indicated petroleum contamination in the subsurface soils. This closure report documents the historical information and investigation results leading to the recommendation to remove soil, and the remedial actions taken at Study Area (SA) 49.

SA 49 is located on an access road off Sheridan Road in the central portion of the Main Post. The area around SA 49 was used as an equipment storage yard for the U.S. Army medical unit. Two 5,000-gallon gasoline USTs were removed in December, 1989 by Franklin Environmental Services, Inc under the direction of Kurz Associates. Petroleum contamination was apparent in soil surrounding the tanks during the removal operation, and approximately 250 cubic yards of contaminated soil were removed at that time. Soil screening measurements, using a photoionization detector (PID) instrument, indicated elevated concentrations of volatile organic compounds (VOCs) in the soil remaining in the excavation. Based on these findings, further investigation was determined to be necessary prior to final remediation. The excavation was backfilled with clean fill and four monitoring wells were installed to evaluate the impact of the petroleum release on groundwater. An additional downgradient well was installed later during the site investigation.

The New England Division (NED) of the United States Army Corps Engineers (USACE) contracted OHM Remediation Services Corporation (OHM) to address the remaining petroleum-contaminated soil. OHM removed an estimated 730 cubic yards (cy) of soil from the excavation at SA 49. A total 452 tons of this material was determined to be petroleum contaminated based on field screening and the balance was clean fill that was reused as backfill in the excavation. Confirmation soil samples were collected from the excavation, subsequent to the removal of contaminated soil and analyzed for the targeted parameters to document that the applicable site action levels for these constituents had been met. "Contaminated" soils were transferred to the Moore Army Airfield (MAAF) located at the North Post of Fort Devens after characterization results indicated that concentrations of soil contaminants were below Reporting Category RCS-1 Soils which is the most conservative category under the Massachusetts Contingency Plan (MCP). Based upon previous investigations and the results of remedial activities described herein, OHM recommends no further action at this site.

## SECTION 1.0 INTRODUCTION

Fort Devens was placed on the National Priorities List (NPL) on December 21, 1989, under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA; Superfund) as amended by the Superfund Amendments and Reauthorization Act (SARA). Subsequently, under Public Law 101-510, the Defense Base Realignment and Closure Act of 1990, Fort Devens was selected for cessation of operations and closure. This closure report has been prepared as part of the U.S. Department of Defense Base Realignment and Closure program to assess the nature and extent of contamination associated with site operations at Fort Devens. This report contains a summary of activities conducted under CERCLA at Study Area (SA) 49.

In conjunction with the Army's Installation Restoration Program, Fort Devens and the U.S. Army Environmental Center (USAEC; formerly the U.S. Army Toxic and Hazardous Materials Agency) developed a Master Environmental Plan (MEP) in 1988. The MEP consisted of assessments of the environmental status of SAs, specified necessary investigations, and provided recommendations for response actions with the objective of identifying priorities for environmental restoration at Fort Devens. The New England Division of the U.S. Army Corps of Engineers (NED) was tasked with removal efforts at the base. This closure report documents the historical findings leading to the response action recommendation and describes the measures taken at SA 49.

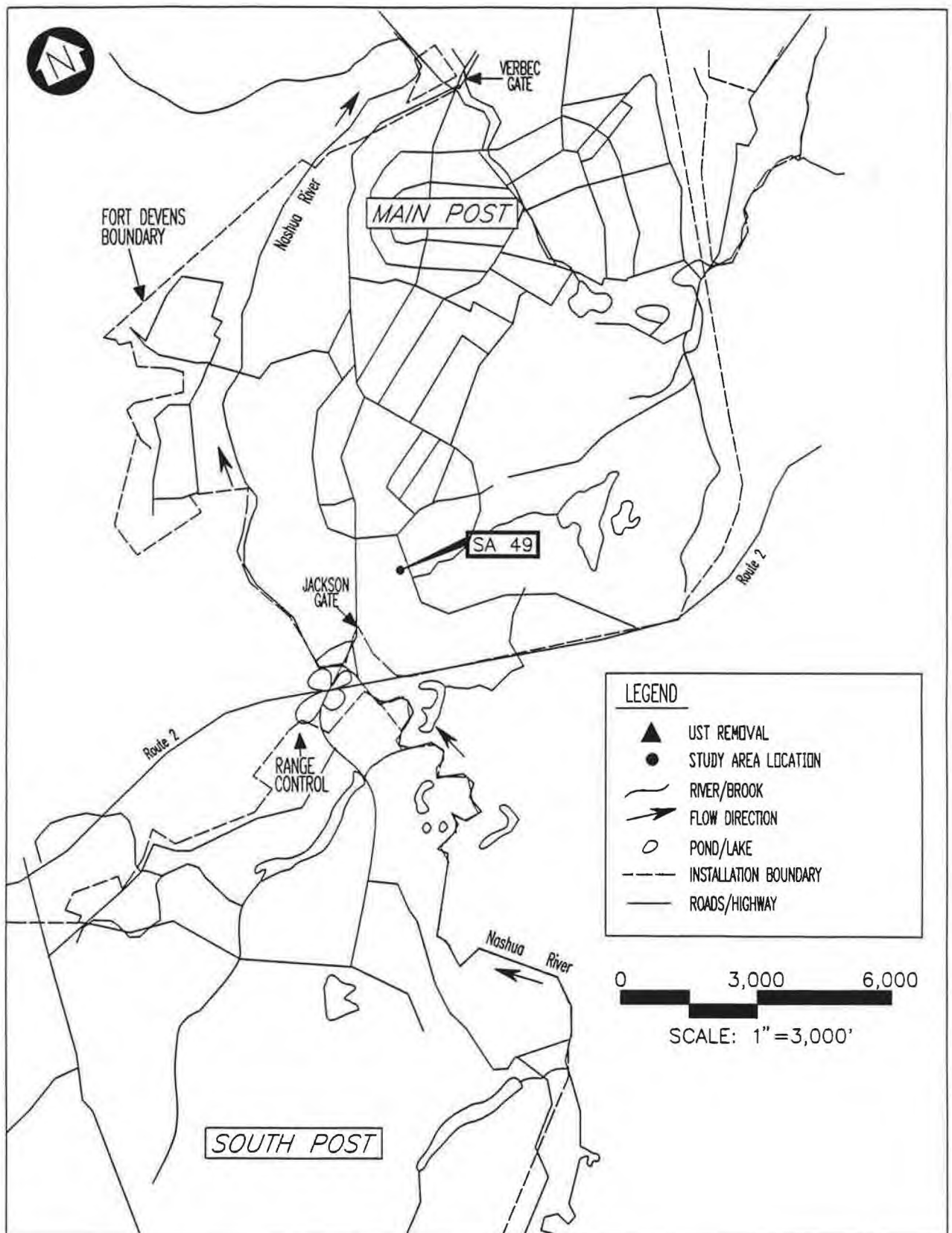
### 1.1 Site History and Background

SA 49 is located in the southern portion of the Main Post on the west side of Sheridan Road, approximately 100 feet east of Building T-3601 (see Figure 1-1). The site was originally a gasoline-dispensing station. Building 3602 appears to have been the original gas station pumphouse (U.S. Engineer Office, 1952). The station had two 5,000-gallon USTs that were used from 1942 to 1975 to store gasoline for a motor pool. It has been used more recently for storing diesel fuel and No. 2 fuel oil.

The USTs were removed in December 1989 by Franklin Environmental Services, Inc. under the direction of Kurz Associates. Petroleum contamination of the soil around the USTs was identified from a depth of approximately 6 feet below ground surface (bgs) to the bottom of the excavation (12-13 feet bgs). Approximately 250 cubic yards of contaminated soil were removed. The soil remaining in the excavation had elevated levels of VOCs as determined by a PID (Kurz Associates, 1991). Due to the presumed large extent of soil contamination detected by Kurz, the excavation was backfilled with clean fill, and four monitoring wells (3602W-01 through 3602W-04) were installed to evaluate the impact on groundwater, which was approximately 9 feet bgs at the time of UST removal. As of May 1993, the motor pool was under the control of an Army Reserve unit and used by the 10th Special Forces headquarters Support Group for vehicle storage. At the time of the site investigation the motor pool was paved except for the former UST location, and was surrounded by a chain-link fence with a locked gate on the east side of the motor pool.

### 1.2 Site Conditions

SA 49 is located in the Shirley Quadrangle. The surficial geology in this quadrangle has not been mapped. The area appears to be blanketed by unconsolidated surficial deposits of glacial and post-glacial origin. Mapping to the east by Jahns (1953) suggests that SA 49 may be underlain by deltaic sands and pebble-to-cobble-gravels of the Pin Hill stage of glacial Lake Nashua, local thin glacial-stream deposits of sand and



DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION  
CORPS OF ENGINEERS  
WALTHAM, MASS

FORT DEVENS, MASSACHUSETTS  
CONTAMINATED SOIL REMOVAL, VARIOUS SITES  
COMPREHENSIVE  
SITE LOCATION MAP

FIGURE  
1-1



gravel, and possibly artificial fill. Ground moraine tills are also possible in the area. Boring data gathered during the installation of monitoring wells 3602W-01 through 3602W-04 indicate the presence of clayey silts below the artificial fill that were described as till (Kurz Associated, Inc., 1991). Boring data from installation of monitoring well 49M-92-01X indicated silty and occasionally gravelly fine sand to a depth of approximately 10 feet bgs. Below 10 feet the soil consisted of gravelly silt. Grain size analysis of a sample from depths of 10 to 12 feet bgs revealed a clay or silty clay with 89.2 percent fines and 10.8 percent fine sand. This material appears to be glacial tills.

Bedrock at SA 49 has been mapped as the generally north-south striking Merrimack Formation, consisting of low grade (Below Biotite isograd) calcareous and ankeritic metasiltstone and phyllite and commonly deformed by kink banding (Russell and Allmendinger, 1975; G.R. Robinson, 1978). The rock unit was called Oakdale Formation by Zen (1983) and Robinson and Goldsmith (1991). The Merrimack (Oakdale) formation crops out south of SA 49, most visibly on Route 2 just east of the Jackson Gate exit.

Groundwater in the surficial aquifer at the facility has been assigned to Class I under Commonwealth of Massachusetts regulations. Class I consists of groundwaters that are "found in the saturated zone of unconsolidated deposits or consolidated rock and bedrock and are designated as a source of potable water supply" (314 CMR 6.03).

The five wells associated with this study area were included in an installation-wide water-level survey of 139 monitoring wells and 15 surface-water stations, conducted on December 22, 1992. Refer to Figure 1-2 for the monitoring well locations. Groundwater flows generally northward across the study area toward a drainage swale north of the SA. The groundwater may turn westward toward the Nashua River, which is the major surface-water body in the region.

### 1.3 Previous Investigation Activities

ABB was tasked by USAEC with investigating SA 49. ABB reviewed available data, installed an additional monitoring well, and collected and evaluated data from the site. This section summarizes information from the ABB report prepared in 1993.

Review of existing information indicated that groundwater flows to the north, and that the four existing monitoring wells (3602W-01 through 3602W-04), installed during tank removal operations, were located upgradient and cross-gradient of the former UST location and were not adequate to assess whether the leaking USTs had impacted the groundwater quality downgradient of SA 49. 49M-92-01X was used in conjunction with the four existing monitoring wells to assess whether the historic use of the study area adversely impacted groundwater quality and therefore posed a risk to human health or the environment.

The field investigation program at SA 49 consisted of drilling one soil boring (49M-92-01X) for the installation of a groundwater monitoring well (49M-92-01X) directly downgradient of the former UST locations. Bedrock was not encountered in this boring.

Monitoring well 49M-92-01X was constructed of 4-inch ID PVC and the well screen was installed across the water table to monitor for floating contaminants and allow for seasonal fluctuations of the water table. The new monitoring well was developed within seven days after completion. The four existing monitoring wells were also redeveloped. Two rounds of groundwater samples were collected from all five monitoring wells. The first round was conducted in September 1992 and the second round was collected in January 1993. The

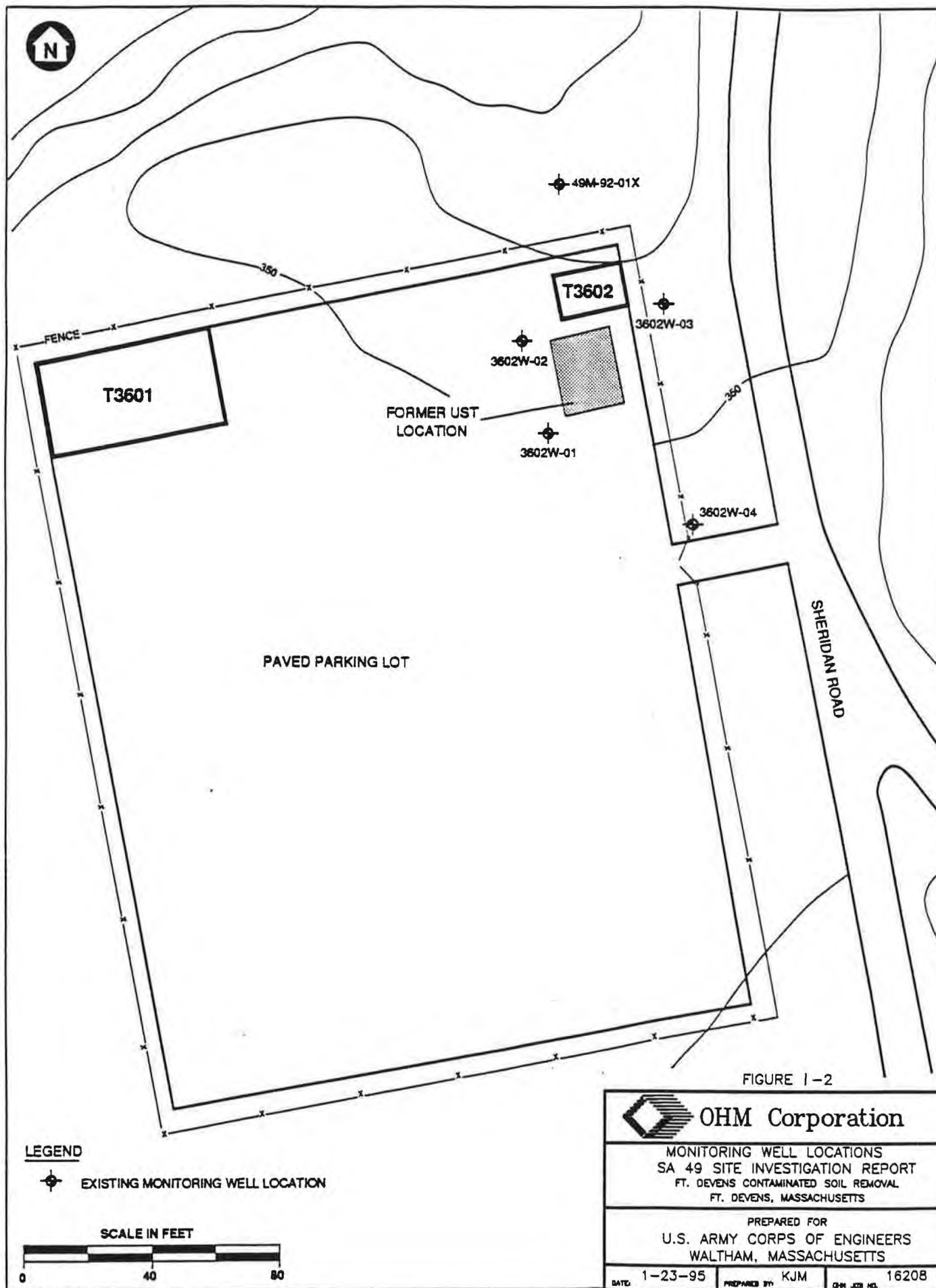
samples were analyzed for PAL VOCs, TPHC, lead, and PAL anions and cations. The newly installed monitoring well was surveyed to establish its horizontal and vertical location.

Aquifer hydraulic conductivity tests were performed in the newly installed monitoring well after development and the first round of groundwater sampling. In-situ aquifer tests were performed in two monitoring wells at SA 49 with sufficient water for testing (49M-92-01X and 3602W-01). The hydraulic conductivities of the soil at the water table in 49M-92-01X were determined to be  $2 \times 10^{-4}$  cm/sec and  $7 \times 10^{-4}$  cm/sec in the two tests. These are low conductivities and reflect the silty/clayey glacial till soils logged in the boring. At monitoring well 3602W-01 the hydraulic conductivities of the soil were measured at  $1 \times 10^{-3}$  cm/sec and  $3 \times 10^{-3}$  cm/sec. The other 3602W-series monitoring wells were not tested for hydraulic conductivities, however, they are partially screened in silty sands characterized as fill and appear likely to have similar hydraulic conductivities to 3602W-01 (Kurz Associates, Inc., 1991). The higher conductivities are characteristic of those more granular soils.

The objective of the sampling program was to investigate the presence or absence of contamination in the groundwater at SA 49. The primary concern at SA 49 was that the fuel in the former USTs, removed from the site in 1989, had leaked and adversely impacted groundwater and soil quality at this SA. One soil sample was collected at the water table during the installation of monitoring well 49M-92-01X for TOC analysis. The results of the TOC analysis showed a concentration of 889.0 mg/kg of TOC in the soils at the water table. No VOCs were detected with the PID during the headspace screening of subsurface soil samples collected from 49M-92-01X.

Results for the first round of groundwater samples indicated that VOCs (ethylbenzene and total xylenes) were present at total concentrations ranging from 17 ug/L at 3602W-03 to 96 ug/L at 3602W-02. Lead was detected above the established Fort Devens background groundwater concentration in four of the five monitoring wells, with concentrations ranging from 18.4 ug/L at 3602W-02 and 3602W-01 to 47.8 ug/L at 3602W-03. Other soluble inorganic analytes (calcium, potassium, and magnesium) were also detected above the established background levels. The inorganic analysis was performed on unfiltered samples.

The results of the second round of groundwater sampling showed similar results. VOCs (ethylbenzene, toluene, and total xylenes) were detected in 3602W-02 and 3602W-03, at concentrations ranging from 210 ug/L total VOCs to 220 ug/L, respectively. TPH was also detected in 3602W-02 at a concentration of 213 ug/L. TPH was not detected in the samples collected during the first round. Lead was detected at concentrations ranging from 27.9 ug/L at 3602W-03 to 49.5 ug/L at 3602W-01. As part of the second groundwater sampling event, a filtered sample was collected from 3602W-04 and analyzed for lead, only. The results of this analysis showed the lead concentration in the filtered sample to be below the detection limit ( $<1.26$  ug/L), while the unfiltered sample had a lead concentration of 42.2 ug/L. Total suspended solids (TSS) analysis was also performed on each groundwater sample collected during Round Two. These results showed TSS concentrations ranging from 129 mg/L to 1820 mg/L. The results of the filtered and the unfiltered analysis, as well as the TSS analyses, suggest that lead concentrations detected in the unfiltered groundwater samples, are caused by suspended solids in the groundwater samples.





## **SECTION 2.0**

# **PETROLEUM-CONTAMINATED SOIL REMOVAL**

OHM was contracted by the USACE NED to excavate the remaining petroleum-contaminated soil at SA 49, coordinate disposal of the excavated material, and restore the site by backfilling.

### **2.1 Site Preparation Activities**

OHM conducted pre-excavation activities at SA 49 to ensure that contaminants would be contained at the site and to prevent the general population from coming into contact with contaminants exposed through excavation activities. An exclusion zone was demarcated using orange fencing, and staging cells were constructed for temporary storage of contaminated soils. Sand berms were constructed at the perimeter of each staging cell and the cells were double lined with polyethylene sheeting.

### **2.2 Excavation and Soil Screening Activities**

Excavation at SA 49 began on July 20, 1994. The clean fill, used to backfill the tank removal excavation in 1989, was removed and staged separately so it could be reused as backfill. Soils were screened using a photoionization detector instrument (PID) during the removal of clean soils in order to determine the exact depth of contaminated soil. Once PID readings indicated that contaminated material was encountered, soil samples were collected and screened on site in order to guide the excavation. All the samples collected during the excavation were screened for TPH by infrared spectroscopy (IR) to determine where more excavation was necessary. The on-site TPH screening procedure is a modification of EPA Method 418.1. The decision to proceed with excavation was based on the site action level of 500 mg/kg for TPH in soil. The screening results are presented in Table 2-1 and the on-site analytical data are provided in Appendix A. Building T3602, a single story building of timber construction, was demolished in one day utilizing a tracked excavator and general duty excavation bucket. The concrete floor and foundation were also removed. Approximately 10 yards of timber debris was comingled with debris from the demolition of Building T2417 (SA 56) which was disposed off site at the Fitchburg Municipal Landfill located in Westminster, Massachusetts. Concrete debris and the asphalt taken up during excavation (approximately 50 yards) were shipped to American Reclamation Recyclers. Further, approximately 60 square feet of transite panels was bagged and staged on site pending off site disposal.

In addition to the soils analyses, two water samples were collected from the groundwater in the bottom of the excavation. The samples, designated SBSA49009A & SBSA49009B, were also screened on site for TPH and showed concentrations of 31 and 85 mg/L, respectively. Groundwater was found at an approximate depth of 9 feet. Approximately 3500 gallons of ground water were removed during the excavation utilizing a skid-mounted vacuum tanker. Dewatering was conducted as necessary to support the removal. All water removed during the excavation was batch processed through OHM's water treatment facility which was located at the staging area, and discharged on site. The treatment process consisted of first stage sediment filtration via sand filters followed by target organics removal via activated carbon. All water encountered during excavation was treated and discharged on site in compliance with the discharge permit requirements for benzene, toluene, ethylbenzene, and xylenes (BTEX), lead, and TPH.

Soil samples below the TPH action level of 500 mg/kg were also analyzed on site for BTEX by gas chromatography to determine if the site action level for these compounds had been satisfied. The on-site screening procedure is a modification of EPA method 8020. The action levels for BTEX are 10 mg/kg, 90 mg/kg, 80 mg/kg, and 500 mg/kg, respectively. Benzene concentrations in screen samples ranged from ND to 4.4 mg/kg. Concentrations of toluene, ethylbenzene and xylenes were all less than 10 mg/kg.

As shown in Figure 2-1, the upper (areal) limits of excavation were sloped extensively to achieve the minimum angles required to support the excavation. As a result, three of the existing monitoring wells were sacrificed. The two remaining wells include 49M-92-01x and 3602W-04. Figure 1-2 shows the location of the five monitoring wells prior to the removal action.

Table 2-1  
Soil Sample Screening Results  
TPH by IR  
Final Closure Report  
SA 49

Sample ID	Sample Location	Sample Date	Sample Depth (ft)	TPH Result (mg/kg)
SBSA49001	NW section sidewall	94-July- 22	14	ND (42)
SBSA49002	NW section sidewall	94-July-22	14	2 J
SBSA49003	NE section sidewall	94-July-22	14	828
SBSA49004	NE section sidewall	94-July-22	14	774
SBSA49005	N section bottom	94-July-22	14	18 J
SBSA49005A	N section bottom	94-July-22	15	21 J
SBSA49003A	NE section sidewall	94-July-25	6	54
SBSA49004A	NE section sidewall	94-July-25	6	ND (42)
SBSA49006	SE section bottom	94-July-25	14	829
SBSA49007	SE section bottom	94-July-25	14	755
SBSA49003B	NE section sidewall	94-July-26	10	246
SBSA49003C	NE section sidewall	94-July-26	12	854
SBSA49004B	NE section sidewall	94-July-26	10	782
SBSA49004C	NE section sidewall	94-July-26	12	715
SBSA49008A	SE section sidewall	94-July-26	6	ND (42)
SBSA49008B	SE section sidewall	94-July-26	10	ND (42)
SBSA49008C	SE section sidewall	94-July-26	12	315
SBSA49004D	NE section sidewall	94-July-26	11	ND (42)
SBSA49008D	SE section sidewall	94-July-26	11	ND (42)
SBSA49004E	NE section sidewall	94-July-27	14	ND (42)



Table 2-1 (continued)  
Soil Sample Screening Results  
TPH by IR  
Final Closure Report  
SA 49

Sample ID	Sample Location	Sample Date	Sample Depth (ft)	TPH Result (mg/kg)
SBSA49008E	SE section sidewall	94-July-27	14	ND (42)
SBSA49003D	NE section sidewall	94-July-27	14	ND (42)
SBSA49010	SE section sidewall	94-July-27	14	ND (42)
SBSA49010A	SE section sidewall	94-July- 29	12.5	ND (42)
SBSA49011	SW section sidewall	94-July-29	12.5	ND (42)
SBSA49012	SW section sidewall	94-July-29	12.5	ND (42)
SBSA49001F	NW section sidewall	94-July-29	12.5	ND (42)
SBSA49002F	NW section sidewall	94-July-29	12.5	75
SBSA49002G	NW section sidewall	94-July-29	12.5	ND (42)
SBSA49B3A	SW section bottom	94-Aug-01	15	118
SBSA49B4A	NW section bottom	94-Aug-01	15	110
SBSA49B6	W section bottom	94-Aug-01	14	950
SBSA49003E	Excavation sidewall	94-Aug-01	11	91
SBSA49B1	NE section bottom	94-Aug-01	13	>629
SBSA49B2	SE section bottom	94-Aug-01	12	28 J
SBSA49B3	SW section bottom	94-Aug-01	13	16 J
SBSA49B4	NW section bottom	94-Aug-01	13	25 J
SBSA49B5	center bottom	94-Aug-01	13	118
SBSA49B1A	NE section bottom	94-Aug-02	15	6 J
SBSA49B2A	SE section bottom	94-Aug-02	15	39 J
SBSA49B7	E section bottom	94-Aug-02	15	10 J

NOTES: TPH = total petroleum hydrocarbons  
 ND (42) = indicates TPH was not detected at the specified practical quantitation limit  
 J = Qualifier indicating estimated concentration below practical quantitation limit

Soil samples were relinquished to the on-site laboratory immediately following collection, and screening results were generally provided to the site supervisor within two hours. Excavation would only continue in areas where screening results indicated concentrations of TPH in excess of the site action level. Confirmation sampling was initiated after screening results indicated that all contaminated material had been removed.

### 2.3 Confirmation Sample Results

A total of ten soil samples were analyzed for confirmation of the excavation at SA 49. Figure 2-1 provides the confirmatory sample locations. Three samples were composited from each sidewall and five samples were composited from the bottom of the excavation. These five composite samples were analyzed for TPH and the polycyclic aromatic hydrocarbons (PAHs) naphthalene, 2-methylnaphthalene, and phenanthrene. Five discrete samples were collected for analysis of BTEX compounds. The PAHs naphthalene, 2-methylnaphthalene, and phenanthrene have site action levels of 4 mg/kg, 0.7 mg/kg, and 700 mg/kg, respectively. The samples were analyzed by ASC laboratory located in Findlay, Ohio. The composite sample and discrete sample from the south sidewall were collected in triplicate. Two of the split samples were sent to ASC and the third split was submitted to the USACE laboratory in Hubbardston, Massachusetts.

The results of the confirmation sample analyses are summarized in Table 2-2(a-b) and the ASC analytical report is presented in Appendix B. TPH analysis was performed by EPA method 418.1, BTEX by EPA method 8020, and PAH compounds by EPA method 8270. The results indicate that petroleum soils have been removed to the site action levels for TPH, BTEX, and applicable PAH compounds.

Table 2-2a  
Confirmation Soil Sample Results  
Composite Samples  
Final Closure Report  
SA 49

Sample ID	Sample Location	TPH Result (mg/kg)	Naphthalene Result (mg/kg)	2- methyl naphthalene result (mg/kg)	Phenanthrene Result (mg/kg)
SBSA49ANC	N sidewall	128	ND (0.385)	ND (0.385)	ND (0.385)
SBSA49ASC	S sidewall	ND (13.1)	ND (0.442)	ND (0.442)	ND (0.442)
SBSA49AWC	W sidewall	153	ND (0.415)	ND (0.415)	ND (0.415)
SBSA49AEC	E sidewall	17.4	ND (0.415)	ND (0.415)	ND (0.415)
SBSA49ABC	Bottom	77.6	ND (0.417)	ND (0.417)	ND (0.417)
SBSA49DUP2	S sidewall	ND (12.5)	ND (0.413)	ND (0.413)	ND (0.413)

NOTES: mg/kg = milligrams per kilogram  
ND( ) = indicates non-detect at specified detection limit

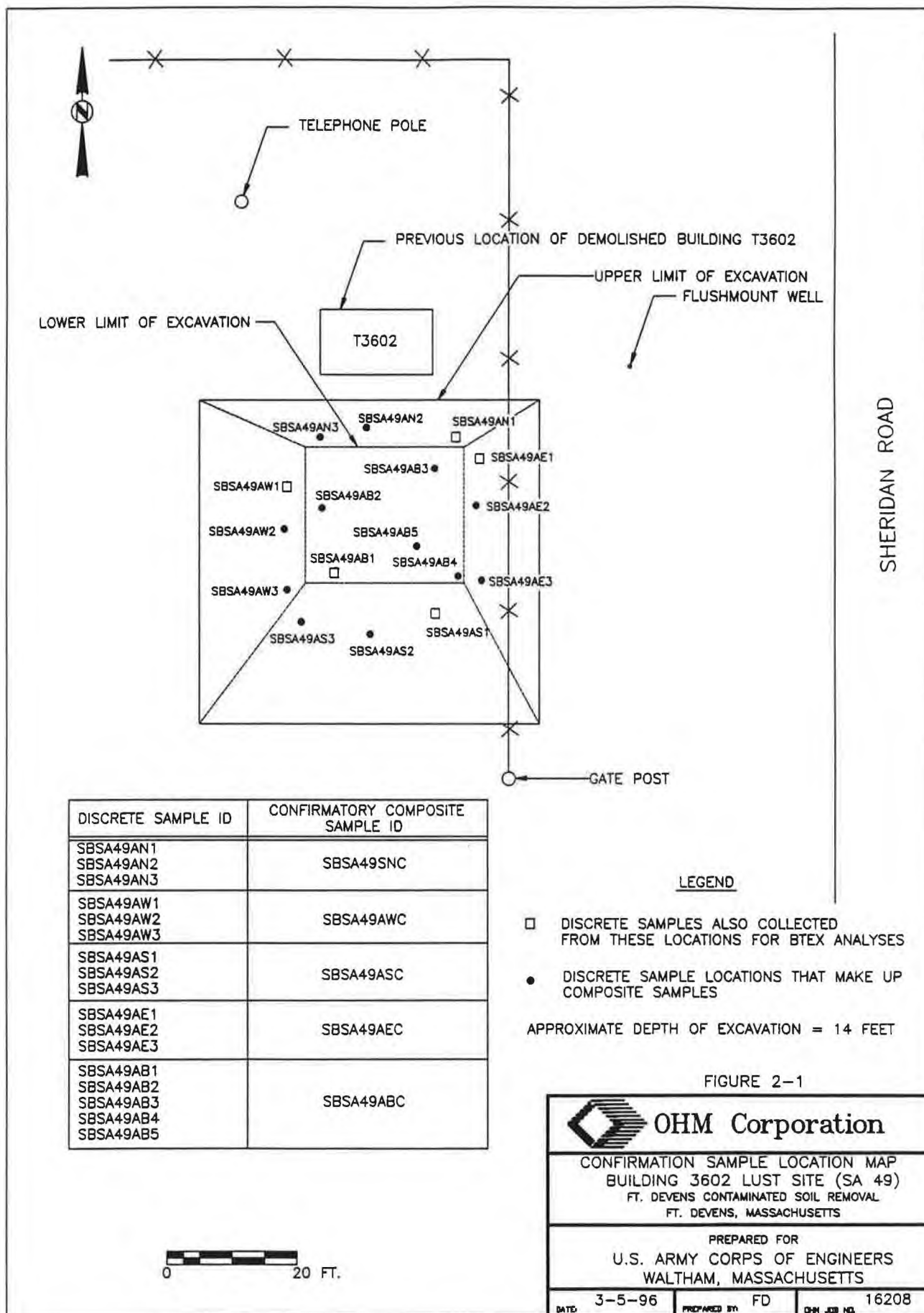


Table 2-2b  
Confirmation Soil Sample Results  
Discrete Samples  
Final Closure Report  
SA 49

Sample ID	Sample Location	Benzene Result (mg/kg)	Toluene Result (mg/kg)	Ethylbenzene Result (mg/kg)	Total Xylene Result (mg/kg)
SBSA49AN1	N sidewall	ND (0.001)	ND (0.001)	ND (0.001)	0.002
SBSA49AS1	S sidewall	ND (0.001)	ND (0.001)	ND (0.001)	0.005
SBSA49AW1	W sidewall	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)
SBSA49AE1	E sidewall	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)
SBSA49AB1	Bottom	ND (0.006)	0.031	0.045	0.108
SBSA49DUP1	S sidewall	ND (0.001)	0.002	0.001	0.008

NOTES: mg/kg = milligrams per kilogram  
ND( ) = indicates non-detect at specified detection limit

## 2.4 Quality Assurance/Quality Control

Appropriate quality assurance/quality control (QA/QC) measures were taken to ensure the collection of representative soil samples and the generation of accurate and reproducible analytical data.

### 2.4.1 Sample Collection Quality Control

Soil samples were collected using either a stainless steel trowel or disposable polyethylene scoops. Composite samples were thoroughly homogenized in stainless steel sampling buckets. The sampling equipment was decontaminated using the following procedure:

- 1) Non-phosphate soap & water rinse;
- 2) tap water rinse;
- 3) distilled water rinse;
- 4) 10% Nitric acid rinse;
- 5) distilled water rinse;
- 6) methanol rinse; and
- 7) distilled water rinse.

Sample integrity was also maintained by changing gloves between each sample location. The composite and discrete sample from the south wall of the excavation were collected in triplicate for QA/QC purposes. A comparison of the results of sample SBSA49ASC and SBSA49AS1 with their respective duplicate samples indicates a good correlation.





All samples collected on site were entered on a chain of custody and documented on a sample collection log and a permanent logbook. Samples sent off-site were properly preserved, packaged and overnight shipped to the proper laboratory.

#### 2.4.2 Laboratory Quality Control

Quality control measures were taken in the on site laboratory to ensure the accuracy and precision of the analytical data. TPH concentrations were determined using an infrared spectrometer and BTEX concentrations were determined using a gas chromatograph equipped with a PID. A calibration curve was developed for each on-site instrument, prior to the start up of sampling activities, to establish detection limits and document linearity of each detector. A single calibration point was run in triplicate to demonstrate measurement precision. Continuing calibrations were also performed on a daily basis thereafter to provide a check on instrument response.

The off-site laboratory took the proper quality control measures as specified in the methods used. Samples were properly preserved upon receipt by the laboratory and sample extraction and analysis were performed within the holding times specified in the methods. Blank and spike samples associated with the SA 49 samples were all within acceptable QC limits.

The USACE laboratory prepared a Chemical Quality Assurance Report (CQAR) comparing their split sample data with the results generated by the contract laboratory. The CQAR is included as Appendix C of this report, and the reports findings are summarized below:

Four QA samples were analyzed, resulting in a total of 79 target analyte determinations -

- Results from the primary and QA samples agreed overall in 76 (96%) of the comparisons.
- Results from the primary and QA samples agreed quantitatively in five (50%) of the comparisons.
- There were two (2.5%) major discrepancies between results from the primary and QA laboratory samples (BTEX)
- There were three (3.5%) minor discrepancies between results from the primary and QA laboratory samples (BTEX-1, TCLP Metals-2)

#### 2.5 Backfilling and Site Restoration

The area of the bottom of the excavation was approximately 23 ft. x 28 ft and the excavation was approximately 14 feet deep. The area of the top of the excavation was significantly larger due to the sloping that was necessary for the removal operation. A composite sample was collected from the stockpiled "clean" material and screened on site for TPH before using used as backfill. Additional fill material was provided by Lagasse trucking to backfill the rest of the excavation. This material was also screened on-site for TPH prior to its use as backfill. No additional site restoration was required by the contract.

#### 2.6 Waste Characterization & Disposal

An estimated 300 cubic yards (450 tons) of contaminated material excavated at SA49 has been characterized for disposal. Samples were collected at a frequency of one sample for every 100 cubic yards. The following parameters were analyzed to characterize the material for off-site disposal; TPH,



TCLP metals, TCLP organics, RCRA characteristics (ignitability, corrosivity, & reactivity) and BTEX compounds. All TCLP results were below regulatory levels and the RCRA characteristic tests indicated negative results for ignitability, corrosivity, and reactive cyanide. Reactive sulfide was detected in three of the four samples collected at concentrations ranging from 50 mg/kg to 175 mg/kg. The ASC Analytical Report for the waste characterization samples are located in Appendix D. The results of the characterization samples indicated that the soils are below Reporting Category RCS-1 Soils which is the most conservative MCP reportable category (i.e. reportable concentrations pertinent to soils at or within 500 feet of a residential dwelling, a residential-zoned property, school, playground, recreational area or park). The soils were further classified as Category B1 soils according to the July 1994 revision of the "General Management Procedures for Excavated Waste Site Soils at Fort Devens". Category B1 soils are those which exceed background but do not exceed RCS-1 Reportable Concentrations for soils under the MCP. Category B1 soils can be reused at Fort Devens in designated areas where future land is to be used for industrial (or equivalent) purposes. The soil excavated at SA49 was transported to the Moore Army Airfield which is a designated area for the reuse of Category B1 soils per the general soil management procedures. The soil was used as backfill in the excavation created by the removal of UST's S-3825, S-3826 and S-3827. Further details regarding the reuse justification for this soil is provided in the document "Final Soil Reuse Justification at The Moore Army Airfield" (May 18, 1995) by ABB Environmental Services, Inc. (ABB). A tracking document was not required for the transport of this soil, however, weight slips for the each truckload of material are provided as Appendix E.

As discussed in Section 2.2, demolition related debris was either disposed off site at the Fitchburg Municipal Landfill (timber) in Westminster, Massachusetts or recycled (concrete, asphalt) by American Reclamation Recyclers. The transite panels were consolidated with asbestos debris from Building T2417 (SA 56) and disposed off site at the Chicopee Sanitary Landfill in Chicopee, Massachusetts.

## SECTION 3.0 CONCLUSIONS

SA 49 is located on an access road off Sheridan Road in the central portion of the Main Post. The area around SA 49 was used as an equipment storage yard for the U.S. Army medical unit. Two 5,000-gallon gasoline USTs were removed in December, 1989, by Franklin Environmental Services, Inc., under the direction of Kurz Associates. Petroleum contamination was apparent in soil surrounding the tanks during the removal operation, and approximately 250 cubic yards of contaminated soil were removed at that time. Soil screening measurements, using a photoionization detector (PID) instrument, indicated elevated concentrations of volatile organic compounds (VOCs) in the soil remaining in the excavation. Based on these findings, further investigation was determined to be necessary prior to final remediation. The excavation was backfilled with clean fill and four monitoring wells were installed to evaluate the impact of the petroleum release on groundwater. An additional downgradient well was installed later during the site investigation.

The New England Division (NED) of the United States Army Corps of Engineers (USACE) contracted OHM Remediation Services Corporation (OHM) to address the remaining petroleum contaminated soil. OHM removed an estimated 730 cubic yards of soil from the excavation at SA 49. A total of 450 tons was petroleum contaminated and the balance was clean fill that was approved for reuse as backfill in the excavation. "Contaminated" soils were transferred to the Moore Army Airfield located on the North Post of Fort Devens after analytical results indicated that concentrations of soil contaminants were below Reporting Category RCS-1 Soils.

Confirmation samples were collected and analyzed by ASC Laboratory for TPH, BTEX, and select PAHs to document that applicable site action levels for these constituents had been attained. Proper QA/QC measures were taken to ensure the collection of accurate and reproducible data. Based upon previous investigations and the results of remedial activities described herein, OHM recommends no further action at this site.

Appendix A  
On-site Laboratory Soil Screening Data

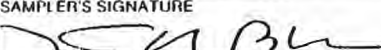


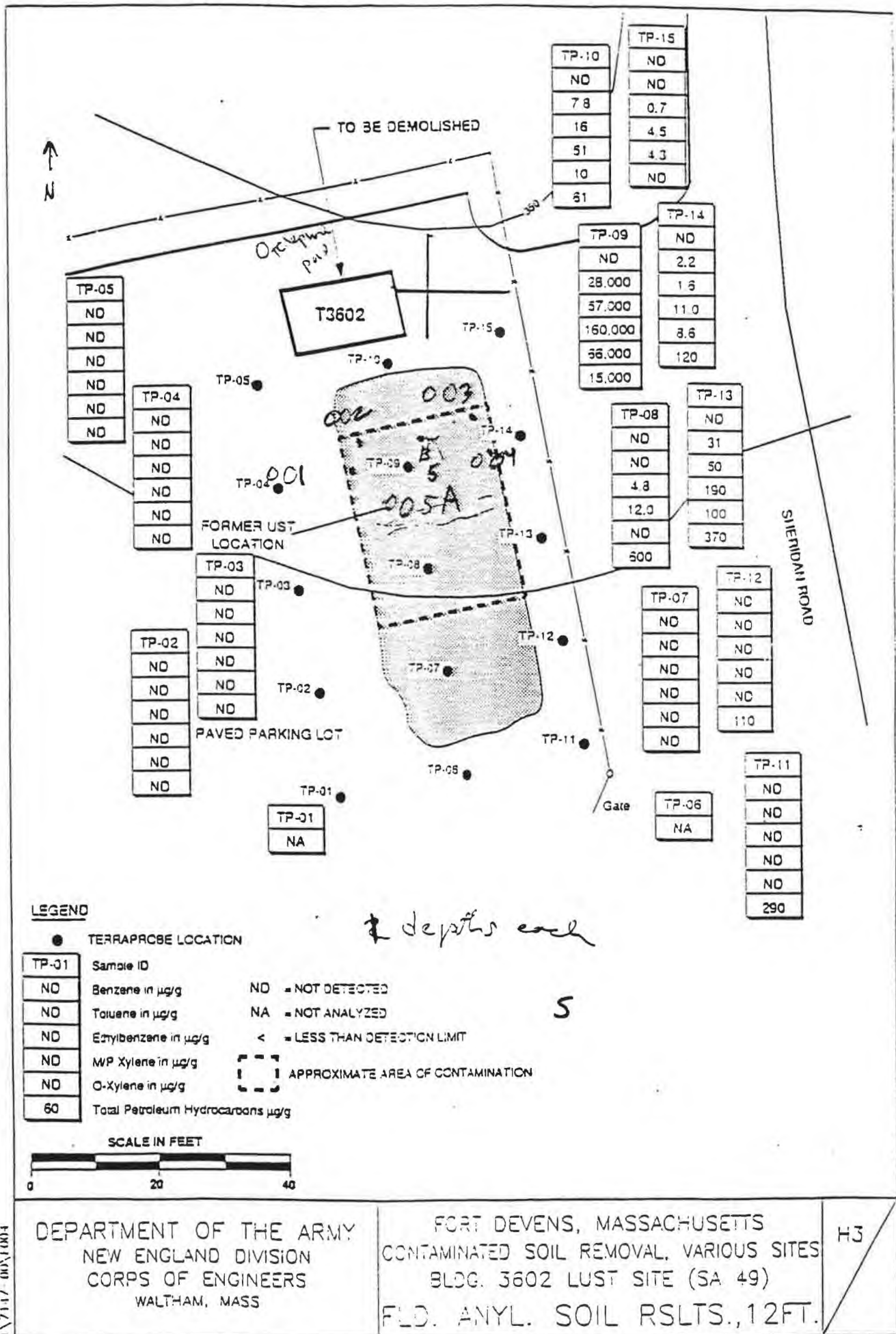
OHM Corporation

## CHAIN-OF-CUSTODY RECORD

Form 0019  
Field Technical Services  
Rev. 08/89

140071

O.H. MATERIALS CORP.		P.O. BOX 551		FINDLAY, OH 45839-0551		419-423-3526	
PROJECT NAME <b>Fort Devens</b>				PROJECT LOCATION <b>Axon, MA</b>			
PROJ. NO. <b>16208</b>		PROJECT CONTACT <b>Margie Bleon</b>		PROJECT TELEPHONE NO. <b>(508) 772-2610</b>			
CLIENT'S REPRESENTATIVE <b>Tom Best</b>				PROJECT MANAGER/SUPERVISOR <b>Bill Snow</b>			
ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)
1	SBSA49001	1002	7:30			14' deep, 36' from fence, 13' from house, gold sand, No PIP	<div style="transform: rotate(-45deg); position: absolute; top: 0; right: 0;">             note: run only if TPH less than 500ppm              BTEX TPH           </div>
2	SBSA49002	1018	7:44			14' deep, 28' 6" from fence, 10' from house, wet, yellow sand, grey clay	
3	SBSA49003	1030				14' deep, 14' 8" from fence, 8' 10" from house, sandy, some clay, PIP 120-150	
4	SBSA49004	1029				14' deep, 28' 6" from fence, 14' from house, crunchy grey clay, PIP 130-185	
5	SBSA49005	1014				14' deep, 22' 5.5" from fence, 5' 6" from house, clay, wet, PIP 140-170	
6	SBSA49005A	1048				15' deep, 22' 5.5" from fence, 5' 6" from house, more sand than 005, PIP 22	
7							
8							
9							
0							
TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY		TRANSFERS ACCEPTED BY		DATE	TIME
1	1-6	MBle		MJ Lacy		7/23	1145
2							
3							
4							
REMARKS						• collected & stored at 4°C * samples had oily/gas smell • samples taken from bucket of excavator	
SAMPLER'S SIGNATURE							



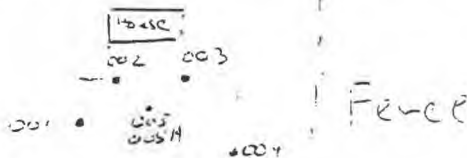


 <b>OHM Corporation</b>	<b>SOIL SAMPLE FIELD COLLECTION REPORT</b>	Project Number <u>16208</u>
		Project Name <u>Ent Deucus</u>
		Site Location <u>Ayer, Ma</u>

Collected By MRB Date and Time Collected 7.22.94 1500 below 1  
 Sample Location Site SA49

**SAMPLE(S) LOCATION SKETCH (use back side if necessary)**

see 2 Holes  
 sketches



SAMPLE ID NUMBER	DEPTH OF SAMPLE		SOIL DESCRIPTION (color, composition, staining, odor, field measurements <sup>(1)</sup> )
	Depth	From base	
002	14'	14' 12"	Sandy, some clay, 120-150 P.D. - 100% clay
005	14'	22' 55"	Clay - wet, 225 clay, 100% clay
005A	15'	22' 55" - 14'	below 005, more sand, 100% clay
001	14'	36' 13'	goldenish sandy, P.D. - ND

Sampling Method out of bucket of excavator

Composite Sample ? ☐ Y ☒ N Composite Sample ID Number \_\_\_\_\_

Describe Compositing NA

**SAMPLE TYPES COLLECTED**

TYPE <sup>(2)</sup>	VOLUME	PER SAMPLE ?		PER COMPOSITE ?	
TPH BTEX	1 x 400ml VOA	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	Y <input type="checkbox"/>	N <input type="checkbox"/>
TPH BTEX	"	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	Y <input type="checkbox"/>	N <input type="checkbox"/>
TPH BTEX	"	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	Y <input type="checkbox"/>	N <input type="checkbox"/>
TPH BTEX	"	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	Y <input type="checkbox"/>	N <input type="checkbox"/>

Number of Containers 1 ea

Date Received By Lab 7.22.94

Laboratory on site

Remarks: BTEX run of TPH < 500ppm

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.

