

6125



**U.S. Army
Environmental
Center**

**NO FURTHER ACTION DECISION UNDER
CERCLA**

**STUDY AREA 43B
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

CONTRACT DAAA15-91-0008

**U.S. ARMY ENVIRONMENTAL CENTER
ABERDEEN PROVING GROUND, MARYLAND**

JANUARY 1995

PRINTED ON RECYCLED PAPER

**DISTRIBUTION UNLIMITED
For Public Release**

20070424313

**NO FURTHER ACTION DECISION UNDER CERCLA
STUDY AREA 43B
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

Prepared for:

U.S. Army Environmental Center
Aberdeen Proving Ground, Maryland
Contract DAAA15-91-0008

Prepared by:

ABB Environmental Services, Inc.
Portland, Maine
Project No. 7053-12

JANUARY 1995

**NO FURTHER ACTION DECISION UNDER CERCLA
STUDY AREA 43B
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page No.</u>
EXECUTIVE SUMMARY		ES-1
1.0	INTRODUCTION	1-1
2.0	BACKGROUND AND PHYSICAL SETTING	2-1
2.1	DESCRIPTION AND LAND USE	2-1
2.2	REGIONAL GEOLOGY	2-2
2.3	REGIONAL HYDROGEOLOGY	2-2
2.4	STUDY AREA DESCRIPTION AND HISTORY	2-3
3.0	RELATED INVESTIGATIONS	3-1
3.1	MASTER ENVIRONMENTAL PLAN	3-1
3.2	ENHANCED PRELIMINARY ASSESSMENT	3-1
3.3	SITE INVESTIGATION REPORT	3-1
3.4	PRELIMINARY RISK EVALUATIONS	3-2
4.0	CONTAMINATION ASSESSMENT	4-1
4.1	GEOPHYSICAL SURVEY	4-1
4.2	SOILS	4-1
4.3	GROUNDWATER	4-3
5.0	PRELIMINARY HUMAN HEALTH RISK EVALUATION	5-1
6.0	PRELIMINARY ECOLOGICAL RISK EVALUATION	6-1
7.0	CONCLUSIONS	7-1
8.0	DECISION	8-1

ABB Environmental Services, Inc.

**NO FURTHER ACTION DECISION UNDER CERCLA
STUDY AREA 43B
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

**TABLE OF CONTENTS
(continued)**

<u>Section</u>	<u>Title</u>	<u>Page No.</u>
----------------	--------------	-----------------

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

REFERENCES

ABB Environmental Services, Inc.

**NO FURTHER ACTION DECISION UNDER CERCLA
STUDY AREA 43B
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

LIST OF FIGURES

<u>Figure</u>	<u>Title</u>
2-1	Location of SA 43B on Fort Devens
2-2	Soil Boring and TerraProbe Locations
4-1	Field Screening Results - Depth at 5 Feet
4-2	Field Screening Results - Depth at 9 Feet
4-3	Field Screening Results - Depth at 15 Feet
4-4	Analytes in Soil

ABB Environmental Services, Inc.

**NO FURTHER ACTION DECISION UNDER CERCLA
STUDY AREA 43B
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

LIST OF TABLES

Table	Title
4-1	Field Analytical Results
4-2	Organic Analytes in Subsurface Soil
5-1	Human Health PRE Evaluation of Subsurface Soil

ABB Environmental Services, Inc.

EXECUTIVE SUMMARY

Investigations of Study Area 43B (Historic Gas Station Site B) at Fort Devens, Massachusetts have resulted in the decision that no further hazardous waste studies or remediation are required at this site. Study Area 43B 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.

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, on December 21, 1989. 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, and a Site Investigation, have been conducted which address SA 43B.

Study Area 43B, one of the 19 Historic Gas Station Sites, is included in the Group 2 SAs located on the Main Post. The structures of the historic gas station at Study Area 43B reportedly consisted of a pump island and a small gasoline pumphouse. Based on historic records, the gas station appears to have had one 5,000-gallon underground storage tank (UST) located between the gasoline pumphouse and the pump island. The station was used during World War II as a vehicle motor pool to support military operations. The motor pool operations were discontinued during the late 1940s or early 1950s. No records were available on the decommissioning of this motor pool or the removal of the associated UST. The motor pool was reportedly located at the north end of an access road that presently connects Queenstown and Hatch Roads in the central portion of the Main Post.

Field investigation of Study Area 43B was initiated in 1992 in conjunction with the other 13 Groups 2, 7, and Historic Gas Stations Site Investigations at Fort Devens. The Study Area 43B site investigation consisted of surficial geophysical surveys, which included a metal detector, magnetometer, and ground penetrating radar survey, and subsurface soil sampling for field and laboratory analysis.

The surficial geophysical surveys covered an area 120 feet by 100 feet around the suspected location of the historic gas station. A total of 10 TerraProbe points were completed around the suspected former UST excavation to determine if residual soil

ABB Environmental Services, Inc.

EXECUTIVE SUMMARY

contamination was present. One soil boring was also completed to confirm the field analytical results.

The results of the geophysical surveys indicated that there was no abandoned UST at this site. Twenty-four soil samples were collected from the 10 TerraProbe points for field analysis. Seven soil samples were collected from a depth of 5 feet below ground surface (bgs), and another seven were collected from 9 feet bgs. Ten soil samples were also collected from the water table which was encountered at 15 feet bgs. All of the soil samples collected from Study Area 43B were analyzed in the field for benzene, toluene, ethylbenzene, and xylenes as well as total petroleum hydrocarbons (TPHC). Based on the results of the field analysis, one soil boring was advanced adjacent to the water table to confirm the field results. Two subsurface soil samples were collected and submitted for laboratory analysis of volatile organic compounds (VOCs), TPHC and lead. The samples were collected from 8 to 10 feet bgs and 14 to 16 feet bgs.