(2) For Example, Metals, VOA, Organics, Etc.

 <b>OHM Corporation</b>	<b>SOIL SAMPLE FIELD COLLECTION REPORT</b>	Project Number <u>16208</u>
		Project Name <u>Fort Devens</u>
		Site Location <u>Axe MA</u>

Collected By mv2 R5 Date and Time Collected 7-22-94 (see below)  
 Sample Location Site SA49

SAMPLE(S) LOCATION SKETCH (use back side if necessary)

See attached &  
previous page

Time 1:15  
1:29

SAMPLE ID NUMBER	DEPTH OF SAMPLE			SOIL DESCRIPTION (color, composition, staining, odor, field measurements <sup>(1)</sup> )
	Depth From Surface	From Top of Excavation	From Bottom	
SBSA49002	14'	25'	5'	light sand over clay, PID-3, wet soil
004	14'	12'	17'	crumbly, orange clay, 100-100 P.D. strong oil/gas smell, wet

Sampling Method out of bucket of excavation

Composite Sample ? ☐ Y ☒ N Composite Sample ID Number \_\_\_\_\_

Describe Compositing \_\_\_\_\_

### SAMPLE TYPES COLLECTED

TYPE <sup>(2)</sup>	VOLUME	PER SAMPLE ?	PER COMPOSITE ?
TPH BTIE X	1x40ml Vol	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
TPH BTIE X	"	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
	"	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
	"	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>

Number of Containers 1 ea

Date Received By Lab 7-22-94 Laboratory on site

Remarks: BTIE X run at TPH < 500ppm

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.

(2) For Example, Metals, VOA, Organics, Etc.

[illegible]

## DAILY FIELD SCREENING RESULTS

Page 1 of 2

Site: Ft. Devins, MA

Location No.: 5A49

Date: 7/25/97

GC Analyst: M

TPH Analyst:

Method 8020

## Sample ID

Concentration (mg/kg)	Action Level	001	002	005														
benzene,	10 ppm	<9	<9	<9														
toluene	90 ppm	<9	<9	<9														
ethylbenzene	80 ppm	ND	ND	<9														
m,p-xylene		ND	ND	ND														
o-xylene		ND	ND	ND														
tot. tylen	500 ppm	ND	ND	ND														
chlorobenzene																		
1,2-dichlorobenz.																		
1,3-dichlorobenz.																		
1,4-dichlorobenz.																		

Percent Recovery

1,1,1-trifluorotoluene

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

See attached sheet



OHM Corporation

## CHAIN-OF-CUSTODY RECORD

Form 0019  
Field Technical Services  
Rev. 08/89

No. 99846

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526


PROJECT NAME		PROJECT LOCATION		ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)					
PROJ NO	PROJECT CONTACT	PROJECT TELEPHONE NO		NUMBER OF CONTAINERS					
CLIENT'S REPRESENTATIVE	PROJECT MANAGER/SUPERVISOR								
Ft Devereaux		Ayer Mz		<div style="transform: rotate(-45deg); border: 1px solid black; padding: 5px;"> TPH 2500  TPH 2500  TPH 2500  TPH 2500  TPH 2500  TPH 2500  TPH 2500  TPH 2500  TPH 2500  TPH 2500 </div>					
16208	Margie Blean	(508) 772-2610							
Tom Best (USACE)		Bill Shaw							
ITEM NO	SAMPLE NUMBER	DATE	TIME			COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	REMARKS
1	SBSA 49004A	25 20 94	1215				/	24' snow W03, 17' from house, 6' deep	1X 40m VUA
2	SBSA 49003A	25 20 94	1233				/	6' deep 32' from W03, 5' 10" from house	"
3									
4									
5									
6									
7									
8									
9									
10									

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	1, 2	NRBL	MJ Lucy	25 20 94	1245	Stored at 4°C   SAMPLER'S SIGNATURE NRBL
2						
3						
4						

LAB COPY



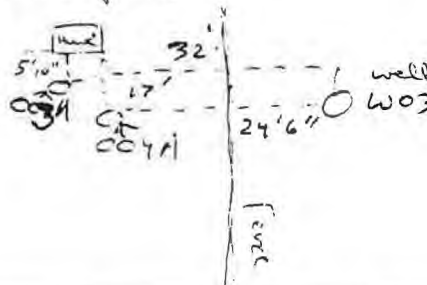
 <b>OHM Corporation</b>	<b>SOIL SAMPLE FIELD COLLECTION REPORT</b>	Project Number <u>16208</u>
		Project Name <u>Ft Devens</u>
		Site Location <u>Ayer MA</u>

Collected By MURB Date and Time Collected 25 Jul 94  
 Sample Location SA 49 Bldg 3602

**SAMPLE(S) LOCATION SKETCH (use back side if necessary)**

Telephone pole  
 23' 8"

See attached map



SAMPLE ID NUMBER	DEPTH OF SAMPLE	SOIL DESCRIPTION (color, composition, staining, odor, field measurements <sup>(1)</sup> )
215 S13SA 49004A	6'	gold color sand PID ND
233 S13SA 49003A	6'	gold sand dark br silt. PID - ND

Sampling Method Removed from bucket of back hoe

Composite Sample ? ☐ Y ☒ N Composite Sample ID Number  


Describe Compositing  

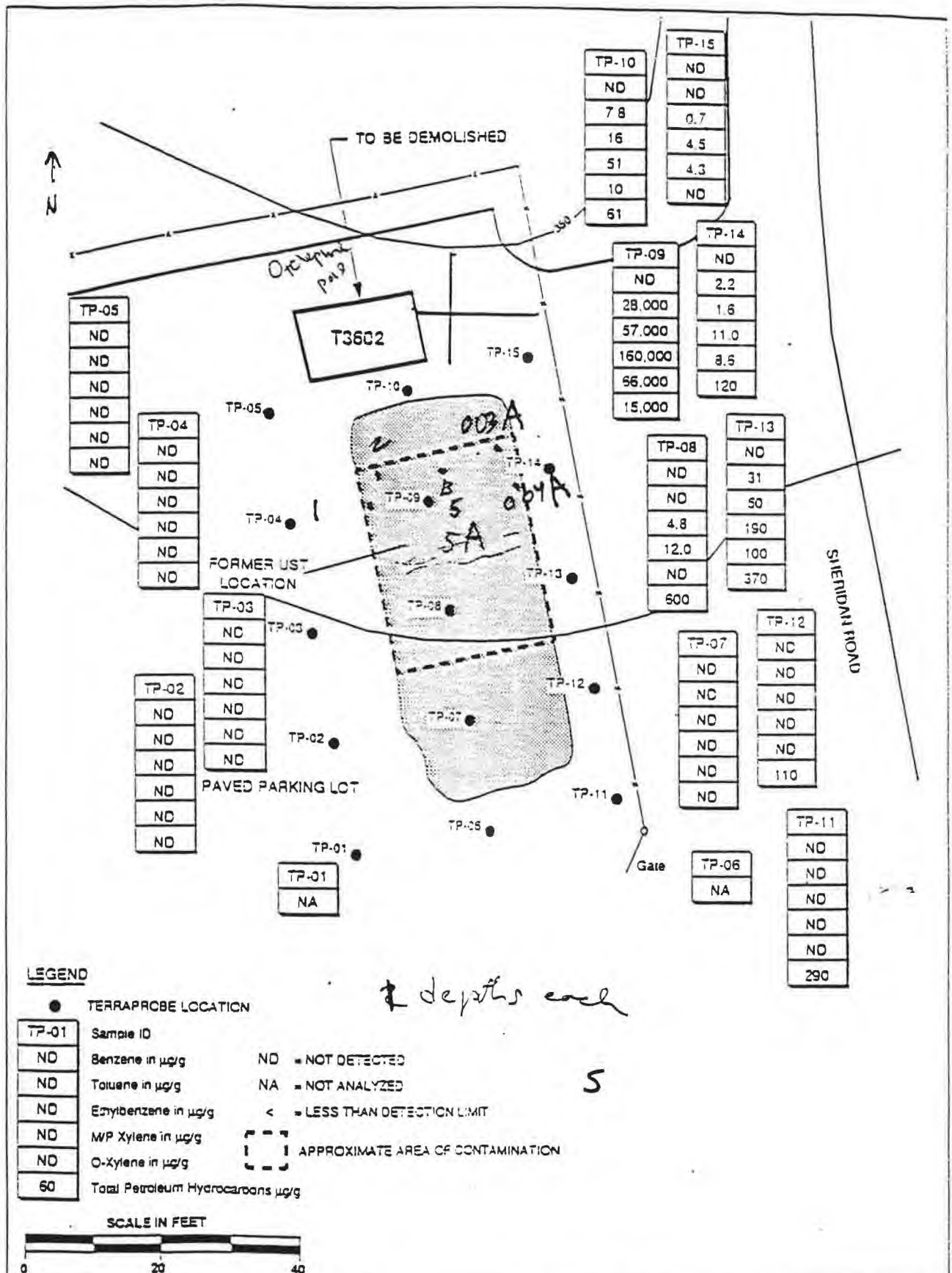
SAMPLE TYPES COLLECTED			
TYPE <sup>(2)</sup>	VOLUME	PER SAMPLE ?	PER COMPOSITE ?
13TFX TPH <sup>1/2</sup> VOA if necessary	40 ml	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
TPH <sup>1/2</sup> VOA if necessary	40 ml	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>

Number of Containers 1 ea  
 Date Received By Lab 25 Jul 94 Laboratory On site  
 Remarks: run if sample > 20 results < 500

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.

(2) For Example, Metals, VOA, Organics, Etc.

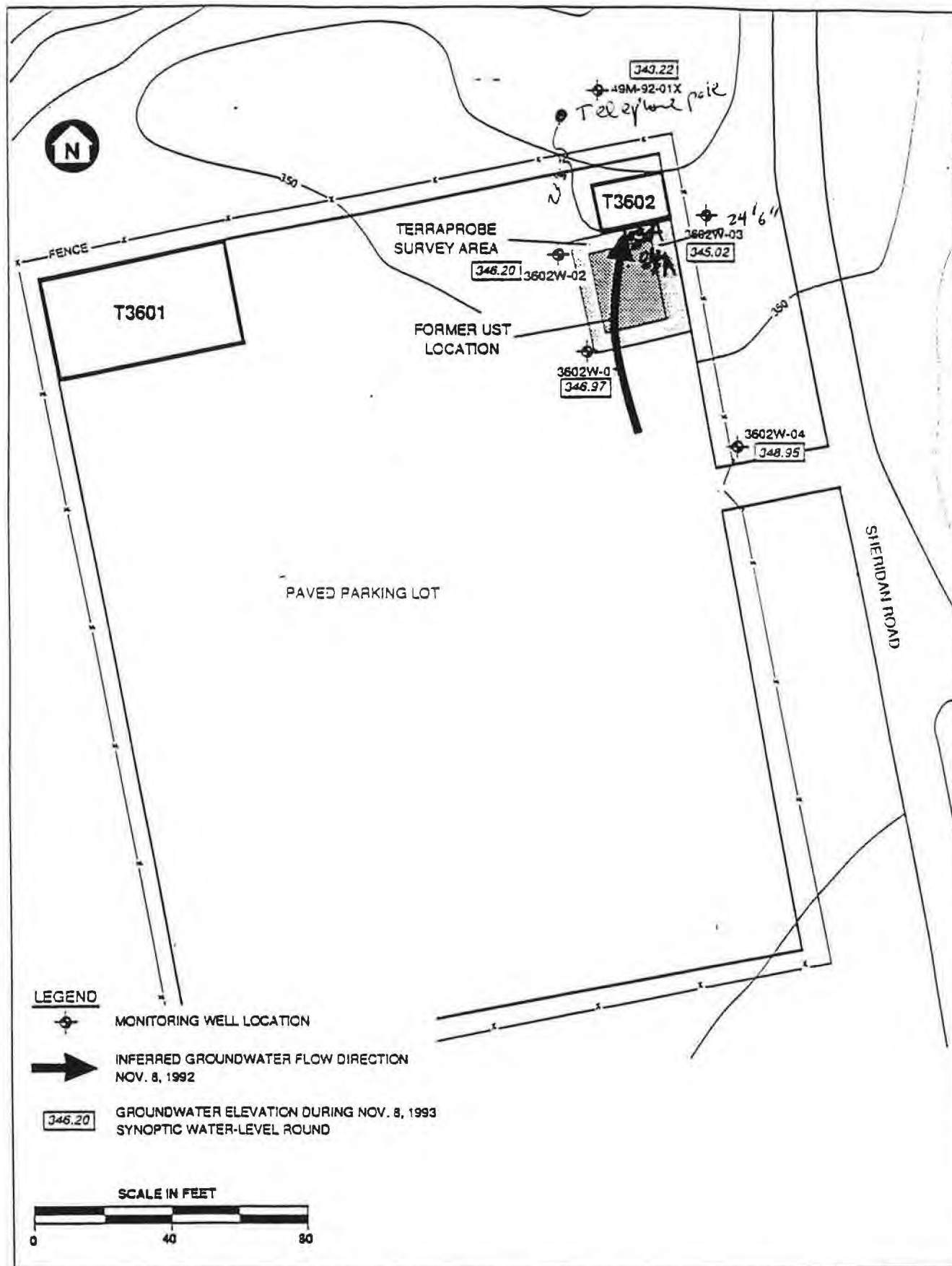
 <b>OHM Corporation</b>	<b>SOIL SAMPLE FIELD COLLECTION REPORT</b>	Project Number <u>16208</u> Project Name <u>FT Devens</u> Site Location <u>Ayer Mz</u>	
Collected By <u>MJB</u> Date and Time Collected _____ Sample Location _____		23' 8" from telephone pole to front of house  17' from well  103 to fence 14' 11" ft 246" 5' 10" house	
SAMPLE(S) LOCATION SKETCH (use back side if necessary)			
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p style="text-align: center;">SAMPLE ID NUMBER</p> <p>1215 <u>SBSA44004A</u></p> <p>233 <u>SBSA44003A</u></p> </div> <div style="width: 20%;"> <p style="text-align: center;">DEPTH OF SAMPLE</p> <p><u>6'</u></p> <p><u>6'</u></p> </div> <div style="width: 40%;"> <p style="text-align: center;">SOIL DESCRIPTION (color, composition, staining, odor, field measurements<sup>(1)</sup>)</p> <p><u>gold sandy, NO-PID</u></p> <p><u>gold sandy, some dark silt/clay, PID NO</u></p> </div> </div>			
Sampling Method _____ Composite Sample ?    Y <input type="checkbox"/> N <input type="checkbox"/> Composite Sample ID Number _____ Describe Compositing _____			
<b>SAMPLE TYPES COLLECTED</b>			
TYPE <sup>(2)</sup> <u>VOA</u> <u>VOA</u>	VOLUME <u>40 ml</u> <u>40 ml</u>	PER SAMPLE ? Y <input checked="" type="checkbox"/> N <input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/>	PER COMPOSITE ? Y <input type="checkbox"/> N <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/>
Number of Containers _____ Date Received By Lab _____ Laboratory _____ Remarks: _____ _____ _____			
(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc. (2) For Example, Metals, VOA, Organics, Etc.			



DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION  
CORPS OF ENGINEERS  
WALTHAM, MASS

FORT DEVENS, MASSACHUSETTS  
CONTAMINATED SOIL REMOVAL, VARIOUS SITES  
BLOC. 3602 LUST SITE (SA 49)  
FLD. ANYL. SOIL RSLTS., 12FT.

H3



J:\7147-00\F004

DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION  
CORPS OF ENGINEERS  
WALTHAM, MASS

FORT DEVENS, MASSACHUSETTS  
CONTAMINATED SOIL REMOVAL, VARIOUS SITES  
BLDG. 3602 LUST SITE (SA 49)  
GROUNDWATER LEVELS

H4

Site: Ft. Devins, MA

Location No.: 5A49

Date: 7/25/94  
7/26/94

GC Analyst: M

Page 2 of 2  
TPII Analyst: M  
M + MB

Method 8080

Concentration (mg/kg)	Action Level	Sample ID															
Aroclor 1260	2 ppm																
chlordane	1 ppm																

Percent Recovery

2,4,5,6-tcmx  
decachlorobiphenyl

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Method 418.1

Concentration (mg/kg)	Action Level	Sample ID															
TRPH AHC	500 ppm	003A	004A	006	007	007											
		57	41	829	726	755											
		11	1	726		729											
		003B	003C	004B	004C	008A	008B	008C	009A	009B	004D	008D					
TRPH AHC	500 ppm	246	854	780	715	41	1	315	31	85	41	41					
		43	244	1085	673	1.1	0.2	110	9	69	1	2					
	500 ppm																

7/25

7/26





OHM Corporation

## CHAIN-OF-CUSTODY RECORD

Form 0019  
Field Technical Services  
Rev. 08/09

No. 99847

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526									
PROJECT NAME <b>Ft Devens</b>				PROJECT LOCATION <b>Apex M2</b>				NUMBER OF CONTAINERS	ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)
PROJ NO <b>16208</b>		PROJECT CONTACT <b>Margie Blean</b>		PROJECT TELEPHONE NO. <b>(508) 772-2610</b>					
CLIENT'S REPRESENTATIVE <b>Tom Best USHEE</b>				PROJECT MANAGER/SUPERVISOR <b>Bill Swol</b>					
ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)		REMARKS	
1	SBSA49006	25 Jul 24	1405		✓	14' depth, 2' from house 31' from well, slightly PID up 1020's			
2	SBSA49007	"	1415		✓	Taken from exc 20' for bucket at 14' depth, PID between 10-182			
3									
4									
5									
6									
7									
8									
9									
10									
TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY		TRANSFERS ACCEPTED BY		DATE	TIME	REMARKS	
1	1,2	<b>SNBL</b>		<b>MJ Lucy</b>		25 Jul 24	1430	<b>Stored at 4°C</b>	
2									
3									
								SAMPLER'S SIGNATURE <b>SNBL</b>	

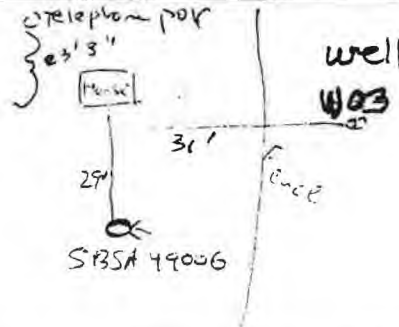
1 AB COPY

 <b>OHM Corporation</b>	<b>SOIL SAMPLE FIELD COLLECTION REPORT</b>	Project Number <u>16208</u>
		Project Name <u>Ft Devens</u>
		Site Location <u>Axon Rd</u>

Collected By MB Date and Time Collected 25 July 94  
 Sample Location Site 49

**SAMPLE(S) LOCATION SKETCH (use back side if necessary)**

See attached maps



SAMPLE ID NUMBER	DEPTH OF SAMPLE	SOIL DESCRIPTION (color, composition, staining, odor, field measurements <sup>(1)</sup> )
1405 SB SA 49006	14'	pick up to 200 strong smell
1415 SB SA 49007	14'	PH 9.0 - 182 strong smell

Sampling Method Recover sample from bucket of excavator / Backhoe

Composite Sample ? Y ☐ N ☒ Composite Sample ID Number \_\_\_\_\_

Describe Compositing \_\_\_\_\_

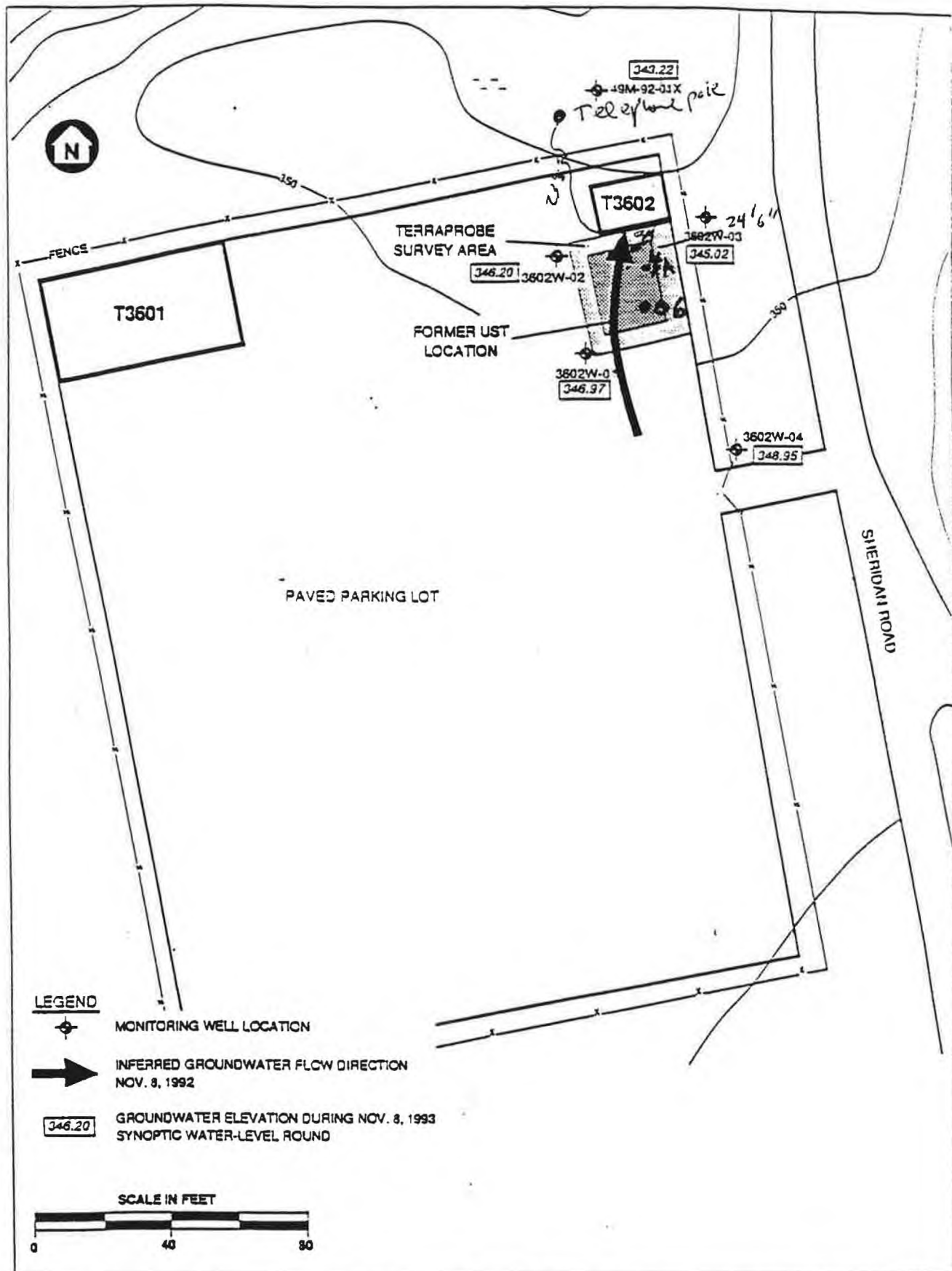
House  
29' 3"  
Bucket of dirt  
excavator

TYPE <sup>(2)</sup>		VOLUME	PER SAMPLE ?	PER COMPOSITE ?
TPH	VOA BTEX	40ml VOA	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
TPH	VOA BTEX	40ml VOA	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
			Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
			Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>

Number of Containers 1 ea  
 Date Received By Lab 25 July 94 Laboratory on site  
 Remarks: run if sample TPH results < 500  
BTEX

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.

(2) For Example, Metals, VOA, Organics, Etc.



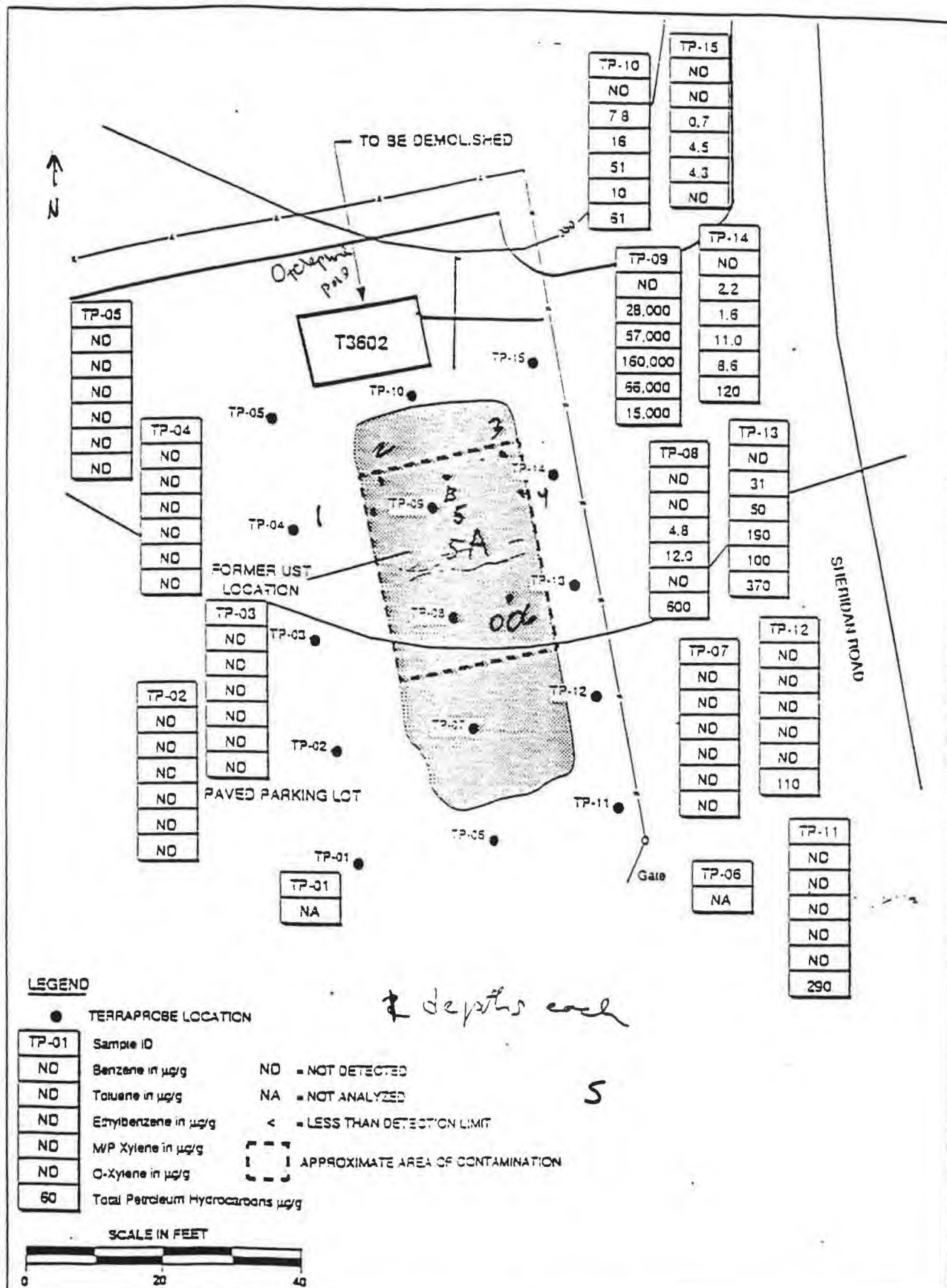
J\7147-00\F004

DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION  
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WALTHAM, MASS

FORT DEVENS, MASSACHUSETTS  
CONTAMINATED SOIL REMOVAL, VARIOUS SITES  
BLDG. 3602 LUST SITE (SA 49)  
GROUNDWATER LEVELS

H4

SB SA 49 001



Site: Ft. Devins, MA

Location No.: 5A49

Date: 7/25/94  
7/26/94

GC Analyst: M

TPH Analyst: M  
M + MB

Page 2 of 2

Method 8080

Concentration (mg/kg)	Action Level	Sample ID															
Aroclor 1260	2 ppm																
chlordane	1 ppm																

Percent Recovery

2,4,5,6-tcmx  
decachlorobiphenyl


Method 418.1

Concentration (mg/kg)	Action Level	Sample ID															
TRPH	500 ppm	003A	004A	006	007	007											
AHC		54	41	834	726	755											
		11	1	726		229											
		003B	003C	004B	004C	008A	008B	008C	009A	009B	009C	009D					
TRPH	500 ppm	246	854	760	715	41	1	315	31	85	41	41					
AHC		43	244	1085	673	1.1	0.2	110	9	69	1	2					
	500 ppm																

7/25

7/26





HIM Corporation

## CHAIN-OF-CUSTODY RECORD


Form 0019  
Field Technical Services  
Rev. 08/89

No. 99871

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME		PROJECT LOCATION		NUMBER OF CONTAINERS	ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)										REMARKS
OBJ. NO.	PROJECT CONTACT	PROJECT TELEPHONE NO.	<div style="text-align: center;"> <div>TPH</div> <div>BTEX IF TPH &lt; 500 ppm</div> </div>												
CLIENT'S REPRESENTATIVE		PROJECT MANAGER/SUPERVISOR													
SAMPLE NUMBER	DATE	TIME	COMP		GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	40 ml VOA vol	40 ml VOA vol	40 ml VOA vol	40 ml VOA vol	40 ml VOA vol	40 ml VOA vol	40 ml VOA vol	40 ml VOA vol	
SBSA49003B	7-26-94	1025		✓	Det Gold Sandy Soil	✓	✓								
SBSA49003C	7-26-94	1000		✓		✓	✓								
SBSA49004B	7-26-94	1030		✓		✓	✓								
SBSA49004C	7-26-94	1033		✓		✓	✓								
SBSA49008A	7-26-94	1032		✓		✓	✓								
SBSA49008B	7-26-94	1035		✓		✓	✓								
SBSA49008C	7-26-94	1040		✓		✓	✓								
SBSA49009A	7-26-94	1050		✓	Liquid (Northern puddle) Particulates	✓	✓								
SBSA49009B	7-26-94	1052		✓	Liquid (Southern puddle) Particulates	✓	✓								

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	1-9	MJ Lacy	MJ Lacy	7/26/94	1100	
2						
3						
4						

  
 SAMPLER'S SIGNATURE

LAB COPY



OHM Corporation

# SOIL SAMPLE FIELD COLLECTION REPORT

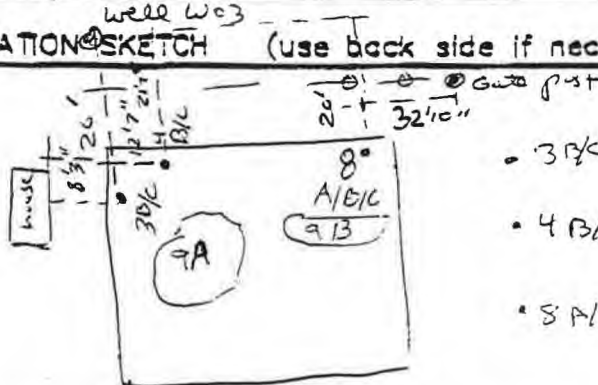
Project Number LG208  
Project Name Fort Devens  
Site Location Ayer Ma

Collected By M. Lacey Date and Time Collected 7.26.94  
Sample Location SA49A

SAMPLE(S) LOCATION SKETCH (use back side if necessary)

Not  
to scale

2 ←



- 3 1/2' 8' 3" from house  
26' from well W03
- 4 B/C 12' 6" from house  
21' 7" from well
- 8 A/B/C 32' 10" from gate post  
20' from well

Time	SAMPLE ID NUMBER	DEPTH OF SAMPLE	SOIL DESCRIPTION (color, composition, staining, odor, field measurements (1))
7:5	SBSA49A003B	10'	wet gold sandy soil w petroleum smell
1:00	SBSA49A003C	12'	
10:30	SBSA49A004B	10' --	
10:33	SBSA49A004C	12'	

Sampling Method Sample taken by grab 6" beyond excavation

Composite Sample? Y ☐ N ☒ Composite Sample ID Number \_\_\_\_\_

Describe Compositing \_\_\_\_\_

## SAMPLE TYPES COLLECTED

TYPE (2)	VOLUME	PER SAMPLE ?	PER COMPOSITE ?
TPH/BTEX if TPH < 300	(X 40 ml vol)	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>

Number of Containers 1


Date Received By Lab 7.26.94 Laboratory on site

Remarks: \_\_\_\_\_

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.

(2) For Example, Metals, VOA, Organics, Etc.

20f3

 <b>OHM Corporation</b>	<b>SOIL SAMPLE FIELD COLLECTION REPORT</b>	Project Number _____
		Project Name _____
		Site Location _____

Collected By M. Lacy Date and Time Collected 7-26-94  
 Sample Location SA44A

**SAMPLE(S) LOCATION SKETCH** (use back side if necessary)

See map on  
p 1 of 3

Time	SAMPLE ID NUMBER	DEPTH OF SAMPLE	SOIL DESCRIPTION
			(color, composition, staining, odor, field measurements <sup>(1)</sup> )
30	SPSA4403A	6'	light gold, sandy soil w/stone fragments
1035	SPSA4403B	10'	
1040	SPSA4403C	12'	

Sampling Method grab samples taken 6 inches beyond penetration

Composite Sample? Y ☐ N ☒ Composite Sample ID Number \_\_\_\_\_

Describe Compositing \_\_\_\_\_

### SAMPLE TYPES COLLECTED

TYPE <sup>(2)</sup>	VOLUME	PER SAMPLE ?	PER COMPOSITE ?
TDH / STEEL / SOIL	1x40 ml VOA vial	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
_____	_____	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
_____	_____	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
_____	_____	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>

Number of Containers 1

Date Received By Lab 7-26-94 Laboratory ON SITE

Remarks: \_\_\_\_\_

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.

(2) For Example, Metals, VOA, Organics, Etc.

3 of 3

 OHM Corporation	<b>SOIL SAMPLE FIELD COLLECTION REPORT</b>	Project Number _____
		Project Name _____
		Site Location _____

Collected By M. Lacy Date and Time Collected 7-26-94  
 Sample Location SA49A

**SAMPLE(S) LOCATION SKETCH (use back side if necessary)**

See attached  
map on p1 of 3

Time  
1:50  
12

SAMPLE ID NUMBER	DEPTH OF SAMPLE	SOIL DESCRIPTION (color, composition, staining, odor, field measurements <sup>(1)</sup> )
SP249A	NA	surface, white, sandy, ground water
SP249B	NA	ground water

Sampling Method immersed in puddle beyond surface and allowed to fill  
 Composite Sample ? Y ☐ N ☒ Composite Sample ID Number \_\_\_\_\_  
 Describe Compositing \_\_\_\_\_

**SAMPLE TYPES COLLECTED**

TYPE <sup>(2)</sup>	VOLUME 1X Quant Amber	PER SAMPLE ?	PER COMPOSITE ?
TPH/RTX & COOP		Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>

Number of Containers 1  
 Date Received By Lab 7-26-94 Laboratory ONSITE  
 Remarks: \_\_\_\_\_

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.

(2) For Example, Metals, VOA, Organics, Etc.



Site: Ft. Devins, MA

Location No.: 5A49

Date: 7/25/94  
7/26/94

GC Analyst: M

TPH Analyst: M  
M + MB

Page 2 of 2

Method 8080

Sample ID

Concentration (mg/kg)	Action Level																	
Aroclor 1260	2 ppm																	
chlordane	1 ppm																	

Percent Recovery

2,4,5,6-tcmx  
decachlorobiphenyl


Method 418.1

Sample ID

Concentration (mg/kg)	Action Level	003A	004A	006	007	007												
TRPH	500 ppm	54	41	839	726	755												
AHC		11	1	726		729												
		003B	003C	004B	004C	008A	008B	008C	009A	009B	004D	008D						
TRPH	500 ppm	246	854	760	715	41	1	315	31	85	41	41						
AHC		43	244	1085	673	1.1	0.2	110	9	69	1	2						
	500 ppm																	

7/25

7/26



# DAILY FIELD SCREENING RESULTS

Page 1 of 2

Site: Ft. Devins, MA

Location No.: SA49

Date: 6/4/94

GC Analyst: M. J. Quinlan

TPH Analyst:

## Method 8020

### Sample ID

Concentration (mg/kg)	Action Level	B6	B3	B3A	10A	12	B4A	3B	8B	8C	B7	2F	B6D	2G	11	B2A	B1A	1F		
benzene	10 ppm	ND	0.4	0.9	ND	1.8	0.6	ND	1.7	ND	4.4	ND	ND	1.4	ND	ND	0.6	1.5		
toluene	90 ppm	ND	1.9	4.5	4.2	5.6	3.5	5.6	4.8	5.2	4.2	4.3	3.6	5.0	4.7	5.9	4.0	4.1		
ethylbenzene	80 ppm	ND	ND	ND	0.5	0.6	ND	0.7	0.5	ND	0.5	ND	1.0	0.6	0.8	ND	0.8	0.7		
m,p-xylene		6.5	ND	ND	ND	ND	ND	0.8	ND	1.1	ND	ND	ND	ND	ND	1.6	ND	ND		
o-xylene		0.8	0.9	2.0	ND	ND	ND	ND	ND	0.8	ND	ND	ND	ND	ND	1.3	ND	ND		
tol. tylen	500 ppm	7.3	0.4	2.0	ND	ND	ND	0.8	ND	1.9	ND	ND	ND	ND	ND	2.9	ND	ND		
chlorobenzene																				
1,2-dichlorobenz.																				
1,3-dichlorobenz.																				
1,4-dichlorobenz.																				

COC Date:

8/1 8/1 8/1 7/29 7/29 8/1 7/6 7/26 7/26 8/2 7/29 7/29 7/29 8/2 8/2 7/29

Percent Recovery

1,1,1-trifluorotoluene

1,3-dichlorobenzene

Note: Lower quantification limit was 6.8 ppm - all values report are below this limit and are therefore estimated concentrations



OHM Corporation

## CHAIN-OF-CUSTODY RECORD

Form 0019  
Field Technical Services  
Rev. 08/89

No. 99848

O.H. MATERIALS CORP.		P.O. BOX 551		FINDLAY, OH 45839-0551		419-423-3526	
PROJECT NAME <b>Ft Devens</b>				PROJECT LOCATION <b>Ayer Ma</b>			
PROJ. NO. <b>16208</b>		PROJECT CONTACT <b>Margie Blew</b>		PROJECT TELEPHONE NO. <b>(508) 772-2610</b>			
CLIENT'S REPRESENTATIVE <b>Tom Best</b>				PROJECT MANAGER/SUPERVISOR <b>Bill Snow</b>			
ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)
1	SBSA 40010	7-26-94	1507		✓	11' deep, 21' 10" to 403, 14' 2" to house, hand packed clay	<div style="border: 1px solid black; padding: 5px; transform: rotate(-45deg); display: inline-block;"> TPH BTEX TPH 4500ppm </div>
2	SBSA 40010	11	1511		✓	11' deep, 23' 5" from closest gatepost 18' 3" to 403 well, hand packed clay	
3							
4							
5							
6							
7							
8							
9							
10							
TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY		TRANSFERS ACCEPTED BY		DATE	TIME
1	1, 2	<i>Enblem</i>		<i>M Lacy</i>		7-26-94	1530
2							
3							
4							
REMARKS						Stored at 4°C	
SAMPLER'S SIGNATURE						<i>Enblem</i>	

LAB COPY

1 of 1



OHM Corporation

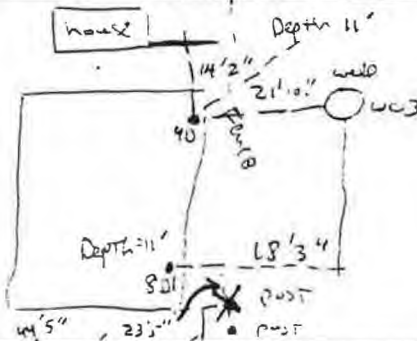
# SOIL SAMPLE FIELD COLLECTION REPORT

Project Number 16208  
Project Name Ft Devers  
Site Location Ayer Ma

Collected By mzm Date and Time Collected 7.26.94  
Sample Location SA49A

## SAMPLE(S) LOCATION SKETCH (use back side if necessary)

Not  
to  
Scale



### SAMPLE ID NUMBER

### DEPTH OF SAMPLE

### SOIL DESCRIPTION

(color, composition, staining, odor, field measurements<sup>(1)</sup>)

1507  
1  
S13SA49AC04D

11' See map above

hard packed grey soil/clay

S13SA49AC08D

11' See map above

hard packed grey clay

Sampling Method grab with disposable scoop

Composite Sample? ☐ Y ☒ N Composite Sample ID Number \_\_\_\_\_

Describe Compositing: \_\_\_\_\_

## SAMPLE TYPES COLLECTED

TYPE <sup>(2)</sup>	VOLUME	PER SAMPLE?	PER COMPOSITE?
TPH	1X 40 ml	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
BTEX w/TPH <500ppm		Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>

Number of Containers 1X 40ml

Date Received By Lab 7.26.94 Laboratory on site

Remarks: \_\_\_\_\_

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.

(2) For Example, Metals, VOA, Organics, Etc.