The results of the field analysis and confirmatory sampling indicated the presence of some residual TPHC contamination at approximately 8 feet bgs. Some of the field analytical results indicated the presence of elevated TPHC contamination, which was attributed to asphalt chips in the samples. The laboratory analytical results of the soil samples collected from the water table indicate the presence of residual TPHC contamination at only one location. These findings appear to indicate that any residual TPHC contamination that may be present at this site is not impacting groundwater quality.

To better establish the nature of the elevated TPHC concentrations detected on the west side of the former UST excavation which were attributed to asphalt chips, one additional boring was completed during the Supplemental Site Investigation field activities completed in 1993. The boring was completed adjacent to the TerraProbe point that exhibited the highest concentration of asphalt related petroleum hydrocarbons during the SI investigation. A total of three soil samples and one duplicate were collected and submitted for laboratory analysis consisting of VOCs, TPHC, and lead. Soil samples were collected from 4 to 6 feet, 10 to 12 feet (plus a duplicate) and 14 to 16 feet bgs.

The laboratory analytical results for these samples indicated the presence of low concentrations (less than 100 ppm) of TPHC at 4 to 6 and 10 to 12 feet bgs. No TPHC contamination was detected in the soil sample collected from the water table. These results confirm that the elevated TPHC concentrations detected during the SI were a result of asphalt chips, as previously reported, not residual TPHC contamination.

ABB Environmental Services, Inc.

EXECUTIVE SUMMARY

A preliminary human health risk evaluation (PRE) was completed after the Site Investigation. The results of the PRE indicated that exposure to soil should pose no significant risk to public health from the residual TPHC contamination detected at Study Area 43B. An ecological PRE was not prepared for this SA because contamination is confined to the subsurface soil, therefore, ecological receptors are not likely to be impacted.

On the basis of findings at Study Area 43B and the PRE, there is no evidence or reason to conclude that exposure to soil at this Study Area poses a threat to human health. The decision has been made to remove Study Area 43B from further consideration in the Installation Restoration Program.

ABB Environmental Services, Inc.

THIS PAGE INTENTIONALLY LEFT BLANK

1.0 INTRODUCTION

This decision document has been prepared to support a no further action decision at Study Area (SA) 43B - Historic Gas Station Site (SA 43B) 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 U.S. 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. The Historic Gas Station Sites were identified in the MEP as potential areas of contamination. 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 43A through S along with the other 13 SAs in SA Groups 2 and 7 at Fort Devens. Additional data were collected during the Supplemental SI (SSI) completed during 1993. The SI and SSI were 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 43B were conducted to support this overall mission.

ABB Environmental Services, Inc.

THIS PAGE INTENTIONALLY LEFT BLANK

2.0 BACKGROUND AND PHYSICAL SETTING

2.1 DESCRIPTION AND LAND USE

Fort Devens is located approximately 35 miles northwest of Boston, Massachusetts, 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 above mean sea level (MSL) along the Nashua River in the northern portion of the installation to 450 feet 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 these functions occurred during World Wars I and II, the Korean and Vietnam conflicts, and operations Desert Shield and Desert Storm. The primary mission of Fort Devens is to command, train, and provide logistical support for non-divisional troop units. The installation also supports that portion of the U.S. Army Intelligence School located at Fort Devens, the Army Readiness Region, Reserve Components, and Army Reserve and National Guard in the New England area.

Fort Devens currently consists of three major land use areas: Main Post, South Post, and North Post.

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 shoppette, cafeteria, post exchange, commissary, bowling alley, golf course, and hospital), administrative buildings, classrooms and training facilities, maintenance facilities, and ammunition storage facilities. The Historic Gas Station Sites, including SA 43B, are located on the Main Post (Figure 2-1).

ABB Environmental Services, Inc.

SECTION 2

The South Post is located south of Massachusetts Highway 2 and contains individual training areas designated for troop training, range activities, and a drop zone. 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.

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 terrain is crossed by numerous brooks and attendant wetlands. There are also several kettle ponds and one kettle lake located within the installation.

2.4 STUDY AREA DESCRIPTION AND HISTORY

SA 43B, one of the 19 Historic Gas Station Sites, is included in the Group 2 SAs located on the Main Post. The structures of the historic gas station at SA 43B reportedly consisted of a pump island and a small gasoline pumphouse. Based on historic records, the gas station appears to have had one 5,000-gallon underground storage tank (UST) located between the gasoline pumphouse and the pump island. The station was used during World War II as a vehicle motor pool to support military operations. The motor pool operations were discontinued during the late 1940s or early 1950s. No records were available on the decommissioning of this motor pool or the removal of the associated UST. The motor pool was reportedly located at the north end of an access road that presently connects Queenstown and Hatch Roads in the central portion of the Main Post (Figure 2-2).

THIS PAGE INTENTIONALLY LEFT BLANK

3.0 RELATED INVESTIGATIONS

3.1 MASTER ENVIRONMENTAL PLAN

SA 43, the Historic Gas Station Sites, was identified as a possible source for release of contaminants into the environment. The 19 gas stations were identified from a circa 1941 map (Barbour, 1941). The MEP recommended that the remaining USTs be located, and residual contamination in soil be removed (Biang, et al., 1992).

3.2 ENHANCED PRELIMINARY ASSESSMENT

The 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 43B were provided in the PA.

3.3 SITE INVESTIGATION REPORT

The SI was initiated in June 1992 and included the following 13 Group 2 and 7 SAs originally identified 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 Leaking Underground Storage Tank (LUST) Site
- SA 56 Building 2417 LUST Site
- SA 57 Building 3713 Fuel Oil Spill
- SA 58 Buildings 2648 and 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)
- SA 42 Popping Furnace

ABB Environmental Services, Inc.

SECTION 3

The SI was conducted by ABB-ES under contract with the USAEC. The Final Site Investigation Report was issued May 1993. The purpose of the SI was to verify the presence or absence of environmental contamination and to determine whether further investigation or remediation was warranted.

The SI field investigation program for SA 43B consisted of a surficial geophysical program which included a metal detector, magnetometer, and ground penetrating radar (GPR) survey, 10 TerraProbe points with subsurface soil sampling and field analysis, and one soil boring. The SSI field investigation consisted of one soil boring and subsurface soil sampling. The results of the SI and SSI field investigations are presented in Section 4.0.

3.4 PRELIMINARY RISK EVALUATIONS

A Preliminary Risk Evaluation (PRE) for human health was performed as part of the SI to assess environmental contamination and help establish future action at SA 43B. This section presents the general approach employed for the SI PRE. Details of the SA 43B human health PRE are presented in Section 5.0. An ecological PRE was not conducted for SA 43B because contaminants associated with the former UST would be confined to subsurface soil and would not effect ecological receptors.

To evaluate the human health risk associated with TPHC in soil, ABB-ES has developed risk-based concentrations for petroleum products. These concentrations have been calculated using the same exposure assumptions as those used by USEPA toxicologists in the USEPA Region III Risk-Based Concentration Table (Fourth Quarter, 1993) for commercial/industrial soil. A more detailed discussion of these risk-based concentrations is provided in the Fort Devens Final SI Report for Groups 2, 7 and Historic Gas Station (ABB-ES, 1993) and the Supplemental Site Investigation Data Package (ABB-ES, 1994). For gasoline the risk-based commercial/industrial soil concentration is 1,680 $\mu\text{g}/\text{g}$.

In addition to the calculated risk-based concentrations, using Region III methodology, the PRE included a comparison to the Massachusetts Department of Environmental Protection's (MADEP) revised Massachusetts Contingency Plan (MCP) promulgated Method 1 soil standards (MADEP, 1993). For a Method 1 Risk Characterization under the MCP, compliance with these soil standards constitutes a demonstration of no significant health risk from exposure to oil or hazardous material in soil. In this

ABB Environmental Services, Inc.

evaluation of residual risk, Method 1 S-2/GW-1 soil standards are used as risk-based guidelines along with the calculated risk-based concentrations. At SA 43B, the subsurface soil best fits the S-2 soil category. For total petroleum hydrocarbon compounds (TPHC), the S-2/GW-1 standard is 2,500 $\mu\text{g/g}$.

THIS PAGE INTENTIONALLY LEFT BLANK

4.0 CONTAMINATION ASSESSMENT

Results of the SI and SSI field investigations are presented below.

4.1 GEOPHYSICAL SURVEY

The geophysical program at SA 43B consisted of a metal detector survey, a magnetometer survey, and a GPR survey. The investigation covered an area 120 feet by 100 feet (see Figure 2-2). The results of the geophysical program did not indicate the presence of an abandoned UST at SA 43B. The geophysical measurements collected in the field are presented in Appendix L of the Final Groups 2, 7 and Historic Gas Station SI Report (ABB-ES, 1993).

4.2 SOILS

Ten TerraProbe points were completed to investigate the presence or absence of residual soil contamination (see Figure 2-2). A total of 24 soil samples were collected for field analysis. Seven soil samples were collected from 5 feet below ground surface (bgs) and another seven soil samples were collected from 9 feet bgs. Ten soil samples were collected from the water table at 15 feet bgs. The field analysis performed on these samples consisted of a gas chromatograph analysis for benzene, toluene, ethylbenzene, and xylenes (BTEX), and an infrared spectrometer scan for TPHC.

Two subsurface soil samples were collected for laboratory analysis from the one soil boring (43B-92-01X) drilled at SA 43B (see Figure 2-2). These samples were submitted for laboratory analysis for Project Analyte List (PAL), volatile organic compounds (VOCs), TPHC, and lead.

Seven soil samples were collected at a depth of 5 feet bgs from seven TerraProbe points. Toluene, ethylbenzene, and xylenes were detected in only one sample (TP-08) and TPHC was detected in four soil samples (TP-02, TP-03, TP-07, and TP-08) (Figure 4-1). The detection of TPHC in these four samples from 5 feet is questionable due to the reported presence of asphalt chips in each of the samples. The asphalt was noticed in the samples by the ABB-ES field chemist, after the samples had been analyzed. Based on this

ABB Environmental Services, Inc.

SECTION 4

finding, it does not appear that the results of the TPHC screening represented actual concentrations of TPHC in the soils at these locations.