Site: Ft. Devins, MA

Location No.: 5A49

Date: 7/25/94  
7/26/94

GC Analyst: M

TPH Analyst: M  
M + MB

Page 2 of 2

Method 8080

Concentration (mg/kg)	Action Level	Sample ID																	
Aroclor 1260	2 ppm																		
chlordane	1 ppm																		

Percent Recovery

2,4,5,6-tcmx  
decachlorobiphenyl


Method 418.1

Concentration (mg/kg)	Action Level	Sample ID																	
TRPH	500 ppm	003A	004A	006	007	007													
AHC		54	41	839	726	755													
		11	1	726		729													
		003B	003C	004B	004C	008A	008B	008C	008A	008B	008D	008D							
TRPH	500 ppm	246	854	760	715	41	1	315	31	85	41	41							
AHC		43	244	1085	673	1.1	0.2	110	9	69	1	2							
	500 ppm																		

7/25

7/26





OHM Corporation

## CHAIN-OF-CUSTODY RECORD

Form 0019  
Field Technical Services  
Rev. 08/89

No. 99869

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526


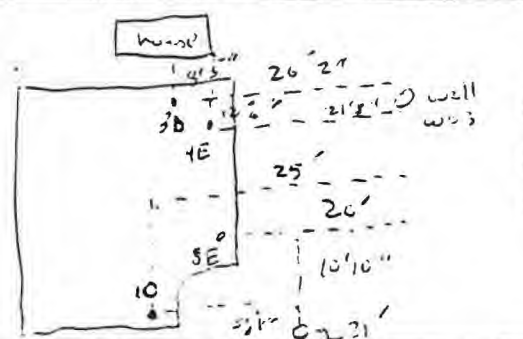
PROJECT NAME Ft Devers		PROJECT LOCATION Ayn Ma		NUMBER OF CONTAINERS		ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)												REMARKS		
PROJ. NO. 16208		PROJECT CONTACT Mazie Blew				PROJECT TELEPHONE NO. (508)		<div style="transform: rotate(-45deg); position: relative; height: 100px;"> <div style="position: absolute; top: 0; left: 0; right: 0; bottom: 0; border: 1px solid black; background: linear-gradient(to top right, transparent 49%, black 49% 51%, black 51% 53%, transparent 53%);"></div> </div>												
CLIENT'S REPRESENTATIVE Tom Best		PROJECT MANAGER/SUPERVISOR Bill Snow																		
ITEM NO.	SAMPLE NUMBER	DATE	TIME			COMP	GRAB													SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)
1	SDSA49004E	21 Jul 0908			/	gold sandy soil w g. fly ash clay	1 x 40.1 JVA	/	/											
2	SDSA49008E	"	0919		/	gold sandy soil	"	/	/											
3	SDSA4910	"	0924		/	gold sandy soil	"	/	/											
4	SDSA491003D	"	0912		/	gold sandy soil	"	/	/											
5																				
6																				
7																				
8																				
9																				
10																				


  

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	1-4	Bill Blew	M J Lacy	21 Jul 94	0946	stored at 4°C  SAMPLER'S SIGNATURE 
2						
3						
4						

LAB COPY



 <b>OHM Corporation</b>	<b>SOIL SAMPLE FIELD COLLECTION REPORT</b>	Project Number <u>16208</u> Project Name <u>Ft Devens</u> Site Location <u>Ayer Ma</u>																																		
	Collected By <u>MV2 B</u> Date and Time Collected <u>27 Jul 94</u> Sample Location <u>SA 49A</u>																																			
SAMPLE(S) LOCATION SKETCH (use back side if necessary)																																				
<div style="display: flex; align-items: flex-start;"> <div style="flex: 1;"> <p>Not to scale</p>  </div> <div style="flex: 1; margin-left: 20px;"> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Well</th> <th>to gate</th> <th>TC</th> </tr> </thead> <tbody> <tr> <td>3D</td> <td>26' 2"</td> <td>8' 5"</td> <td>12' 6"</td> </tr> <tr> <td>4E</td> <td>21' 8"</td> <td>—</td> <td>—</td> </tr> <tr> <td>8E</td> <td>20'</td> <td>31' 10"</td> <td>—</td> </tr> <tr> <td>10</td> <td>25'</td> <td>26' 3"</td> <td>—</td> </tr> </tbody> </table> </div> </div>				Well	to gate	TC	3D	26' 2"	8' 5"	12' 6"	4E	21' 8"	—	—	8E	20'	31' 10"	—	10	25'	26' 3"	—														
	Well	to gate	TC																																	
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4E	21' 8"	—	—																																	
8E	20'	31' 10"	—																																	
10	25'	26' 3"	—																																	
Time 0908 0924 0912	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>SAMPLE ID NUMBER</th> <th>DEPTH OF SAMPLE</th> <th>SOIL DESCRIPTION (color, composition, staining, odor, field measurements<sup>(1)</sup>)</th> </tr> </thead> <tbody> <tr> <td>SB5A49004E</td> <td>14'</td> <td>Sandy gravelly clay (greyish color)</td> </tr> <tr> <td>SB5A49008E</td> <td>"</td> <td>old sand</td> </tr> <tr> <td>SB5A4910</td> <td>"</td> <td>gold sand</td> </tr> <tr> <td>SB5A49A03D</td> <td>"</td> <td>old sand</td> </tr> </tbody> </table>	SAMPLE ID NUMBER	DEPTH OF SAMPLE	SOIL DESCRIPTION (color, composition, staining, odor, field measurements <sup>(1)</sup> )	SB5A49004E	14'	Sandy gravelly clay (greyish color)	SB5A49008E	"	old sand	SB5A4910	"	gold sand	SB5A49A03D	"	old sand	Sampling Method <u>use disposable scoop to dig beyond excavation well</u> Composite Sample?    Y <input type="checkbox"/> N <input checked="" type="checkbox"/> Composite Sample ID Number _____ Describe Compositing: _____																			
SAMPLE ID NUMBER	DEPTH OF SAMPLE	SOIL DESCRIPTION (color, composition, staining, odor, field measurements <sup>(1)</sup> )																																		
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SB5A49A03D	"	old sand																																		
<b>SAMPLE TYPES COLLECTED</b>																																				
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">TYPE<sup>(2)</sup></th> <th rowspan="2">VOLUME</th> <th colspan="2">PER SAMPLE ?</th> <th colspan="2">PER COMPOSITE ?</th> </tr> <tr> <th>Y</th> <th>N</th> <th>Y</th> <th>N</th> </tr> </thead> <tbody> <tr> <td>TPH, BTEX &amp; TPH-SCOP</td> <td>1X40ml vial</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>_____</td> <td>_____</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>_____</td> <td>_____</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>_____</td> <td>_____</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>			TYPE <sup>(2)</sup>	VOLUME	PER SAMPLE ?		PER COMPOSITE ?		Y	N	Y	N	TPH, BTEX & TPH-SCOP	1X40ml vial	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TYPE <sup>(2)</sup>	VOLUME	PER SAMPLE ?			PER COMPOSITE ?																															
		Y	N	Y	N																															
TPH, BTEX & TPH-SCOP	1X40ml vial	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																															
_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																															
_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																															
_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																															
Number of Containers <u>1</u> Date Received By Lab <u>27 Jul 94</u> Laboratory <u>On site</u> Remarks: _____ _____ _____																																				
(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc. (2) For Example, Metals, VOA, Organics, Etc.																																				



SOIL SAMPLE  
FIELD COLLECTION  
REPORT

Project Number 16208  
Project Name Ft. Devos  
Site Location Ave M2

Collected By merb  
Sample Location SAURA

Date and Time Collected 27 Jul 94

SAMPLE(S) LOCATION SKETCH (use back side if necessary)

0908      004E      21' 8" from well      12' 0" from house  
0909      008E      20'      10' 10" from post  
0924      010      25'      5' 3" from post  
0912      003D      26' 2"      8' 5" from house

SAMPLE ID NUMBER	DEPTH OF SAMPLE	SOIL DESCRIPTION (color, composition, staining, odor, field measurements <sup>(1)</sup> )

Sampling Method    
Composite Sample ?    Y ☐    N ☐    Composite Sample ID Number    
Describe Compositing

SAMPLE TYPES COLLECTED

TYPE <sup>(2)</sup>	VOLUME	PER SAMPLE ?	PER COMPOSITE ?
		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>

Number of Containers    
Date Received By Lab      Laboratory    
Remarks:

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.

(2) For Example, Metals, VOCs, Organics, Etc.

[illegible]

## DAILY FIELD SCREENING RESULTS

Page 1 of 2

Site: Ft. Devins, MA

Location No.: 5A49

Date: 7/27/94 GC Analyst: ML

TPH Analyst: —

Method 8020

## Sample ID

Concentration (mg/kg)	Action Level	004E	004E	003D	010													
benzene,	10 ppm	1	ND	<1	ND													
toluene	90 ppm	2	<1	<1	<1													
ethylbenzene	80 ppm	2	ND	ND	ND													
m,p-xylene		2	ND	ND	ND													
o-xylene		2	ND	ND	ND													
tot. tylenes	500 ppm	4	ND	ND	ND													
chlorobenzene																		
1,2-dichlorobenz.																		
1,3-dichlorobenz.																		
1,4-dichlorobenz.																		

Percent Recovery

1,1,1-trifluorotoluene

99.4	96.0	99.7	95.1															
------	------	------	------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

1,3-dichlorobenzene

# CHAIN-OF-CUSTODY RECORD

Field Technician  
Rev. 1

No. 99858

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME		PROJECT LOCATION		ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)				
Ft Devons		Ayer MA		<div style="transform: rotate(-45deg); transform-origin: center;"> TPH BTX TPH 500ppm </div>				
PROJ NO	PROJECT CONTACT	PROJECT TELEPHONE NO						
16208	Margie Bleau	(508) 777-2610						
CLIENT'S REPRESENTATIVE		PROJECT MANAGER/SUPERVISOR						
TOM BEST USACE		Bill Snow						
ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	NUMBER OF CONTAINERS	REMARKS
1	SPSA49A010A	7/29/93	1058			Depth = 12'6" distance to fence (P) gate post = 13'6" to depth of (T) = 6'8"	1X40ml VCH	
2	011		1108			D = 12'6" P = 28'9" T = 6'8" clay & sandy soil		
3	012		1113			D = 12'6" P = 31'10" T = 5'9" 4" grey clay		
4	001F		1121			D = 12'6" P = 34'10" T = 4'0" 5" sandy fill		
5	002F		1123			D = 12'6" P = 27'6" T = 33'8" grey sand, organic clay		
6	002G		1131			resample at creek above down to clay, no sand		
7								
8								
9								
10								
TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY		TRANSFERS ACCEPTED BY		DATE	TIME	REMARKS
1	1-6	[Signature]		[Signature]		7/29/93	1143	preserved at 4°C
2								
3								
4								
SAMPLER'S SIGNATURE								[Signature]





OHM Corporation

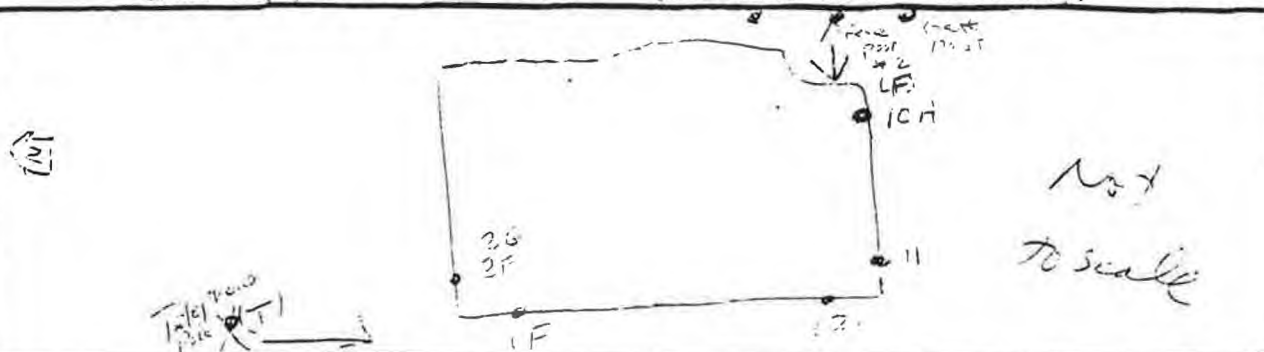
# SOIL SAMPLE FIELD COLLECTION REPORT

Project Number 16708  
Project Name FT Devening  
Site Location 4 van line

Collected By M V 2 V3 Date and Time Collected 7-28-94

Sample Location SA 49

SAMPLE(S) LOCATION SKETCH (use back side if necessary)



<u>Time</u>	<u>SAMPLE ID NUMBER</u>	<u>DEPTH OF SAMPLE</u>	<u>SOIL DESCRIPTION</u> (color, composition, staining, odor, field measurements, etc.)
1055	S135H49 C10A	12' 6" 13' 9" 20' 3"	Sandy gray clay
1055	S135H49 C11	" 20' 3" 30' 3"	gray clay some sand
1113	S135H49 C12	" 30' 3" 39' 0"	gray clay
1121	S135H49 C13F	" 39' 0" 40' 3"	gray clay fill

Sampling Method: dia 6" hand excavation with 10' with 10' resole  
scoops, then sample area

Composite Sample ?    Y ☐    N ☒    Composite Sample ID Number \_\_\_\_\_

Describe Compositing

SAMPLE TYPES COLLECTED

TYPE <sup>(2)</sup>	VOLUME	PER SAMPLE ?	PER COMPOSITE ?
TPH	(X40m) 100%	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
BTFx 2 TPH 2500 ppm		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>

Number of Containers 1

Date Received By Lab 7-29-94 Laboratory On Site

Remarks: \_\_\_\_\_

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.

(2) For Example, Metals, VOA, Organics, Etc.



OHM Corporation

# SOIL SAMPLE FIELD COLLECTION REPORT

Project Number 16208  
 Project Name F-12000  
 Site Location Area 1/12

Collected By Vucis Date and Time Collected 7.22.94 (Sat) 5:20 PM  
 Sample Location SAT 1/2

SAMPLE(S) LOCATION SKETCH (use back side if necessary)

See p. 1 of 2 map

SAMPLE  
ID NUMBER

DEPTH OF  
SAMPLE

SOIL DESCRIPTION

(color, composition, staining, odor, field measurements<sup>(1)</sup>)

55400 002F

12" 24" 33"

Sandy wet down to base clay

55400 003G

12" 24" 33"

re-sample of 002F in upper 30cm of soil

Sampling Method \_\_\_\_\_

Composite Sample ? ☒ Y ☐ N Composite Sample ID Number \_\_\_\_\_

Describe Compositing \_\_\_\_\_

## SAMPLE TYPES COLLECTED

TYPE <sup>(2)</sup>	VOLUME	PER SAMPLE ?	PER COMPOSITE ?
<u>TPH</u>	<u>1 x 4cm 1 VPH</u>	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
<u>12TEX 2 TPH 4500 ppm</u>	_____	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
_____	_____	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
_____	_____	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N

Number of Containers 1

Date Received By Lab 7.29.94 Laboratory on site

Remarks: \_\_\_\_\_

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.

(2) For Example, Metals, VOA, Organics, Etc.

Site: Ft. Devins, MA

Location No.: <sup>SA49</sup> AR69A

Date: 7/29/94 GC Analyst:

TPH Analyst: M, MB Page 2 of 2

Method 8080

Sample ID

Concentration (mg/kg)	Action Level																		
Aroclor 1260	2 ppm																		
chlordane	1 ppm																		

Percent Recovery

2,4,5,6-tcmx  
decachlorobiphenyl


Method 418.1

Sample ID

Concentration (mg/kg)	Action Level	010A	011	012	001F	002F	002G												
TRPH	500 ppm	214	216	214	215	75	215												
AHC	SA49	3	4	5	6	17	4												
		B3	B4	B5	B7	E1	E2	N2	N3	S2	S3								
TRPH	500 ppm	425		612	477	378	390	28	415	173	280								
AHC	AR69A	48		62	46	41	46	96	0	19	31								
						378													
	500 ppm																		

B4 too silty to ~~semi~~ analyze. The filter became clogged.

# DAILY FIELD SCREENING RESULTS

Page 1 of 1

Site: Ft. Devins, MA

Location No.: 5A49

Date: 8/4/94

GC Analyst: M. Quinlan

TPH Analyst:

## Method 8020

### Sample ID

Concentration (mg/kg)	Action Level	B6	B3	B3A	10A	12	B4A	3B	8B	8C	B7	2F	B6D	2G	11	B2A	B1A	1F		
benzene,	10 ppm	ND	0.7	0.9	ND	1.8	0.6	ND	1.7	ND	4.4	ND	ND	1.4	ND	ND	0.6	1.5		
toluene	90 ppm	ND	1.9	4.5	4.2	5.6	3.5	5.6	4.8	5.2	4.2	4.3	3.6	5.0	4.7	5.9	4.0	4.1		
ethylbenzene	80 ppm	ND	ND	ND	0.5	0.6	ND	0.7	0.5	ND	0.5	ND	1.0	0.6	0.8	ND	0.8	0.7		
m,p-xylene		6.5	ND	ND	ND	ND	ND	0.3	ND	1.1	ND	ND	ND	ND	ND	1.6	ND	ND		
o-xylene		0.8	0.4	2.0	ND	ND	ND	ND	ND	0.6	ND	ND	ND	ND	ND	1.3	ND	ND		
tol. tylen	500 ppm	7.3	0.4	2.0	ND	ND	ND	0.8	ND	1.9	ND	ND	ND	ND	ND	2.9	ND	ND		
chlorobenzene																				
1,2-dichlorobenz.																				
1,3-dichlorobenz.																				
1,4-dichlorobenz.																				
COC Date:		8/1	8/1	8/1	7/29	7/29	8/1	7/6	7/26	1/26	8/2	7/29		7/21	7/29	8/2	8/2	7/29		
Percent Recovery																				
1,1,1-trifluorotoluene																				
1,3-dichlorobenzene																				

Note: Lower quantification limit was 6.8 ppm - all values report are below this limit and are therefore estimated concentrations





OHM Corporation

## CHAIN-OF-CUSTODY RECORD

Form 0019  
Field Technical Services  
Rev. 08/89

No. 99873

O.H. MATERIALS CORP.		P.O. BOX 551		FINDLAY, OH 45839-0551		419-423-3526	
PROJECT NAME <b>FT Devers</b>				PROJECT LOCATION <b>Ayon MA</b>			
PROJ NO. <b>16208</b>		PROJECT CONTACT <b>Margie Bleau</b>		PROJECT TELEPHONE NO. <b>(528) 772-2610</b>			
CLIENT'S REPRESENTATIVE <b>Tom Best USACE</b>				PROJECT MANAGER/SUPERVISOR <b>Bill Snow</b>			
ITEM NO	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)
1	SBSA 49A003E	Aug 24	1133			Depth = 11', dist to 2nd floor post (P) = 19' 8", dist to 1st floor post (P) = 31' 4"	<div style="transform: rotate(-45deg); display: inline-block;"> TPH STEX-1 TPH-1 TPH-2 TPH-3 TPH-4 TPH-5 TPH-6 TPH-7 TPH-8 TPH-9 TPH-10 TPH-11 TPH-12 TPH-13 TPH-14 TPH-15 TPH-16 TPH-17 TPH-18 TPH-19 TPH-20 TPH-21 TPH-22 TPH-23 TPH-24 TPH-25 TPH-26 TPH-27 TPH-28 TPH-29 TPH-30 TPH-31 TPH-32 TPH-33 TPH-34 TPH-35 TPH-36 TPH-37 TPH-38 TPH-39 TPH-40 TPH-41 TPH-42 TPH-43 TPH-44 TPH-45 TPH-46 TPH-47 TPH-48 TPH-49 TPH-50 TPH-51 TPH-52 TPH-53 TPH-54 TPH-55 TPH-56 TPH-57 TPH-58 TPH-59 TPH-60 TPH-61 TPH-62 TPH-63 TPH-64 TPH-65 TPH-66 TPH-67 TPH-68 TPH-69 TPH-70 TPH-71 TPH-72 TPH-73 TPH-74 TPH-75 TPH-76 TPH-77 TPH-78 TPH-79 TPH-80 TPH-81 TPH-82 TPH-83 TPH-84 TPH-85 TPH-86 TPH-87 TPH-88 TPH-89 TPH-90 TPH-91 TPH-92 TPH-93 TPH-94 TPH-95 TPH-96 TPH-97 TPH-98 TPH-99 TPH-100 </div>
2	SBSA 49A003B1		1128			D = 13' P = 7' 9" T = 41' 6" strong only small, brown, 16 rough	
3	SBSA 49A003B2		1115			D = 12' 5" P = 14' 6" T = 61' 2" wet clay	
4	SBSA 49A003B3		1108			D = 13' P = 28' 11" T = 62' 3" grey clay	
5	SBSA 49A003B4		1120			D = 13' P = 29' 10" T = 46' 6" wet grey clay	
6	SBSA 49A003B5		1124			D = 13' P = 17' 8" T = 44' 5" grey clay	
7							
8							
9							
10							

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	1-6	<b>STABL</b>	<b>MJ Lucy</b>	Aug 24	1152	<p>preserved at 4°C</p> <p>SAMPLER'S SIGNATURE <b>STABL</b></p>
2						
3						
4						

LAB COPY





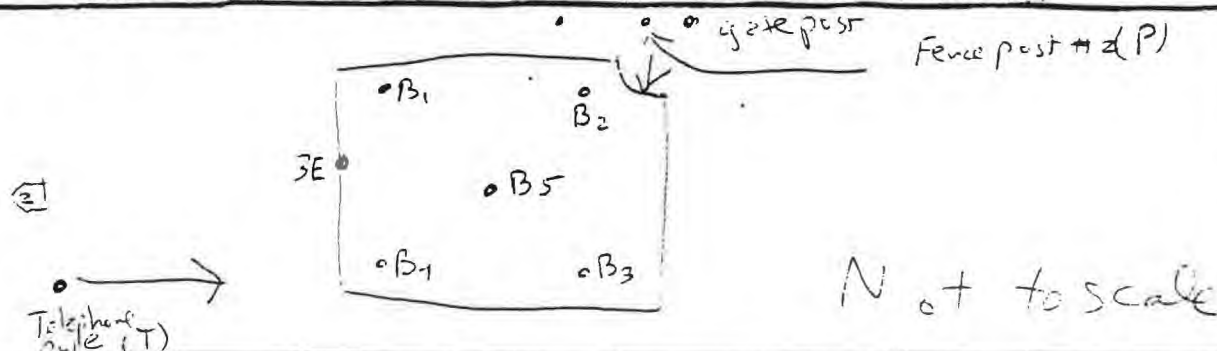
OHM Corporation

# SOIL SAMPLE FIELD COLLECTION REPORT

Project Number 16208  
Project Name FT Devens  
Site Location Away from

Collected By MLC/3Date and Time Collected 8-1-94 (500 samples)Sample Location Site 9

## SAMPLE(S) LOCATION SKETCH (use back side if necessary)



SAMPLE ID NUMBER	DEPTH OF SAMPLE	SOIL DESCRIPTION (color, composition, staining, odor, field measurements <sup>(1)</sup> )
133 SB5H49 C05E	11' 15.8"   31.4"	old sandy soil
135 SB5H49 B1	13' 7.9"   41.6"	grey clay, strong oily smell, break through
136 " B2	12' 5" 14.6"   61.2"	wet clay
1105 " B3	13' 20.1"   67.3"	wet clay layer

Sampling Method dig 6' beyond excavation into grab sample with  
disposable scoopComposite Sample? ☒ Y ☐ N Composite Sample ID Number \_\_\_\_\_

Describe Compositing \_\_\_\_\_

## SAMPLE TYPES COLLECTED

TYPE <sup>(2)</sup>	VOLUME	PER SAMPLE ?	PER COMPOSITE ?
TTH	1 X 4cm   100g	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
BTIFX & TTH		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Number of Containers 1 X 4cmDate Received By Lab 1/17/94 Laboratory on site

Remarks: \_\_\_\_\_

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.

(2) For Example, Metals, VOA, Organics, Etc.

 <b>OHM Corporation</b>	<b>SOIL SAMPLE FIELD COLLECTION REPORT</b>	Project Number <u>16208</u>
		Project Name <u>FT Devens</u>
		Site Location <u>Ayer Rd</u>

Collected By M. J. W. Date and Time Collected 8.1.94 (See sample log)  
 Sample Location SA 49

SAMPLE(S) LOCATION SKETCH (use back side if necessary)

See page 1 of 2  
map

SAMPLE ID NUMBER	DEPTH OF SAMPLE	SOIL DESCRIPTION (color, composition, staining, odor, field measurements <sup>(1)</sup> )
SBSR 49B4	13' 12" 5" 10"	wet grey clay
" B5	13' 7" 8" 44" 5"	grey clay

Sampling Method \_\_\_\_\_

Composite Sample? ☒ Y ☐ N Composite Sample ID Number \_\_\_\_\_

Describe Compositing \_\_\_\_\_

### SAMPLE TYPES COLLECTED

TYPE <sup>(2)</sup>	VOLUME	PER SAMPLE ?	PER COMPOSITE ?
TPH	12-100m/soil	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
BTEX, TPH, LSC, ppm		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
		<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
		<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N

Number of Containers 1

Date Received By Lab 1 Aug 94 Laboratory on site

Remarks: \_\_\_\_\_

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.

(2) For Example, Metals, VOA, Organics, Etc.

Corrected

SA 49

AR 69A

Site: Ft. Devens, MA

Location No.:

Date:

8/1/74

GC Analyst:

TPH Analyst:

Page of

Method 8080

Sample ID

Concentration (mg/kg)	Action Level																	
Aroclor 1260	2 ppm																	
chlordane	1 ppm																	

Percent Recovery

2,4,5,6-tcmx  
decachlorobiphenyl


Method 418.1

Sample ID SP5A49

Concentration (mg/kg)	Action Level	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17
TRPH	500 ppm	2629	28	16	25	118	91	110	118	950								
		965	2	1		16	12	7	16	235								
		B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17
	500 ppm	75	189	75	42		380	55	576	714	100	20	(20)		(91)			
							33	2	52			4						
	500 ppm																	

TPH  
measured by  
on vessel

Legend

- 11111 - previously in opposite site area
- 11111 - previously uncalculated
- OTHER, explanation with sample #

can't find corresponding TPH readings in AR 69A book

not collected until 8/2/74

# DAILY FIELD SCREENING RESULTS

Page 1 of 2

Site: Ft. Devins, MA

Location No.: 5A49

Date: 6/4/94

GC Analyst: M. J. Quinlan

TPH Analyst:

Method 8020

Concentration (mg/kg)	Action Level	Sample ID																
		B6	B3	B3A	10A	12	B4A	3B	8B	8C	B7	2F	B6D	2G	11	B2A	B1A	1E
benzene	10 ppm	ND	0.4	0.9	ND	1.8	0.6	ND	1.7	ND	4.4	ND	ND	1.4	ND	ND	0.6	1.5
toluene	90 ppm	ND	1.9	4.5	4.2	5.6	3.5	5.6	4.8	5.2	4.2	4.3	3.6	5.0	4.7	5.9	4.0	4.1
ethylbenzene	80 ppm	ND	ND	ND	0.5	0.6	ND	0.7	0.5	ND	0.5	ND	1.0	0.6	0.8	ND	0.8	0.7
m,p-xylene	500 ppm	6.5	ND	ND	ND	ND	ND	0.3	ND	1.1	ND	ND	ND	ND	ND	1.6	ND	ND
o-xylene		0.8	0.4	2.0	ND	ND	ND	ND	ND	0.8	ND	ND	ND	ND	ND	1.3	ND	ND
tot. tylenes		7.3	0.4	2.0	ND	ND	ND	0.8	ND	1.9	ND	ND	ND	ND	ND	2.9	ND	ND
chlorobenzene																		
1,2-dichlorobenz.																		
1,3-dichlorobenz.																		
1,4-dichlorobenz.																		
COC Date:		8/1	8/1	8/1	7/29	7/29	8/1	7/6	7/26	7/26	8/2	7/29		7/29	7/29	8/2	8/2	7/29
Percent Recovery																		
1,1,1-trifluorotoluene																		
1,3-dichlorobenzene																		

Note: Lower quantification limit was 6.8 ppm - all values report are below this limit and are therefore estimated concentrations





OHM Corporation

## CHAIN-OF-CUSTODY RECORD

Form 0019  
Field Technical Services  
Rev. 08/89

No. 99874

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME		PROJECT LOCATION		ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)		NUMBER OF CONTAINERS	REMARKS
PROJ. NO.	PROJECT CONTACT	PROJECT TELEPHONE NO.					
CLIENT'S REPRESENTATIVE	PROJECT MANAGER/SUPERVISOR						
1	FT Devel	Ayer M2	678) 772-2610	1 x 40 gal Jca	✓	✓	<p>TPH 4500 ppm BTX 4500 ppm</p>
2	16208	Margie Blean			✓	✓	
3	Tom Best USACE	Bill Shaw			✓	✓	
4							
5							
6							
7							
8							
9							
10							

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	1-3	SRBL	MJ Lacy	8.9.94	1506	<p>preserved at 4°C</p>
2						
3						
4						

SAMPLER'S SIGNATURE: SRBL

LAB COPY





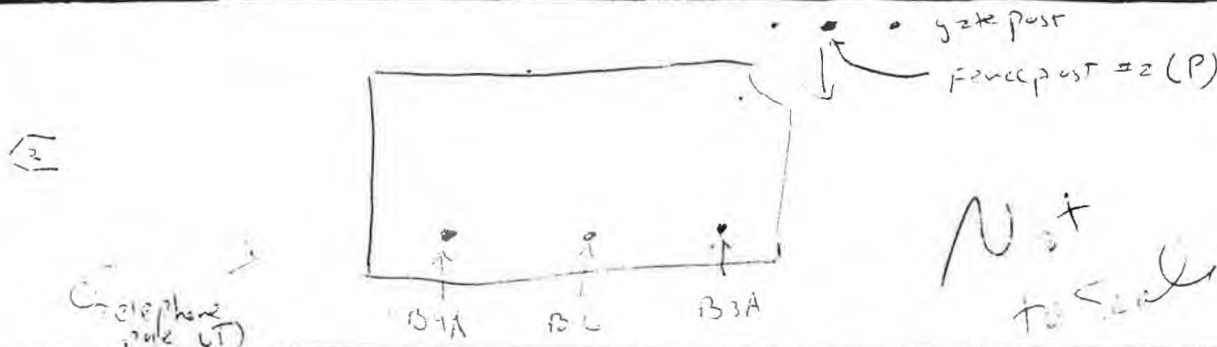
OHM Corporation

# SOIL SAMPLE FIELD COLLECTION REPORT

Project Number 16208  
Project Name FT Devens  
Site Location Ayers Pk

Collected By MRB Date and Time Collected 8.1.94  
Sample Location SA 49

## SAMPLE(S) LOCATION SKETCH (use back side if necessary)



SAMPLE ID NUMBER	DEPTH OF SAMPLE		SOIL DESCRIPTION (color, composition, staining, odor, field measurements <sup>(1)</sup> )
	D	I	
17 SB5A 49 B4A	15	29' 10"	41' 6"
17-16 SB5A 49 B3A	15	29'	62'
1439 SB5A 49 B3G	14	30' 6"	49' 3"

Sampling Method dig 6" beyond limits of excavation, take sample with disposable scoop

Composite Sample? ☐ Y ☒ N Composite Sample ID Number \_\_\_\_\_

Describe Compositing \_\_\_\_\_

## SAMPLE TYPES COLLECTED

TYPE <sup>(2)</sup>	VOLUME	PER SAMPLE ?		PER COMPOSITE ?	
TPH	1 X 40ml VOA	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	Y <input type="checkbox"/>	N <input checked="" type="checkbox"/>
BTEX		Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	Y <input type="checkbox"/>	N <input checked="" type="checkbox"/>
		Y <input type="checkbox"/>	N <input type="checkbox"/>	Y <input type="checkbox"/>	N <input type="checkbox"/>
		Y <input type="checkbox"/>	N <input type="checkbox"/>	Y <input type="checkbox"/>	N <input type="checkbox"/>

Number of Containers 1

Date Received By Lab 8.1.94 Laboratory on site

Remarks: \_\_\_\_\_

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.

(2) For Example, Metals, VOA, Organics, Etc.

Corrected

51149  
A267A

Page of

Site: Ft. Devens, MA

Location No.:

Date:

8/1/94

GC Analyst:

TPH Analyst:

Method 8080

Sample ID

Concentration (mg/kg)  
Action Level  
Aroclor 1260 2 ppm  
chlordane 1 ppm


Percent Recovery

2,4,5,6-tcmx  
decachlorobiphenyl


Method 418.1

Sample ID SP5A49

Concentration (mg/kg)  
Action Level  
TRPH 500 ppm

Bi	B2	B3	B4	B5	cc3L	B4H	B3A	B6										
>629	28	16	25	118	91	110	108	950										
965	2	1		16	12	7	16	235										
B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18	B19
75	189	75	42		380	58	546	714	ND	20	(20)		(91)					
		115			33	2	52			4								

Legend

///

- previously in opposite site
- previously uncalculated
- OTHER, Explanation with sample #

can't find corresponding TPH readings in Mike's book

not until 8/2/94

# DAILY FIELD SCREENING RESULTS

Page 1 of 2

Site: Ft. Devens, MA

Location No.: 5A49

Date: 6/4/94

GC Analyst: M. Quinlan

TPH Analyst:

## Method 8020

		Sample ID																		
Concentration (mg/kg)	Action Level	B6	B3	B3A	10A	12	B4A	3B	8B	8C	B7	2F	B6D	2G	11	B2A	B1A	1F		
benzene,	10 ppm	ND	0.4	0.9	ND	1.8	0.6	ND	1.7	ND	4.4	ND	ND	1.4	ND	ND	0.6	1.5		
toluene	90 ppm	ND	1.9	4.5	4.2	5.6	3.5	5.6	4.8	5.2	4.2	4.3	3.6	5.0	4.7	5.9	4.0	4.1		
ethylbenzene	80 ppm	ND	ND	ND	0.5	0.6	ND	0.7	0.5	ND	0.5	ND	1.0	0.6	0.8	ND	0.8	0.7		
m,p-xylene		6.5	ND	ND	ND	ND	ND	0.8	ND	1.1	ND	ND	ND	ND	ND	1.6	ND	ND		
o-xylene		0.8	0.4	2.0	ND	ND	ND	ND	ND	0.8	ND	ND	ND	ND	ND	1.3	ND	ND		
tol. tylenes	500 ppm	7.3	0.4	2.0	ND	ND	ND	0.8	ND	1.9	ND	ND	ND	ND	ND	2.9	ND	ND		
chlorobenzene																				
1,2-dichlorobenz.																				
1,3-dichlorobenz.																				
1,4-dichlorobenz.																				
COC Date:		8/1	8/1	8/1	7/29	7/29	8/1	7/6	7/26	7/26	8/2	7/29		7/29	7/29	8/2	8/2	7/29		
Percent Recovery																				
1,1,1-trifluorotoluene																				
1,3-dichlorobenzene																				

Note: Lower quantification limit was 6.8 ppm - all values report are below this limit and are therefore estimated concentrations



# CHAIN-OF-CUSTODY RECORD

Form 0019  
Field Technical Services  
Rev. 08/89

No. 99870

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME		PROJECT LOCATION		NUMBER OF CONTAINERS	ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)												REMARKS			
PROJ. NO.	PROJECT CONTACT	PROJECT TELEPHONE NO.																		
CLIENT'S REPRESENTATIVE	PROJECT MANAGER/SUPERVISOR																			
ITEM NO.	SAMPLE NUMBER	DATE	TIME		COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)													
1	SBSA19B1A	7/27	1011			depth (D)=15' 2nd layer point (P) - 7'6" distance to telephone, sk (T) = 40' 1' clay	1 X 4 1-1 W	/	/											
2	SBSA19B2A	↓	1008			D = 15' P = 8' 16" T = 38' 11" hard clay	"	/	/											
3	SBSA19B3	↓	1003			D = 15' P = 7' 3" T = 17' 8" dense, plastic clay	"	/	/											
4																				
5																				
6																				
7																				
8																				
9																				
10																				

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	1-3	— [Signature] —	— [Signature] —	7/27	1033	4" c Storage
2						
3						
4						SAMPLER'S SIGNATURE — [Signature] —

TRANSFER 2





OHM Corporation

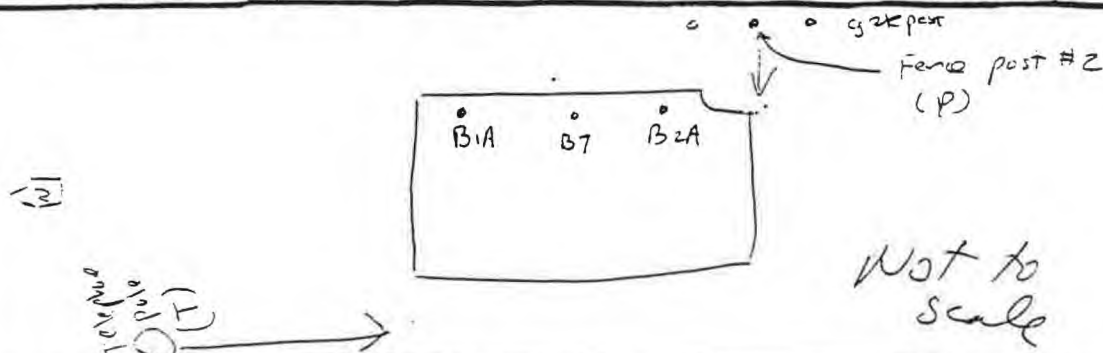
# SOIL SAMPLE FIELD COLLECTION REPORT

Project Number 16208  
Project Name FT Devens  
Site Location Azer 110

Collected By MVLV Date and Time Collected 8.2.94

Sample Location SA49

## SAMPLE(S) LOCATION SKETCH (use back side if necessary)



SAMPLE ID NUMBER	DEPTH OF SAMPLE	SOIL DESCRIPTION (color, composition, staining, odor, field measurements <sup>(1)</sup> )
SB SA49 B1A	15' 7.6" 45.0"	wet clay
SB SA49 B2A	15' 8.6" 58.10"	wet clay
SB SA49 B7	15' 7.3" 41.9"	dense packed grey clay

Sampling Method dig 6" beyond excavation with disposable scoop

Composite Sample? Y ☐ N ☒ Composite Sample ID Number \_\_\_\_\_

Describe Compositing \_\_\_\_\_

## SAMPLE TYPES COLLECTED

TYPE <sup>(2)</sup>	VOLUME	PER SAMPLE?	PER COMPOSITE?
TRH	1X70ml	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
RTF-X 1470H 4524ppm		Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
		Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>

Number of Containers 1

Date Received By Lab 8.2.94

Laboratory On site

Remarks: \_\_\_\_\_

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.

(2) For Example, Metals, VOA, Organics, Etc.



Site: Ft. Devins, MA

Location No.: ~~5141~~  
AR 69A

Date: 8/2/94 GC Analyst: \_\_\_\_\_

TPH Analyst: M

## Method 8080

Sample ID

[illegible]

### Percent Recovery

2,4,5,6-tcmx  
decachlorobiphenyl

[illegible]

### Method 418.1

Sample ID

[illegible]

DAILY FIELD SCREENING RESULTS

Site: Ft. Devins, MA

Location No.: 5A49

Date: 6/4/94

GC Analyst: M. Lacy  
M. Quinlan

TPH Analyst:

Method 8020

		Sample ID																	
Concentration (mg/kg)	Action Level	B6	B3	B3A	10A	12	B4A	3B	8B	8C	B7	2F	B6D	2G	11	B2A	B1A	1E	
benzene,	10 ppm	ND	0.4	0.9	ND	1.8	0.6	ND	1.7	ND	4.4	ND	ND	1.4	ND	ND	0.6	1.5	
toluene	90 ppm	ND	1.9	4.5	4.2	5.6	3.5	5.6	4.8	5.2	4.2	4.3	3.6	5.0	4.7	5.9	4.0	4.1	
ethylbenzene	80 ppm	ND	ND	ND	0.5	0.6	ND	0.7	0.5	ND	0.5	ND	1.0	0.6	0.8	ND	0.8	0.7	
m,p-xylene	500 ppm	6.5	ND	ND	ND	ND	ND	0.8	ND	1.1	ND	ND	ND	ND	ND	1.6	ND	ND	
o-xylene		0.8	0.4	2.0	ND	ND	ND	ND	ND	0.8	ND	ND	ND	ND	ND	1.3	ND	ND	
tot. tylen		7.3	0.4	2.0	ND	ND	ND	0.8	ND	1.9	ND	ND	ND	ND	ND	2.9	ND	ND	
chlorobenzene																			
1,2-dichlorobenz.																			
1,3-dichlorobenz.																			
1,4-dichlorobenz.																			
COC Date:		8/1	8/1	8/1	7/29	7/29	8/1	7/6	7/26	7/26	8/2	7/29		7/29	7/29	8/2	8/2	7/29	
Percent Recovery																			
1,1,1-trifluorotoluene																			
1,3-dichlorobenzene																			

Note: Lower quantification limit was 6.8 ppm - all values report are below this limit and are therefore estimated concentrations



OILM Corporation

## CHAIN-OF-CUSTODY RECORD

Form 0019  
Field Technical Services  
Rev. 08/89

#No. 107601

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME		PROJECT LOCATION		NUMBER OF CONTAINERS		ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)										REMARKS		
PROJ. NO.	PROJECT CONTACT	PROJECT TELEPHONE NO.																
CLIENT'S REPRESENTATIVE		PROJECT MANAGER/SUPERVISOR																
ITEM NO	SAMPLE NUMBER	DATE	TIME			COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)										
1	BSA49AN-	Aug 94	1653		-	At side of excavation, some black spots in sand	2x1001	✓										
2	BSA49AN-		1530	✓		At side of excavation, some black spots in sand	2x1002	✓	✓									
3	BSA49AS+		1500	✓		gray clay like soil, packed fine, small clumps of gravel	2x1000	✓										
4	BSA49AS-		1500	✓		gray clay like soil, packed fine, small clumps of gravel	2x401	✓	✓									
5	BSA49AN+		1700	✓		golden sand, some black marks, (16) Sides of gravel	2x1001	✓										
6	BSA49AL-		1515	✓		golden sand, some black marks, (16) Sides of gravel	2x1002	✓	✓									
7	BSA49AL-		1502	✓		golden sand, some black marks, (16) Sides of gravel	2x1001	✓										
8	BSA49AL-		1520	✓		golden sand, some black marks, (16) Sides of gravel	2x1002	✓	✓									
9	BSA49B+		1611	✓		gray clay, wet, bottom of excavation	2x1001	✓										
10	BSA49AL-		1012	✓		gray clay, wet, bottom of excavation	2x1002	✓	✓									

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	1-10	SMBLE	Ford Ex. Aurbill 177284090	Aug 94	2000	• Samples preserved at 4°C
2						• 3rd day TAT
3						• Temperature two Black included
4						SAMPLER'S SIGNATURE SMBLE

TRANSFER 3



OHM Corporation

# SOIL SAMPLE FIELD COLLECTION REPORT

Project Number 116208  
 Project Name Fort Stevens  
 Site Location Ayer Ma

Collected By MRB / BD Date and Time Collected 2 Aug 94  
 Sample Location SA 49A

SAMPLE(S) LOCATION SKETCH (use back side if necessary)

See 2 attached  
map and legend

SAMPLE ID NUMBER	DEPTH OF SAMPLE	SOIL DESCRIPTION (color, composition, staining, odor, field measurements <sup>(1)</sup> )
SBSA49051	T=6' W=46' D=55"	firm packed grey clay like soil
SBSA49AD4PI		
SBSA49ATRP		
SBSA49AN1		

Sampling Method <sup>grab</sup> Sample taken at depth 6" beyond excavation wall

Composite Sample? Y ☐ N ☒ Composite Sample ID Number \_\_\_\_\_

Describe Compositing \_\_\_\_\_

## SAMPLE TYPES COLLECTED

TYPE <sup>(2)</sup>	VOLUME	PER SAMPLE?	PER COMPOSITE?
BTEX	2 x 40ml	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
		Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>

Number of Containers 2

Date Received By Lab 3 Aug 94

Laboratory ASC Environmental Lab

Remarks: \_\_\_\_\_

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.

(2) For Example, Metals, VOA, Organics, Etc.





OHM Corporation

# SOIL SAMPLE FIELD COLLECTION REPORT

Project Number \_\_\_\_\_

Project Name \_\_\_\_\_

Site Location \_\_\_\_\_

Collected By \_\_\_\_\_

Date and Time Collected 2 Aug 94Sample Location SA49A

SAMPLE(S) LOCATION SKETCH (use back side if necessary)

SEE ATTACHED MAP  
and Legend

Time

SAMPLE  
ID NUMBERDEPTH OF  
SAMPLE

SOIL DESCRIPTION

(color, composition, staining, odor, field measurements<sup>(1)</sup>)

1703

SSSA49A10-8'03" T-42'05" W-53'11"Golden sand some black markings

17

SSSA49A20-7'9" T-50'10" W-51'5"Golden sand grey clay mix

1644

SSSA49A30-9'0" T-57'7" W-53'4"Grey Clay, Wet, punchedSampling Method Grab Samples taken six inches beyond excavation wall/bottom

Composite Sample ?

Y ☐N ☒

Composite Sample ID Number \_\_\_\_\_

Describe Compositing \_\_\_\_\_

## SAMPLE TYPES COLLECTED

TYPE <sup>(2)</sup>	VOLUME	PER SAMPLE ?	PER COMPOSITE ?
<u>BTEX</u>	<u>2x40ml</u>	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
_____	<u>↓</u>	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
_____	_____	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>
_____	_____	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>

Number of Containers 2Date Received By Lab 3 - Aug - 94Laboratory ASC & Environmental Lab

Remarks: \_\_\_\_\_

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.

(2) For Example, Metals, VOA, Organics, Etc.





OHM Corporation

# SOIL SAMPLE FIELD COLLECTION REPORT

Project Number \_\_\_\_\_

Project Name \_\_\_\_\_

Site Location \_\_\_\_\_

Collected By \_\_\_\_\_

Date and Time Collected 2 Aug 94Sample Location SA49A

SAMPLE(S) LOCATION SKETCH (use back side if necessary)

See attached Map and Legend

SAMPLE  
ID NUMBERDEPTH OF  
SAMPLE

SOIL DESCRIPTION

(color, composition, staining, odor, field measurements<sup>(1)</sup>)

SBS-4AASC

S<sub>1</sub> + S<sub>2</sub> + S<sub>3</sub>

Gray Clay, soil smooth firm, packed

SBSA49ADip2

---

SBSA49A top2

---

SBSA49ANL

N<sub>1</sub> + N<sub>2</sub> + N<sub>3</sub>

Some black spotting gold sand

Sampling Method Samples were taken at 3 locations along site walls 6 inches beyond excavation

Composite Sample ?

Y ☒N ☐

Composite Sample ID Number \_\_\_\_\_

Describe Compositing

Samples from three locations were mixed in a 55 gal to a uniform composition and sample jars then filled.

## SAMPLE TYPES COLLECTED

TYPE<sup>(2)</sup>

VOLUME

PER SAMPLE ?

PER COMPOSITE ?

TRPH

1X40L

Y ☐N ☒Y ☒N ☐

Naphthalene, 2-methylanthracene, Phenanthrene

1X40L

Y ☐N ☒Y ☒N ☐Y ☐N ☐Y ☐N ☐Y ☐N ☐Y ☐N ☐

Number of Containers

2

Data Received By Lab

3-Aug-94

Laboratory

ASC & Environmental Lab

Remarks: \_\_\_\_\_

(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.

(2) For Example, Metals, VOA, Organics, Etc.



OHM Corporation

# SOIL SAMPLE FIELD COLLECTION REPORT

Project Number \_\_\_\_\_

Project Name \_\_\_\_\_

Site Location \_\_\_\_\_

Collected By \_\_\_\_\_

Date and Time Collected 2 Aug 94Sample Location SA49A

SAMPLE(S) LOCATION SKETCH (use back side if necessary)

See attached map and legend

SAMPLE  
ID NUMBERDEPTH OF  
SAMPLESOIL DESCRIPTION  
(color, composition, staining, odor, field measurements<sup>(1)</sup>)SBSA49A80+mmW1 + W2 + W3Golden sand some black markingsSBSA49AEE1 + E2 + E3Golden sand grey clay mixSBSA49ABB1 + B2 + B3 + B4 + B5Grey clay, wet, packed at B2 hole break through when digging.Sampling Method Sonde taken 6 inches behind excavation

Composite Sample ?

Y ☒ N ☐

Composite Sample ID Number \_\_\_\_\_

Describe Compositing

Samples from three locations were mixed in a 55 gal to a uniform composition and sample jar filed

## SAMPLE TYPES COLLECTED

TYPE<sup>(2)</sup>

VOLUME

PER SAMPLE ?

PER COMPOSITE ?

TRPH1x402Y ☐ N ☒Y ☒ N ☐Uphthalic, 2-methyl naphthalene, Phenanthrene1x402Y ☐ N ☒Y ☒ N ☐Y ☐ N ☐Y ☐ N ☐Y ☐ N ☐Y ☐ N ☐Number of Containers 2Date Received By Lab 3 - Aug - 94

Laboratory

ASC & Environmental Lab

Remarks: \_\_\_\_\_

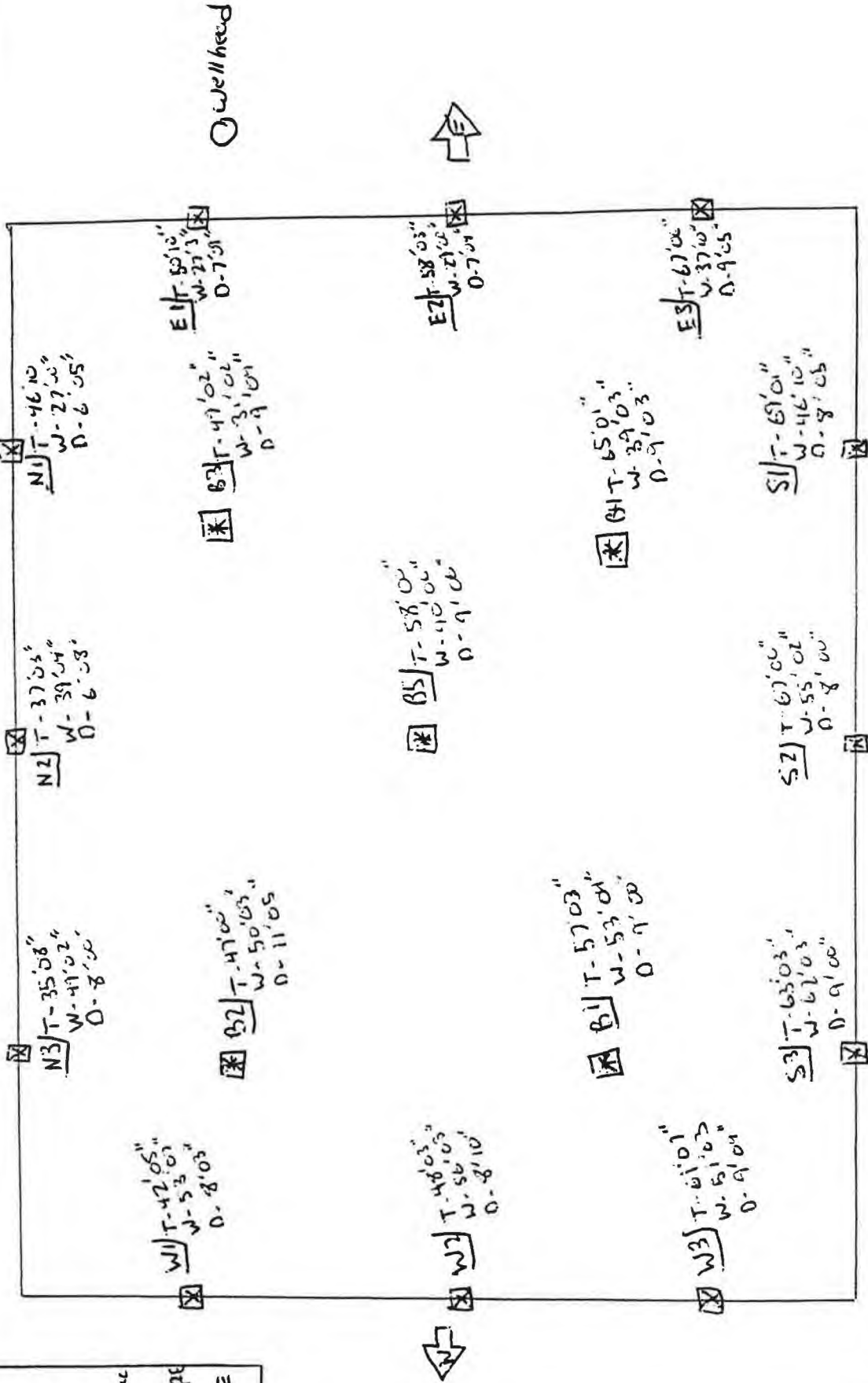
(1) For Example, Organic Vapor Analysis, Pocket Penetrometer, Etc.

(2) For Example, Metals, VOA, Organics, Etc.

NOT TO SCALE

T = Telephone pole  
W = Well head  
D = Depth from surface  
☒ BOTTOM SAMPLE  
☒ WALL SAMPLE

S. 49A  
2 Aug 94



NOTE: Depth readings are probably inaccurate when compared to previous depth measurements and engineers reading of depth may be possibly give at least 10% tolerance.



HIM Corporation

## CHAIN-OF-CUSTODY RECORD

Form 0019

Field Technical Services

Rev. 08/89

No. 107634

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME		PROJECT LOCATION		ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)				
PROJ. NO.	PROJECT CONTACT	PROJECT TELEPHONE NO.						
CLIENT'S REPRESENTATIVE	PROJECT MANAGER/SUPERVISOR							
ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	NUMBER OF CONTAINERS	REMARKS
1	EXSA4901	8-11-94	1515	/		Sandy soil golden color petroleum smell See Map A 1 B + C + D + E + F	3X402 1X1L	
2	EXSA4901	"	1515	/		Sandy soil golden color petroleum smell See Map A 1 B + C + D + E + F	1L	Duplicate of EXSA4901
3	EXSA4902	"	1530	/		Sandy soil golden color petroleum smell See map B.D. 8-11-94 Point F	2X402 1X1L	
4								
5								
6								
7								
8								
9								
10								

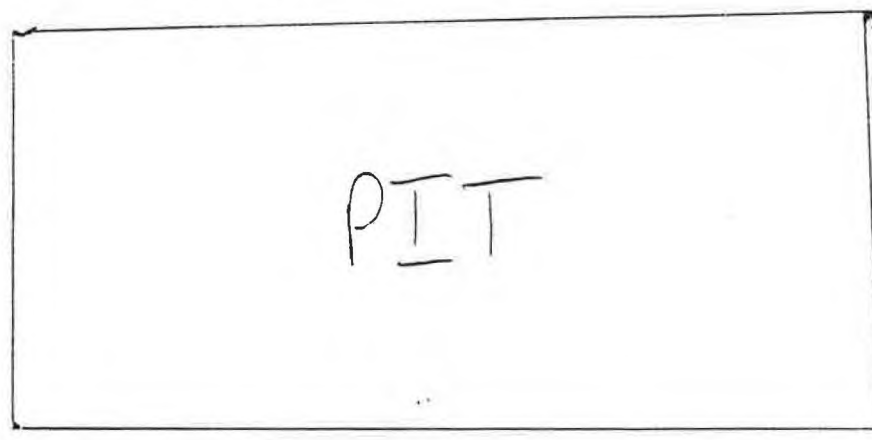
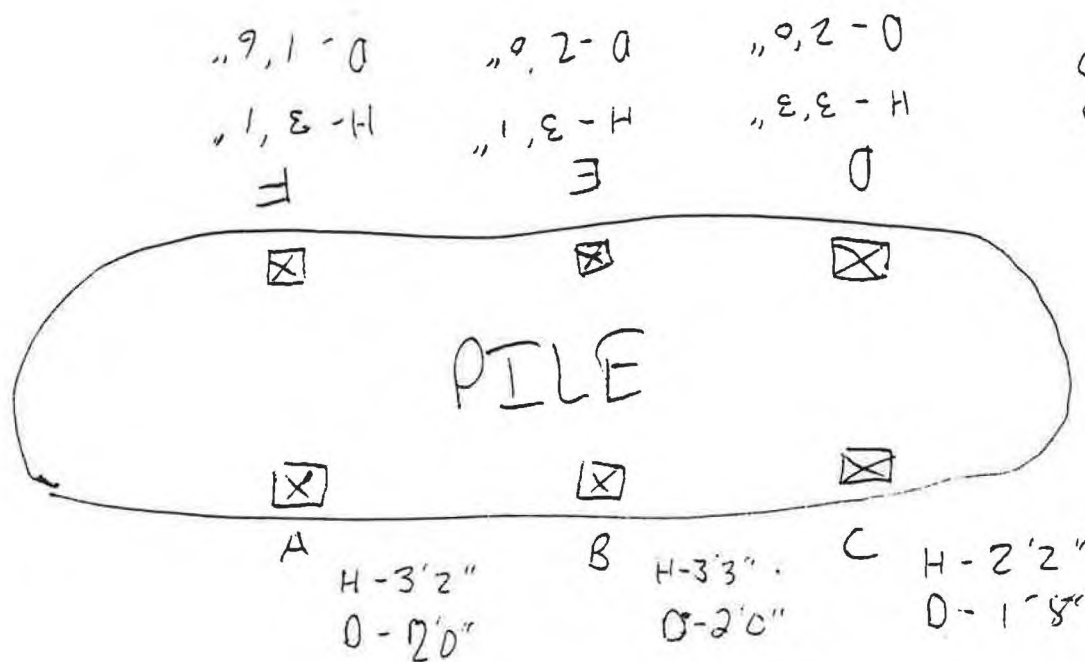
TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	1-3	JAB	Ed Ex Aurbill 1779840856	8-11-94		3 day TAT except where noted in remarks • Temp blank included • Preserved at 4 °C
2						
3						
4						

SAMPLER'S SIGNATURE: JAB

LAB COPY

SA49

8/11/94



ROAD



SOIL SAMPLE COLLECTION LOG  
FORT DEVENS PROJECT

Pg 1 of 2

DATE: 8-12-94

SITE NAME: SA49

WEATHER: Smy, Partly Cloudy, 79°

SAMPLER(S): BD

SAMPLE ID NUMBER	TIME	CCMP/ GRAB	SAMPLE DEPTH (FT)	COORDINATES		SAMPLE DESCRIPTION	# OF CONTAINERS
				REF. PT. 1	REF. PT. 2		
CPS049C	0800	Comp	SEE ATTACHED MAP	LEGEND		golden sand / rubble	1 x 16.5" / 1 mbc.

REF. PT. 1 - L1

REF. PT. 2 - L2

MAP ATTACHED: YES NO

SAMPLE TYPE: SCREENING CONFIRMATION \* CLEAN PILE SAMPLE PER MACER REQUEST

LABORATORY DESTINATION: ON-SITE LAB ASC USACE QA

DUPLICATE TAKEN: YES NO

RINSATE TAKEN: YES NO

ON-SITE LAB CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

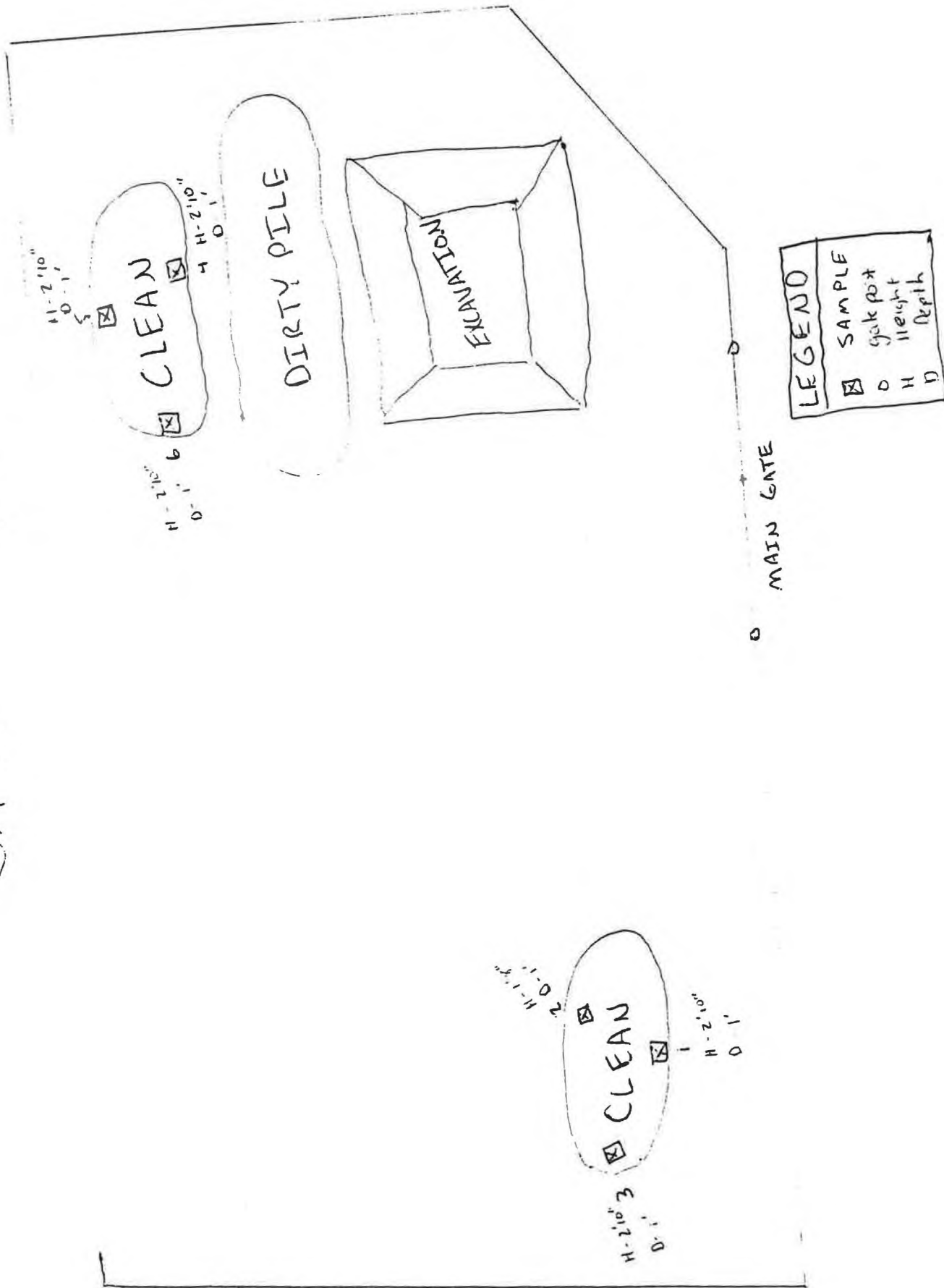
REQUESTED TESTING: TPH BTEX CHLORDANE PCBs

RELINQUISHED BY (DATE/TIME): William J. Dale 8-12-94 0810

CEIVED BY (DATE/TIME): Michael N. Dault 8-12-94 0810

8/12/94

SA414



Site: Ft. Devens, MA

Location No.: SA49, SA69  
SA43D

Date: 08-12-94

GC Analyst:

TPI Analyst: Quintan, Bleau, Dale

Method 8080

Sample ID

Concentration (mg/kg)	Action Level																	
Aroclor 1260	2 ppm																	
chlordane	1 ppm																	

Percent Recovery

2,4,5,6-tcmx																		
decachlorobiphenyl																		

Method 418.1

Sample ID → SA69

composite of clean soil piles on site  
SA49 per MADEP

Concentration (mg/kg)	Action Level	SA69	SA69	SA69	SA69	SA69	SA69	SA69	SA69	SA69	SA69	SA69	SA69	SA69	SA69	SA69	SA69	SA69
TRPH	500 ppm	E3A	S8	S4A	S6A	S7A	S5A	E4A										
AHC		426	16	76	3232	ND	329	805										
		40	ND	NI	61	ND	27	79										
		SA43D	SA43D	SA43A	SA43D	SA43D	SA43D	SA43D										
		18	19	20	21	22	23											
TRPH	500 ppm	2211	273	2712	1478	1069	3364											
AHC		48	17	66	30	78	101											
	500 ppm																	

**Soil Sample Collection Log**  
**Fort Devens - Project #16208**

Pg. 1 of 2

Date: 9-8-94

Site Name: SA49

Weather: Cool, Partly Cloudy      Samplers: BC

Sample ID Number	Time	Comp/Grab	Sample Depth (ft)	Coordinates		Sample Description	# of Bottles
				Ref. Pt.	Ref. Pt.		
EXSA49CA	1000	C	1'	SEE	MAP	TAN Brown soil sand material	3x002 1x10
EXSA49CB	1040	C	1'	"	"	"	1x002 1x10
EXSA49CC	1100	C	1'	"	"	"	3x002 1x10
EXSA49CD	1120	C	1'	"	"	"	3x002 1x10
EXSA49CE	1040	C	1'	"	"	"	1x10

Ref. Pt. UA: \_\_\_\_\_

Ref. Pt. UA: \_\_\_\_\_

Map Attached: (Yes)      No

Sample Type:    Screening      Confirmation      Disposal/Characterization

Laboratory Destination:    Onsite Lab      ASC - coc # 107636      USACE- coc # 107637

Duplicate Taken:    Yes (No)      Rinsate Taken:    Yes (No)

**On-site Laboratory Chain of Custody/Request for Analysis**

Requested Testing:    TPH      BTEX      Chlordane      PCBs      Other \_\_\_\_\_

Relinquished by(dd/tt): \_\_\_\_\_      Received by (dd/tt): \_\_\_\_\_

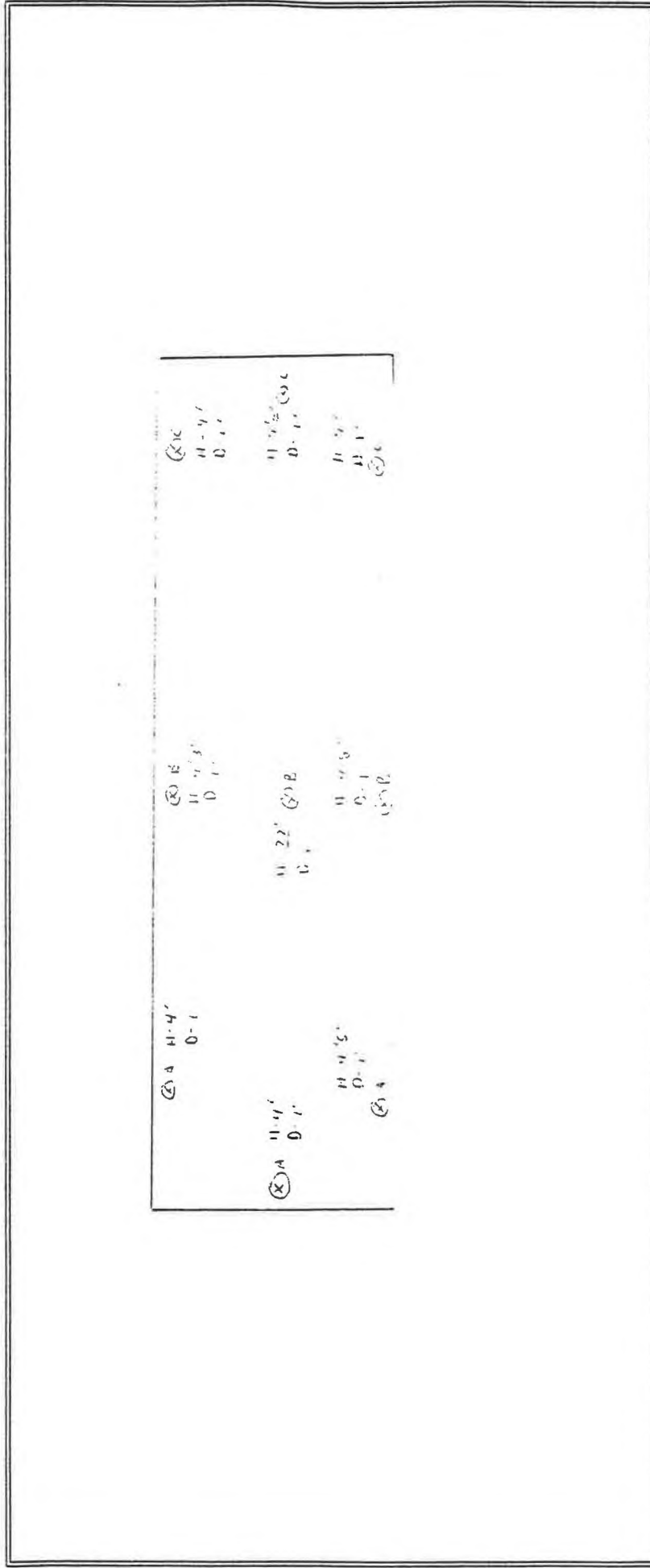
Relinquished by(dd/tt): \_\_\_\_\_      Received by (dd/tt): \_\_\_\_\_

# Sample Location Map Fort Devens - Project #16208

Pg. 2 of 2

Date: 9-8-04

Site Name: SA44



Comments/Observations:

Prepared by: Bill Allen



**Soil Sample Collection Log  
Fort Devens - Project #16208**

Pg. 1 of 2

Date: 10-24-94

Site Name: SA49

Weather: SNOWY

Samplers: BO

Sample ID Number	Time	Comp/ Grab	Sample Depth (ft)	Coordinates		Sample Description	# of Bottles
				Ref. Pt.	Ref. Pt.		
EXSA4403	1459	C	1'			Gold brown sandy soil	1 X 402

Ref. Pt. \_\_\_\_: \_\_\_\_\_

Ref. Pt. \_\_\_\_: \_\_\_\_\_

Map Attached: Yes No

Sample Type: Screening Confirmation Disposal/Characterization

Laboratory Destination: Onsite Lab ASC - coc # 107719 USACE- coc # 107714

Duplicate Taken: Yes No Rinsate Taken: Yes No

**On-site Laboratory Chain of Custody/Request for Analysis**

Requested Testing: TPH BTEX Chlordane PCBs Other \_\_\_\_\_

Relinquished by(dd/tt): \_\_\_\_\_ Received by (dd/tt): \_\_\_\_\_

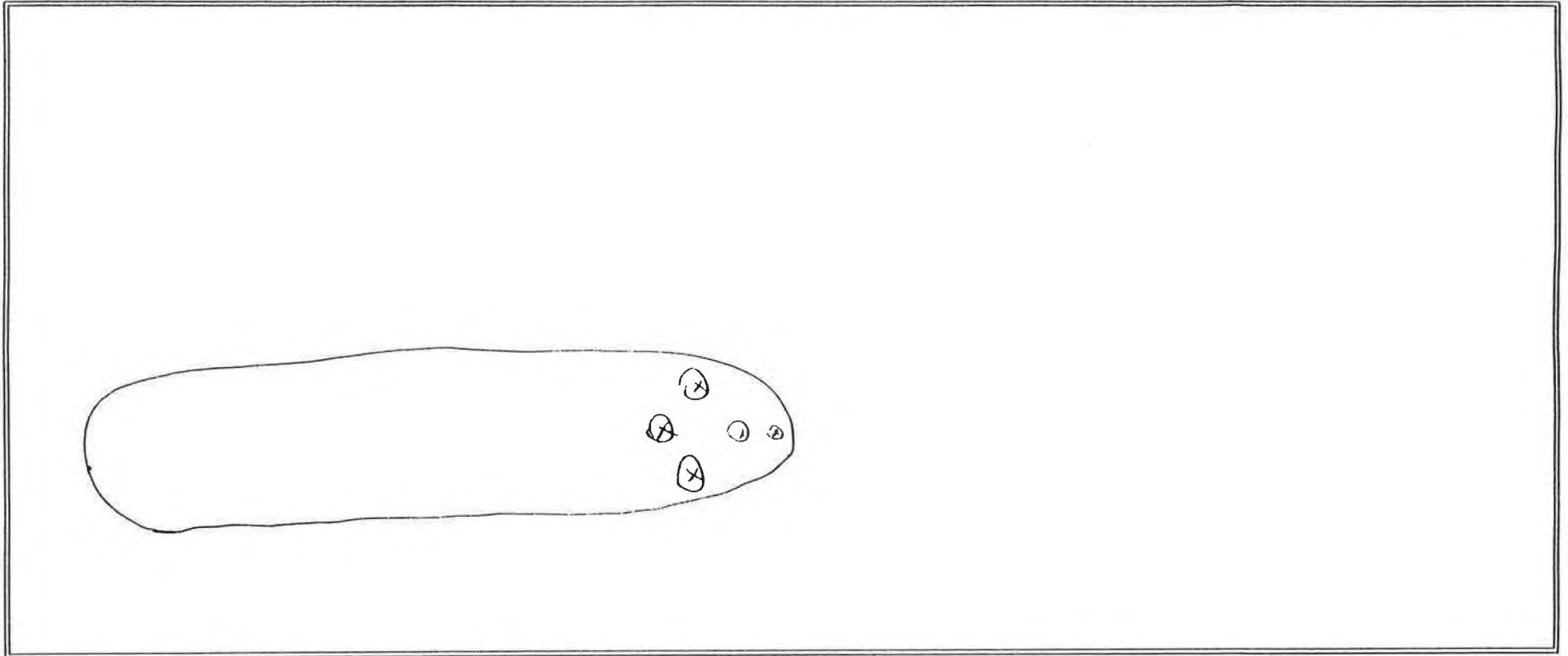
Relinquished by(dd/tt): \_\_\_\_\_ Received by (dd/tt): \_\_\_\_\_

Sample Location Map  
Fort Devens - Project #16208

Pg. 2 of 2

Date: 10-24-94

Site Name: SA44



Comments/Observations:

Prepared by: RLH

**Soil Sample Collection Log**  
**Fort Devens - Project #16208**

Date:

24  
10-24-94

Site Name:

SAT

Pg. 1 of 2

Weather:

Sunny

Samplers:

BD

Sample ID Number	Time	Comp/Grab	Sample Depth (ft)	Coordinates		Sample Description	# of Bottles
				Ref. Pt.	Ref. Pt.		
EXSA 1914	1257	G	1'-6"			Fine golden clay, collected from pile A	2-
EXSA 1914 PBL	1257	G	1'-6"			Fine golden clay, ground from pile B	2
EXSA 1914 PCE	1301	G	1'-6"			Fine golden clay, ground from pile C	1

Ref. Pt. \_\_\_\_\_

Ref. Pt. \_\_\_\_\_

Map Attached: ☒ Yes ☐ No

Sample Type:    Screening    Confirmation    Disposal/Characterization

Laboratory Destination:    Onsite Lab    ASC - coc # 107719    USACE - coc # 107714

Duplicate Taken:    Yes ☒ No    Rinsate Taken:    Yes ☒ No

**On-site Laboratory Chain of Custody/Request for Analysis**

Requested Testing:    TPH    BTEX    Chlordane    PCBs    Other \_\_\_\_\_

Relinquished by(dd/tt): \_\_\_\_\_ Received by (dd/tt): \_\_\_\_\_

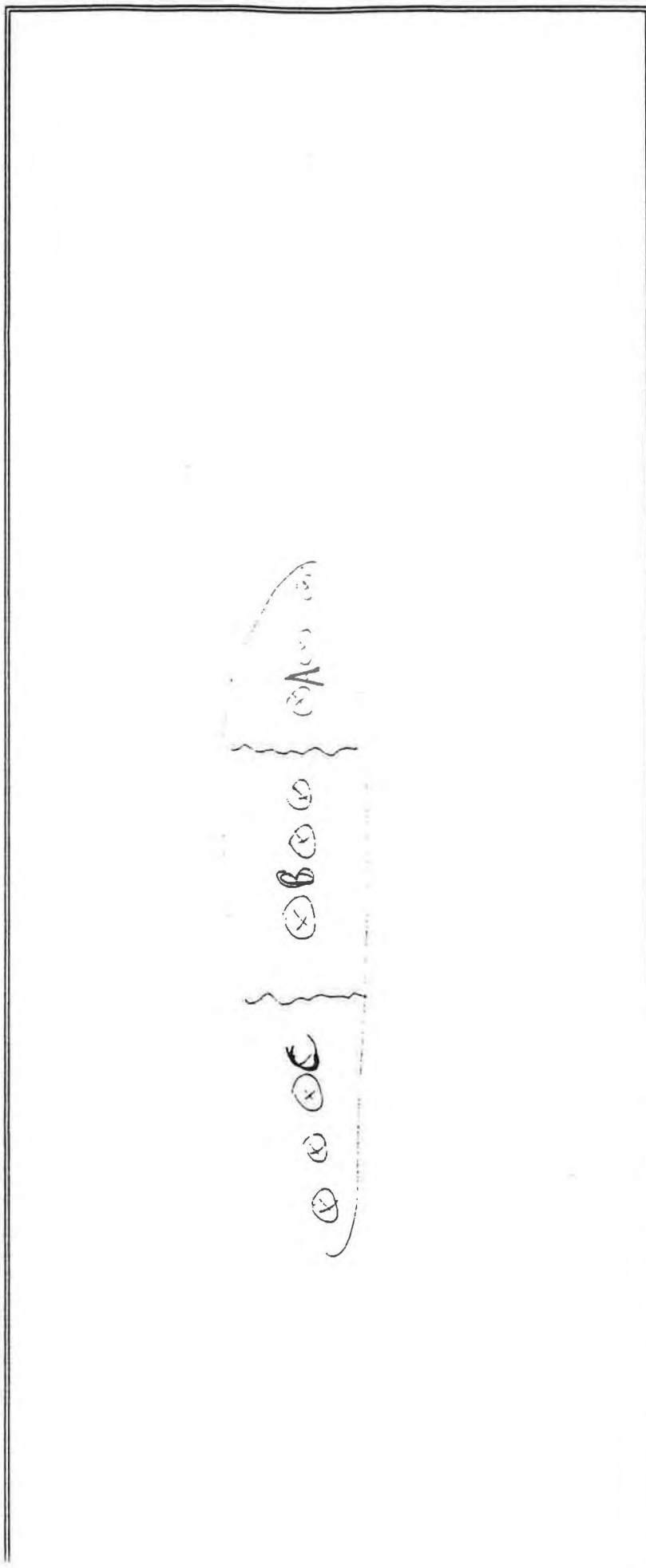
Relinquished by(dd/tt): \_\_\_\_\_ Received by (dd/tt): \_\_\_\_\_

Sample Location Map  
Fort Devens - Project #16208

Pg. 2 of 2

Date: 10-24-94

Site Name: 5A4H



Comments/Observations:

Prepared by: MLL

Appendix B  
ASC Analytical Report - Confirmation Soil Sample Results





Analytical Services Corp.

## ANALYTICAL REPORT

**Client:** OHM Remediation Services Corporation  
Eastern Region (Trenton, NJ)

**Attn:** William Snow  
Ron Kenyon

**Project:** 16208C - USACE; Fort Devens, MA

**Sample Type(s):** Solid

**Analysis Performed:** Conventional and Organic

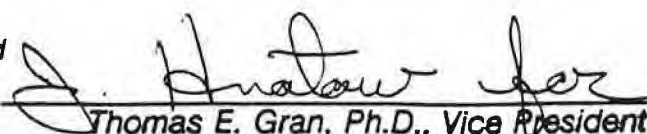
**Date Sample Received:** August 3, 1994

**Date Order Received:** August 3, 1994

**Joblink(s):** 616351

*This report is "PROPRIETARY AND CONFIDENTIAL" and delivered to, and intended for the exclusive use of the above named client only. Analytical Services Corporation assumes no responsibility or liability for the reliance hereon or use hereof by anyone other than the above named client.*

Reviewed and  
Approved by:

  
Thomas E. Gran, Ph.D., Vice President

Date: August 10, 1994

## PROJECT NARRATIVE

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The following items relate to the samples and analytical data contained in this report.

- o All sample results are reported on a "dry weight" basis.
- o Quality Assurance data for the PNA Analysis is provided on Table #MS02 in Appendix C.
- o Note any and all comments at the bottom of the tables in Appendix B and/or Appendix C.
- o **ASC** will retain samples for a maximum of thirty (30) days after completion of the analysis, samples will be held for a longer period of time, if appropriate arrangements are made in advance. A nominal disposal charge of \$5.00/sample will be imposed for unreturned samples.

**APPENDIX A**  
**DATA SUMMARY REPORT**

**NOTE:** The Tentatively Identified Volatile (GC/MS) Screen result(s), if applicable, is included in Appendix B.

# DATA SUMMARY REPORT

DATE: 08/09/94

PAGE: 1

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:	SBSA49AN1	SBSA49AS1	SBSA49AW1	SBSA49AE1	SBSA49B1	SBSA49DUP1
ASC Sample Number:	JN0902	JN0903	JN0904	JN0905	JN0906	JN0907
Sample Date:	940802	940802	940802	940802	940802	940802
Facility Code:	016208C	016208C	016208C	016208C	016208C	016208C

Parameters

Units

## Conventional Data (CV10)

Solids, Total	%	85.6	80.1	81.4	80.2	81.7	78.4
---------------	---	------	------	------	------	------	------

## BTIE Volatile Analysis, GC, (GV33)

Benzene	mg/kg	<.001	<.001	<.001	<.001	<.006	<.001
Ethylbenzene	mg/kg	<.001	<.001	<.001	<.001	.031	.002
Toluene	mg/kg	<.001	<.001	<.001	<.001	.045	.001
Xylenes	mg/kg	.002	.005	<.001	<.001	.108	.008

# DATA SUMMARY REPORT

DATE: 08/09/94

PAGE: 1

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:	SBSA49ANC	SBSA49ASC	SBSA49AWC	SBSA49AEC	SBSA49ABC	SBSA49DUP2
ASC Sample Number:	JN0908	JN0909	JN0910	JN0911	JN0912	JN0913
Sample Date:	940802	940802	940802	940802	940802	940802
Facility Code:	016208C	016208C	016208C	016208C	016208C	016208C

Parameters	Units
------------	-------

## Conventional Data (CV10)

Solids, Total	%	86.1	74.7	79.3	79.0	78.8	79.9
---------------	---	------	------	------	------	------	------

## Total Petroleum Hydrocarbon Analysis, IR (IR00)

Petroleum Hydrocarbons (IR)	mg/kg	128	<13.1	153	17.4	77.6	<12.5
-----------------------------	-------	-----	-------	-----	------	------	-------

## Special Requested Base/Neutral/Acid Analysis, MS, (MS42)

2-Methylnaphthalene	mg/kg	<.385	<.442	<.415	<.415	<.417	<.413
Naphthalene	mg/kg	<.385	<.442	<.415	<.415	<.417	<.413
Phenanthrene	mg/kg	<.385	<.442	<.415	<.415	<.417	<.413



**APPENDIX B**

**QUANTITATIVE RESULTS**

### CONVENTIONAL DATA (CV10)

Company Name

Facility

### Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49AN1**

JN0902

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	85.6	.100	-	

### CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49AS1**

JN0903

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	80.1	.100	-	

### CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49AW1**

JN0904

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	81.4	.100	-	

### CONVENTIONAL DATA (CV10)

Company Name

Facility

### Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49AE1**

JN0905

[illegible]



### CONVENTIONAL DATA (CV10)

**Company Name**

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49B1**

JN0906

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	81.7	.100	-	

### CONVENTIONAL DATA (CV10)

**Company Name**

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49DUP1**

JN0907

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	78.4	.100	-	

### CONVENTIONAL DATA (CV10)

**Company Name**

### Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49ANC**

JN0908

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	86.1	.100	-	

### CONVENTIONAL DATA (CV10)

Company Name

Facility

### Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49ASC**

JN0909

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	74.7	.100	-	

### CONVENTIONAL DATA (CV10)

**Company Name**

Facility

**Sample Point**

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49AWC**

JN0910

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	79.3	.100	-	



### CONVENTIONAL DATA (CV10)

**Company Name**

Facility

### Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49AEC**

JN0911

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	79.0	.100	-	

### CONVENTIONAL DATA (CV10)

**Company Name**

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49ABC**

JN0912

[illegible]

### CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49DUP2**

JN0913

[illegible]

**BTXE VOLATILE ANALYSIS, GC, (GV33)**

**Company Name**

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49AN1**

JN0902

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	ND	.001	ND	Q2W3759
Ethylbenzene	ND	.001	ND	Q2W3759
Toluene	ND	.001	ND	Q2W3759
Xylenes	.002	.001	ND	Q2W3759

**BTXE VOLATILE ANALYSIS, GC, (GV33)**

**Company Name**

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49AS1**

JN0903

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	ND	.001	ND	Q2W3759
Ethylbenzene	ND	.001	ND	Q2W3759
Toluene	ND	.001	ND	Q2W3759
Xylenes	.005	.001	ND	Q2W3759



**BTXE VOLATILE ANALYSIS, GC, (GV33)**

**Company Name**

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49AW1**

JN0904

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	ND	.001	ND	Q2W3759
Ethylbenzene	ND	.001	ND	Q2W3759
Toluene	ND	.001	ND	Q2W3759
Xylenes	ND	.001	ND	Q2W3759

BTXE VOLATILE ANALYSIS, GC, (GV33)

**Company Name**

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49AE1**

JN0905

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	ND	.001	ND	Q2W3759
Ethylbenzene	ND	.001	ND	Q2W3759
Toluene	ND	.001	ND	Q2W3759
Xylenes	ND	.001	ND	Q2W3759

BTXE VOLATILE ANALYSIS, GC, (GV33)

**Company Name**

Facility

### Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49B1**

JN0906

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	ND	.006	ND	Q2W3759
Ethylbenzene	.031	.006	ND	Q2W3759
Toluene	.045	.006	ND	Q2W3759
Xylenes	.108	.006	ND	Q2W3759

**BTXE VOLATILE ANALYSIS, GC, (GV33)**

**Company Name**

Facility

Sample Point

ASC Sample No.

**OHM REMEDIATION SERVICES CORPORATION**

016208C

**SBSA49DUP1**

JN0907

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	ND	.001	ND	Q2W3759
Ethylbenzene	.002	.001	ND	Q2W3759
Toluene	.001	.001	ND	Q2W3759
Xylenes	.008	.001	ND	Q2W3759

## TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)

**Company Name**

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49ANC**

JN0908

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Petroleum Hydrocarbons (IR)	128	11.6	ND	Q2T41069



**TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)**

**Company Name**

Facility

### Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49ASC**

JN0909

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Petroleum Hydrocarbons (IR)	ND	13.1	ND	Q2T41069

**TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)**

**Company Name**

**Facility**

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49AWC**

JN0910

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Petroleum Hydrocarbons (IR)	153	12.4	ND	Q2T41069

## TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)

**Company Name**

Facility

### Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA49AEC

JN0911

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Petroleum Hydrocarbons (IR)	17.4	12.5	ND	Q2T41069

**TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)**

**Company Name**

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49ABC**

JN0912

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Petroleum Hydrocarbons (IR)	77.6	12.5	ND	Q2T41069

**TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)**

**Company Name**

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**SBSA49DUP2**

JN0913

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Petroleum Hydrocarbons (IR)	ND	12.5	ND	Q2T41069

**SPECIAL REQUESTED BASE/NEUTRAL/ACID ANALYSIS, MS, (MS42)**

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA49ANC

JN0908

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
2-Methylnaphthalene	ND	.385	ND	Q2C41063
Naphthalene	ND	.385	ND	Q2C41063
Phenanthrene	ND	.385	ND	Q2C41063



**SPECIAL REQUESTED BASE/NEUTRAL/ACID ANALYSIS, MS, (MS42)**

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA49ASC

JN0909

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
2-Methylnaphthalene	ND	.442	ND	Q2C41063
Naphthalene	ND	.442	ND	Q2C41063
Phenanthrene	ND	.442	ND	Q2C41063

SPECIAL REQUESTED BASE/NEUTRAL/ACID ANALYSIS, MS, (MS42)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA49AWC

JN0910

[illegible]

**SPECIAL REQUESTED BASE/NEUTRAL/ACID ANALYSIS, MS, (MS42)**

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA49AEC

JN0911

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
2-Methylnaphthalene	ND	.415	ND	Q2C41063
Naphthalene	ND	.415	ND	Q2C41063
Phenanthrene	ND	.415	ND	Q2C41063

**SPECIAL REQUESTED BASE/NEUTRAL/ACID ANALYSIS, MS, (MS42)**

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

SBSA49ABC

JN0912

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
2-Methylnaphthalene	ND	.417	ND	Q2C41063
Naphthalene	ND	.417	ND	Q2C41063
Phenanthrene	ND	.417	ND	Q2C41063

ASC Sample No.

570913

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
2-Methylnaphthalene	ND	.413	ND	Q2C41063
Naphthalene	ND	.413	ND	Q2C41063
Phenanthrene	ND	.413	ND	Q2C41063

**APPENDIX C**  
**QUALITY ASSURANCE DATA**



## SUMMARY OF ANALYTICAL METHODOLOGY

Parameter	Reference	Method
<b>Conventionals</b>		
Solids, Total (solid)	CAWW	160.3
<b>Organics</b>		
Semi-volatile Compounds by GC/MS	SW-846	8270
Total Petroleum Hydrocarbons (TPHC) by IR	CAWW	418.1
BTXE by GC	SW-846	8020

## METHODOLOGY REFERENCES

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- ASTM**      *American Society for Testing and Materials*, 1985 edition.
- CAWW**      *Methods for Chemical Analysis of Water and Wastes*, April 1979 and Updated #1 March 1983.
- CLP**        *USEPA Contract Laboratory Program*, Document #OLMO1.0, updates December 1990 #OLMO1.1 and February 1991 #OLMO1.1.1.
- EPA-500**    *USEPA Methods for the Determination of Organic Compounds in Drinking Water*, EPA-600/4-88/039 December 1988.
- EPA-600**    *USEPA Test Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater*, EPA-600/4-82-057 July 1982.
- NIOSH**      *National Institute for Occupational Safety and Health*, 3rd edition, 1984.
- SMEWW**    *Standard Methods for the Examination of Water and Wastewater*, 17th edition, 1989.
- STOA**       *Spot Tests In Organic Analysis*, 7th edition, 1966.
- SW-846**    *Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, 3rd edition, September 1986 and Update #1 July 1992.
- (1)**          This method was modified to incorporate the use of Boron Trifluoride (BF<sub>3</sub>) as the derivatizing reagent according to Method 6640 in *SMEWW*, 17th edition, 1989.
- Title 22**    *Waste Extraction Test*, Title 22, Section 66261.126 Appendix 2 of the California Administrative Code, May 1991.