A total of seven soil samples were also collected at 9 feet bgs from seven TerraProbe points (Figure 4-2). No BTEX compounds were detected, but TPHC was detected in three of the samples. The TPHC results from the soil samples collected from TP-08 at 9 feet (1,500 parts per million [ppm]) is also questionable due to asphalt in the sample, and may not have represented actual TPHC concentrations in the soil at this depth (see Figure 4-2). The results from the other two samples (130 ppm at TP-05 and 760 ppm at TP-03) do appear to represent TPHC concentrations at 9 feet (see Figure 4-2).

Ten TerraProbe soil samples were collected from the groundwater table encountered at 15 feet. No BTEX compounds were detected in any of the samples, but TPHC was detected at 230 ppm in the one sample collected from TP-02 (Figure 4-3). The field screening results are presented in Table 4-1.

Two subsurface confirmation soil samples were collected for laboratory analysis from 43B-92-01X (Figure 4-4). Soil samples were collected from 8 feet to 10 feet and 14 feet to 16 feet bgs. No VOCs were detected in either sample. TPHC was detected at 177 micrograms per gram ($\mu\text{g/g}$) in the soil sample collected from 8 feet to 10 feet bgs but was not detected in the sample collected from the water table encountered at 14 feet to 16 feet bgs. The results of the laboratory analysis appear to indicate that some residual TPHC contamination may be present at approximately 8 feet bgs, but it does not appear that similar contamination is present in the soil at the water table (Table 4-2; see Figure 4-4).

The objective of the subsurface soil sampling program conducted at SA 43B during the SSI was to investigate the nature of the contamination detected during the SI. One soil boring (XBB-93-02X) was advanced adjacent to TP-08 completed during the SI in which elevated TPHC concentrations were detected (see Figure 4-4). Four soil samples were collected from the boring and submitted for laboratory analysis consisting of PAL VOCs, lead, and TPHC. The soil samples were collected at 4 feet, 10 feet (plus one duplicate) and 14 feet bgs. These depths were chosen to replicate the depths of the field analytical samples collected during the SI.

The results of the laboratory analysis indicated the presence of TPHC at $84.2 \mu\text{g/g}$ and xylene at $0.004 \mu\text{g/g}$ in the 4-foot sample. One VOC (trichlorofluoromethane at 0.006 in the 10-foot sample, to $0.007 \mu\text{g/g}$ in the 10-foot duplicate sample) and TPHC at

ABB Environmental Services, Inc.

85.4 $\mu\text{g/g}$ were detected in the 10-foot sample, 393 $\mu\text{g/g}$ in the duplicate sample collected from the 10-foot sample, and $<28.7 \mu\text{g/g}$ in the 14-foot sample (see Table 4-2 and Figure 4-4).

Based on the above mentioned SSI laboratory soils results it appears that the TPHC concentrations, detected in the subsurface soil field analysis samples collected from TP-08, appear to be caused from the reported asphalt chips rather than residual soil contamination.

4.3 GROUNDWATER

Groundwater was encountered at 15 feet bgs, however, no groundwater monitoring wells were installed and no groundwater samples were collected at SA 43B.

THIS PAGE INTENTIONALLY LEFT BLANK

5.0 PRELIMINARY HUMAN HEALTH RISK EVALUATION

The PRE for SA 43B was completed for the Groups 2, 7, and Historic Gas Station Final SI Report and was not updated in the SSI Data Package. However, the TPHC results from both investigations were compared to the most recent ABB-ES-calculated, risk-based TPHC concentration of 1,680 $\mu\text{g/g}$ for gasoline and the MCP S-2 soil standard for TPHC of 2,500 $\mu\text{g/g}$. No UST was detected at this site. Field analysis of 24 shallow and intermediate depth TerraProbe soil samples revealed no measurable concentrations of BTEX to a depth of 10 feet, with the exception of the 5-foot sample from TP-08. TPHC was detected above the method detection limit in seven of the 24 samples, ranging from 140 to 2,000 ppm (the highest concentrations are attributed to asphalt chips in the sample). Based on a comparison of these results against the MCP S-2 soil standard of 2,500 ppm, there should be no significant risk to public health from soil contamination at SA 43B (Table 5-1). Although one sample had a concentration above the calculated risk-based concentration for gasoline of 1,680 ppm, the average TPHC concentration (184.9) is below this screening guideline. Based on the results of the field and laboratory analysis, it appears that some residual TPHC contamination is present in the soil to approximately 15 feet bgs around the suspected former UST location. However, the results of the soil samples collected from the water table do not indicate that the groundwater in this area is being impacted by this concentration of contaminants.

Field analytical samples collected at a depth below 15 feet bgs, the approximate water table depth, indicate no BTEX contamination. TPHC was detected above the method detection limit in one of these samples, at 230 ppm.

The results of the laboratory confirmation samples collected by ABB-ES supports the field-screening results. Soil samples collected from soil borings indicated that residual TPHC contamination ranged from <28.7 to 393 $\mu\text{g/g}$, well below the MCP S-2 soil standard of 2,500 ppm and the calculated risk-based concentration for gasoline of 1,680 ppm. At 14 feet, the TPHC level was below the detection limit. Concentrations of lead did not exceed the established Fort Devens background concentration. These results clearly indicate that little residual contamination exists at SA 43B from petroleum products and that exposure to soil at this SA poses no significant risk to human health.

ABB Environmental Services, Inc.

THIS PAGE INTENTIONALLY LEFT BLANK

6.0 PRELIMINARY ECOLOGICAL RISK EVALUATION

A preliminary ecological risk evaluation was not prepared for SA 43B because contaminants associated with a UST would be confined to subsurface soil, and would not impact any ecological receptors.