## ASC Certifications

State	Agency	Certification #
Alabama	ADEM	40830
California	CADOH	1178
Colorado	CODOH	OH113
Delaware	DEHSS	OH113
Kansas	KSDHE	E-202 & E-1173
Louisiana	LADOHH	92-10
Maryland	MDDHMH	210
Massachusetts	MADEP	M-OH113
New Jersey	NJDEPE	74603
New York	NYDOH	10712
North Carolina	NCDEM	392
Ohio	OHEPA	OH113
Oklahoma	OKDEQ	9216
Pennsylvania	PADER	68-450
South Carolina	SCDEHNR	92002
Tennessee	TNDOH/TNDEC	2978
Virginia	VADGS	00011
Washington	WADOE	C154
Wisconsin	WIDNR	999037160

### Validated by:

- o US Army Corps of Engineers ..... Chemical Analysis In Various Matrices

### Approvals:

- o Chemical Waste Management ..... Waste Characterization Analysis
- o EnviroSAFE ..... Waste Characterization Analysis
- o USDA ..... Permit for Importing Soils
- o Florida DEP ..... Quality Assurance Plan #930034G
- o Naval Facilities Engineering Service Center ..... Chemical Analysis In Various Matrices

## REPORT KEY

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mg/kg	= milligram per kilogram (ppm)
Mg/m <sup>3</sup>	= milligram per cubic meter
ug/kg	= microgram per kilogram (ppb)
mg/L	= milligram per liter (ppm)
ug/L	= microgram per liter (ppb)
mg/W	= milligram per wipe
ug/W	= microgram per wipe
mg/SMP	= milligram per sample
ug/SMP	= microgram per sample
um/cm	= microMho per centimeter
pCi/l	= picocurie per liter
gm/cc	= grams per cubic centimeter
ppm	= parts per million
ppb	= parts per billion
ND	= Not detected at or above stated detection limit
<	= less than
>	= greater than
%	= percent
BTU/lb	= British Thermal Units per pound
Deg. C	= Degrees Celsius
n/a	= not applicable
Unk	= unknown
std	= result is relative to standard pH units
CV	= Conventional
IR	= Infrared Spectrophotometric
GC	= Gas Chromatograph Instrument
GC/MS	= Gas Chromatography/Mass Spectrometer Instrument
GRO	= Gasoline Range Organics
DRO	= Diesel Range Organics
PCB	= Polychlorinated Biphenyls (PCBs)
EP TOX	= Extraction Procedure Toxicity
TCLP	= Toxicity Characteristic Leaching Procedure
RCRA	= Resource Conservation and Recovery Act

**BTXE VOLATILE ANALYSIS, GC, (GV33)**

6

# QUALITY ASSURANCE DATA

## TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Petroleum Hydrocarbons (IR)	ND	73	ND	64	16	Q2T41069



## TOTAL BASE/NEUTRAL/ACID ANALYSIS, MS, (MS02)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Acenaphthene	ND	72	ND	78	5	Q2C41063
Benzidine	ND	32	ND	-	-	Q2C41063
bis (2-Chloroethoxy) methane	ND	59	ND	65	4	Q2C41063
bis (2-Chloroisopropyl) ether	ND	71	ND	77	2	Q2C41063
p-Chloro-m-cresol	ND	74	ND	83	3	Q2C41063
2-Chloronaphthalene	ND	71	ND	79	3	Q2C41063
2-Chlorophenol	ND	72	ND	78	4	Q2C41063
Dibenzo (a, h) anthracene	ND	75	ND	-	-	Q2C41063
Di-n-butyl phthalate	ND	81	ND	92	1	Q2C41063
1,3-Dichlorobenzene	ND	64	ND	69	1	Q2C41063
1,4-Dichlorobenzene	ND	66	ND	71	1	Q2C41063
Diethyl phthalate	ND	110	ND	118	3	Q2C41063
4,6-Dinitro-o-cresol	ND	46	ND	53	15	Q2C41063
2,4-Dinitrotoluene	ND	77	ND	85	2	Q2C41063
Fluoranthene	ND	80	ND	84	4	Q2C41063
Fluorene	ND	72	ND	78	4	Q2C41063
Hexachlorobenzene	ND	77	ND	83	5	Q2C41063
Hexachlorocyclopentadiene	ND	60	ND	-	-	Q2C41063
2-Methylphenol	ND	64	ND	75	3	Q2C41063
4-Methylphenol	ND	65	ND	73	4	Q2C41063
N-Nitrosodimethylamine	ND	67	ND	73	2	Q2C41063
N-Nitrosodi-n-propylamine	ND	72	ND	78	3	Q2C41063
4-Nitroaniline	ND	74	ND	75	1	Q2C41063
2-Nitrophenol	ND	60	ND	67	3	Q2C41063
4-Nitrophenol	ND	71	ND	85	2	Q2C41063
Pentachlorophenol	ND	48	ND	75	6	Q2C41063
Phenol	ND	20	ND	23	19	Q2C41063
Pyrene	ND	82	ND	99	5	Q2C41063
1,2,4-Trichlorobenzene	ND	69	ND	76	3	Q2C41063

1-Methyl- and 4-Methylphenol coelute and are reported as the total  
Batch acceptance based on method spike recoveries.  
Due to apparent interactions between the spiked compound and sample  
components, no matrix spike recoveries were observed for the  
parameters designated with a dash.

# QUALITY ASSURANCE DATA SURROGATE SUMMARY REPORT

SURROGATE ID	A159	B732	A121	A884	A158	B142	# OUT
QC BATCH: Q2C41063 Solid (Semi-Volatile organics by MS)							
SAMPLE ID							
BLANK	66	74	46	61	79	91	0
BLANK SPIKE	71	79	72	64	83	88	0
SBSA49ABC	67	75	51	61	76	88	0
SBSA49AEC	72	80	63	63	81	90	0
SBSA49ANC	79	85	71	68	87	99	0
SBSA49ANC MD	75	83	83	68	90	106	0
SBSA49ANC MS	75	81	79	67	88	101	0
SBSA49ASC	73	79	51	62	79	88	0
SBSA49AWC	70	78	60	62	81	91	0
SBSA49DUP2	66	73	46	57	73	82	0
QC LIMITS	(25-121) (24-113) (19-122) (23-120) (30-115) (18-137)						

SURROGATE ID	A228	# OUT
QC BATCH: Q2W3759 Solid (Volatile organics by GC)		
SAMPLE ID		
BLANK	93	0
BLANK SPIKE	100	0
SBSA49AE1	75	0
SBSA49AN1	89	0
SBSA49AS1	67	0
SBSA49AW1	83	0
SBSA49B1	99	0
SBSA49DUP1	55	0
SBSA49DUP1 MD	73	0
SBSA49DUP1 MS	80	0
QC LIMITS	(30-130)	

SURROGATE ID
A159 = 2-Fluorophenol
B732 = Phenol-D6
A121 = 2,4,6-Tribromophenol
A884 = Nitrobenzene-D5
A158 = 2-Fluorobiphenyl
B142 = Terphenyl-D14
A228 = a,a,a-Trifluorotoluene

\* Values outside of method quality control limits  
D Sample was diluted, however, some surrogates may be reported if results were observed.

It is ASC's laboratory policy to allow one surrogate per sample fraction (acid, base-neutral or pesticide) to exceed the stated QC limits. This policy is based upon the USEPA SOW for the Contract Laboratory Program (CLP).

**APPENDIX D**  
**CHAIN-OF-CUSTODY RECORD(S)**



OHM Corporation

## CHAIN-OF-CUSTODY RECORD

Form 0019

Field Technical Services

Rev. 08/89

No. 107601

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME		PROJECT LOCATION		NUMBER OF CONTAINERS		ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)  TRPH CIE Naphthalene, 2-Methyl Phenol										REMARKS						
PROJ. NO.	PROJECT CONTACT	PROJECT TELEPHONE NO.	CLIENT'S REPRESENTATIVE															PROJECT MANAGER/SUPERVISOR				
ITEM NO.	SAMPLE NUMBER	DATE	TIME															COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	ANALYSIS	REMARKS
Fort Pevers																		Ayer Ma				
16208					Maurice Blum					(508) 772-2610												
Tom Best					USACE					Bill Snow												
1	SBSA49AN1	8/24/94	1653			N side of excavation, some black spots in gold sand	2x404 VOA	✓														
2	SBSA49ANL		1530			N side of excavation, some black spots in gold sand	2x402 GL200	✓	✓													
3	SBSA49AS1		1500			grey clay like soil, packed firm, south side of excavation	2x404 VOA	✓														
4	SBSA49ASL		1500			grey clay like soil, packed firm, south side of excavation	2x402 GL	✓	✓													
5	SBSA49AW1		1708			golden sand, some black markings, W side of excavation	2x404 VOA	✓														
6	SBSA49AWL		1515			golden sand, some black markings, west side of excavation	2x402 GL200	✓	✓													
7	SBSA49AE1		1202			gold sand / grey clay mix, East side of excavation	2x404 VOA	✓							Label reads SBSA49AE1							
8	SBSA49AEL		1524			gold sand, grey clay mix, East side of excavation	2x402 GL200	✓	✓													
9	SBSA49B1		1644			grey clay, wet, Bottom of excavation	2x404 VOA	✓														
10	SBSA49BCL	✓	1522			grey clay, wet, Bottom of excavation	2x402 GL200	✓	✓													

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	1-10	ENBLE	Fed Ex Airtel 1779840790	8/24/94	2000	• Samples preserved at 4°C
2	1-10	Fed Ex 1779840790		8/30/94	1004	• 3 day TAT
3						• temperature Black, included temp°C, 99
4						SAMPLE'S SIGNATURE: ENBLE

LAB COPY



Appendix C  
Chemical Quality Assurance Report



RECORD OF TRANSMITTAL

CENED-ED-GL

6 February 1995

FOR Project Engineer, Mr. Mark Applebee  
U.S. Army Corps of Engineer,  
New England Division  
424 Trapelo Rd.  
Waltham, MA 02254-9149

SUBJECT: Fort Devens - Study Area 49, Chemical Quality  
Assurance Report (CQAR)

1. References:

- a. Project No. E0251
- b. Contractor Data Report, Dated November 9, 1994.
- c. Memorandum, CEMRD-ED-GC, 16 Aug 1989, Subject: Minimum Chemistry Data Reporting Requirements for DERP and Superfund HTW Projects.

2. Four QA samples were analyzed, resulting in a total of 79 target analyte determinations. Results from analysis of QA samples were compared with results from analysis of the corresponding primary samples (ref 1b). Results of the comparison are as follows:

- a. The contractor's laboratory was Analytical Services Corporation, Findlay, OH, (ASC).
- b. Results from the primary and QA samples agreed overall in 76 (96%) of the comparisons.
- c. Results from the primary and QA samples agreed quantitatively in 5 (50%) of the comparisons.
- d. There were 2 (2.5%) major discrepancies between results from the primary and QA laboratory samples.
- e. There were minor discrepancies between results from the primary and QA samples in 3 (3.5%) of the comparisons.

3. QA analyses were mostly performed in-house at the Environmental Laboratory. QA analyses were also performed at E3I, Sommerville, MA.

4. The CENED-ED-GL POC is Gary S. Rogowski, 508-928-4238.

Encl

CF (w/encl):

CEMP-RT Larry Becker

CEMRD-ED-EC Anand Mudambi

## QA Findings

(Ft. Devens SA49)

### 1. QA sample shipping and chain-of-custody deficiencies.

Three sample shipments of QA samples were received on August 3, August 12, and September 9, 1994. Proper sample handling protocols were mostly followed with the following exception, 8/3/94 no custody seals on the outside of the cooler and the project was not identifiable from the custody papers; 8/12/94 the project was not identifiable from the custody papers; 9/9/94 there was some headspace in the soil VOA containers. The chain-of-custody documents and cooler receipt form are appended to this report for reference. All shipment information was faxed to Mr. Mark Applebee within 24 hours of receipt.

### 2. Data comparison for BTEX.

There were four determinations. In 3 of these determinations BTEX were detected by both the QA lab and contractor's lab. There was an overall agreement in 1 (25%) and 0 (0%) quantitative agreement of the cases. There were 2 (50%) major discrepancies and 1 (25%) minor discrepancy between the QA and contractor's laboratory.

In sample 26770 there were major discrepancies in which the contractor's laboratory reported <1 ng/g ethylbenzene and 5 ng/g total xylenes, whereas the QA lab reported 17 ng/g ethylbenzene and 400 ng/g total xylenes.

### 3. Data comparison for TPH.

There was one determination. In this determination TPH was detected by both the QA lab and contractor's lab. There was an overall and quantitative agreement of 1 (100%). No major or minor discrepancies were noted.

### 4. Data comparison for BNA.

There were 3 determinations. In 1 of these determinations BNA's were detected by the QA lab. There was an overall and quantitative agreement of 3 (100%). No major or minor discrepancies were noted.

### 5. Data comparison for TCLP BNA.

There were 24 determinations. In 0 of these determinations BNA's were detected by the QA lab or contractor's laboratory. There was 100% agreement. There were no major or minor discrepancies.

### 6. Data comparison for TCLP Metals.

There were 16 determinations. In 3 of these determinations metals were detected by the QA lab or contractor's laboratory. There was an overall agreement in 6 (75%) and 1 (33%) quantitative agreement. There were 2 (25%) minor discrepancies between the QA lab and the contractor's laboratory. No major discrepancies were noted.

7. Data comparison for TCLP Pesticides.

There were 7 determinations. In 0 of these determinations pesticides were detected by the QA lab or contractor's laboratory. There was 100% agreement. There were no major or minor discrepancies noted.

8. Data comparison for TCLP VOA.

There were 22 determinations. In 0 of these determinations VOA's were detected by the QA lab or contractor's laboratory. There was 100% agreement. There were no major or minor discrepancies noted.

9. Data comparison for TCLP Herbicides.

There were 2 determinations. In these determinations no herbicides were detected by the QA lab or contractor's laboratory. There was 100% agreement. No major or minor discrepancies were noted.

10. Comments.

Contractor's data package was not in full compliance with Minimum Chemistry Data Reporting Requirements as sample receiving information, method numbers were not provided and surrogate recoveries for the organics were not provided. For sample number 26908 no TCLP pesticide data will be available due to the sample being lost during the extraction procedure.

Quality Assurance Split Sample  
Data Comparison Summary

Project: Ft. Devens - SA49

Test Parameter	Overall Agreement (1)		Quantitative Agreement (2)	
	Number	Percent	Number	Percent
BNA- TCLP	24/24	100	0/0	N/A
Metals-TCLP	16/16	100	1/3	33
Pest-TCLP	7/7	100	0/0	N/A
VOA-TCLP	22/22	100	0/0	N/A
Herb-TCLP	2/2	100	0/0	N/A
BTEX	1/4	25	0/3	0
TPH	1/1	100	1/1	100
BNA	3/3	100	3/3	100
Total	76/79	96	5/10	50

NOTES:

- (1) Represents the number and percentage agreement of all determinations including analytes not detected by either laboratory.
- (2) Represents the number and percentage agreement of only those determinations where an analyte was detected by at least one laboratory.

**APPENDIX B**  
**KEY TO COMMENTS ON DATA COMPARISON TABLES**

0 - Data agrees if any one of the following apply:

- both values are less than respective detection limit ( $N < MDL$ )
- $N_1 < MDL_1$  and  $N_2 > MDL_2$  but  $< MDL_1$
- both values are above respective detection limit ( $N > MDL$ ) and difference between two values satisfies conditions below

Metals	<2x difference for waters, TCLP extracts <3x difference for airs <10x difference for solids and oils
--------	--

Semivolatiles Volatiles TPH, BTEX	<5x difference for all matrices
---	---------------------------------

Pesticides Herbicides PCB's	<5x difference for liquids <10x difference for solids
-----------------------------------	--

Alkalinity Hardness, Ammonia (water quality, etc.)	<2x difference for all matrices
--	---------------------------------

- 1 - Minor contamination by laboratory contaminant  
 2 - Not tested by both laboratories  
 3 - Minor data discrepancy, disagreement not serious, if any one of the following apply:

- $N_1 < MDL_1$  and  $N_2 > MDL_2$  and the difference between values  $N_2$  and  $MDL_1$  does not exceed the upper limit (described below) defining a minor data discrepancy
- both values are above respective detection limit ( $N > MDL$ ) and conditions described below apply to the difference between the two values

Metals	2x < difference < 5x for waters, TCLP extracts 10x < difference < 20x for solids, oils 3x < difference < 5x for airs
--------	--

Semivolatiles, VOA, TPH, BTEX	5x < difference < 10x for all matrices
----------------------------------	--

Pesticide/PCB Herbicides	5x < difference < 10x for liquids 10x < difference < 20x for solids
-----------------------------	--

Alkalinity Hardness, Ammonia (water quality, etc.)	2x < difference < 5x for all matrices
--	---------------------------------------



4 - Major data discrepancy, disagreement serious, if any one of the following apply:

- $N_1 < MDL_1$  and  $N_2 > MDL_2$  and the difference between values  $N_2$  and  $MDL_1$  exceeds the limit (described below) defining a major data discrepancy
- both values are above respective detection limit ( $N > MDL$ ) and conditions described below apply to the difference between the two values

Metals                      >5x difference for waters, TCLP extracts, airs  
                             >20x difference for solids, oils

Semivolatiles,      >10x difference for all matrices  
VOA, TPH, BTEX

Pesticide/PCB      >10x difference for liquids  
Herbicides           >20x difference for solids

Alkalinity           >5x difference for all matrices  
Hardness, Ammonia  
(water quality, etc.)

MDL = Method Detection Limit  
N    = Analytical result

Key to data qualifiers:

B - detected in method blank  
J - estimated value, above MDL but below practical quantitation limit  
NR - Not reported

## COMPARISON OF QA &amp; CONTRACTOR RESULTS

PROJECT: PORT DEVERNS

QA SAMPLE NO.: 26770                      CONTRACTOR'S SAMPLE NO.: JN0903  
QA FIELD ID: SBSA49ATEP1              CONTRACTOR'S FIELD ID: SBSA49AS1  
QA ANALYSIS DATE: 08/25/94              CONTRACTOR'S ANALYSIS DATE: 08/09/94

MATERIAL DESCRIPTION: SOLID

DATE SAMPLED: 08/02/94

UNITS: mg/g

PARAMETER	RESULTS		RESULTS		COMPARISON CODE
	QA LAB MDL	QA LAB	CONTRACTOR MDL	CONTRACTOR	
Benzene	< 1.3		< 1		0
Toluene	< 1.2	4.4	< 1		3
Ethylbenzene	< 1.1	17	< 1		4
o/m/p-Xylenes	< 1.5	400	< 1	5	4

## SURROGATE RECOVERIES (%)

	QA	CONTRACTOR
1,2-Dichloroethane D4 (76-114)	112	NR
Toluene D8 (88-110)	94	NR
4-Bromofluorobenzene (86-115)	87	NR

\* = SURROGATE RECOVERY OUTSIDE ACCEPTABLE RANGE

SEE APPENDIX B FOR KEY TO COMMENTS

## COMPARISON OF QA AND CONTRACTOR RESULTS

PROJECT: FORT DEVENS

ANALYSIS PERFORMED: TOTAL PETROLEUM HYDROCARBONS

UNITS: mg/kg

* SAMPLE	SAMPLE	CONTRACTOR	CONTRACTOR	ENV. LAB	QA FIELD	CONTRACTOR	QA LAB	C	*
* DATE	MATRIX	SAMPLE NO.	FIELD ID	NO.	ID	RESULTS	RESULTS		*
* 7/28/94	SOIL	JN0813	KXAR61K001	C-26672	KXAR61KTRP	2390	2800	0	*
* 8/02/94	SOIL	JN0909	SBSA49ASC	C-26771	SBSA49ATRP2	< 13	< 32	0	*
* 8/03/94	SOIL	JN0908	SBAR69ANC	C-26806	SBAR69ATRP	128	41	0	*
* 8/17/94	SOIL	JN1455	SBARKE69SC	C-26979	SBARKE69TRP	410	450	0	*
* 10/03/94	SOIL			C-27658	SBSA56TRP2		< 28		*
* 9/22/94	SOIL	JN2580	SBSA56SEC	C-27708	SBSA56TRPC	997	120	3	*
* 10/05/94	SOIL	JN3118	SB1435WC	C-27755	SB1435TRPC	< 7.4	< 28	0	*

COMPARISON OF QA & CONTRACTOR RESULTS  
PROJECT: PORT DEVENS

PAGE 1 OF 1

QA SAMPLE NO.: 26771  
QA FIELD ID: SBSA49ATRP2  
QA ANALYSIS DATE: 08/24/94

CONTRACTOR'S SAMPLE NO.: JW0909  
CONTRACTOR'S FIELD ID: SBSA49ASC  
CONTRACTOR'S ANALYSIS DATE: 08/09/94

MATERIAL DESCRIPTION: SOIL  
DATE SAMPLED: 08/02/94  
UNITS: ug/g

PARAMETER	RESULTS		RESULTS		COMPARISON CODE
	QA LAB MDL	QA LAB	CONTRACTOR MDL	CONTRACTOR	
Napthalene	< 0.0	J 0.015	< 0.442		0
2-Methylnapthalene	< 0.0		< 0.442		0
Acenaphthylene	< 0.0		NR	NA	2
Acenaphthene	< 0.0		NR	NA	2
Fluorene	< 0.0		NR	NA	2
Phenanthrene	< 0.0		< 0.442		0
Anthracene	< 0.0		NR	NA	2
Fluoranthene	< 0.0		NR	NA	2
Pyrene	< 0.0		NR	NA	2
Benzo (a) anthracene	< 0.0		NR	NA	2
Chrysene	< 0.0		NR	NA	2
Benzo (b) fluoranthene	< 0.1		NR	NA	2
Benzo (k) fluoranthene	< 0.1		NR	NA	2
Benzo (a) pyrene	< 0.1		NR	NA	2
Indeno (1,2,3-cd) pyrene	< 0.0		NR	NA	2
Dibenz (a,h) anthracene	< 0.0		NR	NA	2
Benzo (g,h,i) perylene	< 0.0		NR	NA	2

SURROGATE RECOVERIES (%)

	QA	CONTRACTOR
Nitrobenzene-d5	115	NR
2-Fluorobiphenyl	118	NR
Terphenyl-d14	131	NR

\* = SURROGATE RECOVERY OUTSIDE ACCEPTABLE RANGE

SEE APPENDIX B FOR KEY TO COMMENTS

## COMPARISON OF QA &amp; CONTRACTOR RESULTS

PROJECT: FORT DEVENS

QA SAMPLE NO.: 27315  
 QA FIELD ID: EISA49TEP  
 QA ANALYSIS DATE: 10/18/94

CONTRACTOR'S SAMPLE NO.: JN2071  
 CONTRACTOR'S FIELD ID: EISA49CA  
 CONTRACTOR'S ANALYSIS DATE: 09/20/94

MATERIAL DESCRIPTION: TCLP EXTRACT

DATE SAMPLED: 09/08/94

UNITS: ug/L

PARAMETER	QA LAB MDL	RESULTS	CONTRACTOR MDL	RESULTS	COMPARISON CODE
		QA LAB		CONTRACTOR	
1,4-Dichlorobenzene	< 0.13		< 125		0
2-Methylphenol	< 2.2		< 100		0
4-Methylphenol	< 1.55		< 100		0
Hexachloroethane	< 0.24		< 100		0
Nitrobenzene	< 0.53		< 100		0
Hexachlorobutadiene	< 0.18		< 100		0
2,4,6-Trichlorophenol	< 2.4		< 100		0
2,4,5-Trichlorophenol	< 2.2		< 100		0
2,4-Dinitrotoluene	< 1.25		< 100		0
Hexchlorobenzene	< 0.21		< 100		0
Pentachlorophenol	< 50		< 100		0
3-Methylphenol (m-cresol)	< 4.0		NR	NA	2

## SURROGATE RECOVERIES (%)

	QA	CONTRACTOR
2-Fluorophenol (10-94)	78	NR
Phenol (21-100)	62	NR
Nitrobenzene-d5 (35-114)	102	NR
2-Fluorobiphenyl (43-116)	103	NR
2,4,6-Tribromophenol (10-123)	97	NR
4-Terphenyl-d4 (33-141)	118	NR

SEE APPENDIX B FOR KEY TO COMMENTS

COMPARISON OF QA & CONTRACTOR RESULTS  
PROJECT: PORT DEVENS

QA SAMPLE NO.: 26908  
QA FIELD ID: EXSA49TRP1  
QA ANALYSIS DATE: 09/03/94

CONTRACTOR'S SAMPLE NO.: JN1314  
CONTRACTOR'S FIELD ID: EXSA4901  
CONTRACTOR'S ANALYSIS DATE: 08/22/94

MATERIAL DESCRIPTION: TCLF EXTRACT  
DATE SAMPLED: 08/11/94  
UNITS: ug/L

PARAMETER	QA LAB MDL	RESULTS	CONTRACTOR MDL	RESULTS	COMPARISON CODE
		QA LAB		CONTRACTOR	
1,4-Dichlorobenzene	< 0.13		< 125		0
2-Methylphenol	< 2.2		< 100		0
4-Methylphenol	< 1.55		< 100		0
Hexachloroethane	< 0.24		< 100		0
Nitrobenzene	< 0.53		< 100		0
Hexachlorobutadiene	< 0.18		< 100		0
2,4,6-Trichlorophenol	< 2.4		< 100		0
2,4,5-Trichlorophenol	< 2.2		< 100		0
2,4-Dinitrotoluene	< 1.25		< 100		0
Hexchlorobenzene	< 0.21		< 100		0
Pentachlorophenol	< 50		< 100		0
3-Methylphenol (m-cresol)	< 4.0		NR	NA	2

SURROGATE RECOVERIES (%)

	QA	CONTRACTOR
2-Fluorophenol (10-94)	97	NR
Phenol (21-100)	60	NR
Nitrobenzene-d5 (35-114)	100	NR
2-Fluorobiphenyl (43-116)	82	NR
2,4,6-Tribromophenol (10-123)	84	NR
4-Terphenyl-d4 (33-141)	153	NR

SEE APPENDIX B FOR KEY TO COMMENTS



## COMPARISON OF QA &amp; CONTRACTOR RESULTS

PROJECT: PORT DEVERNS

QA SAMPLE NO.: 27315 CONTRACTOR'S SAMPLE NO.: JN2071  
QA FIELD ID: EKSA49TRP CONTRACTOR'S FIELD ID: EKSA49CA  
QA ANALYSIS DATE: 12/21/94 CONTRACTOR'S ANALYSIS DATE: 09/20/94

MATERIAL DESCRIPTION: TCLP EXTRACT

DATE SAMPLED: 09/08/94

UNITS: ug/ml

PARAMETER	QA LAB MDL	RESULTS		RESULTS		COMPARISON CODE
		QA LAB	CONTRACTOR MDL	CONTRACTOR		
Silver	0.006		< 0.020			0
Arsenic	0.050		< 0.100			0
Barium	0.009	0.16	NR	0.45		3
Cadmium	0.001		< 0.005			0
Chromium	0.006		< 0.020			0
Mercury	0.0002	NA	< 0.001			2
Lead	0.560		< 0.100			0
Selenium	0.170		< 0.100			0

SEE APPENDIX B FOR KEY TO COMMENTS

COMPARISON OF QA & CONTRACTOR RESULTS  
PROJECT: FORT DEVENS

QA SAMPLE NO.: 26908  
QA FIELD ID: EKSA49TRP1  
QA ANALYSIS DATE: 08/29/94

CONTRACTOR'S SAMPLE NO.: JN1314  
CONTRACTOR'S FIELD ID: EKSA4901  
CONTRACTOR'S ANALYSIS DATE: 08/22/94

MATERIAL DESCRIPTION: TCLP EXTRACT  
DATE SAMPLED: 08/11/994  
UNITS: ug/ml

PARAMETER	QA LAB MDL	RESULTS		CONTRACTOR MDL	RESULTS		COMPARISON CODE
		QA LAB			CONTRACTOR		
Silver	< 0.011			< 0.020			0
Arsenic	< 0.190			< 0.100			0
Barium	< NR	0.19		< 0.100	0.366		0
Cadmium	< 0.004			< 0.005			0
Chromium	< 0.011			< 0.020			0
Mercury	< NR	0.0004		< 0.001			0
Lead	< 0.180			< 0.100			0
Selenium	< 0.260			< 0.100			0

SEE APPENDIX B FOR KEY TO COMMENTS

## COMPARISON OF QA &amp; CONTRACTOR RESULTS

PROJECT: FORT DEVENS

QA SAMPLE NO.: 27315  
QA FIELD ID: EXSA49TRD  
QA ANALYSIS DATE: 12/20/94

CONTRACTOR'S SAMPLE NO.: JN2071  
CONTRACTOR'S FIELD ID: EXSA49CA  
CONTRACTOR'S ANALYSIS DATE: 09/20/94

MATERIAL DESCRIPTION: TCLP EXTRACT

DATE SAMPLED: 09/08/94

UNITS: ug/L

PARAMETER	QA LAB MDL	RESULTS	CONTRACTOR MDL	RESULTS	COMPARISON CODE
		QA LAB		CONTRACTOR	
Gamma-BHC (Lindane)	< 0.0069		< 2.0		0
Heptachlor	< 0.0080		< 2.0		0
Heptachlor epoxide	< 0.0095		< 2.0		0
Endrin	< 0.0260		< 2.0		0
Methoxychlor	< 0.0095		< 2.0		0
Chlordane	< 0.0150		< 20		0
Toxaphene	< 0.0860		< 40		0

## SURROGATE RECOVERIES (%)

	QA	CONTRACTOR
TCMX (60-150)	88	NR
DCB (60-150)	104	NR

\* = SURROGATE RECOVERY OUTSIDE ACCEPTABLE RANGE

SEE APPENDIX B FOR KEY TO COMMENTS

## COMPARISON OF QA &amp; CONTRACTOR RESULTS

PROJECT: FORT DEVENS

QA SAMPLE NO.: 26908                      CONTRACTOR'S SAMPLE NO.: JN1314  
QA FIELD ID: EXSA49TRP1                      CONTRACTOR'S FIELD ID: EXSA4901  
QA ANALYSIS DATE: SAMPLE LOST DURING EX                      CONTRACTOR'S ANALYSIS DATE: 08/22/94

MATERIAL DESCRIPTION: TCLP EXTRACT

DATE SAMPLED: 08/11/94

UNITS: ug/L

PARAMETER	QA LAB MDL	RESULTS	CONTRACTOR MDL	RESULTS	COMPARISON CODE
		QA LAB		CONTRACTOR	
Gamma-BHC (Lindane)	< 0.05	NA	< 100		2
Heptachlor	< 0.05	NA	< 2.0		2
Heptachlor epoxide	< 0.05	NA	< 2.0		2
Endrin	< 0.10	NA	< 2.0		2
Methoxychlor	< 0.50	NA	< 100		2
Chlordane	< 0.50	NA	< 20		2
Toxaphene	< 5.0	NA	< 40		2

## SURROGATE RECOVERIES (%)

	QA	CONTRACTOR
TCMX (60-150)		NR
DCB (60-150)		NR

\* = SURROGATE RECOVERY OUTSIDE ACCEPTABLE RANGE

SEE APPENDIX B FOR KEY TO COMMENTS

## COMPARISON OF QA &amp; CONTRACTOR RESULTS

PROJECT: FORT DEVENS

QA SAMPLE NO.: 27315  
 QA FIELD ID: EKSA49TRP  
 QA ANALYSIS DATE: 10/06/94

CONTRACTOR'S SAMPLE NO.: JN2071  
 CONTRACTOR'S FIELD ID: EKSA49CA  
 CONTRACTOR'S ANALYSIS DATE: 09/20/94

MATERIAL DESCRIPTION: TCLP EXTRACT

DATE SAMPLED: 09/08/94

UNITS: ug/L

PARAMETER	RESULTS		RESULTS		COMPARISON CODE
	QA LAB MDL	QA LAB	CONTRACTOR MDL	CONTRACTOR	
Vinyl chloride	< 13.7		< 125		0
1,1-Dichloroethane	< 1		< 125		0
Chloroform	< 1		< 125		0
1,2-Dichloroethane	< 0		< 125		0
2-Butanone	< 1.6		< 250		0
Carbon tetrachloride	< 0.4		< 125		0
Benzene	< 0.6		< 125		0
Trichloroethane	< 0.6		< 125		0
Tetrachloroethane	< 0.5		< 125		0
Chlorobenzene	< 0.8		< 125		0
Pyridine	< 1.6	NA	< 100		2

## SURROGATE RECOVERIES (%)

	QA	CONTRACTOR
1,2-Dichloroethane D4 (76-114)	133	NR
Toluene D8 (88-110)	103	NR
4-Bromofluorobenzene (86-115)	93	NR

\* = SURROGATE RECOVERY OUTSIDE ACCEPTABLE RANGE

SEE APPENDIX B FOR KEY TO COMMENTS

COMPARISON OF QA & CONTRACTOR RESULTS  
PROJECT: FORT DEVENS

QA SAMPLE NO.: 26908  
QA FIELD ID: EXSA49TRP1  
QA ANALYSIS DATE: 08/18/94

CONTRACTOR'S SAMPLE NO.: JN1314  
CONTRACTOR'S FIELD ID: EXSA4901  
CONTRACTOR'S ANALYSIS DATE: 08/22/94

MATERIAL DESCRIPTION: TCLP EXTRACT  
DATE SAMPLED: 08/11/94  
UNITS: ug/L

PARAMETER	RESULTS		RESULTS		COMPARISON CODE
	QA LAB MDL	QA LAB	CONTRACTOR MDL	CONTRACTOR	
Vinyl chloride	< 14.0		< 125		0
1,1-Dichloroethene	< 1		< 125		0
Chloroform	< 1		< 125		0
1,2-Dichloroethane	< 0		< 125		0
2-Butanone	< 1.6		< 250		0
Carbon tetrachloride	< 0.4		< 125		0
Benzene	< 0.6		< 125		0
Trichloroethane	< 0.6		< 125		0
Tetrachloroethane	< 0.5		< 125		0
Chlorobenzene	< 0.8		< 125		0
Pyridine	< 1.6	NA	< 100		2

SURROGATE RECOVERIES (%)

	QA	CONTRACTOR
1,2-Dichloroethane D4 (76-114)	102	NR
Toluene D8 (88-110)	94	NR
4-Bromofluorobenzene (86-115)	79	NR

\* = SURROGATE RECOVERY OUTSIDE ACCEPTABLE RANGE

SEE APPENDIX B FOR KEY TO COMMENTS



## COMPARISON OF QA &amp; CONTRACTOR RESULTS

PROJECT: PORT DEVENS

QA SAMPLE NO.: 27315  
QA FIELD ID: EXSA49TRP  
QA ANALYSIS DATE: 10/26/94

CONTRACTOR'S SAMPLE NO.: JN2071  
CONTRACTOR'S FIELD ID: EXSA49CA  
CONTRACTOR'S ANALYSIS DATE: 09/20/94

MATERIAL DESCRIPTION: TCLP EXTRACT

DATE SAMPLED: 09/08/94

UNITS: ug/L

PARAMETER	RESULTS		RESULTS		COMPARISON CODE
	QA LAB MDL	QA LAB	CONTRACTOR MDL	CONTRACTOR	
2,4-D	< 1.0		< 250		0
2,4,5-TP	< 0.20		< 250		0

SEE APPENDIX B FOR KEY TO COMMENTS

## COMPARISON OF QA &amp; CONTRACTOR RESULTS

PROJECT: FORT DEVENS

QA SAMPLE NO.: 26908

CONTRACTOR'S SAMPLE NO.: JN1114

QA FIELD ID: EXSA49TRP1

CONTRACTOR'S FIELD ID: EXSA4901

QA ANALYSIS DATE: NOT ANALYZED

CONTRACTOR'S ANALYSIS DATE: 08/22/94

MATERIAL DESCRIPTION: TCLP EXTRACT

DATE SAMPLED: 08/11/94

UNITS: ug/L

PARAMETER	QA LAB MDL	RESULTS	CONTRACTOR MDL	RESULTS	COMPARISON CODE
		QA LAB		CONTRACTOR	
2,4-D	< 3.3	NA	< 250		2
2,4,5-TP	< 0.67	NA	< 250		2

SEE APPENDIX B FOR KEY TO COMMENTS



CENED-ED-GL-E  
SAMPLE CONTAINER RECEIPT FORM

PROJECT: Fort DevensProject #: E0251Work Order #: NoneContainer received on 8.3.94 and inspected on 8.3.94 by: Cheryl Varnum

1. Shipper (USM, UPS, DHL, FEDEX, P/C, AIR EXP, HAND-DELIVERED):
2. Container type (Cooler, box, envelope, etc.) \_\_\_\_\_
3. Were custody seals on outside of container? N/A Yes No

How many &amp; where: \_\_\_\_\_, seal date: \_\_\_\_\_, seal name: \_\_\_\_\_

4. Were custody papers taped to lid inside container? N/A Yes No
5. Custody papers properly filled out? (ink, signed, etc.) Yes No
6. Was project and project # identifiable from custody papers? Yes No
7. Did you sign custody papers in appropriate place? Yes No
8. Did you attach shipper's packing form to this form? N/A Yes No
9. Packing material (peanuts, vermiculite, bubble wrap, paper, cans, other)
10. Was sufficient ice used? Temperature 28 °C upon arrival N/A Yes No
11. Were all samples sealed in separate plastic bags? N/A Yes No
12. Did all samples arrive in good condition? Yes No
13. Sample labels complete? (#, date, analysis, preservation, sign.) Yes No
14. Did all sample labels agree with custody papers? Yes No
15. Were correct sample containers used for tests indicated? N/A Yes No
16. Were correct preservatives used? (TM pH\_\_\_\_, CN- pH\_\_\_\_) N/A Yes No  
(TOC pH\_\_\_\_, NUTRIENT pH\_\_\_\_, TOX pH\_\_\_\_, TPH pH\_\_\_\_, OTHER pH\_\_\_\_)
17. Were VOA vials bubble-free (H<sub>2</sub>O) or no headspace (soil)? N/A Yes No
18. Was sufficient amount of sample sent in each container? Yes No
19. Were air volumes noted for air samples? N/A Yes No
20. Were initial weights noted for pre-weighed filters? N/A Yes No

Discrepancies: No project #.



OHM Corporation

## CHAIN-OF-CUSTODY RECORD

E0251

Form 0019  
Field Technical Services  
Rev. 08/89

No. 107607

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME <b>Ft Devers</b>		PROJECT LOCATION <b>Ayer Mo</b>		ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)													
PROJ. NO. <b>16208</b>	PROJECT CONTACT <b>Margie Blean</b>	PROJECT TELEPHONE NO. <b>(508) 772-2610</b>															
CLIENT'S REPRESENTATIVE <b>Tom Best WME</b>		PROJECT MANAGER/SUPERVISOR <b>Bill Snow</b>															
ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	NUMBER OF CONTAINERS	REMARKS									
1	EX SA 49 TRP1	8/11/94	1515	/		Sandy soil, golden color, Petroleum well	1 XL	Triplicate of EX SA 49 01 and EX SA 49 04 P1									
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	1	SABL	Fed Ex Ayerbill 17298-10856	8/11/94		<ul style="list-style-type: none"> <li>Temp blank included</li> <li>Preserved at 4°C</li> </ul>
2		FED EX	Carl H. Am...	8/12/94	1100	
3						
4						

SAMPLER'S SIGNATURE: SABL ✓

LAB COPY



CENED-ED-GL-E

## CONTAMINATED SOIL - SAMPLE CONTAINER RECEIPT FORM

PROJECT:

FT DEVENISProject #: E0251Work Order #: -Container received on 8-12-94 and inspected on 8-13-94 by: [Signature]

1. Shipper (USM, UPS, DHL, FEDEX, P/C, AIR EXP, HAND-DELIVERED) AB 177 98408 60
2. Container type (Cooler, box, envelope, etc.) \_\_\_\_\_
3. Were custody seals on outside of container? N/A Yes No  
How many & where: (2) AROUND, seal date: 8-11-94, seal name: M. B. BARRY <sup>DESIGNEE</sup>
4. Were custody papers taped to lid inside container? N/A Yes No
5. Custody papers properly filled out? (ink, signed, etc.) Yes No
6. Was project and project # identifiable from custody papers? Yes No
7. Did you sign custody papers in appropriate place? Yes No
8. Did you attach shipper's packing form to this form? N/A Yes No
9. Packing material (peanuts, vermiculite, bubble wrap, paper, cans, other)
10. Was sufficient ice used? Temperature 2.0 °C upon arrival N/A Yes No
11. Were all samples sealed in separate plastic bags? N/A Yes No
12. Did all samples arrive in good condition? Yes No
13. Sample labels complete? (#, date, analysis, preservation, sign.) Yes No
14. Did all sample labels agree with custody papers? Yes No
15. Were correct sample containers used for tests indicated? N/A Yes No
16. Were correct preservatives used? (TM pH\_\_\_\_, CN- pH\_\_\_\_) N/A Yes No  
(TOC pH\_\_\_\_, NUTRIENT pH\_\_\_\_, TOX pH\_\_\_\_, TPH pH\_\_\_\_, OTHER pH\_\_\_\_)
17. Were VOA vials bubble-free (H<sub>2</sub>O) or no headspace (soil)? N/A Yes No
18. Was sufficient amount of sample sent in each container? Yes No
19. Were air volumes noted for air samples? N/A Yes No
20. Were initial weights noted for pre-weighed filters? N/A Yes No

Discrepancies: (6) PLEASE REFER TO PROJECT NAME AS "CONTAMINATED SOIL  
FT. DEVENIS #16-208". PROJ # E0251.





OHM Corporation

ED 251

## CHAIN-OF-CUSTODY RECORD

FIELD TECHNICIAN Rev. 09/89

No. 10 37

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME FORT DEUDON'S		PROJECT LOCATION AYER MA		NUMBER OF CONTAINERS	ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)										REMARKS		
PROJ. NO. 16218	PROJECT CONTACT MARGI BLEAD / MIKE WINUN	PROJECT TELEPHONE NO. (508) - 772-2610	<div style="text-align: center;"> <div>ICLP</div> <div>VOL</div> <div>FULL</div> <div>Precip Pollutants</div> </div>														
CLIENT'S REPRESENTATIVE TOMBEST (USACE)		PROJECT MANAGER/SUPERVISOR BILL SNOW															
ITEM NO	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)											
27301	0A0894TB	9-8 94	-	-	-	-	-	1x10~1 WA	✓								TEMP BLANK
27310	EXSA33TRP	1005	7-8 94	✓		Brown dirt w/ cobble	1x1L	✓									
27311	EXSA41TRP	1040	7-8 94	✓		Sand with clay, more light color	1	✓									
27312	EX34246TRP	9-8 94	1000	✓		Brown soil mixed with sand	1	✓									
27313	EXSA33CTRP	1005	7-8 94		✓	Brown dirt with small cobbles	1x10~1 WA	✓									
6																	
7																	
8																	
9																	
10																	

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	1-5	With RL	FEDER ATRBILL	10/7/94	9:45	* Note • 4°C storage • TEMP BLANK INCLUDED • 3 DAY TAT
2		FEDER	Chafin	9/9/94		
3						
4						

SAMPLER'S SIGNATURE: *With RL*

LAB COPY

## SAMPLE CONTAINER RECEIPT

SUBJECT: Fort Davis Contaminated SoilProject #: EN 251  
Work Order #: 94-352a' er received on 9.9.94 and inspected on 9.9.94 by: C. NormanTemperature 4 °C. Temperature taken on 9.9.94 (date)Shipper \_\_\_\_\_ Shipper # 1779841490  
(USM, UPS, DHL, FEDEX, P/C, AIR EXP, HAND-DELIVERED):Container type (Cooler, box, envelope, etc.) \_\_\_\_\_Were custody seals on outside of container? N/A Yes No  
How many & where: 2 Around Lid, seal date: 9.8.94, seal name: B.11Were custody papers taped to lid inside container? N/A Yes NoCustody papers properly filled out? (ink, signed, etc.) Yes NoWas project and project # identifiable from custody papers? Yes NoDid you sign custody papers in appropriate place? Yes NoDid you attach shipper's packing form to this form? N/A Yes No10. Packing material (peanuts, vermiculite, bubble wrap, paper, cans, other)11. Were all samples sealed in separate plastic bags? N/A Yes No12. Did all samples arrive in good condition? Yes No13. Sample labels complete? (#, date, analysis, preservation, sign.) Yes No14. Were correct sample containers used for tests indicated? N/A Yes No15. Were correct preservatives used? (TM pH\_\_\_\_, CN- pH\_\_\_\_)  
(TOC pH\_\_\_\_, NUTRIENT pH\_\_\_\_, TOX pH\_\_\_\_, TPH pH\_\_\_\_, OTHER pH\_\_\_\_) N/A Yes No16. Were VOA vials bubble-free (H<sub>2</sub>O) Some headspace in soil or no headspace (soil)? N/A Yes No17. Was sufficient amount of sample sent in each container? Yes No18. Did all sample labels agree with custody papers? Yes No

19. Were air volumes noted for air samples? N/A Yes No

20. Were initial weights noted for pre-weighed filters? N/A Yes No

Discrepancies: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Appendix D  
ASC Analytical Report - Waste Characterization Sample Results



Analytical Services Corp.

## ANALYTICAL REPORT

**Client:** OHM Remediation Services Corporation  
Eastern Region (Trenton, NJ)

**Attn:** William Snow  
Ron Kenyon  
Mike Quinlan

**Project:** 16208C - USACE; Fort Devens, MA

**Sample Type(s):** Solid

**Analysis Performed:** Conventional, Organics and RCRA TCLP Leachate Parameters

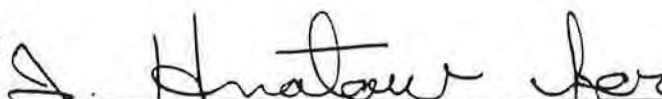
**Date Sample Received:** August 12, 1994

**Date Order Received:** August 12, 1994

**Joblink(s):** 616443

*This report is "PROPRIETARY AND CONFIDENTIAL" and delivered to, and intended for the exclusive use of the above named client only. Analytical Services Corporation assumes no responsibility or liability for the reliance hereon or use hereof by anyone other than the above named client.*

Reviewed and  
Approved by:

  
Thomas E. Gran, Ph.D., Vice President

Date: August 23, 1994

## PROJECT NARRATIVE

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The following items relate to the samples and analytical data contained in this report.

- o All solid sample results are reported on a "dry weight" basis.
- o The identity of all pesticide herbicides compounds were confirmed by secondary column analysis.
- o Note any and all comments at the bottom of the tables in Appendix B and/or Appendix C.
- o **ASC** will retain samples for a maximum of thirty (30) days after completion of the analysis, samples will be held for a longer period of time, if appropriate arrangements are made in advance. A nominal disposal charge of \$5.00/sample will be imposed for unreturned samples.

**APPENDIX A**  
**DATA SUMMARY REPORT**

**NOTE:** The Tentatively Identified Volatile (GC/MS) Screen result(s), if applicable, is included in Appendix B.



# DATA SUMMARY REPORT

DATE: 08/22/94

PAGE: 1

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:	EXSA4901	EXSA4902
ASC Sample Number:	JN1314	JN1316
Sample Date:	940811	940811
Facility Code:	016208C	016208C

Parameters	Units
------------	-------

## Conventional Data (CV10)

Flash Point, Seta Flash	Deg C	>93	-
Reactive Cyanide	mg/kg	<10.0	-
Reactive Sulfide	mg/kg	<10.0	-
Solids, Total	%	88.1	87.2
pH (Electrode)	std	6.62	-

Sample Point ID:	EXSA4901	EXSA49DUP1
ASC Sample Number:	JN1314	JN1315
Sample Date:	940811	940811
Facility Code:	016208C	016208C

Parameters	Units
------------	-------

## CRA TCLP Leachate Herbicide Analysis, GC, (GS52)

2,4-D	mg/L	<.250	<.250
2,4,5-TP (Silvex)	mg/L	<.250	<.250

## CRA TCLP Leachate Pesticide Analysis, GC, (GS54)

Chlordane	mg/L	<.020	<.020
Endrin	mg/L	<.002	<.002
Heptachlor	mg/L	<.002	<.002
Heptachlor epoxide	mg/L	<.002	<.002
Toxaphene	mg/L	<.040	<.040

# DATA SUMMARY REPORT

DATE: 08/22/94

PAGE: 2

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID: EYSA4902  
 ASC Sample Number: JN1316  
 Sample Date: 940811  
 Facility Code: 016208C

Parameters Units

## TXE Volatile Analysis, GC, (GV33)

Benzene	mg/kg	<.001
Ethylbenzene	mg/kg	<.001
Toluene	mg/kg	<.001
Xylenes	mg/kg	.002

Sample Point ID: EYSA4901  
 ASC Sample Number: JN1314  
 Sample Date: 940811  
 Facility Code: 016208C

Parameters Units

## total Petroleum Hydrocarbon Analysis, IR (IR00)

Petroleum Hydrocarbons (IR)	mg/kg	71.2
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Sample Point ID:	EYSA4901	EYSA49DUP1
ASC Sample Number:	JN1314	JN1315
Sample Date:	940811	940811
Facility Code:	016208C	016208C

Parameters Units

## CRA TCLP Leachate Metals Analysis, (ME52)

Arsenic	mg/L	<.100	<.100	
Barium	mg/L	.366	.338	870
Cadmium	mg/L	<.005	<.005	
Chromium	mg/L	<.020	<.020	
Lead	mg/L	<.100	<.100	
Mercury	mg/L	<.001	<.001	
Selenium	mg/L	<.100	<.100	
Silver	mg/L	<.020	<.020	
Copper	mg/L	<.020	<.020	
Zinc	mg/L	<.200	<.200	

# DATA SUMMARY REPORT

DATE: 08/22/94

PAGE: 3

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID: EYSA4901  
 ASC Sample Number: JN1314  
 Sample Date: 940811  
 Facility Code: 016208C

Parameters Units

## Target Compound List Base/Neutral/Acid Analysis, MS, (MS22)

Acenaphthene	mg/kg	<.379
Acenaphthylene	mg/kg	<.379
Anthracene	mg/kg	<.379
Benzo(a)anthracene	mg/kg	<.379
Benzo(b)fluoranthene	mg/kg	<.379
Benzo(k)fluoranthene	mg/kg	<.379
Benzo(ghi)perylene	mg/kg	<.379
Benzo(a)pyrene	mg/kg	<.379
bis(2-Chloroethyl) ether	mg/kg	<.379
bis(2-Chloroethoxy)methane	mg/kg	<.379
bis(2-Chloroisopropyl)ether	mg/kg	<.379
bis(2-Ethylhexyl)phthalate	mg/kg	<.379
4-Bromophenyl phenyl ether	mg/kg	<.379
Butyl benzyl phthalate	mg/kg	<.379
Carbazole	mg/kg	<.379
4-Chloroaniline	mg/kg	<.379
p-Chloro-m-cresol	mg/kg	<.379
2-Chloronaphthalene	mg/kg	<.379
2-Chlorophenol	mg/kg	<.379
4-Chlorophenyl phenyl ether	mg/kg	<.379
Chrysene	mg/kg	<.379
Dibenzo(a,h)anthracene	mg/kg	<.379
Dibenzofuran	mg/kg	<.379
Di-n-butyl phthalate	mg/kg	<.379
1,2-Dichlorobenzene	mg/kg	<.379
1,3-Dichlorobenzene	mg/kg	<.379
1,4-Dichlorobenzene	mg/kg	<.379
3,3'-Dichlorobenzidine	mg/kg	<.379
2,4-Dichlorophenol	mg/kg	<.379
Diethyl phthalate	mg/kg	<.379
Dimethyl phthalate	mg/kg	<.379
2,4-Dimethylphenol	mg/kg	<.379
4,6-Dinitro-o-cresol	mg/kg	<.947
2,4-Dinitrophenol	mg/kg	<1.89
2,4-Dinitrotoluene	mg/kg	<.379

# DATA SUMMARY REPORT

DATE: 08/22/94

PAGE: 4

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID: EYSA4901  
ASC Sample Number: JN1314  
Sample Date: 940811  
Facility Code: 016208C

Parameters Units

## Target Compound List Base/Neutral/Acid Analysis, MS, (MS22)

2,6-Dinitrotoluene	mg/kg	<.379
Di-n-octyl phthalate	mg/kg	<.379
Fluoranthene	mg/kg	<.379
Fluorene	mg/kg	<.379
Hexachlorobenzene	mg/kg	<.379
Hexachlorobutadiene	mg/kg	<.379
Hexachlorocyclopentadiene	mg/kg	<.379
Hexachloroethane	mg/kg	<.379
Indeno(1,2,3-c,d)pyrene	mg/kg	<.379
Isophorone	mg/kg	<.379
2-Methylnaphthalene	mg/kg	<.379
2-Methylphenol	mg/kg	<.379
4-Methylphenol	mg/kg	<.379
N-Nitrosodi-n-propylamine	mg/kg	<.379
N-Nitrosodiphenylamine	mg/kg	<.379
Naphthalene	mg/kg	<.379
2-Nitroaniline	mg/kg	<.379
3-Nitroaniline	mg/kg	<.379
4-Nitroaniline	mg/kg	<.379
Nitrobenzene	mg/kg	<.379
2-Nitrophenol	mg/kg	<.379
4-Nitrophenol	mg/kg	<1.89
Pentachlorophenol	mg/kg	<.379
Phenanthrene	mg/kg	<.379
Phenol	mg/kg	<.379
Pyrene	mg/kg	<.379
1,2,4-Trichlorobenzene	mg/kg	<.379
2,4,5-Trichlorophenol	mg/kg	<.379
2,4,6-Trichlorophenol	mg/kg	<.379

# DATA SUMMARY REPORT

DATE: 08/22/94

PAGE: 5

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID: EYSA4901 EYSA49DUP1  
 ASC Sample Number: JN1314 JN1315  
 Sample Date: 940811 940811  
 Facility Code: 016208C 016208C

Parameters Units

## RA TCLP Leachate Base/Neutral/Acid Analysis, MS, (MS52)

2,4-Dinitrotoluene	mg/L	<.100	<.100
Hexachlorobenzene	mg/L	<.100	<.100
Hexachloroethane	mg/L	<.100	<.100
Hexachlorobutadiene	mg/L	<.100	<.100
Indane	mg/L	<.100	<.100
Methoxychlor	mg/L	<.100	<.100
p-Methylphenol	mg/L	<.100	<.100
p-Methylphenol	mg/L	<.100	<.100
Nitrobenzene	mg/L	<.100	<.100
Pentachlorophenol	mg/L	<.100	<.100
Pyridine	mg/L	<.100	<.100
2,4,5-Trichlorophenol	mg/L	<.100	<.100
2,4,6-Trichlorophenol	mg/L	<.100	<.100

## RA TCLP Leachate (ZHE) Volatile Analysis, MS, (MV50)

Benzene	mg/L	<.125	<.125
Carbon tetrachloride	mg/L	<.125	<.125
Chlorobenzene	mg/L	<.125	<.125
Chloroform	mg/L	<.125	<.125
1,4-Dichlorobenzene	mg/L	<.125	<.125
1,2-Dichloroethane	mg/L	<.125	<.125
1,1-Dichloroethylene	mg/L	<.125	<.125
Methyl ethyl ketone	mg/L	<.250	<.250
Tetrachloroethylene	mg/L	<.125	<.125
Trichloroethylene	mg/L	<.125	<.125
Vinyl chloride	mg/L	<.125	<.125

**APPENDIX B**  
**QUANTITATIVE RESULTS**



ASC Sample No.

**JN1314**

## Compounds

### CONVENTIONAL DATA (CV10)

**Company Name**

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**EXSA4902**

JN1316

Compounds	Sample Results %	Detection Limits %	Blank Results %	Batch Number
Solids, Total	87.2	.100	-	

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA4902	JN1316

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	ND	.001	ND	Q2W3789
Ethylbenzene	ND	.001	ND	Q2W3789
Toluene	ND	.001	ND	Q2W3789
Xylenes	.002	.001	ND	Q2W3789

## TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)

**Company Name**

Facility

### Sample Point

ASC Sample No.

**OHM REMEDIATION SERVICES CORPORATION**

016208C

EXSA4901

JN1314

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Petroleum Hydrocarbons (IR)	71.2	11.3	ND	Q2T41130

# TARGET COMPOUND LIST BASE/NEUTRAL/ACID ANALYSIS, MS, (MS22)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA4901	JN1314

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Acenaphthene	ND	.379	ND	Q2C41129
Acenaphthylene	ND	.379	ND	Q2C41129
Anthracene	ND	.379	ND	Q2C41129
Benzo (a) anthracene	ND	.379	ND	Q2C41129
Benzo (b) fluoranthene	ND	.379	ND	Q2C41129
Benzo (k) fluoranthene	ND	.379	ND	Q2C41129
Benzo (ghi) perylene	ND	.379	ND	Q2C41129
Benzo (a) pyrene	ND	.379	ND	Q2C41129
bis (2-Chloroethyl) ether	ND	.379	ND	Q2C41129
bis (2-Chloroethoxy) methane	ND	.379	ND	Q2C41129
bis (2-Chloroisopropyl) ether	ND	.379	ND	Q2C41129
bis (2-Ethylhexyl) phthalate	ND	.379	ND	Q2C41129
4-Bromophenyl phenyl ether	ND	.379	ND	Q2C41129
Butyl benzyl phthalate	ND	.379	ND	Q2C41129
Carbazole	ND	.379	ND	Q2C41129
4-Chloroaniline	ND	.379	ND	Q2C41129
p-Chloro-m-cresol	ND	.379	ND	Q2C41129
2-Chloronaphthalene	ND	.379	ND	Q2C41129
2-Chlorophenol	ND	.379	ND	Q2C41129
4-Chlorophenyl phenyl ether	ND	.379	ND	Q2C41129
Chrysene	ND	.379	ND	Q2C41129
Benzo (a, h) anthracene	ND	.379	ND	Q2C41129
Benzo (f) furan	ND	.379	ND	Q2C41129
Di-n-butyl phthalate	ND	.379	ND	Q2C41129
1,2-Dichlorobenzene	ND	.379	ND	Q2C41129
1,3-Dichlorobenzene	ND	.379	ND	Q2C41129
1,4-Dichlorobenzene	ND	.379	ND	Q2C41129
3,3'-Dichlorobenzidine	ND	.379	ND	Q2C41129
2,4-Dichlorophenol	ND	.379	ND	Q2C41129
Diethyl phthalate	ND	.379	ND	Q2C41129
Dimethyl phthalate	ND	.379	ND	Q2C41129
2,4-Dimethylphenol	ND	.379	ND	Q2C41129
4,6-Dinitro-o-cresol	ND	.947	ND	Q2C41129
2,4-Dinitrophenol	ND	1.89	ND	Q2C41129
2,4-Dinitrotoluene	ND	.379	ND	Q2C41129
2,6-Dinitrotoluene	ND	.379	ND	Q2C41129
Di-n-octyl phthalate	ND	.379	ND	Q2C41129
Fluoranthene	ND	.379	ND	Q2C41129
Fluorene	ND	.379	ND	Q2C41129
Hexachlorobenzene	ND	.379	ND	Q2C41129
Hexachlorobutadiene	ND	.379	ND	Q2C41129
Hexachlorocyclopentadiene	ND	.379	ND	Q2C41129
Hexachloroethane	ND	.379	ND	Q2C41129
Indeno (1, 2, 3-c, d) pyrene	ND	.379	ND	Q2C41129
Isophorone	ND	.379	ND	Q2C41129
2-Methylnaphthalene	ND	.379	ND	Q2C41129
2-Methylphenol	ND	.379	ND	Q2C41129
4-Methylphenol	ND	.379	ND	Q2C41129
N-Nitrosodi-n-propylamine	ND	.379	ND	Q2C41129
N-Nitrosodiphenylamine	ND	.379	ND	Q2C41129

**TARGET COMPOUND LIST BASE/NEUTRAL/ACID ANALYSIS, MS, (MS22)**

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA4901

JN1314

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Naphthalene	ND	.379	ND	Q2C41129
2-Nitroaniline	ND	.379	ND	Q2C41129
3-Nitroaniline	ND	.379	ND	Q2C41129
4-Nitroaniline	ND	.379	ND	Q2C41129
Nitrobenzene	ND	.379	ND	Q2C41129
2-Nitrophenol	ND	.379	ND	Q2C41129
4-Nitrophenol	ND	1.89	ND	Q2C41129
Pentachlorophenol	ND	.379	ND	Q2C41129
Phenanthrene	ND	.379	ND	Q2C41129
Phenol	ND	.379	ND	Q2C41129
Pyrene	ND	.379	ND	Q2C41129
1,2,4-Trichlorobenzene	ND	.379	ND	Q2C41129
2,4,5-Trichlorophenol	ND	.379	ND	Q2C41129
2,4,6-Trichlorophenol	ND	.379	ND	Q2C41129

3-Methyl- and 4-Methylphenol coelute and are reported as the total



## RCRA TCLP LEACHATE HERBICIDE ANALYSIS, GC, (GS52)

**Company Name**

Facility

### Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA4901

JN1314

Compounds	Sample Results mg/L	Bias Corrected Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number	Bias Recov
2,4-D	ND	-	.250	ND	Q7H41131	63
2,4,5-TP (Silvex)	ND	-	.250	ND	Q7H41131	67

## RCRA TCLP LEACHATE HERBICIDE ANALYSIS, GC, (GS52)

**Company Name**

Facility

**Sample Point**

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49DUP1

JN1315

Compounds	Sample Results mg/L	Bias Corrected Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number	Bias Recov
2,4-D	ND	-	.250	ND	Q7H41131	63
2,4,5-TP (Silvex)	ND	-	.250	ND	Q7H41131	67

## RCRA TCLP LEACHATE PESTICIDE ANALYSIS, GC, (GS54)

**Company Name**

Facility

### Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA4901

JN1314

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Chlordane	ND	.020	ND	Q7P41133
Endrin	ND	.002	ND	Q7P41133
Heptachlor	ND	.002	ND	Q7P41133
Heptachlor epoxide	ND	.002	ND	Q7P41133
Toxaphene	ND	.040	ND	Q7P41133

## RCRA TCLP LEACHATE PESTICIDE ANALYSIS, GC, (GS54)

**Company Name**

Facility

### Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49DUP1

JN1315

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Chlordane	ND	.020	ND	Q7P41133
Endrin	ND	.002	ND	Q7P41133
Heptachlor	ND	.002	ND	Q7P41133
Heptachlor epoxide	ND	.002	ND	Q7P41133
Toxaphene	ND	.040	ND	Q7P41133

## RCRA TCLP LEACHATE METALS ANALYSIS, (ME52)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA4901

JN1314

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Arsenic	ND	.100	ND	Q7M5217
Barium	.366	.100	ND	Q7M5217
Cadmium	ND	.005	ND	Q7M5217
Chromium	ND	.020	ND	Q7M5217
Lead	ND	.100	ND	Q7M5217
Mercury	ND	.001	ND	Q7G5218
Selenium	ND	.100	ND	Q7M5217
Silver	ND	.020	ND	Q7M5217
Copper	ND	.020	ND	Q7M5217
Zinc	ND	.200	ND	Q7M5217

## RCRA TCLP LEACHATE METALS ANALYSIS, (ME52)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49DUP1

JN1315

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Arsenic	ND	.100	ND	Q7M5217
Barium	.338	.100	ND	Q7M5217
Cadmium	ND	.005	ND	Q7M5217
Chromium	ND	.020	ND	Q7M5217
Lead	ND	.100	ND	Q7M5217
Mercury	ND	.001	ND	Q7G5218
Selenium	ND	.100	ND	Q7M5217
Silver	ND	.020	ND	Q7M5217
Copper	ND	.020	ND	Q7M5217
Zinc	ND	.200	ND	Q7M5217



## RCRA TCLP LEACHATE BASE/NEUTRAL/ACID ANALYSIS, MS, (MS52)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA4901

JN1314

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
2,4-Dinitrotoluene	ND	.100	ND	Q7C41125
Hexachlorobenzene	ND	.100	ND	Q7C41125
Hexachloroethane	ND	.100	ND	Q7C41125
Hexachlorobutadiene	ND	.100	ND	Q7C41125
Lindane	ND	.100	ND	Q7C41125
Methoxychlor	ND	.100	ND	Q7C41125
2-Methylphenol	ND	.100	ND	Q7C41125
4-Methylphenol	ND	.100	ND	Q7C41125
Nitrobenzene	ND	.100	ND	Q7C41125
Pentachlorophenol	ND	.100	ND	Q7C41125
Pyridine	ND	.100	ND	Q7C41125
2,4,5-Trichlorophenol	ND	.100	ND	Q7C41125
2,4,6-Trichlorophenol	ND	.100	ND	Q7C41125

3-Methyl- and 4-Methylphenol coelute and are reported as the total

# RCRA TCLP LEACHATE BASE/NEUTRAL/ACID ANALYSIS, MS, (MS52)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA49DUP1	JN1315

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
2,4-Dinitrotoluene	ND	.100	ND	Q7C41125
Hexachlorobenzene	ND	.100	ND	Q7C41125
Hexachloroethane	ND	.100	ND	Q7C41125
Hexachlorobutadiene	ND	.100	ND	Q7C41125
Lindane	ND	.100	ND	Q7C41125
Methoxychlor	ND	.100	ND	Q7C41125
2-Methylphenol	ND	.100	ND	Q7C41125
4-Methylphenol	ND	.100	ND	Q7C41125
Nitrobenzene	ND	.100	ND	Q7C41125
Pentachlorophenol	ND	.100	ND	Q7C41125
Pyridine	ND	.100	ND	Q7C41125
2,4,5-Trichlorophenol	ND	.100	ND	Q7C41125
2,4,6-Trichlorophenol	ND	.100	ND	Q7C41125

3-Methyl- and 4-Methylphenol coelute and are reported as the total

# RCRA TCLP LEACHATE (ZHE) VOLATILE ANALYSIS, MS, (MV50)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA4901	JN1314

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Benzene	ND	.125	ND	Q7V3790
Carbon tetrachloride	ND	.125	ND	Q7V3790
Chlorobenzene	ND	.125	ND	Q7V3790
Chloroform	ND	.125	ND	Q7V3790
1,4-Dichlorobenzene	ND	.125	ND	Q7V3790
1,2-Dichloroethane	ND	.125	ND	Q7V3790
1,1-Dichloroethylene	ND	.125	ND	Q7V3790
Methyl ethyl ketone	ND	.250	ND	Q7V3790
Tetrachloroethylene	ND	.125	ND	Q7V3790
Trichloroethylene	ND	.125	ND	Q7V3790
Vinyl chloride	ND	.125	ND	Q7V3790

# RCRA TCLP LEACHATE (ZHE) VOLATILE ANALYSIS, MS, (MV50)

Company Name Facility Sample Point ASC Sample No.  
OHM REMEDIATION SERVICES CORPORATION 016208C EXSA49DUP1 JN1315

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Benzene	ND	.125	ND	Q7V3790
Carbon tetrachloride	ND	.125	ND	Q7V3790
Chlorobenzene	ND	.125	ND	Q7V3790
Chloroform	ND	.125	ND	Q7V3790
1,4-Dichlorobenzene	ND	.125	ND	Q7V3790
1,2-Dichloroethane	ND	.125	ND	Q7V3790
1,1-Dichloroethylene	ND	.125	ND	Q7V3790
Methyl ethyl ketone	ND	.250	ND	Q7V3790
Tetrachloroethylene	ND	.125	ND	Q7V3790
Trichloroethylene	ND	.125	ND	Q7V3790
Vinyl chloride	ND	.125	ND	Q7V3790

**APPENDIX C**  
**QUALITY ASSURANCE DATA**

## SUMMARY OF ANALYTICAL METHODOLOGY

ASC Joblink # 616443

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REFERENCE	TITLE
<hr/>	
1020	SW-846 Flash Point, Setaflash
1311	SW-846 Toxicity Characteristic Leaching Procedure
160.3	CAWW Residue, Total, Gravimetric, Dried at 103-105 C
418.1	MCAWW Petroleum Hydrocarbons, Total Recoverable
6010	SW-846 Inductively Coupled Plasma Atomic Emmision Spectroscopy
7470	SW-846 Mercury in Liquid Waste (Manual Cold-Vapor Technique)
8020	SW-846 Aromatic Volatile Organics by GC
8080	SW-846 Organochlorine Pesticides and/or PCBs
8150	SW-846 Chlorinated Herbicides
8240	SW-846 GC/MS for Volatile Organics
8270	SW-846 GC/MS for Semivolatile Organics: Capillary Column Technique
CLP 1.7.1.1	CLP pH, Electrode (soil)
SECTION 7.3.3.2	SW-846 Test Method to Determine HCN Released from Wastes
SECTION 7.3.4.2	SW-846 Test Method to Determine HS Released from Wastes



## METHODOLOGY REFERENCES

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- ASTM**      *American Society for Testing and Materials*, 1985 edition.
- CAWW**      *Methods for Chemical Analysis of Water and Wastes*, April 1979 and Updated #1 March 1983.
- CLP**      *USEPA Contract Laboratory Program*, Document #OLMO1.0, updates December 1990 #OLMO1.1 and February 1991 #OLMO1.1.1.
- EPA-500**      *USEPA Methods for the Determination of Organic Compounds in Drinking Water*, EPA-600/4-88/039 December 1988.
- EPA-600**      *USEPA Test Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater*, EPA-600/4-82-057 July 1982.
- NIOSH**      *National Institute for Occupational Safety and Health*, 3rd edition, 1984.
- SMEWW**      *Standard Methods for the Examination of Water and Wastewater*, 17th edition, 1989.
- STOA**      *Spot Tests In Organic Analysis*, 7th edition, 1966.
- SW-846**      *Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, 3rd edition, September 1986 and Update #1 July 1992.
- (1)**      This method was modified to incorporate the use of Boron Trifluoride (BF<sub>3</sub>) as the derivatizing reagent according to Method 6640 in *SMEWW*, 17th edition, 1989.
- Title 22**      *Waste Extraction Test*, Title 22, Section 66261.126 Appendix 2 of the California Administrative Code, May 1991.

## ASC Certifications

State	Agency	Certification #
Alabama	ADEM	40830
California	CADOH	1178
Colorado	CODOH	OH113
Delaware	DEHSS	OH113
Kansas	KSDHE	E-202 & E-1173
Louisiana	LADOHH	92-10
Maryland	MDDHMH	210
Massachusetts	MADEP	M-OH113
New Jersey	NJDEPE	74603
New York	NYDOH	10712
North Carolina	NCDEM	392
Ohio	OHEPA	OH113
Oklahoma	OKDEQ	9216
Pennsylvania	PADER	68-450
South Carolina	SCDEHNR	92002
Tennessee	TNDOH/TNDEC	2978
Virginia	VADGS	00011
Washington	WADOE	C154
Wisconsin	WIDNR	999037160

### Validated by:

- o US Army Corps of Engineers ..... Chemical Analysis in Various Matrices

### Approvals:

- o Chemical Waste Management ..... Waste Characterization Analysis
- o EnviroSAFE ..... Waste Characterization Analysis
- o USDA ..... Permit for Importing Soils
- o Florida DEP ..... Quality Assurance Plan #930034G
- o Naval Facilities Engineering Service Center ..... Chemical Analysis in Various Matrices

## REPORT KEY

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mg/kg	= milligram per kilogram (ppm)
Mg/m <sup>3</sup>	= milligram per cubic meter
ug/kg	= microgram per kilogram (ppb)
mg/L	= milligram per liter (ppm)
ug/L	= microgram per liter (ppb)
mg/W	= milligram per wipe
ug/W	= microgram per wipe
mg/SMP	= milligram per sample
ug/SMP	= microgram per sample
um/cm	= microMho per centimeter
pCi/l	= picocurie per liter
gm/cc	= grams per cubic centimeter
ppm	= parts per million
ppb	= parts per billion
ND	= Not detected at or above stated detection limit
<	= less than
>	= greater than
%	= percent
BTU/lb	= British Thermal Units per pound
Deg. C	= Degrees Celsius
n/a	= not applicable
Unk	= unknown
std	= result is relative to standard pH units
CV	= Conventional
IR	= Infrared Spectrophotometric
GC	= Gas Chromatograph Instrument
GC/MS	= Gas Chromatography/Mass Spectrometer Instrument
GRO	= Gasoline Range Organics
DRO	= Diesel Range Organics
PCB	= Polychlorinated Biphenyls (PCBs)
EP TOX	= Extraction Procedure Toxicity
TCLP	= Toxicity Characteristic Leaching Procedure
RCRA	= Resource Conservation and Recovery Act

### CONVENTIONAL DATA (CV10)

Compounds		Blank Results	Blank Spike Recov	Unspiked Sample Results	Matrix Spike Recov	Relative Percent Diff	Batch Number
Reactive Cyanide	mg/kg	ND	112	-	-	-	Q2I3804
Reactive Sulfide	mg/kg	ND	70	-	-	-	Q2I3802

# QUALITY ASSURANCE DATA

## BTXE VOLATILE ANALYSIS, GC, (GV33)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Benzene	ND	90	ND	83	1	Q2W3789
Ethylbenzene	ND	91	ND	85	9	Q2W3789
Toluene	ND	90	ND	82	1	Q2W3789
Xylenes	ND	91	.002	86	12	Q2W3789

**TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)**

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Petroleum Hydrocarbons (IR)	ND	79	71.2	83	4	Q2T41130



# QUALITY ASSURANCE DATA

## TARGET COMPOUND LIST BASE/NEUTRAL/ACID ANALYSIS, MS, (MS22)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Acenaphthene	ND	95	ND	90	9	Q2C41129
bis (2-Chloroethoxy) methane	ND	83	ND	76	4	Q2C41129
bis (2-Chloroisopropyl) ether	ND	92	ND	82	3	Q2C41129
p-Chloro-m-cresol	ND	98	ND	96	9	Q2C41129
2-Chloronaphthalene	ND	97	ND	89	8	Q2C41129
2-Chlorophenol	ND	98	ND	92	4	Q2C41129
Dibenzo (a, h) anthracene	ND	66	ND	88	11	Q2C41129
Di-n-butyl phthalate	ND	108	ND	106	4	Q2C41129
1,3-Dichlorobenzene	ND	91	ND	77	15	Q2C41129
1,4-Dichlorobenzene	ND	94	ND	84	7	Q2C41129
Diethyl phthalate	ND	106	ND	103	6	Q2C41129
4,6-Dinitro-o-cresol	ND	99	ND	93	8	Q2C41129
2,4-Dinitrotoluene	ND	101	ND	96	8	Q2C41129
Fluoranthene	ND	105	ND	100	8	Q2C41129
Fluorene	ND	94	ND	90	4	Q2C41129
Hexachlorobenzene	ND	105	ND	102	4	Q2C41129
Hexachlorocyclopentadiene	ND	89	ND	-	-	Q2C41129
2-Methylphenol	ND	88	ND	88	6	Q2C41129
4-Methylphenol	ND	87	ND	85	8	Q2C41129
N-Nitrosodi-n-propylamine	ND	94	ND	91	3	Q2C41129
4-Nitroaniline	ND	95	ND	91	2	Q2C41129
2-Nitrophenol	ND	89	ND	78	11	Q2C41129
4-Nitrophenol	ND	95	ND	110	7	Q2C41129
Pentachlorophenol	ND	101	ND	139	8	Q2C41129
phenol	ND	99	ND	92	5	Q2C41129
Pyrene	ND	103	ND	102	8	Q2C41129
1,2,4-Trichlorobenzene	ND	99	ND	87	9	Q2C41129

3-Methyl- and 4-Methylphenol coelute and are reported as the total

- Due to apparent interactions between the spiked compound and sample components, no matrix spike recoveries were observed for the parameters designated with a dash.

## RCRA TCLP LEACHATE HERBICIDE ANALYSIS, GC, (GS52)

Compounds	Blank Results mg/L	Blank Spike Recov	Unspiked Sample Results mg/L	Matrix Spike Recov	Relative Percent Diff	Batch Number
2,4-D	ND	87	ND	63	28	Q7H41131
2,4,5-TP (Silvex)	ND	92	ND	67	25	Q7H41131

## RCRA TCLP LEACHATE PESTICIDE ANALYSIS, GC, (GS54)

Chlordane	ND	106	ND	103	3	Q7P41133
Endrin	ND	94	ND	92	2	Q7P41133
Heptachlor	ND	85	ND	77	9	Q7P41133
Heptachlor epoxide	ND	88	ND	84	4	Q7P41133
Toxaphene	ND	106	ND	95	-	Q7P41133

# QUALITY ASSURANCE DATA

## RCRA TCLP LEACHATE METALS ANALYSIS, (ME52)

Compounds	Blank Results mg/L	Blank Spike Recov	Unspiked Sample Results mg/L	Matrix Spike Recov	Relative Percent Diff	Batch Number
Arsenic	ND	96	ND	106	1	Q7M5217
Barium	ND	93	.366	97	1	Q7M5217
Cadmium	ND	97	ND	103	1	Q7M5217
Chromium	ND	96	ND	103	2	Q7M5217
Lead	ND	99	ND	104	2	Q7M5217
Mercury	ND	102	ND	97	6	Q7G5218
Selenium	ND	91	ND	103	0	Q7M5217
Silver	ND	95	ND	104	7	Q7M5217
Copper	ND	88	ND	94	1	Q7M5217
Zinc	ND	95	ND	103	2	Q7M5217

# QUALITY ASSURANCE DATA

## RCRA TCLP LEACHATE BASE/NEUTRAL/ACID ANALYSIS, MS, (MS52)

Compounds	Blank Results mg/L	Blank Spike Recov	Unspiked Sample Results mg/L	Matrix Spike Recov	Relative Percent Diff	Batch Number
2,4-Dinitrotoluene	ND	86	ND	103	31	Q7C41125
Hexachlorobenzene	ND	121	ND	144	37	Q7C41125
Hexachloroethane	ND	77	ND	82	27	Q7C41125
Hexachlorobutadiene	ND	88	ND	88	30	Q7C41125
Lindane	ND	188	ND	216	23	Q7C41125
Methoxychlor	ND	106	ND	117	8	Q7C41125
2-Methylphenol	ND	105	ND	123	27	Q7C41125
4-Methylphenol	ND	106	ND	122	27	Q7C41125
Nitrobenzene	ND	104	ND	117	28	Q7C41125
Pentachlorophenol	ND	108	ND	161	46	Q7C41125
Pyridine	ND	94	ND	102	25	Q7C41125
2,4,5-Trichlorophenol	ND	109	ND	126	24	Q7C41125
2,4,6-Trichlorophenol	ND	105	ND	116	27	Q7C41125

3-Methyl- and 4-Methylphenol coelute and are reported as the total

# QUALITY ASSURANCE DATA

## RCRA TCLP LEACHATE (ZHE) VOLATILE ANALYSIS, MS, (MV50)

Compounds	Blank Results mg/L	Blank Spike Recov	Unspiked Sample Results mg/L	Matrix Spike Recov	Relative Percent Diff	Batch Number
Benzene	ND	111	ND	110	1	Q7V3790
Carbon tetrachloride	ND	111	ND	111	0	Q7V3790
Chlorobenzene	ND	101	ND	100	1	Q7V3790
Chloroform	ND	105	ND	106	1	Q7V3790
1,4-Dichlorobenzene	ND	91	ND	89	1	Q7V3790
1,2-Dichloroethane	ND	103	ND	108	2	Q7V3790
1,1-Dichloroethylene	ND	91	ND	92	1	Q7V3790
Methyl ethyl ketone	ND	93	ND	98	3	Q7V3790
Tetrachloroethylene	ND	102	ND	98	1	Q7V3790
Trichloroethylene	ND	106	ND	105	0	Q7V3790
Vinyl chloride	ND	92	ND	91	3	Q7V3790



# QUALITY ASSURANCE DATA SURROGATE SUMMARY REPORT

SURROGATE ID	A159	B732	A121	A884	A158	B142	# OUT
QC BATCH: Q2C41129 Solid (Semi-Volatile organics by MS)							
SAMPLE ID							
BLANK	77	84	78	80	77	71	0
BLANK SPIKE	78	88	93	82	80	69	0
EXSA4901	82	85	105	78	79	73	0
EXSA4901 MD	82	89	110	87	82	78	0
EXSA4901 MS	78	84	104	76	74	69	0
QC LIMITS	(25-121) (24-113) (19-122) (23-120) (30-115) (18-137)						
QC BATCH: Q7C41125 Leachate (Semi-Volatile organics by MS)							
SAMPLE ID							
BLANK	82	89	105	81	78	20	0
BLANK SPIKE	90	96	121	109	87	80	0
EXSA4901	73	75	113	76	76	84	0
EXSA4901 MD	73	79	96	87	71	68	0
EXSA4901 MS	99	107	133 *	113	92	95	1
EXSA49DUP1	67	68	102	77	71	61	0
QC LIMITS	(25-121) (24-113) (19-122) (23-120) (30-115) (18-137)						

SURROGATE ID	F047	# OUT
QC BATCH: Q7H41131 Leachate (Herbicide compounds by GC)		
SAMPLE ID		
BLANK	98	0
BLANK SPIKE	108	0
EXSA4901	117	0
EXSA4901 MD	96	0
EXSA4901 MS	118	0
EXSA49DUP1	119	0
QC LIMITS	(30-130)	

SURROGATE ID	B816	A500	# OUT
QC BATCH: Q7P41133 Leachate (Pesticide compounds by GC)			
SAMPLE ID			
BLANK	37	44	0
BLANK SPIKE	83	79	0
EXSA4901	86	131 *	1
EXSA4901 MD	82	119	0
EXSA4901 MS	77	119	0
EXSA49DUP1	82	116	0
QC LIMITS	(30-130) (30-130)		

SURROGATE ID	
A047 = 1,2-Dichloroethane-D4	B816 = 2,4,5,6-Tetrachloro-m-xylene
B185 = Toluene-D8	A500 = Decachlorobiphenyl
B668 = Bromofluorobenzene	F047 = 2,4-Dichlorophenylacetic-acid
A159 = 2-Fluorophenol	
B732 = Phenol-D6	
A121 = 2,4,6-Tribromophenol	
A884 = Nitrobenzene-D5	
A158 = 2-Fluorobiphenyl	
B142 = Terphenyl-D14	
A228 = a,a,a-Trifluorotoluene	

\* Values outside of method quality control limits  
D Sample was diluted, however, some surrogates may be reported if results were observed.

It is ASC's laboratory policy to allow one surrogate per sample fraction (acid, base-neutral or pesticide) to exceed the stated QC limits. This policy is based upon the USEPA SOW for the Contract Laboratory Program (CLP).

# QUALITY ASSURANCE DATA SURROGATE SUMMARY REPORT

SURROGATE ID	A047	B185	B668	# OUT
QC BATCH: Q7V3790 Leachate (Volatile organics by MS)				
SAMPLE ID				
BLANK	98	97	96	0
BLANK SPIKE	105	102	100	0
EXSA4901	109	109	104	0
EXSA49DUP1	104	99	100	0
HHSTP-01 MD	105	102	99	0
HHSTP-01 MS	105	99	99	0
QC LIMITS	(70-121)	(81-117)	(74-121)	

SURROGATE ID			A228	# OUT
QC BATCH: Q2W3789 Solid (Volatile organics by GC)				
SAMPLE ID				
BLANK	95	0		
BLANK SPIKE	93	0		
EXSA4902	78	0		
EXSA4902 MD	80	0		
EXSA4902 MS	83	0		
QC LIMITS	(30-130)			

SURROGATE ID	
A047 = 1,2-Dichloroethane-D4	B816 = 2,4,5,6-Tetrachloro-m-xylene
B185 = Toluene-D8	A500 = Decachlorobiphenyl
B668 = Bromofluorobenzene	F047 = 2,4-Dichlorophenylacetic-acid
A159 = 2-Fluorophenol	
B732 = Phenol-D6	
A121 = 2,4,6-Tribromophenol	
A884 = Nitrobenzene-D5	
A158 = 2-Fluorobiphenyl	
B142 = Terphenyl-D14	
A228 = a,a,a-Trifluorotoluene	

\* Values outside of method quality control limits  
D Sample was diluted, however, some surrogates may be reported if results were observed.

It is ASC's laboratory policy to allow one surrogate per sample fraction (acid, base-neutral or pesticide) to exceed the stated QC limits. This policy is based upon the USEPA SOW for the Contract Laboratory Program (CLP).

**APPENDIX D**  
**CHAIN-OF-CUSTODY RECORD(S)**





Analytical Services Corp.

## ANALYTICAL REPORT

REVISED: 9/27/94

**Client:** OHM Remediation Services Corporation  
Eastern Region (Hopkinton, MA)

**Attn:** William Snow  
Ron Kenyon  
Mike Quinlan

**Project:** 16208C - USACE; Fort Devens, MA

**Sample Type(s):** Solid

**Analysis Performed:** Conventional, Organics and RCRA TCLP Leachate Parameters


**Date Sample Received:** September 9, 1994

**Date Order Received:** September 9, 1994

**Joblink(s):** 616589

*This report is "PROPRIETARY AND CONFIDENTIAL" and delivered to, and intended for the exclusive use of the above named client only. Analytical Services Corporation assumes no responsibility or liability for the reliance hereon or use hereof by anyone other than the above named client.*

Reviewed and  
Approved by:

  
Thomas E. Gran, Ph.D., Vice President

Date: September 27, 1994

## PROJECT NARRATIVE

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The following items relate to the samples and analytical data contained in this report.

- o All solid sample results are reported on a "dry weight" basis.
- o The identity of all pesticide and herbicides compounds were confirmed by secondary column analysis.
- o The detection limit reported for 2-Methylnaphthalene was greater than the action limit for this compound. Reporting this compound on a "wet weight" basis would have resulted in a detection limit that would have been below the action limit. Based on Method Detection Limit (MDL) studies performed, the good response of this compound and no "J" values reportable for the samples. In this report, it is probable that this compound is not present in the samples above the action limit.
- o Note any and all comments at the bottom of the tables in Appendix B and/or Appendix C.
- o **ASC** will retain samples for a maximum of thirty (30) days after completion of the analysis, samples will be held for a longer period of time, if appropriate arrangements are made in advance. A nominal disposal charge of \$5.00/sample will be imposed for unreturned samples.

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### Reason for Revision:

- o Project Narrative revised to include comment regarding 2-Methylnaphthalene.



**APPENDIX A**  
**DATA SUMMARY REPORT**

NOTE: The Tentatively Identified Volatile (GC/MS) Screen result(s), if applicable, is included in Appendix B.