THIS PAGE INTENTIONALLY LEFT BLANK

7.0 CONCLUSIONS

Residual fuel-related contaminants were detected in the subsurface soil at historic gas station SA 43B. However, the concentrations detected do not appear to pose a threat to human health. Additionally, since the investigation has focused on the subsurface, and because ecological receptors would not come into contact with subsurface media, no ecological PRE was conducted.

The elevated TPHC concentration detected on the west side of the former UST excavation during the SI, was attributed to asphalt chips. The results of the SSI investigation confirmed that the elevated TPHC was due to the asphalt chips and not residual soil contamination. Based on these results, it appears that the past activities at SA 43B have not adversely impacted the groundwater quality at the site.

THIS PAGE INTENTIONALLY LEFT BLANK

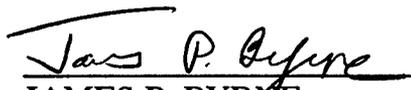
8.0 DECISION

On the basis of findings at SA 43B, there is no evidence or reason to conclude that petroleum contamination from the former UST has caused significant environmental contamination or poses a threat to human health or the environment. The decision has been made to remove SA 43B 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

18 JAN 95
Date

U.S. ENVIRONMENTAL PROTECTION AGENCY

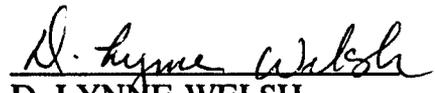

JAMES P. BYRNE
Fort Devens Remedial Project Manager

1/18/95
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

1/18/95
Date

Concur

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

ABB Environmental Services, Inc.

THIS PAGE INTENTIONALLY LEFT BLANK

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ABB-ES	ABB Environmental Services, Inc.
bgs	below ground surface
BRAC	Base Realignment and Closure
BTEX	benzene, toluene, ethylbenzene, and xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DoD	U.S. Department of Defense
gpm	gallons per minute
GPR	ground penetrating radar
IRP	Installation Restoration Program
LUST	leaking underground storage tank
MCP	Massachusetts Contingency Plan
MEP	Master Environmental Plan
MSL	mean sea level
PA	Enhanced Preliminary Assessment
PAL	Project Analyte List
PID	photoionization detector
ppm	part per million
PRE	Preliminary Risk Evaluation
SA	Study Area
SI	site investigation
SSI	supplemental site investigation
TPHC	total petroleum hydrocarbon compounds
$\mu\text{g/g}$	micrograms per gram
USAEC	U.S. Army Environmental Center
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

ABB Environmental Services, Inc.