# DATA SUMMARY REPORT

DATE: 09/21/94

PAGE: 1

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:	EYSA49CA	EYSA49CB	EYSA49CC	EYSA49DUP
ASC Sample Number:	JN2071	JN2072	JN2073	JN2074
Sample Date:	940908	940908	940908	940908
Facility Code:	016208C	016208C	016208C	016208C

Parameters	Units
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## Conventional Data (CV10)

Flash Point, Set Flash	Deg C	>93	>93	>93	>93
Reactive Cyanide	mg/kg	<10.0	<10.0	<10.0	<10.0
Reactive Sulfide	mg/kg	75.0	50.0	175	75.0
Solids, Total	%	94.1	80.8	91.9	-
pH (Electrode)	std	5.87	6.21	6.33	6.03

## ICRA TCLP Leachate Herbicide Analysis, GC, (GS52)

2,4-D	mg/L	<.250	<.250	<.250	<.250
2,4,5-TP (Silvex)	mg/L	<.250	<.250	<.250	<.250

## ICRA TCLP Leachate Pesticide Analysis, GC, (GS54)

Chlordane	mg/L	<.020	<.020	<.020	<.020
Endrin	mg/L	<.002	<.002	<.002	<.002
Heptachlor	mg/L	<.002	<.002	<.002	<.002
Heptachlor epoxide	mg/L	<.002	<.002	<.002	<.002
Lindane	mg/L	<.002	<.002	<.002	<.002
Methoxychlor	mg/L	<.002	<.002	<.002	<.002
Toxaphene	mg/L	<.040	<.040	<.040	<.040

Sample Point ID:	EYSA49CA	EYSA49CB	EYSA49CC
ASC Sample Number:	JN2071	JN2072	JN2073
Sample Date:	940908	940908	940908
Facility Code:	016208C	016208C	016208C

Parameters	Units
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## Total Petroleum Hydrocarbon Analysis, IR (IR00)

Petroleum Hydrocarbons (IR)	mg/kg	108	57.9	116
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# DATA SUMMARY REPORT

DATE: 09/21/94

PAGE: 2

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:	EYSA49CA	EYSA49CB	EYSA49CC	EYSA49DUP
ASC Sample Number:	JN2071	JN2072	JN2073	JN2074
Sample Date:	940908	940908	940908	940908
Facility Code:	016208C	016208C	016208C	016208C

Parameters	Units
------------	-------

## RCRA TCLP Leachate Metals Analysis, (ME52)

Arsenic	mg/L	<.100	<.100	<.100	<.100
Barium	mg/L	.452	.371	.497	.459
Cadmium	mg/L	<.005	<.005	<.005	<.005
Chromium	mg/L	<.020	<.020	<.020	<.020
Lead	mg/L	<.100	<.100	<.100	.517
Mercury	mg/L	<.001	<.001	<.001	<.001
Selenium	mg/L	<.100	<.100	<.100	<.100
Silver	mg/L	<.020	<.020	<.020	<.020
Copper	mg/L	<.020	<.020	<.020	<.020
Zinc	mg/L	<.200	<.200	<.200	<.200

Sample Point ID:	EYSA49CA	EYSA49CB	EYSA49CC
ASC Sample Number:	JN2071	JN2072	JN2073
Sample Date:	940908	940908	940908
Facility Code:	016208C	016208C	016208C

Parameters	Units
------------	-------

## Total Base/Neutral/Acid Analysis, MS, (MS02)

Acenaphthene	mg/kg	<.702	<.816	<.714
Acenaphthylene	mg/kg	<.702	<.816	<.714
Anthracene	mg/kg	<.702	<.816	<.714
Benzidine	mg/kg	<.702	<.816	<.714
Benzo(a)anthracene	mg/kg	<.702	<.816	<.714
Benzo(b)fluoranthene	mg/kg	<.702	<.816	<.714
Benzo(k)fluoranthene	mg/kg	<.702	<.816	<.714
Benzo(ghi)perylene	mg/kg	<.702	<.816	<.714
Benzo(a)pyrene	mg/kg	<.702	<.816	<.714
bis(2-Chloroethyl) ether	mg/kg	<.702	<.816	<.714
bis(2-Chloroethoxy)methane	mg/kg	<.702	<.816	<.714
bis(2-Chloroisopropyl)ether	mg/kg	<.702	<.816	<.714
bis(2-Ethylhexyl)phthalate	mg/kg	1.78	2.42	1.34
4-Bromophenyl phenyl ether	mg/kg	<.702	<.816	<.714
Butyl benzyl phthalate	mg/kg	<.702	<.816	<.714

# DATA SUMMARY REPORT

DATE: 09/21/94

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Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:	EISA49CA	EISA49CB	EISA49CC
ASC Sample Number:	JN2071	JN2072	JN2073
Sample Date:	940908	940908	940908
Facility Code:	016208C	016208C	016208C

Parameters	Units
------------	-------

## atal Base/Neutral/Acid Analysis, MS, (MS02)

Carbazole	mg/kg	<.702	<.816	<.714
1-Chloroaniline	mg/kg	<.702	<.816	<.714
2-Chloro-m-cresol	mg/kg	<.702	<.816	<.714
1-Chloronaphthalene	mg/kg	<.702	<.816	<.714
1-Chlorophenol	mg/kg	<.702	<.816	<.714
1-Chlorophenyl phenyl ether	mg/kg	<.702	<.816	<.714
Chrysene	mg/kg	<.702	<.816	<.714
Dibenzo(a,h)anthracene	mg/kg	<.702	<.816	<.714
Dibenzofuran	mg/kg	<.702	<.816	<.714
Di-n-butyl phthalate	mg/kg	<.702	<.816	<.714
1,2-Dichlorobenzene	mg/kg	<.702	<.816	<.714
1,3-Dichlorobenzene	mg/kg	<.702	<.816	<.714
1,4-Dichlorobenzene	mg/kg	<.702	<.816	<.714
3,3'-Dichlorobenzidine	mg/kg	<.702	<.816	<.714
2,4-Dichlorophenol	mg/kg	<.702	<.816	<.714
Diethyl phthalate	mg/kg	<.702	<.816	<.714
Dimethyl phthalate	mg/kg	<.702	<.816	<.714
2,4-Dimethylphenol	mg/kg	<.702	<.816	<.714
1,6-Dinitro-o-cresol	mg/kg	<1.75	<2.04	<1.79
2,4-Dinitrophenol	mg/kg	<3.51	<4.08	<3.57
2,4-Dinitrotoluene	mg/kg	<.702	<.816	<.714
2,6-Dinitrotoluene	mg/kg	<.702	<.816	<.714
Di-n-octyl phthalate	mg/kg	<.702	<.816	<.714
Fluoranthene	mg/kg	<.702	<.816	<.714
Fluorene	mg/kg	<.702	<.816	<.714
Hexachlorobenzene	mg/kg	<.702	<.816	<.714
Hexachlorobutadiene	mg/kg	<.702	<.816	<.714
Hexachlorocyclopentadiene	mg/kg	<.702	<.816	<.714
Hexachloroethane	mg/kg	<.702	<.816	<.714
Indeno(1,2,3-c,d)pyrene	mg/kg	<.702	<.816	<.714
Isophorone	mg/kg	<.702	<.816	<.714
2-Methylnaphthalene	mg/kg	<.702	<.816	<.714
2-Methylphenol	mg/kg	<.702	<.816	<.714
4-Methylphenol	mg/kg	<.702	<.816	<.714
N-Nitrosodimethylamine	mg/kg	<.702	<.816	<.714

# DATA SUMMARY REPORT

DATE: 09/21/94

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Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:	EISA49CA	EISA49CB	EISA49CC
ASC Sample Number:	JN2071	JN2072	JN2073
Sample Date:	940908	940908	940908
Facility Code:	016208C	016208C	016208C

Parameters	Units
------------	-------

## Total Base/Neutral/Acid Analysis, MS, (MS02)

N-Nitrosodi-n-propylamine	mg/kg	<.702	<.816	<.714
N-Nitrosodiphenylamine	mg/kg	<.702	<.816	<.714
Naphthalene	mg/kg	<.702	<.816	<.714
2-Nitroaniline	mg/kg	<.702	<.816	<.714
3-Nitroaniline	mg/kg	<.702	<.816	<.714
4-Nitroaniline	mg/kg	<.702	<.816	<.714
Nitrobenzene	mg/kg	<.702	<.816	<.714
2-Nitrophenol	mg/kg	<.702	<.816	<.714
4-Nitrophenol	mg/kg	<3.51	<4.08	<3.57
Pentachlorophenol	mg/kg	<.702	<.816	<.714
Phenanthrene	mg/kg	<.702	<.816	<.714
Phenol	mg/kg	<.702	<.816	<.714
Pyrene	mg/kg	<.702	<.816	<.714
Pyridine	mg/kg	<.702	<.816	<.714
1,2,4-Trichlorobenzene	mg/kg	<.702	<.816	<.714
2,4,5-Trichlorophenol	mg/kg	<.702	<.816	<.714
2,4,6-Trichlorophenol	mg/kg	<.702	<.816	<.714
1,2,4,5-Tetrachlorobenzene	mg/kg	<.702	<.816	<.714

Sample Point ID:	EISA49CA	EISA49CB	EISA49CC	EISA49DUP
ASC Sample Number:	JN2071	JN2072	JN2073	JN2074
Sample Date:	940908	940908	940908	940908
Facility Code:	016208C	016208C	016208C	016208C

Parameters	Units
------------	-------

## CRA TCLP Leachate Base/Neutral/Acid Analysis, MS, (MS52)

2,4-Dinitrotoluene	mg/L	<.100	<.100	<.100	<.100
Hexachlorobenzene	mg/L	<.100	<.100	<.100	<.100
Hexachloroethane	mg/L	<.100	<.100	<.100	<.100
Hexachlorobutadiene	mg/L	<.100	<.100	<.100	<.100
2-Methylphenol	mg/L	<.100	<.100	<.100	<.100
4-Methylphenol	mg/L	<.100	<.100	<.100	<.100
Nitrobenzene	mg/L	<.100	<.100	<.100	<.100

# DATA SUMMARY REPORT

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Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:	EXSA49CA	EXSA49CB	EXSA49CC	EXSA49DUP
ASC Sample Number:	JN2071	JN2072	JN2073	JN2074
Sample Date:	940908	940908	940908	940908
Facility Code:	016208C	016208C	016208C	016208C

Parameters	Units
------------	-------

## CRA TCLP Leachate Base/Neutral/Acid Analysis, MS, (MS52)

Pentachlorophenol	mg/L	<.100	<.100	<.100	<.100
Pyridine	mg/L	<.100	<.100	<.100	<.100
2,4,5-Trichlorophenol	mg/L	<.100	<.100	<.100	<.100
2,4,6-Trichlorophenol	mg/L	<.100	<.100	<.100	<.100

## CRA TCLP Leachate (ZHE) Volatile Analysis, MS, (MV50)

Benzene	mg/L	<.125	<.125	<.125	<.125
Carbon tetrachloride	mg/L	<.125	<.125	<.125	<.125
Chlorobenzene	mg/L	<.125	<.125	<.125	<.125
Chloroform	mg/L	<.125	<.125	<.125	<.125
1,4-Dichlorobenzene	mg/L	<.125	<.125	<.125	<.125
1,2-Dichloroethane	mg/L	<.125	<.125	<.125	<.125
1,1-Dichloroethylene	mg/L	<.125	<.125	<.125	<.125
Methyl ethyl ketone	mg/L	<.250	<.250	<.250	<.250
Tetrachloroethylene	mg/L	<.125	<.125	<.125	<.125
Trichloroethylene	mg/L	<.125	<.125	<.125	<.125
Vinyl chloride	mg/L	<.125	<.125	<.125	<.125



**APPENDIX B**  
**QUANTITATIVE RESULTS**

### CONVENTIONAL DATA (CV10)

**Company Name**

Facility

### Sample Point

ASC Sample No.

**OHM REMEDIATION SERVICES CORPORATION**

016208C

**EXSA49CA**

JN2071

Compounds		Sample Results	Detection Limits	Blank Results	Batch Number
Reactive Cyanide	mg/kg	ND	10.0	ND	Q2I3861
Reactive Sulfide	mg/kg	75.0	20.0	ND	Q2I3860
Solids, Total	%	94.1	.100	-	
pH (Electrode)	std	5.87	-	-	
Flash Point, Seta Flash	Deg C	>93	-	-	

### CONVENTIONAL DATA (CV10)

**Company Name**

Facility

**Sample Point**

ASC Sample No.

**OHM REMEDIATION SERVICES CORPORATION**

016208C

**EXSA49CB**

JN2072

Compounds		Sample Results	Detection Limits	Blank Results	Batch Number
Reactive Cyanide	mg/kg	ND	10.0	ND	Q2I3861
Reactive Sulfide	mg/kg	50.0	20.0	ND	Q2I3860
Solids, Total	%	80.8	.100	-	
pH (Electrode)	std	6.21	-	-	
Flash Point, Seta Flash	Deg C	>93	-	-	

### CONVENTIONAL DATA (CV10)

**Company Name**

Facility

### Sample Point

ASC Sample No.

**OHM REMEDIATION SERVICES CORPORATION**

016208C

**EXSA49CC**

JN2073

Compounds		Sample Results	Detection Limits	Blank Results	Batch Number
Reactive Cyanide	mg/kg	ND	10.0	ND	Q2I3861
Reactive Sulfide	mg/kg	175	20.0	ND	Q2I3860
Solids, Total	%	91.9	.100	-	
pH (Electrode)	std	6.33	-	-	
Flash Point, Seta Flash	Deg C	>93	-	-	

### CONVENTIONAL DATA (CV10)

**Company Name**

Facility

### Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**EXSA49DUP**

JN2074

Compounds		Sample Results	Detection Limits	Blank Results	Batch Number
Reactive Cyanide	mg/kg	ND	10.0	ND	Q2I3861
Reactive Sulfide	mg/kg	75.0	20.0	ND	Q2I3860
pH (Electrode)	std	6.03	-	-	
Flash Point, Seta Flash	Deg C	>93	-	-	

**TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)**

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49CA

JN2071

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Petroleum Hydrocarbons (IR)	108	41.6	ND	Q2T41259



## TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49CB

JN2072

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Petroleum Hydrocarbons (IR)	57.9	48.3	ND	Q2T41259

**TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)**

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49CC

JN2073

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Petroleum Hydrocarbons (IR)	116	43.3	ND	Q2T41259

# TOTAL BASE/NEUTRAL/ACID ANALYSIS, MS, (MS02)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA49CA	JN2071

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Acenaphthene	ND	.702	ND	Q2C41251
Acenaphthylene	ND	.702	ND	Q2C41251
Anthracene	ND	.702	ND	Q2C41251
Benzidine	ND	.702	ND	Q2C41251
Benzo (a) anthracene	ND	.702	ND	Q2C41251
Benzo (b) fluoranthene	ND	.702	ND	Q2C41251
Benzo (k) fluoranthene	ND	.702	ND	Q2C41251
Benzo (ghi) perylene	ND	.702	ND	Q2C41251
Benzo (a) pyrene	ND	.702	ND	Q2C41251
bis (2-Chloroethyl) ether	ND	.702	ND	Q2C41251
bis (2-Chloroethoxy) methane	ND	.702	ND	Q2C41251
bis (2-Chloroisopropyl) ether	ND	.702	ND	Q2C41251
bis (2-Ethylhexyl) phthalate	1.78	.702	ND	Q2C41251
4-Bromophenyl phenyl ether	ND	.702	ND	Q2C41251
Butyl benzyl phthalate	ND	.702	ND	Q2C41251
Carbazole	ND	.702	ND	Q2C41251
4-Chloroaniline	ND	.702	ND	Q2C41251
p-Chloro-m-cresol	ND	.702	ND	Q2C41251
2-Chloronaphthalene	ND	.702	ND	Q2C41251
2-Chlorophenol	ND	.702	ND	Q2C41251
4-Chlorophenyl phenyl ether	ND	.702	ND	Q2C41251
Chrysene	ND	.702	ND	Q2C41251
Fluoranthene	ND	.702	ND	Q2C41251
Benzo (a, h) anthracene	ND	.702	ND	Q2C41251
Benzo (b) furan	ND	.702	ND	Q2C41251
Di-n-butyl phthalate	ND	.702	ND	Q2C41251
1,2-Dichlorobenzene	ND	.702	ND	Q2C41251
1,3-Dichlorobenzene	ND	.702	ND	Q2C41251
1,4-Dichlorobenzene	ND	.702	ND	Q2C41251
3,3'-Dichlorobenzidine	ND	.702	ND	Q2C41251
2,4-Dichlorophenol	ND	.702	ND	Q2C41251
Diethyl phthalate	ND	.702	ND	Q2C41251
Dimethyl phthalate	ND	.702	ND	Q2C41251
2,4-Dimethylphenol	ND	.702	ND	Q2C41251
4,6-Dinitro-o-cresol	ND	1.75	ND	Q2C41251
2,4-Dinitrophenol	ND	3.51	ND	Q2C41251
2,4-Dinitrotoluene	ND	.702	ND	Q2C41251
2,6-Dinitrotoluene	ND	.702	ND	Q2C41251
Di-n-octyl phthalate	ND	.702	ND	Q2C41251
Fluoranthene	ND	.702	ND	Q2C41251
Fluorene	ND	.702	ND	Q2C41251
Hexachlorobenzene	ND	.702	ND	Q2C41251
Hexachlorobutadiene	ND	.702	ND	Q2C41251
Hexachlorocyclopentadiene	ND	.702	ND	Q2C41251
Hexachloroethane	ND	.702	ND	Q2C41251
Indeno (1,2,3-c,d) pyrene	ND	.702	ND	Q2C41251
Isophorone	ND	.702	ND	Q2C41251
2-Methylnaphthalene	ND	.702	ND	Q2C41251
2-Methylphenol	ND	.702	ND	Q2C41251
4-Methylphenol	ND	.702	ND	Q2C41251
N-Nitrosodimethylamine	ND	.702	ND	Q2C41251

# TOTAL BASE/NEUTRAL/ACID ANALYSIS, MS, (MS02)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA49CA	JN2071

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
N-Nitrosodi-n-propylamine	ND	.702	ND	Q2C41251
N-Nitrosodiphenylamine	ND	.702	ND	Q2C41251
Naphthalene	ND	.702	ND	Q2C41251
2-Nitroaniline	ND	.702	ND	Q2C41251
3-Nitroaniline	ND	.702	ND	Q2C41251
4-Nitroaniline	ND	.702	ND	Q2C41251
Nitrobenzene	ND	.702	ND	Q2C41251
2-Nitrophenol	ND	.702	ND	Q2C41251
4-Nitrophenol	ND	3.51	ND	Q2C41251
Pentachlorophenol	ND	.702	ND	Q2C41251
Phenanthrene	ND	.702	ND	Q2C41251
Phenol	ND	.702	ND	Q2C41251
Pyrene	ND	.702	ND	Q2C41251
Pyridine	ND	.702	ND	Q2C41251
1,2,4,5-Tetrachlorobenzene	ND	.702	ND	Q2C41251
1,2,4-Trichlorobenzene	ND	.702	ND	Q2C41251
2,4,5-Trichlorophenol	ND	.702	ND	Q2C41251
2,4,6-Trichlorophenol	ND	.702	ND	Q2C41251

3-Methyl- and 4-Methylphenol coelute and are reported as the total

# TOTAL BASE/NEUTRAL/ACID ANALYSIS, MS, (MS02)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA49CB	JN2072

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Acenaphthene	ND	.816	ND	Q2C41251
Acenaphthylene	ND	.816	ND	Q2C41251
Anthracene	ND	.816	ND	Q2C41251
Benzidine	ND	.816	ND	Q2C41251
Benzo (a) anthracene	ND	.816	ND	Q2C41251
Benzo (b) fluoranthene	ND	.816	ND	Q2C41251
Benzo (k) fluoranthene	ND	.816	ND	Q2C41251
Benzo (ghi) perylene	ND	.816	ND	Q2C41251
Benzo (a) pyrene	ND	.816	ND	Q2C41251
bis (2-Chloroethyl) ether	ND	.816	ND	Q2C41251
bis (2-Chloroethoxy) methane	ND	.816	ND	Q2C41251
bis (2-Chloroisopropyl) ether	ND	.816	ND	Q2C41251
bis (2-Ethylhexyl) phthalate	2.42	.816	ND	Q2C41251
4-Bromophenyl phenyl ether	ND	.816	ND	Q2C41251
Butyl benzyl phthalate	ND	.816	ND	Q2C41251
Carbazole	ND	.816	ND	Q2C41251
4-Chloroaniline	ND	.816	ND	Q2C41251
p-Chloro-m-cresol	ND	.816	ND	Q2C41251
2-Chloronaphthalene	ND	.816	ND	Q2C41251
2-Chlorophenol	ND	.816	ND	Q2C41251
4-Chlorophenyl phenyl ether	ND	.816	ND	Q2C41251
Chrysene	ND	.816	ND	Q2C41251
Benzo (a, h) anthracene	ND	.816	ND	Q2C41251
Benzo (f) furan	ND	.816	ND	Q2C41251
Di-n-butyl phthalate	ND	.816	ND	Q2C41251
1,2-Dichlorobenzene	ND	.816	ND	Q2C41251
1,3-Dichlorobenzene	ND	.816	ND	Q2C41251
1,4-Dichlorobenzene	ND	.816	ND	Q2C41251
3,3'-Dichlorobenzidine	ND	.816	ND	Q2C41251
2,4-Dichlorophenol	ND	.816	ND	Q2C41251
Diethyl phthalate	ND	.816	ND	Q2C41251
Dimethyl phthalate	ND	.816	ND	Q2C41251
2,4-Dimethylphenol	ND	.816	ND	Q2C41251
4,6-Dinitro-o-cresol	ND	2.04	ND	Q2C41251
2,4-Dinitrophenol	ND	4.08	ND	Q2C41251
2,4-Dinitrotoluene	ND	.816	ND	Q2C41251
2,6-Dinitrotoluene	ND	.816	ND	Q2C41251
Di-n-octyl phthalate	ND	.816	ND	Q2C41251
Fluoranthene	ND	.816	ND	Q2C41251
Fluorene	ND	.816	ND	Q2C41251
Hexachlorobenzene	ND	.816	ND	Q2C41251
Hexachlorobutadiene	ND	.816	ND	Q2C41251
Hexachlorocyclopentadiene	ND	.816	ND	Q2C41251
Hexachloroethane	ND	.816	ND	Q2C41251
Indeno (1,2,3-c,d) pyrene	ND	.816	ND	Q2C41251
Isophorone	ND	.816	ND	Q2C41251
2-Methylnaphthalene	ND	.816	ND	Q2C41251
2-Methylphenol	ND	.816	ND	Q2C41251
4-Methylphenol	ND	.816	ND	Q2C41251
N-Nitrosodimethylamine	ND	.816	ND	Q2C41251

# TOTAL BASE/NEUTRAL/ACID ANALYSIS, MS, (MS02)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA49CB	JN2072

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
N-Nitrosodi-n-propylamine	ND	.816	ND	Q2C41251
N-Nitrosodiphenylamine	ND	.816	ND	Q2C41251
Naphthalene	ND	.816	ND	Q2C41251
2-Nitroaniline	ND	.816	ND	Q2C41251
3-Nitroaniline	ND	.816	ND	Q2C41251
4-Nitroaniline	ND	.816	ND	Q2C41251
Nitrobenzene	ND	.816	ND	Q2C41251
2-Nitrophenol	ND	.816	ND	Q2C41251
4-Nitrophenol	ND	4.08	ND	Q2C41251
Pentachlorophenol	ND	.816	ND	Q2C41251
Phenanthrene	ND	.816	ND	Q2C41251
Phenol	ND	.816	ND	Q2C41251
Pyrene	ND	.816	ND	Q2C41251
Pyridine	ND	.816	ND	Q2C41251
1,2,4,5-Tetrachlorobenzene	ND	.816	ND	Q2C41251
1,2,4-Trichlorobenzene	ND	.816	ND	Q2C41251
2,4,5-Trichlorophenol	ND	.816	ND	Q2C41251
2,4,6-Trichlorophenol	ND	.816	ND	Q2C41251

3-Methyl- and 4-Methylphenol coelute and are reported as the total



# TOTAL BASE/NEUTRAL/ACID ANALYSIS, MS, (MS02)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA49CC	JN2073

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Acenaphthene	ND	.714	ND	Q2C41251
Acenaphthylene	ND	.714	ND	Q2C41251
Anthracene	ND	.714	ND	Q2C41251
Benzidine	ND	.714	ND	Q2C41251
Benzo(a)anthracene	ND	.714	ND	Q2C41251
Benzo(b)fluoranthene	ND	.714	ND	Q2C41251
Benzo(k)fluoranthene	ND	.714	ND	Q2C41251
Benzo(ghi)perylene	ND	.714	ND	Q2C41251
Benzo(a)pyrene	ND	.714	ND	Q2C41251
bis(2-Chloroethyl) ether	ND	.714	ND	Q2C41251
bis(2-Chloroethoxy)methane	ND	.714	ND	Q2C41251
bis(2-Chloroisopropyl) ether	ND	.714	ND	Q2C41251
bis(2-Ethylhexyl)phthalate	1.34	.714	ND	Q2C41251
4-Bromophenyl phenyl ether	ND	.714	ND	Q2C41251
Butyl benzyl phthalate	ND	.714	ND	Q2C41251
Carbazole	ND	.714	ND	Q2C41251
4-Chloroaniline	ND	.714	ND	Q2C41251
p-Chloro-m-cresol	ND	.714	ND	Q2C41251
2-Chloronaphthalene	ND	.714	ND	Q2C41251
2-Chlorophenol	ND	.714	ND	Q2C41251
4-Chlorophenyl phenyl ether	ND	.714	ND	Q2C41251
Chrysene	ND	.714	ND	Q2C41251
Benzo(a,h)anthracene	ND	.714	ND	Q2C41251
benzofuran	ND	.714	ND	Q2C41251
Di-n-butyl phthalate	ND	.714	ND	Q2C41251
1,2-Dichlorobenzene	ND	.714	ND	Q2C41251
1,3-Dichlorobenzene	ND	.714	ND	Q2C41251
1,4-Dichlorobenzene	ND	.714	ND	Q2C41251
3,3'-Dichlorobenzidine	ND	.714	ND	Q2C41251
2,4-Dichlorophenol	ND	.714	ND	Q2C41251
Diethyl phthalate	ND	.714	ND	Q2C41251
Dimethyl phthalate	ND	.714	ND	Q2C41251
2,4-Dimethylphenol	ND	.714	ND	Q2C41251
4,6-Dinitro-o-cresol	ND	1.79	ND	Q2C41251
2,4-Dinitrophenol	ND	3.57	ND	Q2C41251
2,4-Dinitrotoluene	ND	.714	ND	Q2C41251
2,6-Dinitrotoluene	ND	.714	ND	Q2C41251
Di-n-octyl phthalate	ND	.714	ND	Q2C41251
Fluoranthene	ND	.714	ND	Q2C41251
Fluorene	ND	.714	ND	Q2C41251
Hexachlorobenzene	ND	.714	ND	Q2C41251
Hexachlorobutadiene	ND	.714	ND	Q2C41251
Hexachlorocyclopentadiene	ND	.714	ND	Q2C41251
Hexachloroethane	ND	.714	ND	Q2C41251
Indeno(1,2,3-c,d)pyrene	ND	.714	ND	Q2C41251
Isophorone	ND	.714	ND	Q2C41251
2-Methylnaphthalene	ND	.714	ND	Q2C41251
2-Methylphenol	ND	.714	ND	Q2C41251
4-Methylphenol	ND	.714	ND	Q2C41251
N-Nitrosodimethylamine	ND	.714	ND	Q2C41251

# TOTAL BASE/NEUTRAL/ACID ANALYSIS, MS, (MS02)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA49CC	JN2073

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
N-Nitrosodi-n-propylamine	ND	.714	ND	Q2C41251
N-Nitrosodiphenylamine	ND	.714	ND	Q2C41251
Naphthalene	ND	.714	ND	Q2C41251
2-Nitroaniline	ND	.714	ND	Q2C41251
3-Nitroaniline	ND	.714	ND	Q2C41251
4-Nitroaniline	ND	.714	ND	Q2C41251
Nitrobenzene	ND	.714	ND	Q2C41251
2-Nitrophenol	ND	.714	ND	Q2C41251
4-Nitrophenol	ND	3.57	ND	Q2C41251
Pentachlorophenol	ND	.714	ND	Q2C41251
Phenanthrene	ND	.714	ND	Q2C41251
Phenol	ND	.714	ND	Q2C41251
Pyrene	ND	.714	ND	Q2C41251
Pyridine	ND	.714	ND	Q2C41251
1,2,4,5-Tetrachlorobenzene	ND	.714	ND	Q2C41251
1,2,4-Trichlorobenzene	ND	.714	ND	Q2C41251
2,4,5-Trichlorophenol	ND	.714	ND	Q2C41251
2,4,6-Trichlorophenol	ND	.714	ND	Q2C41251

3-Methyl- and 4-Methylphenol coelute and are reported as the total

## RCRA TCLP LEACHATE HERBICIDE ANALYSIS, GC, (GS52)

**Company Name**

**Facility**

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**EXSA49CA**

JN2071

Compounds	Sample Results mg/L	Bias Corrected Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number	Bias Recov
2,4-D	ND	-	.250	ND	Q7H41261	79
2,4,5-TP (Silvex)	ND	-	.250	ND	Q7H41261	63

## RCRA TCLP LEACHATE HERBICIDE ANALYSIS, GC, (GS52)

**Company Name**

Facility

### Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**EXSA49CB**

JN2072

Compounds	Sample Results mg/L	Bias Corrected Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number	Bias Recov
2,4-D	ND	-	.250	ND	Q7H41261	79
2,4,5-TP (Silvex)	ND	-	.250	ND	Q7H41261	63

## RCRA TCLP LEACHATE HERBICIDE ANALYSIS, GC, (GS52)

**Company Name**

Facility

### Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

**EXSA49CC**

JN2073

Compounds	Sample Results mg/L	Bias Corrected Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number	Bias Recov
2,4-D	ND	-	.250	ND	Q7H41261	79
2,4,5-TP (Silvex)	ND	-	.250	ND	Q7H41261	63

## RCRA TCLP LEACHATE HERBICIDE ANALYSIS, GC, (GS52)

**Company Name**

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49DUP

**JN2074**

Compounds	Sample Results mg/L	Bias Corrected Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number	Bias Recov
2,4-D	ND	-	.250	ND	Q7H41261	79
2,4,5-TP (Silvex)	ND	-	.250	ND	Q7H41261	63



# RCRA TCLP LEACHATE PESTICIDE ANALYSIS, GC, (GS54)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49CA

JN2071

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Chlordane	ND	.020	ND	Q7P41262
Endrin	ND	.002	ND	Q7P41262
Heptachlor	ND	.002	ND	Q7P41262
Heptachlor epoxide	ND	.002	ND	Q7P41262
Lindane	ND	.002	ND	Q7P41262
Methoxychlor	ND	.002	ND	Q7P41262
Toxaphene	ND	.040	ND	Q7P41262

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA49CB	JN2072

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Chlordane	ND	.020	ND	Q7P41262
Endrin	ND	.002	ND	Q7P41262
Heptachlor	ND	.002	ND	Q7P41262
Heptachlor epoxide	ND	.002	ND	Q7P41262
Lindane	ND	.002	ND	Q7P41262
Methoxychlor	ND	.002	ND	Q7P41262
Toxaphene	ND	.040	ND	Q7P41262

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA49CC	JN2073

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Chlordane	ND	.020	ND	Q7P41262
Endrin	ND	.002	ND	Q7P41262
Heptachlor	ND	.002	ND	Q7P41262
Heptachlor epoxide	ND	.002	ND	Q7P41262
Lindane	ND	.002	ND	Q7P41262
Methoxychlor	ND	.002	ND	Q7P41262
Toxaphene	ND	.040	ND	Q7P41262

## RCRA TCLP LEACHATE PESTICIDE ANALYSIS, GC, (GS54)

**Company Name**

Facility

### Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49DUP

JN2074

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Chlordane	ND	.020	ND	Q7P41262
Endrin	ND	.002	ND	Q7P41262
Heptachlor	ND	.002	ND	Q7P41262
Heptachlor epoxide	ND	.002	ND	Q7P41262
Lindane	ND	.002	ND	Q7P41262
Methoxychlor	ND	.002	ND	Q7P41262
Toxaphene	ND	.040	ND	Q7P41262

# RCRA TCLP LEACHATE METALS ANALYSIS, (ME52)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49CA

JN2071

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Arsenic	ND	.100	ND	Q7M5316
Barium	.452	.100	ND	Q7M5316
Cadmium	ND	.005	ND	Q7M5316
Chromium	ND	.020	ND	Q7M5316
Lead	ND	.100	ND	Q7M5316
Mercury	ND	.001	ND	Q7G5315
Selenium	ND	.100	ND	Q7M5316
Silver	ND	.020	ND	Q7M5316
Copper	ND	.020	ND	Q7M5316
Zinc	ND	.200	ND	Q7M5316

# RCRA TCLP LEACHATE METALS ANALYSIS, (ME52)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49CB

JN2072

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Arsenic	ND	.100	ND	Q7M5316
Barium	.371	.100	ND	Q7M5316
Cadmium	ND	.005	ND	Q7M5316
Chromium	ND	.020	ND	Q7M5316
Lead	ND	.100	ND	Q7M5316
Mercury	ND	.001	ND	Q7G5315
Selenium	ND	.100	ND	Q7M5316
Silver	ND	.020	ND	Q7M5316
Copper	ND	.020	ND	Q7M5316
Zinc	ND	.200	ND	Q7M5316



# RCRA TCLP LEACHATE METALS ANALYSIS, (ME52)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49CC

JN2073

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Arsenic	ND	.100	ND	Q7M5316
Barium	.497	.100	ND	Q7M5316
Cadmium	ND	.005	ND	Q7M5316
Chromium	ND	.020	ND	Q7M5316
Lead	ND	.100	ND	Q7M5316
Mercury	ND	.001	ND	Q7G5315
Selenium	ND	.100	ND	Q7M5316
Silver	ND	.020	ND	Q7M5316
Copper	ND	.020	ND	Q7M5316
Zinc	ND	.200	ND	Q7M5316

# RCRA TCLP LEACHATE METALS ANALYSIS, (ME52)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49DUP

JN2074

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Arsenic	ND	.100	ND	Q7M5316
Barium	.459	.100	ND	Q7M5316
Cadmium	ND	.005	ND	Q7M5316
Chromium	ND	.020	ND	Q7M5316
Lead	.517	.100	ND	Q7M5316
Mercury	ND	.001	ND	Q7G5315
Selenium	ND	.100	ND	Q7M5316
Silver	ND	.020	ND	Q7M5316
Copper	ND	.020	ND	Q7M5316
Zinc	ND	.200	ND	Q7M5316

# RCRA TCLP LEACHATE BASE/NEUTRAL/ACID ANALYSIS, MS, (MS52)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA49CA	JN2071

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
2,4-Dinitrotoluene	ND	.100	ND	Q7C41260
Hexachlorobenzene	ND	.100	ND	Q7C41260
Hexachloroethane	ND	.100	ND	Q7C41260
Hexachlorobutadiene	ND	.100	ND	Q7C41260
2-Methylphenol	ND	.100	ND	Q7C41260
4-Methylphenol	ND	.100	ND	Q7C41260
Nitrobenzene	ND	.100	ND	Q7C41260
Pentachlorophenol	ND	.100	ND	Q7C41260
Pyridine	ND	.100	ND	Q7C41260
2,4,5-Trichlorophenol	ND	.100	ND	Q7C41260
2,4,6-Trichlorophenol	ND	.100	ND	Q7C41260

3-Methyl- and 4-Methylphenol coelute and are reported as the total

# RCRA TCLP LEACHATE BASE/NEUTRAL/ACID ANALYSIS, MS, (MS52)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA49CB	JN2072

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
2,4-Dinitrotoluene	ND	.100	ND	Q7C41260
Hexachlorobenzene	ND	.100	ND	Q7C41260
Hexachloroethane	ND	.100	ND	Q7C41260
Hexachlorobutadiene	ND	.100	ND	Q7C41260
2-Methylphenol	ND	.100	ND	Q7C41260
4-Methylphenol	ND	.100	ND	Q7C41260
Nitrobenzene	ND	.100	ND	Q7C41260
Pentachlorophenol	ND	.100	ND	Q7C41260
Pyridine	ND	.100	ND	Q7C41260
2,4,5-Trichlorophenol	ND	.100	ND	Q7C41260
2,4,6-Trichlorophenol	ND	.100	ND	Q7C41260

3-Methyl- and 4-Methylphenol coelute and are reported as the total

# RCRA TCLP LEACHATE BASE/NEUTRAL/ACID ANALYSIS, MS, (MS52)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA49CC	JN2073

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
2,4-Dinitrotoluene	ND	.100	ND	Q7C41273
Hexachlorobenzene	ND	.100	ND	Q7C41273
Hexachloroethane	ND	.100	ND	Q7C41273
Hexachlorobutadiene	ND	.100	ND	Q7C41273
2-Methylphenol	ND	.100	ND	Q7C41273
4-Methylphenol	ND	.100	ND	Q7C41273
Nitrobenzene	ND	.100	ND	Q7C41273
Pentachlorophenol	ND	.100	ND	Q7C41273
Pyridine	ND	.100	ND	Q7C41273
2,4,5-Trichlorophenol	ND	.100	ND	Q7C41273
2,4,6-Trichlorophenol	ND	.100	ND	Q7C41273

3-Methyl- and 4-Methylphenol coelute and are reported as the total

# RCRA TCLP LEACHATE BASE/NEUTRAL/ACID ANALYSIS, MS, (MS52)

Company Name Facility Sample Point ASC Sample No.  
OHM REMEDIATION SERVICES CORPORATION 016208C EXSA49DUP JN2074

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
2,4-Dinitrotoluene	ND	.100	ND	Q7C41260
Hexachlorobenzene	ND	.100	ND	Q7C41260
Hexachloroethane	ND	.100	ND	Q7C41260
Hexachlorobutadiene	ND	.100	ND	Q7C41260
2-Methylphenol	ND	.100	ND	Q7C41260
4-Methylphenol	ND	.100	ND	Q7C41260
Nitrobenzene	ND	.100	ND	Q7C41260
Pentachlorophenol	ND	.100	ND	Q7C41260
Pyridine	ND	.100	ND	Q7C41260
2,4,5-Trichlorophenol	ND	.100	ND	Q7C41260
2,4,6-Trichlorophenol	ND	.100	ND	Q7C41260

3-Methyl- and 4-Methylphenol coelute and are reported as the total



# RCRA TCLP LEACHATE (ZHE) VOLATILE ANALYSIS, MS, (MV50)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49CA

JN2071

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Benzene	ND	.125	ND	Q7V3860
Carbon tetrachloride	ND	.125	ND	Q7V3860
Chlorobenzene	ND	.125	ND	Q7V3860
Chloroform	ND	.125	ND	Q7V3860
1,4-Dichlorobenzene	ND	.125	ND	Q7V3860
1,2-Dichloroethane	ND	.125	ND	Q7V3860
1,1-Dichloroethylene	ND	.125	ND	Q7V3860
Methyl ethyl ketone	ND	.250	ND	Q7V3860
Tetrachloroethylene	ND	.125	ND	Q7V3860
Trichloroethylene	ND	.125	ND	Q7V3860
Vinyl chloride	ND	.125	ND	Q7V3860

# RCRA TCLP LEACHATE (ZHE) VOLATILE ANALYSIS, MS, (MV50)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA49CB	JN2072

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Benzene	ND	.125	ND	Q7V3860
Carbon tetrachloride	ND	.125	ND	Q7V3860
Chlorobenzene	ND	.125	ND	Q7V3860
Chloroform	ND	.125	ND	Q7V3860
1,4-Dichlorobenzene	ND	.125	ND	Q7V3860
1,2-Dichloroethane	ND	.125	ND	Q7V3860
1,1-Dichloroethylene	ND	.125	ND	Q7V3860
Methyl ethyl ketone	ND	.250	ND	Q7V3860
Tetrachloroethylene	ND	.125	ND	Q7V3860
Trichloroethylene	ND	.125	ND	Q7V3860
Vinyl chloride	ND	.125	ND	Q7V3860

# RCRA TCLP LEACHATE (ZHE) VOLATILE ANALYSIS, MS, (MV50)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49CC

JN2073

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Benzene	ND	.125	ND	Q7V3860
Carbon tetrachloride	ND	.125	ND	Q7V3860
Chlorobenzene	ND	.125	ND	Q7V3860
Chloroform	ND	.125	ND	Q7V3860
1,4-Dichlorobenzene	ND	.125	ND	Q7V3860
1,2-Dichloroethane	ND	.125	ND	Q7V3860
1,1-Dichloroethylene	ND	.125	ND	Q7V3860
Methyl ethyl ketone	ND	.250	ND	Q7V3860
Tetrachloroethylene	ND	.125	ND	Q7V3860
Trichloroethylene	ND	.125	ND	Q7V3860
Vinyl chloride	ND	.125	ND	Q7V3860

# RCRA TCLP LEACHATE (ZHE) VOLATILE ANALYSIS, MS, (MV50)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA49DUP	JN2074

Compounds	Sample Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number
Benzene	ND	.125	ND	Q7V3860
Carbon tetrachloride	ND	.125	ND	Q7V3860
Chlorobenzene	ND	.125	ND	Q7V3860
Chloroform	ND	.125	ND	Q7V3860
1,4-Dichlorobenzene	ND	.125	ND	Q7V3860
1,2-Dichloroethane	ND	.125	ND	Q7V3860
1,1-Dichloroethylene	ND	.125	ND	Q7V3860
Methyl ethyl ketone	ND	.250	ND	Q7V3860
Tetrachloroethylene	ND	.125	ND	Q7V3860
Trichloroethylene	ND	.125	ND	Q7V3860
Vinyl chloride	ND	.125	ND	Q7V3860

**APPENDIX C**  
**QUALITY ASSURANCE DATA**

# SUMMARY OF ANALYTICAL METHODOLOGY

ASC Joblink # 616589

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REFERENCE		TITLE
<hr/>		
1020	SW-846	Flash Point, Setaflash
1311	SW-846	Toxicity Characteristic Leaching Procedure
160.3	CAWW	Residue, Total, Gravimetric, Dried at 103-105 C
418.1	MCAWW	Petroleum Hydrocarbons, Total Recoverable
6010	SW-846	Inductively Coupled Plasma Atomic Emmision Spectroscopy
7470	SW-846	Mercury in Liquid Waste (Manual Cold-Vapor Technique)
8080	SW-846	Organochlorine Pesticides and/or PCBs
8150	SW-846	Chlorinated Herbicides
8240	SW-846	GC/MS for Volatile Organics
8270	SW-846	GC/MS for Semivolatile Organics: Capillary Column Technique
CLP 1.7.1.1	CLP	pH, Electrode (soil)
SECTION 7.3.3.2	SW-846	Test Method to Determine HCN Released from Wastes
SECTION 7.3.4.2	SW-846	Test Method to Determine HS Released from Wastes

## METHODOLOGY REFERENCES

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- ASTM**      *American Society for Testing and Materials*, 1985 edition.
- CAWW**      *Methods for Chemical Analysis of Water and Wastes*, April 1979 and Updated #1 March 1983.
- CLP**      *USEPA Contract Laboratory Program*, Document #OLMO1.0, updates December 1990 #OLMO1.1 and February 1991 #OLMO1.1.1.
- EPA-500**      *USEPA Methods for the Determination of Organic Compounds in Drinking Water*, EPA-600/4-88/039 December 1988.
- EPA-800**      *USEPA Test Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater*, EPA-600/4-82-057 July 1982.
- NIOSH**      *National Institute for Occupational Safety and Health*, 3rd edition, 1984.
- SMEWW**      *Standard Methods for the Examination of Water and Wastewater*, 17th edition, 1989.
- STOA**      *Spot Tests In Organic Analysis*, 7th edition, 1966.
- SW-846**      *Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, 3rd edition, September 1986 and Update #1 July 1992.
- (1)      This method was modified to incorporate the use of Boron Trifluoride (BF<sub>3</sub>) as the derivatizing reagent according to Method 6640 in *SMEWW*, 17th edition, 1989.
- Title 22**      *Waste Extraction Test*, Title 22, Section 66261.126 Appendix 2 of the California Administrative Code, May 1991.





OHM Remediation  
Services Corp.

A Subsidiary of OHM Corporation

## ANALYTICAL REPORT

**Client:** OHM Remediation Services Corporation  
Eastern Region (Hopkinton, MA)

**Attn:** William Snow  
Ron Kenyon  
Mike Quinlan

**Project:** 16208C - USACE; Fort Devens, MA

**Sample Type(s):** Solid

**Analysis Performed:** Metal

**Date Sample Received:** September 9, 1994

**Date Order Received:** October 24, 1994

**Joblink(s):** 616905

*This report is "PROPRIETARY AND CONFIDENTIAL" and delivered to, and intended for the exclusive use of the above named client only. Analytical Services Corporation assumes no responsibility or liability for the reliance hereon or use hereof by anyone other than the above named client.*

Reviewed and  
Approved by:

Thomas E. Gran, Ph.D., Vice President

Date: November 1, 1994

## PROJECT NARRATIVE

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The following items relate to the samples and analytical data contained in this report.

- o All sample results are reported on a "dry weight" basis.
- o Note any and all comments at the bottom of the tables in Appendix B and/or Appendix C.
- o **ASC** will retain samples for a maximum of thirty (30) days after completion of the analysis, samples will be held for a longer period of time, if appropriate arrangements are made in advance. A nominal disposal charge of \$5.00/sample will be imposed for unreturned samples.

**APPENDIX A**  
**DATA SUMMARY REPORT**

NOTE: The Tentatively Identified Volatile (GC/MS) Screen result(s), if applicable, is included in Appendix B.

# DATA SUMMARY REPORT

DATE: 10/28/94

PAGE: 1

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:	EXSA49CA	EXSA49CB	EXSA49CC	EXSA49DUP
ASC Sample Number:	JN3697	JN3698	JN3699	JN3700
Sample Date:	940908	940908	940908	940908
Facility Code:	016208C	016208C	016208C	016208C

Parameters

Units

Special Requested Total Metals Analysis, (ME40)

Lead	mg/kg	2.36	3.43	4.03	2.44
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**APPENDIX B**

**QUANTITATIVE RESULTS**

**SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)**

**Company Name**

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49CA

JN3697

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	2.36	1.85	ND	Q2M5535

**SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)**

**Company Name**

Facility

### Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49CB

JN3698

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	3.43	1.87	ND	Q2M5535



**SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)**

**Company Name**

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49CC

JN3699

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	4.03	1.90	ND	Q2M5535

**SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)**

Company Name

Facility

### Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49DUP

JN3700

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	2.44	1.88	ND	Q2M5535

**APPENDIX C**  
**QUALITY ASSURANCE DATA**

# SUMMARY OF ANALYTICAL METHODOLOGY

ASC Joblink # 616905

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REFERENCE	TITLE
6010	SW-846 Inductively Coupled Plasma Atomic Emmision Spectroscopy

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## METHODOLOGY REFERENCES

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ASTM	<i>American Society for Testing and Materials</i> , 1985 edition.
CAWW	<i>Methods for Chemical Analysis of Water and Wastes</i> , April 1979 and Updated #1 March 1983.
CLP	<i>USEPA Contract Laboratory Program</i> , Document #OLMO1.0, updates December 1990 #OLMO1.1 and February 1991 #OLMO1.1.1.
EPA-500	<i>USEPA Methods for the Determination of Organic Compounds in Drinking Water</i> , EPA-600/4-88/039 December 1988.
EPA-600	<i>USEPA Test Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater</i> , EPA-600/4-82-057 July 1982.
NIOSH	<i>National Institute for Occupational Safety and Health</i> , 3rd edition, 1984.
SMEWW	<i>Standard Methods for the Examination of Water and Wastewater</i> , 17th edition, 1989.
STOA	<i>Spot Tests In Organic Analysis</i> , 7th edition, 1966.
SW-846	<i>Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods</i> , 3rd edition, September 1986 and Update #1 July 1992.
(1)	This method was modified to incorporate the use of Boron Trifluoride (BF <sub>3</sub> ) as the derivatizing reagent according to Method 6640 in SMEWW, 17th edition, 1989.
Title 22	<i>Waste Extraction Test</i> , Title 22, Section 66261.126 Appendix 2 of the California Administrative Code, May 1991.

## ASC Certifications

State	Agency	Certification #
Alabama	ADEM	40830
California	CADOH	1178
Colorado	CODOH	OH113
Delaware	DEHSS	OH113
Kansas	KSDHE	E-202 & E-1173
Louisiana	LADOHH	92-10
Maryland	MDDHMH	210
Massachusetts	MADEP	M-OH113
New Jersey	NJDEPE	74603
New York	NYDOH	10712
North Carolina	NCDEM	392
Ohio	OHEPA	OH113
Oklahoma	OKDEQ	9216
Pennsylvania	PADER	68-450
South Carolina	SCDEHNR	92002
Tennessee	TNDOH/TNDEC	2978
Virginia	VADGS	00011
Washington	WADOE	C154
Wisconsin	WIDNR	999037160

### Validated by:

- o US Army Corps of Engineers ..... Chemical Analysis in Various Matrices

### Approvals:

- o Chemical Waste Management ..... Waste Characterization Analysis
- o EnviroSAFE ..... Waste Characterization Analysis
- o USDA ..... Permit for Importing Soils
- o Florida DEP ..... Quality Assurance Plan #930034G
- o Naval Facilities Engineering Service Center ..... Chemical Analysis in Various Matrices

## REPORT KEY

---

mg/kg	= milligram per kilogram (ppm)
Mg/m <sup>3</sup>	= milligram per cubic meter
ug/kg	= microgram per kilogram (ppb)
mg/L	= milligram per liter (ppm)
ug/L	= microgram per liter (ppb)
mg/W	= milligram per wipe
ug/W	= microgram per wipe
mg/SMP	= milligram per sample
ug/SMP	= microgram per sample (Tedlar Bag)
ug/smp	= microgram per sample
um/cm	= microMho per centimeter
pCi/l	= picocurie per liter
gm/cc	= grams per cubic centimeter
ppm	= parts per million
ppb	= parts per billion
ND	= Not detected at or above stated detection limit
<	= less than
>	= greater than
%	= percent
BTU/lb	= British Thermal Units per pound
Deg. C	= Degrees Celsius
n/a	= not applicable
Unk	= unknown
std	= result is relative to standard pH units
CV	= Conventional
IR	= Infrared Spectrophotometric
GC	= Gas Chromatograph Instrument
GC/MS	= Gas Chromatography/Mass Spectrometer Instrument
GRO	= Gasoline Range Organics
DRO	= Diesel Range Organics
PCB	= Polychlorinated Biphenyls (PCBs)
EP TOX	= Extraction Procedure Toxicity
TCLP	= Toxicity Characteristic Leaching Procedure
RCRA	= Resource Conservation and Recovery Act
SOW	= Statement of Work



# QUALITY ASSURANCE DATA

## SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Lead	ND	105	2.44	89	3	Q2M5535

**APPENDIX D**  
**CHAIN-OF-CUSTODY RECORD(S)**



OHM Corporation

## CHAIN-OF-CUSTODY RECORD

Form 06/  
Field Technical Service  
Rev. 02/

No. 107636

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME		PROJECT LOCATION		ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)		NUMBER OF CONTAINERS	REMARKS
PROJ. NO.	PROJECT CONTACT	PROJECT TELEPHONE NO.					
CLIENT'S REPRESENTATIVE	PROJECT MANAGER/SUPERVISOR						
ITEM NO.	SAMPLE NUMBER	DATE	TIME				
FORT DELOUS		AYER MA					
16208	MARGIE BLEAU/Mike Dunham	(508)-772-2610					
Tom BEST (USACE)		Bill Snow					
1	EXSA49CA	10/10	9:48	✓		SANDY SOIL with mixed clay lumps	3 x 102 1 x 1L
2	EXSA49DD	10/10	9:48	✓		"	1 x 102 1 x 1L
3	EXSA49EE	11/00	9:48	✓		"	3 x 102 1 x 1L
4	EXSA49CC	11/20	9:48	✓		"	3 x 102 1 x 1L
5	TEMP BLK	9-1-94	15:55			BI-WATER	1 x 102
6							
7							
8							
9							
10							

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	1-4	Will DL	Fedex receipt 1779841501	9-8-94		NOTE * - preserved at 4°C - TEMP. BLANK included - 304XTAT  Temp 3°C
2	1-4.5	Fedex	Will DL	9-9-94	1002	
3						
4						

SAMPLER'S SIGNATURE: Will DL

LAB COPY



Analytical Services Corp.

## ANALYTICAL REPORT

**Client:** OHM Remediation Services Corporation  
Eastern Region (Hopkinton, MA)

**Attn:** William Snow  
Ron Kenyon  
Mike Quinlan

**Project:** 16208C - USACE; Fort Devens, MA

**Sample Type(s):** Solid

**Analysis Performed:** Conventional, Metal and Organics

**Date Sample Received:** October 25, 1994

**Date Order Received:** October 25, 1994

**Joblink(s):** 616911

*This report is "PROPRIETARY AND CONFIDENTIAL" and delivered to, and intended for the exclusive use of the above named client only. Analytical Services Corporation assumes no responsibility or liability for the reliance hereon or use hereof by anyone other than the above named client.*

Reviewed and  
Approved by:

Thomas E. Gran, Ph.D., Vice President

Date: November 1, 1994

## PROJECT NARRATIVE

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The following items relate to the samples and analytical data contained in this report.

- o All sample results are reported on a "dry weight" basis.
- o Note any and all comments at the bottom of the tables in Appendix B and/or Appendix C.
- o **ASC** will retain samples for a maximum of thirty (30) days after completion of the analysis, samples will be held for a longer period of time, if appropriate arrangements are made in advance. A nominal disposal charge of \$5.00/sample will be imposed for unreturned samples.
- o Valid Lead spike recoveries could not be reported due to the high level present in the unspiked sample. Batch acceptance is based on acceptable method spike recovery.

**APPENDIX A**

**DATA SUMMARY REPORT**

NOTE: The Tentatively Identified Volatile (GC/MS) Screen result(s), if applicable, is included in Appendix B.

# DATA SUMMARY REPORT

DATE: 10/28/94

PAGE: 1

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID: EXSA4903    EXSA49PAG    EXSA49PBG    EXSA49PCG  
ASC Sample Number: JN3711    JN3712    JN3713    JN3714  
Sample Date: 941024    941024    941024    941024  
Facility Code: 016208C    016208C    016208C    016208C

Parameters                      Units

## Conventional Data (CV10)

Solids, Total	%	94.4	87.5	95.4	93.1
---------------	---	------	------	------	------

Sample Point ID: EXSA49PAG    EXSA49PBG    EXSA49PCG  
ASC Sample Number: JN3712    JN3713    JN3714  
Sample Date: 941024    941024    941024  
Facility Code: 016208C    016208C    016208C

Parameters                      Units

## MTX Volatile Analysis, GC, (GV33)

Benzene	mg/kg	<.001	<.001	<.001
Ethylbenzene	mg/kg	<.001	<.001	.004
Toluene	mg/kg	<.001	<.001	<.001
Xylenes	mg/kg	.001	.002	.011

Sample Point ID: EXSA4903  
ASC Sample Number: JN3711  
Sample Date: 941024  
Facility Code: 016208C

Parameters                      Units

## Special Requested Total Metals Analysis, (ME40)

Lead	mg/kg	4.95
------	-------	------



**APPENDIX B**

**QUANTITATIVE RESULTS**

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	016208C	EXSA4903	JN3711

Compounds	Sample Results	Detection Limits	Blank Results	Batch Number
Solids, Total %	94.4	.100	-	

### CONVENTIONAL DATA (CV10)

**Company Name**

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49PAG

JN3712

Compounds	Sample Results	Detection Limits	Blank Results	Batch Number
Solids, Total %	87.5	.100	-	

### CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49PBG

JN3713

Compounds	Sample Results	Detection Limits	Blank Results	Batch Number
Solids, Total %	95.4	.100	-	

### CONVENTIONAL DATA (CV10)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49PCG

JN3714

Compounds	Sample Results	Detection Limits	Blank Results	Batch Number
Solids, Total %	93.1	.100	-	

**SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)**

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA4903

JN3711

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Lead	4.95	1.91	ND	Q2M5540

# BTXE VOLATILE ANALYSIS, GC, (GV33)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49PAG

JN3712

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	ND	.001	ND	Q2W3966
Ethylbenzene	ND	.001	ND	Q2W3966
Toluene	ND	.001	ND	Q2W3966
Xylenes	.001	.001	ND	Q2W3966



# BTXE VOLATILE ANALYSIS, GC, (GV33)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49PBG

JN3713

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Benzene	ND	.001	ND	Q2W3966
Ethylbenzene	ND	.001	ND	Q2W3966
Toluene	ND	.001	ND	Q2W3966
Xylenes	.002	.001	ND	Q2W3966

BTXE VOLATILE ANALYSIS, GC, (GV33)

Company Name

Facility

Sample Point

ASC Sample No.

OHM REMEDIATION SERVICES CORPORATION

016208C

EXSA49PCG

JN3714

[illegible]

**APPENDIX C**  
**QUALITY ASSURANCE DATA**

## SUMMARY OF ANALYTICAL METHODOLOGY

ASC Joblink # 616911

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REFERENCE	TITLE
<hr/>	
160.3	CAWW Residue, Total, Gravimetric, Dried at 103-105 C
6010	SW-846 Inductively Coupled Plasma Atomic Emmision Spectroscopy
8020	SW-846 Aromatic Volatile Organics by GC

## METHODOLOGY REFERENCES

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(1)	This method was modified to incorporate the use of Boron Trifluoride (BF <sub>3</sub> ) as the derivatizing reagent according to Method 6640 in <i>SMEWW</i> , 17th edition, 1989.
Title 22	<i>Waste Extraction Test</i> , Title 22, Section 66261.126 Appendix 2 of the California Administrative Code, May 1991.

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North Carolina	NCDEM	392
Ohio	OHEPA	OH113
Oklahoma	OKDEQ	9216
Pennsylvania	PADER	68-450
South Carolina	SCDEHNR	92002
Tennessee	TNDOH/TNDEC	2978
Virginia	VADGS	00011
Washington	WADOE	C154
Wisconsin	WIDNR	999037160

### Validated by:

- o US Army Corps of Engineers ..... Chemical Analysis in Various Matrices

### Approvals:

- o Chemical Waste Management ..... Waste Characterization Analysis
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## REPORT KEY

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>	= greater than
%	= percent
BTU/lb	= British Thermal Units per pound
Deg. C	= Degrees Celsius
n/a	= not applicable
Unk	= unknown
std	= result is relative to standard pH units
CV	= Conventionals
IR	= Infrared Spectrophotometric
GC	= Gas Chromatograph Instrument
GC/MS	= Gas Chromatography/Mass Spectrometer Instrument
GRO	= Gasoline Range Organics
DRO	= Diesel Range Organics
PCB	= Polychlorinated Biphenyls (PCBs)
EP TOX	= Extraction Procedure Toxicity
TCLP	= Toxicity Characteristic Leaching Procedure
RCRA	= Resource Conservation and Recovery Act
SOW	= Statement of Work



# QUALITY ASSURANCE DATA

## SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Lead	ND	101	266	-	1	Q2M5540

- Because the analyte was present in the unspiked sample at a high level, the spiked sample does not provide valid spike recovery data.

## BTXE VOLATILE ANALYSIS, GC, (GV33)

[illegible]

QUALITY ASSURANCE DATA  
SURROGATE SUMMARY REPORT

SURROGATE ID      A228      # OUT

QC BATCH: Q2W3966 Solid (Volatile organics by GC)

SAMPLE ID		
BLANK	99	0
BLANK SPIKE	100	0
EXSA49PAG	80	0
EXSA49PBG	88	0
EXSA49PCG	53	0
EXSA49PCG MD	53	0
EXSA49PCG MS	47	0

QC LIMITS      (30-130)

SURROGATE ID

A228 = a,a,a-Trifluorotoluene

\* Values outside of method quality control limits  
D Sample was diluted, however, some surrogates may be reported if results were observed.

It is ASC's laboratory policy to allow one surrogate per sample fraction (acid, base-neutral or pesticide) to exceed the stated QC limits. This policy is based upon the USEPA SOW for the Contract Laboratory Program (CLP).

**APPENDIX D**  
**CHAIN-OF-CUSTODY RECORD(S)**



# CHAIN-OF-CUSTODY RECORD

Form 0019  
File Technical Services  
Rev. 08/89

No. 107719

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME		PROJECT LOCATION		ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)		NUMBER OF CONTAINERS	REMARKS
PROJ. NO.	PROJECT CONTACT	PROJECT TELEPHONE NO.					
CLIENT'S REPRESENTATIVE	PROJECT MANAGER/SUPERVISOR						
Fort Devens		AYERMA					
16208	Mike Guntan / Margie Bleu	1(508) - 272-2019					
Tom Best (USACE)		Bill Snow					
ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	
1	EXSA4903	10-24 94	1459	✓		Gold Brown S-dy soil 5 point composite	1
2	EXSA49PAG	10-24 94	1253		✓	Fine Gold clay collected from pile A	2
3	EXSA49PBG	10-24 94	1257		✓	Fine Gold clay, grabbed from pile B	2
4	EXSA49PLG	10-24 94	1301		✓	Fine Gold clay, grabbed from pile C	2
5							
6							
7							
8							
9							
10							

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	1-4	Bill R	1944570865 Federal Express Airbill	10-24 94	1800	* 3 DAY TAT * Preserved at 4°C * Temp Blank included 29
2	1-4	Fed X	M. Radabaugh	10/25/94	1001	
3						
4						

SAMPLER'S SIGNATURE: Bill R

LAB COPY

# TABLE OF CONTENTS

(continuation)

## LIST OF APPENDICES

Appendices	Title
A	On-site Laboratory Soil Screening Data
B	ASC Analytical Report - Confirmatory Soil Samples
C	Chemical Quality Assurance Report
D	ASC Analytical Report - Waste Characterization Soil Samples
E	Transportation & Disposal Documentation
F	Site Photographs

## ASC Certifications

State	Agency	Certification #
Alabama	ADEM	40830
California	CADOH	1178
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North Carolina	NCDEM	392
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- o EnviroSAFE ..... Waste Characterization Analysis
- o USDA ..... Permit for Importing Soils
- o Florida DEP ..... Quality Assurance Plan #930034G
- o Naval Facilities Engineering Service Center ..... Chemical Analysis in Various Matrices



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>	= greater than
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GC/MS	= Gas Chromatography/Mass Spectrometer Instrument
GRO	= Gasoline Range Organics
DRO	= Diesel Range Organics
PCB	= Polychlorinated Biphenyls (PCBs)
EP TOX	= Extraction Procedure Toxicity
TCLP	= Toxicity Characteristic Leaching Procedure
RCRA	= Resource Conservation and Recovery Act

### CONVENTIONAL DATA (CV10)

Compounds		Blank Results	Blank Spike Recov	Unspiked Sample Results	Matrix Spike Recov	Relative Percent Diff	Batch Number
Reactive Cyanide	mg/kg	ND	71	-	-	-	Q2I3861
Reactive Sulfide	mg/kg	ND	97	-	-	-	Q2I3860

# QUALITY ASSURANCE DATA

## TOTAL PETROLEUM HYDROCARBON ANALYSIS, IR (IR00)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Petroleum Hydrocarbons (IR)	ND	79	108	121	37	Q2T41259

- Variable QC matrix spike recoveries were attributed to sample matrix interference.

# QUALITY ASSURANCE DATA

## TOTAL BASE/NEUTRAL/ACID ANALYSIS, MS, (MS02)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Acenaphthene	ND	80	ND	102	2	Q2C41251
Benzidine	ND	84	ND	12	4	Q2C41251
bis (2-Chloroethoxy) methane	ND	73	ND	85	1	Q2C41251
bis (2-Chloroisopropyl) ether	ND	87	ND	86	1	Q2C41251
p-Chloro-m-cresol	ND	86	ND	102	2	Q2C41251
2-Chloronaphthalene	ND	77	ND	99	1	Q2C41251
2-Chlorophenol	ND	87	ND	88	1	Q2C41251
Dibenzo (a, h) anthracene	ND	85	ND	61	5	Q2C41251
Di-n-butyl phthalate	ND	93	ND	116	1	Q2C41251
1,3-Dichlorobenzene	ND	81	ND	84	1	Q2C41251
1,4-Dichlorobenzene	ND	85	ND	85	2	Q2C41251
Diethyl phthalate	ND	79	ND	103	1	Q2C41251
4,6-Dinitro-o-cresol	ND	83	ND	43	15	Q2C41251
2,4-Dinitrotoluene	ND	98	ND	123	2	Q2C41251
Fluoranthene	ND	95	ND	108	2	Q2C41251
Fluorene	ND	85	ND	95	3	Q2C41251
Hexachlorobenzene	ND	88	ND	97	1	Q2C41251
Hexachlorocyclopentadiene	ND	69	ND	-	-	Q2C41251
2-Methylphenol	ND	84	ND	101	4	Q2C41251
4-Methylphenol	ND	82	ND	86	3	Q2C41251
N-Nitrosodimethylamine	ND	79	ND	74	1	Q2C41251
N-Nitrosodi-n-propylamine	ND	83	ND	102	1	Q2C41251
4-Nitroaniline	ND	85	ND	91	3	Q2C41251
2-Nitrophenol	ND	74	ND	78	1	Q2C41251
4-Nitrophenol	ND	88	ND	93	3	Q2C41251
Pentachlorophenol	ND	83	ND	96	3	Q2C41251
Phenol	ND	87	ND	92	1	Q2C41251
Pyrene	ND	86	ND	120	3	Q2C41251
1,2,4-Trichlorobenzene	ND	79	ND	93	1	Q2C41251

3-Methyl- and 4-Methylphenol coelute and are reported as the total  
Due to apparent interactions between the spiked compound and sample  
components, no matrix spike recoveries were observed for the  
parameters designated with a dash.

## RCRA TCLP LEACHATE HERBICIDE ANALYSIS, GC, (GS52)

2,4-D	ND	144	ND	79	4	Q7H41261
2,4,5-TP (Silvex)	ND	124	ND	63	7	Q7H41261

## RCRA TCLP LEACHATE PESTICIDE ANALYSIS, GC, (GS54)

[illegible]

# QUALITY ASSURANCE DATA

## RCRA TCLP LEACHATE METALS ANALYSIS, (ME52)

Compounds	Blank Results mg/L	Blank Spike Recov	Unspiked Sample Results mg/L	Matrix Spike Recov	Relative Percent Diff	Batch Number
Arsenic	ND	93	ND	92	3	Q7M5316
Barium	ND	93	.459	85	3	Q7M5316
Cadmium	ND	99	ND	94	3	Q7M5316
Chromium	ND	92	ND	86	3	Q7M5316
Lead	ND	93	.517	86	3	Q7M5316
Mercury	ND	93	ND	79	8	Q7G5315
Selenium	ND	93	ND	91	4	Q7M5316
Silver	ND	94	ND	88	1	Q7M5316
Copper	ND	93	ND	87	3	Q7M5316
Zinc	ND	93	ND	89	3	Q7M5316



# QUALITY ASSURANCE DATA

## RCRA TCLP LEACHATE BASE/NEUTRAL/ACID ANALYSIS, MS, (MS52)

Compounds	Blank Results mg/L	Blank Spike Recov	Unspiked Sample Results mg/L	Matrix Spike Recov	Relative Percent Diff	Batch Number
2,4-Dinitrotoluene	ND	107	ND	77	5	Q7C41260
Hexachlorobenzene	ND	123	ND	74	5	Q7C41260
Hexachloroethane	ND	78	ND	45	3	Q7C41260
Hexachlorobutadiene	ND	108	ND	50	1	Q7C41260
2-Methylphenol	ND	96	ND	71	43	Q7C41260
4-Methylphenol	ND	97	ND	74	73	Q7C41260
Nitrobenzene	ND	100	ND	71	5	Q7C41260
Pentachlorophenol	ND	122	ND	97	200	Q7C41260
Pyridine	ND	81	ND	55	16	Q7C41260
2,4,5-Trichlorophenol	ND	105	ND	76	194	Q7C41260
2,4,6-Trichlorophenol	ND	99	ND	76	197	Q7C41260

3-Methyl- and 4-Methylphenol coelute and are reported as the total

- Low QC matrix spike recoveries were observed for this particular analysis, batch acceptance is based on QC spike recovery results.

QUALITY ASSURANCE DATA

RCRA TCLP LEACHATE BASE/NEUTRAL/ACID ANALYSIS, MS, (MS52)

Compounds	Blank Results mg/L	Blank Spike Recov	Unspiked Sample Results mg/L	Matrix Spike Recov	Relative Percent Diff	Batch Number
2,4-Dinitrotoluene	ND	112	ND	107	14	Q7C41273
Hexachlorobenzene	ND	136	ND	117	16	Q7C41273
Hexachloroethane	ND	63	ND	41	30	Q7C41273
Hexachlorobutadiene	ND	89	ND	52	23	Q7C41273
2-Methylphenol	ND	98	ND	97	14	Q7C41273
4-Methylphenol	ND	99	ND	98	9	Q7C41273
Nitrobenzene	ND	106	ND	103	10	Q7C41273
Pentachlorophenol	ND	136	ND	135	17	Q7C41273
Pyridine	ND	72	ND	79	22	Q7C41273
2,4,5-Trichlorophenol	ND	112	ND	111	13	Q7C41273
2,4,6-Trichlorophenol	ND	107	ND	103	14	Q7C41273

1-Methyl- and 4-Methylphenol coelute and are reported as the total

# QUALITY ASSURANCE DATA

## RCRA TCLP LEACHATE (ZHE) VOLATILE ANALYSIS, MS, (MV50)

Compounds	Blank Results mg/L	Blank Spike Recov	Unspiked Sample Results mg/L	Matrix Spike Recov	Relative Percent Diff	Batch Number
Benzene	ND	99	ND	100	2	Q7V3860
Carbon tetrachloride	ND	103	ND	104	0	Q7V3860
Chlorobenzene	ND	98	ND	95	2	Q7V3860
Chloroform	ND	96	ND	99	3	Q7V3860
1,4-Dichlorobenzene	ND	93	ND	88	7	Q7V3860
1,2-Dichloroethane	ND	94	ND	98	3	Q7V3860
1,1-Dichloroethylene	ND	90	ND	90	3	Q7V3860
Methyl ethyl ketone	ND	82	ND	90	3	Q7V3860
Tetrachloroethylene	ND	98	ND	95	6	Q7V3860
Trichloroethylene	ND	96	ND	97	3	Q7V3860
Vinyl chloride	ND	91	ND	90	8	Q7V3860

**QUALITY ASSURANCE DATA  
SURROGATE SUMMARY REPORT**

SURROGATE ID	A159	B732	A121	A884	A158	B142	# OUT
QC BATCH: Q2C41251 Solid (Semi-Volatile organics by MS)							
SAMPLE ID							
BLANK	65	72	81	81	67	59	0
BLANK SPIKE	68	76	85	80	68	62	0
EXSA49CA	69	79	88	82	76	76	0
EXSA49CA MD	73	80	90	88	79	86	0
EXSA49CA MS	72	80	88	88	81	83	0
EXSA49CB	80	88	92	96	85	82	0
EXSA49CC	71	81	84	85	79	81	0
QC LIMITS	(25-121) (24-113) (19-122) (23-120) (30-115) (18-137)						
QC BATCH: Q7C41260 Leachate (Semi-Volatile organics by MS)							
SAMPLE ID							
BLANK	79	82	86	86	88	48	0
BLANK SPIKE	80	84	90	91	92	73	0
EXSA49CA	82	76	88	89	89	71	0
EXSA49CA MS	58	59	64	66	66	57	0
EXSA49CB	78	79	84	90	90	77	0
EXSA49DUP	62	61	68	75	68	54	0
R-3 MD	78	77	86	93	90	79	0
R-3 MS	0 *	11 *	0 *	96	90	76	3
QC LIMITS	(25-121) (24-113) (19-122) (23-120) (30-115) (18-137)						
QC BATCH: Q7C41273 Leachate (Semi-Volatile organics by MS)							
SAMPLE ID							
BLANK	76	71	91	84	81	36	0
BLANK SPIKE	83	78	101	94	96	87	0
EXSA49CC	74	65	81	83	82	85	0
P-1 MD	95	97	103	100	95	102	0
P-1 MS	84	89	92	91	86	92	0
QC LIMITS	(25-121) (24-113) (19-122) (23-120) (30-115) (18-137)						

SURROGATE ID	F047	# OUT
QC BATCH: Q7H41261 Leachate (Herbicide compounds by GC)		
SAMPLE ID		
BLANK	123	0
BLANK SPIKE	121	0
EXSA49CA	109	0
EXSA49CA MD	119	0
EXSA49CA MS	114	0
EXSA49CB	105	0
EXSA49CC	105	0
EXSA49DUP	104	0
R-3 MS	98	0
QC LIMITS	(30-130)	

SURROGATE ID	
A047 = 1,2-Dichloroethane-D4	A500 = Decachlorobiphenyl
B185 = Toluene-D8	F047 = 2,4-Dichlorophenylacetic-acid
B668 = Bromofluorobenzene	
A159 = 2-Fluorophenol	
B732 = Phenol-D6	
A121 = 2,4,6-Tribromophenol	
A884 = Nitrobenzene-D5	
A158 = 2-Fluorobiphenyl	
B142 = Terphenyl-D14	
B316 = 2,4,5,6-Tetrachloro-m-xylene	

\* Values outside of method quality control limits  
D Sample was diluted, however, some surrogates may be reported if results were observed.

It is ASC's laboratory policy to allow one surrogate per sample fraction (acid, base-neutral or pesticide) to exceed the stated QC limits. This policy is based upon the USEPA SOW for the Contract Laboratory Program (CLP).

**QUALITY ASSURANCE DATA  
SURROGATE SUMMARY REPORT**

SURROGATE ID	B816	A500	# OUT
QC BATCH: Q7P41262 Leachate (Pesticide compounds by GC)			
SAMPLE ID			
BLANK	93	83	0
BLANK SPIKE	94	99	0
EXSA49CA	95	115	0
EXSA49CA MD	91	114	0
EXSA49CA MS	95	120	0
EXSA49CB	93	114	0
EXSA49CC	88	111	0
EXSA49DUP	88	111	0
R-3 MS	93	117	0
QC LIMITS	(30-130)	(30-130)	

SURROGATE ID	A047	B185	B668	# OUT
QC BATCH: Q7V3860 Leachate (Volatile organics by MS)				
SAMPLE ID				
BLANK	101	107	103	0
BLANK SPIKE	104	104	102	0
EXSA49CA	107	106	104	0
EXSA49CA MD	102	103	97	0
EXSA49CA MS	110	106	103	0
EXSA49CB	115	109	107	0
EXSA49CC	104	108	109	0
EXSA49DUP	109	104	104	0
QC LIMITS	(70-121)	(81-117)	(74-121)	

SURROGATE ID	
A047 = 1,2-Dichloroethane-D4	A500 = Decachlorobiphenyl
B185 = Toluene-D8	F047 = 2,4-Dichlorophenylacetic-acid
B668 = Bromofluorobenzene	
A159 = 2-Fluorophenol	
B732 = Phenol-D6	
A121 = 2,4,6-Tribromophenol	
A884 = Nitrobenzene-D5	
158 = 2-Fluorobiphenyl	
142 = Terphenyl-D14	
B816 = 2,4,5,6-Tetrachloro-m-xylene	

\* Values outside of method quality control limits  
D Sample was diluted, however, some surrogates may be reported if results were observed.

It is ASC's laboratory policy to allow one surrogate per sample fraction (acid, base-neutral or pesticide) to exceed the stated QC limits. This policy is based upon the USEPA SOW for the Contract Laboratory Program (CLP).

**APPENDIX D**  
**CHAIN-OF-CUSTODY RECORD(S)**





OHM Corporation

## CHAIN-OF-CUSTODY RECORD

Form 0019  
Field Technical Services  
Rev. 08/89

No. 107636

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME		PROJECT LOCATION		NUMBER OF CONTAINERS		ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)										REMARKS			
PROJ NO	PROJECT CONTACT	PROJECT TELEPHONE NO	CLIENT'S REPRESENTATIVE			PROJECT MANAGER/SUPERVISOR	<div style="display: flex; justify-content: space-between;"> <div> TPDA 4000 Lb TLP BLA </div> <div> containing residue </div> </div>												
ITEM NO	SAMPLE NUMBER	DATE	TIME			COMP											GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	
1	EXSA49CA	1040	9:48 9/1	✓		SAND/SOIL with mixed clay lumps	3x102 1x16	✓	✓	✓	✓								
2	EXSA49DD	1040	9:48 9/1	✓		"	1x102 1x16		✓	✓									
3	EXSA49CB	1100	9:48 9/1	✓		"	3x102 1x16	✓	✓	✓	✓								
4	EXSA49CC	1120	9:48 9/1	✓		"	3x102 1x16	✓	✓	✓	✓								
5	PRIP BLK	9/1	1555			PT. WATER	1x102											press bottles - not on COOC 9/9/91	
6																			
7																			
8																			
9																			
10																			

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	1-4	Will RL	Federick 1779 84 1501	8-8 94		NOTE * - Preserved at 4°C - Temp BLANK included - 3DAY TAR
2	1-4, 5	Federick	[Signature]	9-9 94	1002	
3						SAMPLER'S SIGNATURE Will RL Temp 3°C
4						

LAB COPY



Appendix E  
Transportation & Disposal Documentation

## WEIGHT RECORDED BY

Number <sup>2</sup>.....  
# 10207Ft. Devens  
Transportation Office

Date 9/22/51

## IDENTIFICATION

## WEIGHT

SA49

26.75

92620LB  
39120

lbs. GROSS

lbs. TARE

53500

lbs. NET

Commodity ..... @ ..... per lb.

Remarks: ..... Driver On [ ] Off [ ]

..... Load No. ....

..... Weigher .....

Shipper .....

Seller .....

Buyer .....

Address .....

FtDevFm 154  
17 Apr 80

## WEIGHT RECORDED BY

Number.....

Ft. Devens  
Transportation Office

Date 9/22/51

## IDENTIFICATION

## WEIGHT

9762

SA49

24.35

84640LB  
35940

lbs. GROSS

lbs. TARE

48700

lbs. NET

Commodity ..... @ ..... per lb.

Remarks: ..... Driver On [ ] Off [ ]

..... Load No. ....

..... Weigher .....

Shipper .....

Seller .....

Buyer .....

Address .....

FtDevFm 154  
17 Apr 80

## WEIGHT RECORDED BY

Number.....

Ft. Devens

Date.....

9/22/95

Transportation Office

E40038

IDENTIFICATION

WEIGHT

SA49

96880LB

lbs. GROSS

37980

lbs. TARE

58900

lbs. NET

29.45

Commodity ..... @ ..... per lb.

Remarks: ..... Driver On [ ] Off [ ]

..... Load No. ....

..... Weigher .....

Shipper .....

Seller .....

Buyer .....

Address .....

FtDevFm 154

17 Apr 80

## WEIGHT RECORDED BY

Number.....

Ft. Devens

Date.....

9/22/95

Transportation Office

32588

IDENTIFICATION

WEIGHT

SA49

91560LB

lbs. GROSS

31240

lbs. TARE

60320

lbs. NET

30.16

Commodity ..... @ ..... per lb.

Remarks: ..... Driver On [ ] Off [ ]

..... Load No. ....

..... Weigher .....

Shipper .....

Seller .....

Buyer .....

Address .....

FtDevFm 154

17 Apr 80

## WEIGHT RECORDED BY

Number.....

32588

Ft. Devens  
Transportation Office

Date.....9/22/55.....

## IDENTIFICATION

## WEIGHT

SA 49

91540LB

lbs. GROSS

31240LB

lbs. TARE

80.15

60300

lbs. NET

Commodity ..... @ ..... per lb.

Remarks: ..... Driver On [ ] Off [ ]

Load No. ....

Weigher .....

Shipper .....

Seller .....

Buyer .....

Address .....

FtDevFm 154

17 Apr 80

## WEIGHT RECORDED BY

Number.....

licence #

10207

SA 49

Ft. Devens  
Transportation Office

Date.....9/22/55.....

## IDENTIFICATION

## WEIGHT

95020LB

lbs. GROSS

39120LB

lbs. TARE

27.55

55900

lbs. NET

Commodity ..... @ ..... per lb.

Remarks: ..... Driver On [ ] Off [ ]

Load No. ....

Weigher .....

Shipper .....

Seller .....

Buyer .....

Address .....

FtDevFm 154

17 Apr 80

## WEIGHT RECORDED BY

Number.....

Ft. Devens  
Transportation Office

Date.....9/22/55

9762

IDENTIFICATION

WEIGHT

5A49

94980LB  
35940LB

lbs. GROSS

lbs. TARE

29.52

59040

lbs. NET

Commodity ..... @ ..... per lb.

Remarks: ..... Driver On [ ] Off [ ]

Load No. ....

Weigher .....

Shipper .....

Seller .....

Buyer .....

Address .....

FtDevFm 154

17 Apr 80

## WEIGHT RECORDED BY

Number.....

Ft. Devens  
Transportation Office

Date.....9/22/55

E40-038

IDENTIFICATION

WEIGHT

5A49

90700LB  
37980LB

lbs. GROSS

lbs. TARE

26.36

52720

lbs. NET

Commodity ..... @ ..... per lb.

Remarks: ..... Driver On [ ] Off [ ]

Load No. ....

Weigher .....

Shipper .....

Seller .....

Buyer .....

Address .....

FtDevFm 154

17 Apr 80

## WEIGHT RECORDED BY

Number.....

Ft. Devens

Date.....

9/22/55

Transportation Office

E40-038

IDENTIFICATION

WEIGHT

SA49

98320LB

lbs. GROSS

37980

lbs. TARE

30.17

60340

lbs. NET

Commodity ..... @ ..... per lb.

Remarks: ..... Driver On [ ] Off [ ]

Load No. ....

Weigher .....

Shipper .....

Seller .....

Buyer .....

Address .....

FtDevFm 154

17 Apr 80

## WEIGHT RECORDED BY

Number.....

Ft. Devens

Date.....

9/22/55

Transportation Office

32588

IDENTIFICATION

WEIGHT

SA49

87340LB

lbs. GROSS

31240

lbs. TARE

28.05

56100

lbs. NET

Commodity ..... @ ..... per lb.

Remarks: ..... Driver On [ ] Off [ ]

Load No. ....

Weigher .....

Shipper .....

Seller .....

Buyer .....

Address .....

FtDevFm 154

17 Apr 80

## WEIGHT RECORDED BY

Number.....

Ft. Devens  
Transportation Office

Date.....9/22/85

10207

IDENTIFICATION

WEIGHT

SA 49

88720LB

lbs. GROSS

39120

lbs. TARE

49580

lbs. NET

(24.79)

Commodity ..... @ ..... per lb.

Remarks: ..... Driver On [ ] Off [ ]

Load No. ....

Weigher .....

Shipper .....

Seller .....

Buyer .....

Address .....

FtDevFm 154  
17 Apr 80

## WEIGHT RECORDED BY

Number.....

Ft. Devens  
Transportation Office

Date.....9/22/85

9762

IDENTIFICATION

WEIGHT

SA 49

98260LB

lbs. GROSS

35940

lbs. TARE

(31.16)

~~60260~~ 62320  
MA

lbs. NET

Commodity ..... @ ..... per lb.

Remarks: ..... Driver On [ ] Off [ ]

Load No. ....

Weigher .....

Shipper .....

Seller .....

Buyer .....

Address .....

FtDevFm 154  
17 Apr 80



## WEIGHT RECORDED BY

Number.....

Ft. Devens  
Transportation Office

Date.....9/22/55

32588  
SA-49

## IDENTIFICATION

## WEIGHT

81580LB  
31240

lbs. GROSS

lbs. TARE

50340

lbs. NET

(25.17)

Commodity ..... @ ..... per lb.

Remarks: ..... Driver On [ ] Off [ ]

..... Load No. ....

..... Weigher .....

Shipper .....

Seller .....

Buyer .....

Address .....

FtDevFm 154  
17 Apr 80

## WEIGHT RECORDED BY

Number.....

Ft. Devens  
Transportation Office

Date.....9/22/55

E40-038  
SA-49

## IDENTIFICATION

## WEIGHT

99080LB  
37980

lbs. GROSS

lbs. TARE

61100

lbs. NET

(30.55)

Commodity ..... @ ..... per lb.

Remarks: ..... Driver On [ ] Off [ ]

..... Load No. ....

..... Weigher .....

Shipper .....

Seller .....

Buyer .....

Address .....

FtDevFm 154  
17 Apr 80

## WEIGHT RECORDED BY

Number.....

Ft. Devens  
Transportation Office

Date..... 9/22/95

9762  
SA 49

IDENTIFICATION

WEIGHT

92700LB  
35940

lbs. GROS

lbs. TAR

56760

lbs. NE

(28.38)

Commodity ..... @ ..... per lb.

Remarks: ..... Driver On [ ] Off [ ]

..... Load No. ....

..... Weigher .....

Shipper .....

Seller .....

Buyer .....

Address .....

FtDevFm 154  
17 Apr 80

## WEIGHT RECORDED BY

Number.....

Ft. Devens  
Transportation Office

Date..... 9/22/95

# 10207  
SA 49

IDENTIFICATION

WEIGHT

96360LB  
39120

lbs. GROS

lbs. TAR

57240

lbs. NET

(28.62)

Commodity ..... @ ..... per lb.

Remarks: ..... Driver On [ ] Off [ ]

..... Load No. ....

..... Weigher .....

Shipper .....

Seller .....

Buyer .....

Address .....

FtDevFm 154  
17 Apr 80



Partyka  
Resource  
Management

645 Shawinigan Drive  
Chicopee, MA 01020  
(413) 785-1581

*Bill*

Dear Customer:

In compliance with the notification requirements of Federal and state regulations, find enclosed a completed asbestos disposal and documentation form acknowledging that the listed asbestos wastes have been disposed of at our facility.

The enclosed duplicate copy of the form(s) indicate the date of disposal, type of material and quantity. If you have any questions or comments, please do not hesitate to contact us. Thank you for your business.

Very truly yours,

*A. Ronald Wesolowski*

A. Ronald Wesolowski  
Office Manager

ARW/jk

Enc.



Partyka  
Resource  
Management

# Chicopee Sanitary Landfill Facility

## SPECIAL WASTE LOG

Date: Nov. 14, 1994 Time: \_\_\_\_\_ Ticket Number: \_\_\_\_\_

- |  |  |
|--|--|
| <p>1. <u>W.C. Kelly, Corp. of Engineers</u></p> <p>Generator's Name<br/><u>2613 Lake George St., Fort Devens</u></p> <p>Generator's Address<br/><u>Ayer, MA 01020</u></p> <p>Generator's Phone<br/>_____</p> | <p>2. <u>OHM Corporation</u></p> <p>Operator's Name<br/><u>88C Elm St.</u></p> <p>Operator's Address<br/><u>Hookington, MA 01748</u></p> <p>Operator's Phone<br/><u>(508) 435-9561</u></p> |
|--|--|

3. Waste Disposal Site Name, Mailing Address, Physical Site Name and Location, and Telephone #:

Connecticut Valley Sanitary Waste Disposal, Inc., 645 Shawinigan Drive, Chicopee, MA 01020

Chicopee Sanitary Landfill Facility, New Lombard Road, Chicopee, MA - (413) -785-1531

4. Name and Address of Responsible Agency:

Regional Asbestos Coordinator, US EPA, Region I, JFK Federal Building, Boston, MA 02203 or

DEP, Western Region, State House West, 436 Dwight Street, Springfield, MA 01103

5. Description of Waste Disposed: Non-Friable Asbestos

6. # and Type of Containers: 1 round box 7. Total Quantity (yds): 7

8. Special Handling Instruction and Other Additional Information None

9. Michael P. Decherty Michael P. Decherty 11.14.94  
Operator's Certification (Printed Name and Title) (Signature) (Date)

(I certify above that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packaged, marked, and labeled; and, are in all respects in proper condition for transport by highway and for disposal according to applicable international and governmental regulations)

10. Fleet Environmental Services, Inc. 11.
- |  |   |
|--|---|
| <p>Transporter 1 (Name, Title, Address &amp; Tele. #)</p> <p><u>P.O. Box 939</u></p> <p><u>Assonet, MA 02702</u></p> | <p>Transporter 2 (Name, Title, Address &amp; Tele. #)</p> <p>_____</p> <p>_____</p> |
|--|---|

12. Discrepancies: \_\_\_\_\_

13. \_\_\_\_\_
- Disposal Certification (Print Name and Title) (Signature) (Date)

FOR HELP IN CHEMICAL EMERGENCIES INVOLVING SPILL, LEAK, FIRE OR EXPOSURE CALL TOLL-FREE 1-800-424-9300 DAY OR NIGHT

<b>STRAIGHT BILL OF LADING</b> <b>ORIGINAL - NOT NEGOTIABLE</b>		Shipper's No. <b>N<sup>o</sup> 0708</b>	
CARRIER: <b>FLEET ENVIRONMENTAL SERVICES, INC.</b>		SCAC	Carrier's No. _____ Date <b>11/14/94</b>
<b>TO:</b> Partyka Resource Management <b>Consignee</b> 645 Shawinigan Drive <b>Street</b> Chicopee, MA 01020 <b>Destination</b> Zip		<b>FROM:</b> U.S. Army Corp. of Engineers <b>Shipper</b> Fort Devens <b>Street</b> 2613 Lake George St. <b>Origin</b> Fort Devens, MA Zip <b>01433</b>	
Route:		Vehicle Number	
No. of Packages	Kind or Primary Description of Article (If Hazardous Materials, Proper Shipping Name)	Hazard Class	Weight (Subject to Correction) and Rate
7cy	Non-Friable Asbestos	NONE	200 P
Remit C.O.D. to: Address: City: State: Zip:		<b>C.O.D. FEE:</b> Prepaid <input type="checkbox"/> Collect <input type="checkbox"/> \$	
NOTE — Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding \$ _____ RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of issue of this Bill of Lading, the property described above in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated above which said Carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if an air route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of said property over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment. Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.		<b>FREIGHT CHARGES</b> <input type="checkbox"/> PREPAID <input type="checkbox"/> COLLECT	
It is to certify that the above named materials are properly classified, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.		<b>PLACARDS SUPPLIED</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO — FURNISHED BY CARRIER DRIVER SIGNATURE: _____	
SHIPPER: <b>U.S. Army Corp of Engineers</b>		CARRIER: <b>Fleet Environmental Services</b>	
PER: _____		PER: <b>Michael J. Herbert</b>	
DATE: <b>11-14-94</b>		DATE: <b>11-14-94</b>	
EMERGENCY RESPONSE TELEPHONE NUMBER: <b>(800) 537-4540</b>		Manned 24 hours/day by a person with knowledge of the hazards of the material and emergency response information or who has access to a person with that knowledge.	

FOR HELP IN CHEMICAL EMERGENCIES INVOLVING SPILL, LEAK, FIRE OR EXPOSURE CALL TOLL-FREE 1-800-424-9300 DAY OR NIGHT



CUSTOMER: OHM  
MAILING ADDRESS: 88 C Elm St.  
Hopkinton, MA. ZIP: 01743  
CONTACT PERSON: Kelly Carey  
TEL. #: (508) 435-9561 P.O. #: 0210729-0000 Weather: \_\_\_\_\_ Temp: \_\_\_\_\_  
\*\*\*\*\*

FES SALESPERSON: Cosello  
Start Date 11/14/94  
Mon/Tues/Wed/Thurs/Fri/Sat  
Completion Date 11/14/94

JOB SITE: FOR + DODGE ADDRESS: \_\_\_\_\_  
Alex, MA. ZIP: 01453 ZIP: \_\_\_\_\_  
SITE CONTACT PERSON: Kevin Mack TEL. #: \_\_\_\_\_  
SITE TEL. #: (508) 772-2275 FAX #: \_\_\_\_\_  
EPA #: \_\_\_\_\_ CONTACT PERSON: \_\_\_\_\_  
DIG SAFE #: \_\_\_\_\_ START DATE: \_\_\_\_\_  
\*\*\*\*\*

ON SITE TIME: \_\_\_\_\_  
SCOPE OF WORK: Pick-up 67C yd Containers  
Take to Bartyke  
7:00 AM

Left FES Yard 5:20 a.m./p.m. Departed Site \_\_\_\_\_ a.m./p.m.  
Arrived @ Site 6:40 a.m./p.m. Return to Yard \_\_\_\_\_ a.m./p.m.

LABORER	REG.	O.T.	EQUIPMENT	HOURS
<u>11-12 D</u>			<u>11001 10K</u>	

SUPPLIES - QUANTITY	SUPPLIES - QUANTITY	SUPPLIES - QUANTITY
Speedi Dry	Poly	Dry Ice
Absorb. Pads	Waste	Tyvek
Boom. Absorb.	Gloves	Drums
Boom. Contain.	Misc.	Misc.

\*\*\*\*\*

SUBCONTRACTOR: \_\_\_\_\_ HRS. SUBCONTRACTOR: \_\_\_\_\_ HRS.

PRODUCT - QTY	WASTE DESCRIPTION	WASTE CODE/MANIFEST #	T.O.D.P.
Bulk Liquid:			
Drum Liquid:			
Bulk Solid:			
Drum Solid:			

FACILITY TIME - Arrived: \_\_\_\_\_ Departed: \_\_\_\_\_  
Site Left Clean & Satisfactory ? YES: \_\_\_\_\_ NO: \_\_\_\_\_  
Job Completed ? YES: \_\_\_\_\_ NO: \_\_\_\_\_

Customer Signature: Kevin Mack Date 11/14/94 FES Representative: X  
\*\*\*\*\*

CONTRACT: \_\_\_\_\_ T&M: \_\_\_\_\_ FIXED PRICING: \_\_\_\_\_  
QUOTED PRICE: \_\_\_\_\_ OFFICE APPROVAL BY: \_\_\_\_\_  
WHITE - Work Crew YELLOW - Customer Copy PINK - Billing





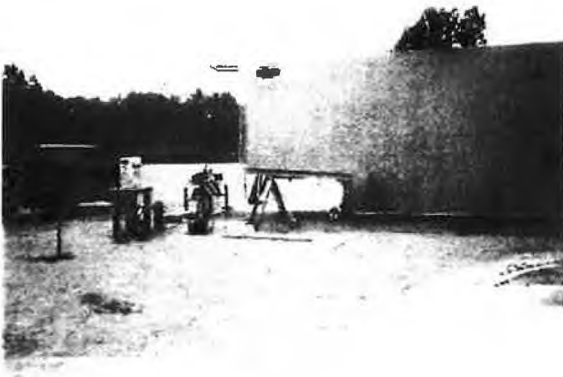
Appendix F  
Site Photographs



Opening Previous Excavation



Soil Staging Cells



Frac Tank Storing Water from Excavation



Limits of Excavation



Technicians Collecting Confirmation Samples



Backfilling Excavation



Excavation Restored to Rough Grade



Re-installation of Existing Fence