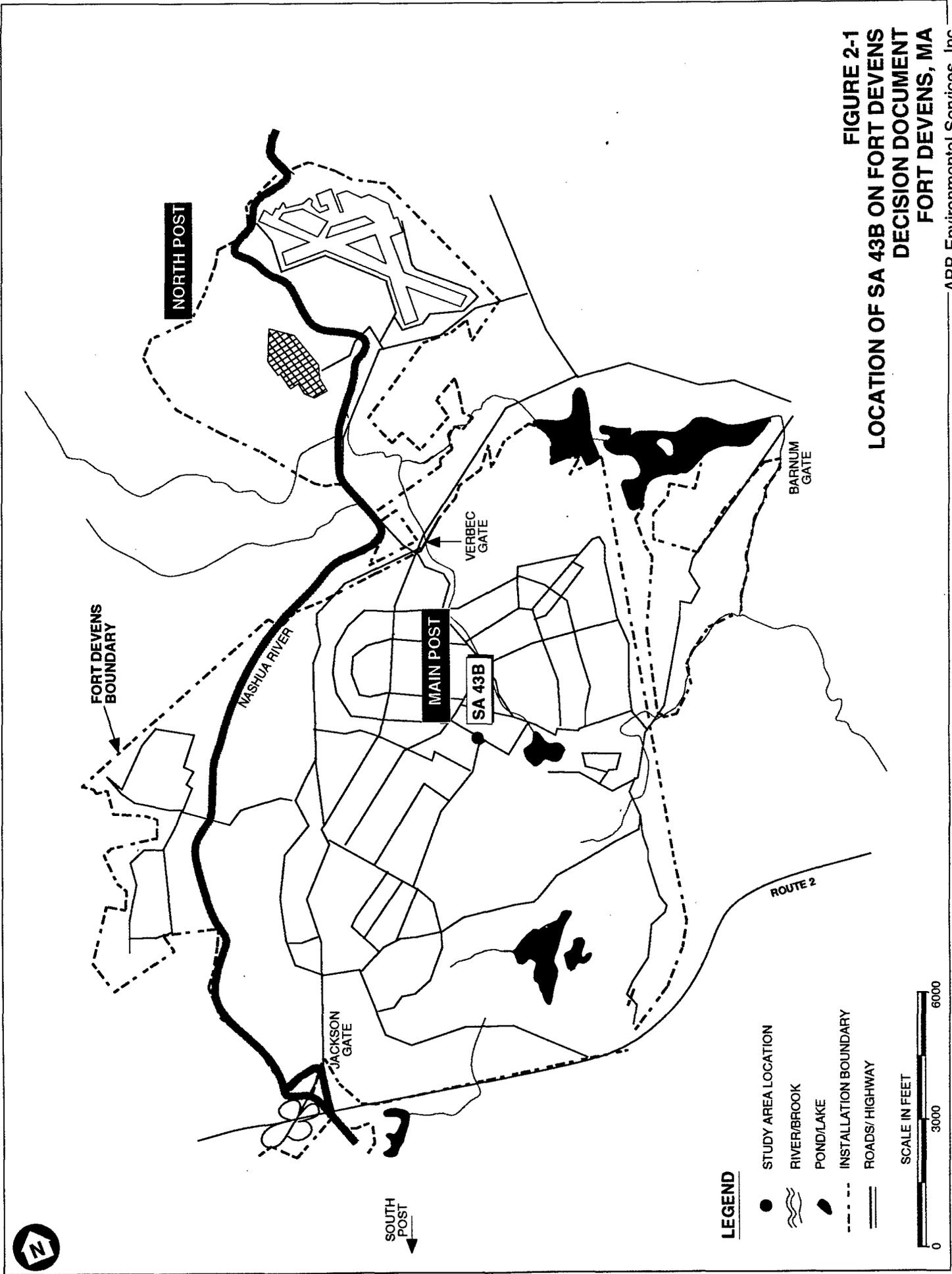
THIS PAGE INTENTIONALLY LEFT BLANK

REFERENCES

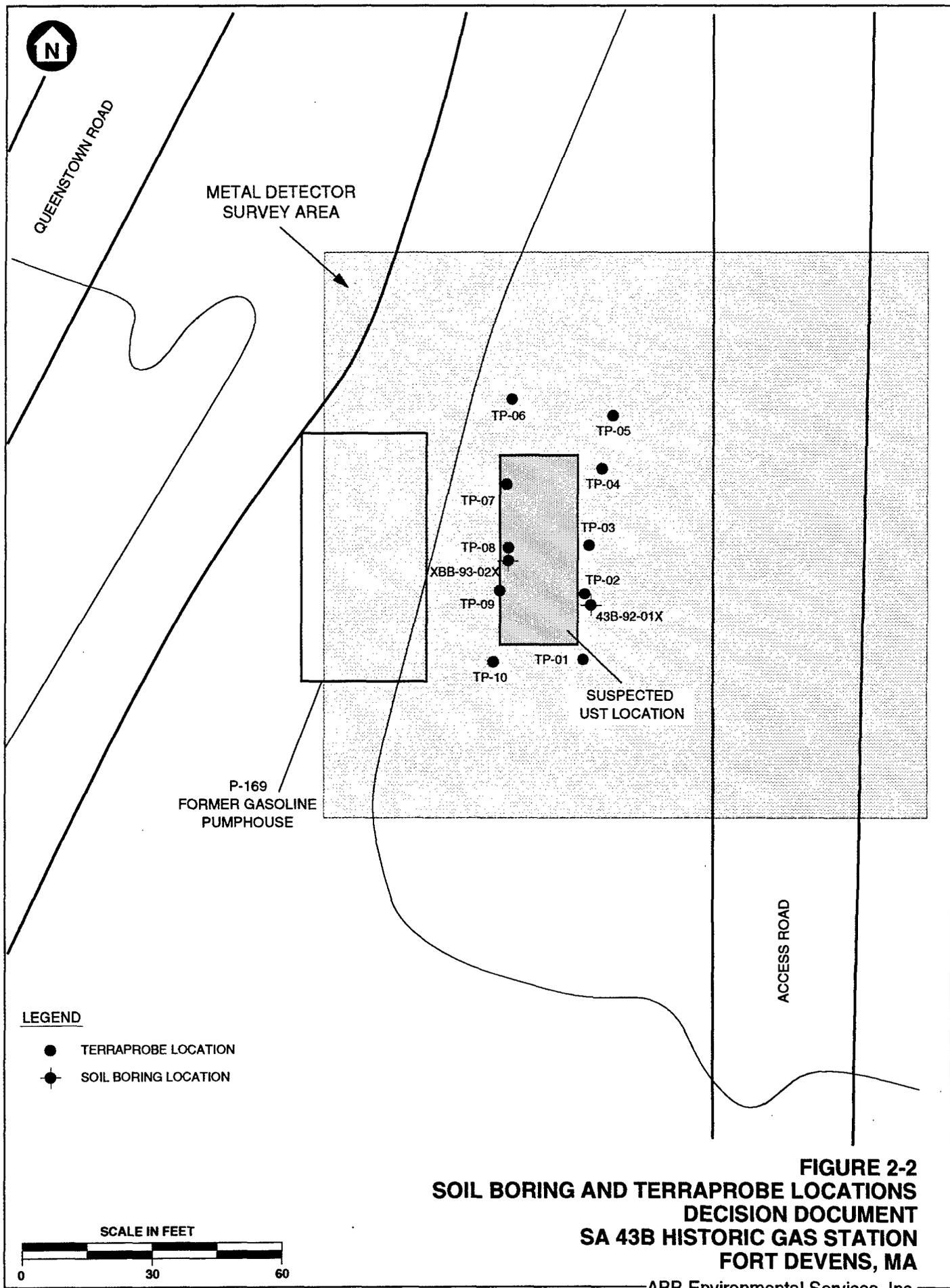
- ABB Environmental Services, Inc. (ABB-ES), 1993. "Final Site Investigation Report - Groups 2, 7, and Historic Gas Stations, Fort Devens, Massachusetts"; Data Item A009; prepared for the U.S. Army Environmental Center by ABB Environmental Services, Inc., Portland, ME, May.
- Barbour, F.A., c. 1941. "Fort Devens, Mass. General Layout Plan"; Plan 6101-710.1B; prepared for Construction Division, Office of Quartermaster General; Scale approximately 1:7,000.
- 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.

ABB Environmental Services, Inc.

THIS PAGE INTENTIONALLY LEFT BLANK









QUEENSTOWN ROAD

TP-06	Depth	5'
TPHC	< 60	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

TP-05	Depth	5'
TPHC	< 60	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

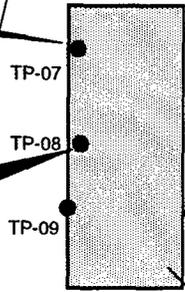
TP-04	Depth	5'
TPHC	< 60	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

TP-07	Depth	5'
TPHC	1200	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

P-169
FORMER
GASOLINE
PUMPHOUSE

TP-03	Depth	5'
TPHC	140	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

TP-08	Depth	5'
TPHC	2000	
Benzene	ND	
Toluene	9.4	
Ethylbenzene	6.4	
Xylene	37	
Orthoxylene	19	



SUSPECTED
UST LOCATION

TP-02	Depth	5'
TPHC	530	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

LEGEND

- TERRAPROBE LOCATION
- TPHC TOTAL PETROLEUM HYDROCARBON COMPOUNDS
- ND NON DETECT

NOTES

- TPH CONCENTRATIONS IN ppm
- BTEX CONCENTRATIONS IN ppb

SCALE IN FEET



ACCESS ROAD

FIGURE 4-1
FIELD SCREENING RESULTS
DEPTH AT 5 FT
DECISION DOCUMENT
SA 43B HISTORIC GAS STATION
FORT DEVENS, MA



QUEENSTOWN ROAD

TP-06	Depth	9'
TPHC	< 55	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

TP-05	Depth	9'
TPHC	130	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

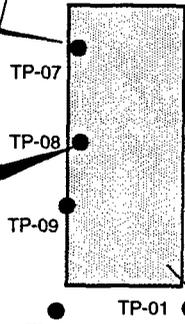
TP-04	Depth	9'
TPHC	<54	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

TP-07	Depth	9'
TPHC	< 55	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

P-169
FORMER
GASOLINE
PUMPHOUSE

TP-03	Depth	9'
TPHC	760	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

TP-08	Depth	9'
TPHC	1500	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	



SUSPECTED
UST LOCATION

TP-02	Depth	9'
TPHC	< 55	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

ACCESS ROAD

LEGEND

- TERRAPROBE LOCATION
- TPHC TOTAL PETROLEUM HYDROCARBON COMPOUNDS
- ND NON DETECT

NOTES

TPHC CONCENTRATIONS IN ppm

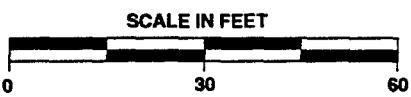
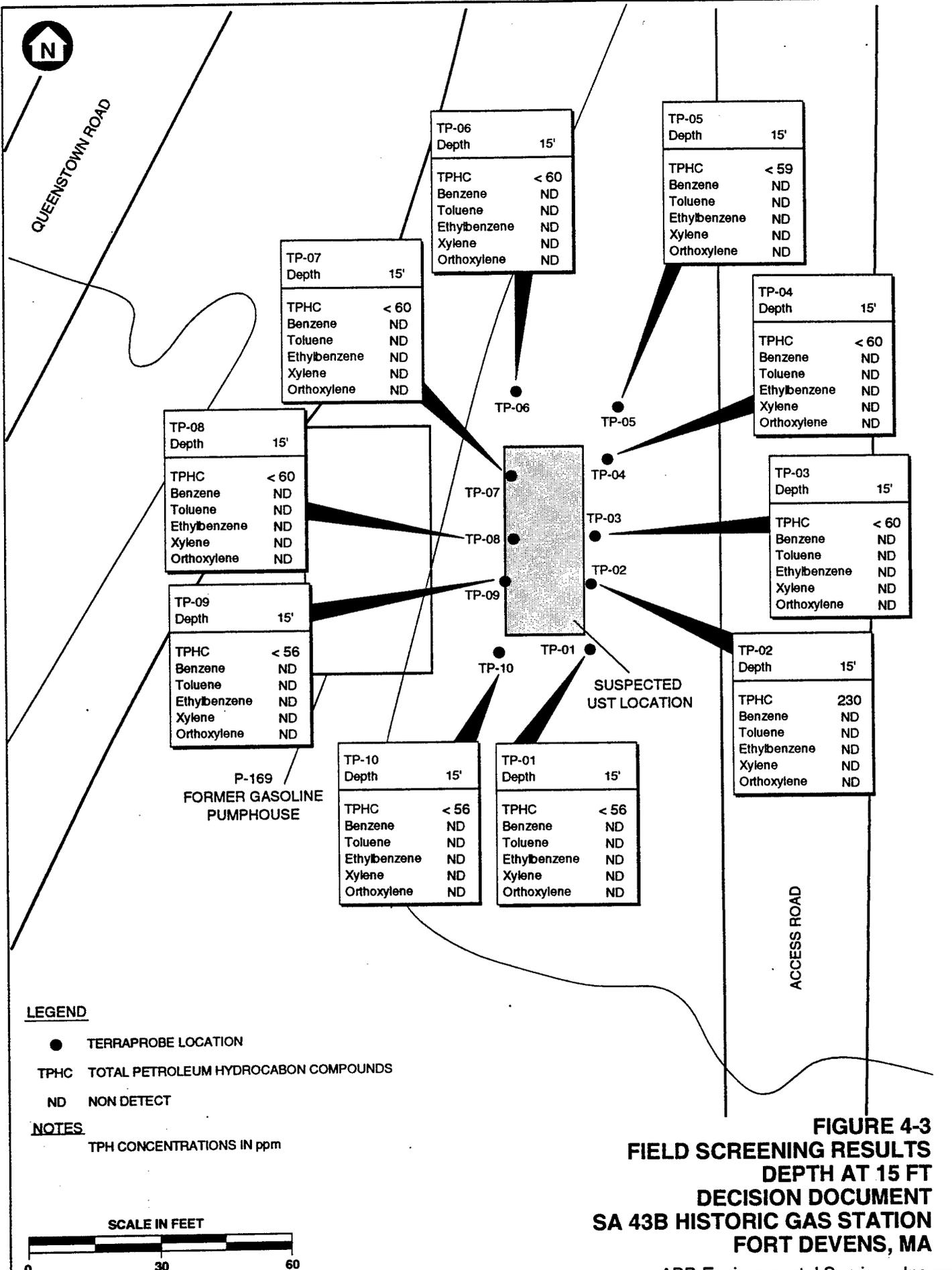


FIGURE 4-2
FIELD ANALYTICAL RESULTS
DEPTH AT 9 FT
DECISION DOCUMENT
SA 43B HISTORIC GAS STATION
FORT DEVENS, MA



QUEENSTOWN ROAD

P-169
FORMER GASOLINE
PUMPHOUSE

SUSPECTED
UST LOCATION

ACCESS ROAD

LEGEND

- TERRAPROBE LOCATION
- TPHC TOTAL PETROLEUM HYDROCARBON COMPOUNDS
- ND NON DETECT

NOTES

TPH CONCENTRATIONS IN ppm

SCALE IN FEET

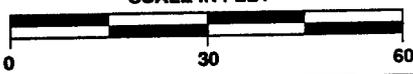


FIGURE 4-3
FIELD SCREENING RESULTS
DEPTH AT 15 FT
DECISION DOCUMENT
SA 43B HISTORIC GAS STATION
FORT DEVENS, MA

TP-06	Depth	15'
TPHC	< 60	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

TP-05	Depth	15'
TPHC	< 59	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

TP-07	Depth	15'
TPHC	< 60	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

TP-04	Depth	15'
TPHC	< 60	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

TP-08	Depth	15'
TPHC	< 60	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

TP-03	Depth	15'
TPHC	< 60	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

TP-09	Depth	15'
TPHC	< 56	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

TP-02	Depth	15'
TPHC	230	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

TP-10	Depth	15'
TPHC	< 56	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	

TP-01	Depth	15'
TPHC	< 56	
Benzene	ND	
Toluene	ND	
Ethylbenzene	ND	
Xylene	ND	
Orthoxylene	ND	



QUEENSTOWN ROAD

4 - 6	10 - 12	Dup 10 - 12	14 - 16
0.004	0.006	0.007	LT
13.0	0.4	10.2	7.49
84.2	85.4	393.0	LT

14 - 16
LT
5.42
LT

8 - 10
LT
14.0
177.0

XBB-93-02X

43B-92-01X

SUSPECTED UST LOCATION

P-169
FORMER GASOLINE
PUMPHOUSE

ACCESS ROAD

LEGEND



SOIL BORING LOCATION

0 - 2
LT
9.1
LT

DEPTH IN FT
TOTAL VOCs in $\mu\text{g/g}$
LEAD in $\mu\text{g/g}$
TPHC in $\mu\text{g/g}$

LT LESS THAN DETECTION LIMIT
Dup DUPLICATE SAMPLE TAKEN

SCALE IN FEET



**FIGURE 4-4
ANALYTES IN SOIL
DECISION DOCUMENT
SA 43B HISTORIC GAS STATION
FORT DEVENS, MA**

TABLE 4-1
 FIELD ANALYTICAL RESULTS
 HISTORIC GAS STATION - SITE 43B

DECISION DOCUMENT
 FORT DEVENS, MA

SAMPLE ID	SA#	MEDIUM	SITE ID	DEPTH (feet)	TPHC ppm	TOTAL BTEX ppb	BEN* ppb	TOL* ppb	E-BEN* ppb	M/P XYL** ppb	O-XYL* ppb	COMMENTS
43TSB01X1501XF	43B	SOIL	TP-01	15	< 56	0	ND	ND	ND	ND	ND	
43TSB02XX501XF	43B	SOIL	TP-02	5	530	0	ND	ND	ND	ND	ND	POSSIBLE COLOR INTERFERENCE
43TSB02XX901XF	43B	SOIL	TP-02	9	< 55	0	ND	ND	ND	ND	ND	
43TSB02X1501XF	43B	SOIL	TP-02	15	230	0	ND	ND	ND	ND	ND	
43TSB03XX501XF	43B	SOIL	TP-03	5	140	0	ND	ND	ND	ND	ND	
43TSB03XX901XF	43B	SOIL	TP-03	9	760	0	ND	ND	ND	ND	ND	POSSIBLE COLOR INTERFERENCE
43TSB03X1501XF	43B	SOIL	TP-03	15	< 60	0	ND	ND	ND	ND	ND	
43TSB04XX501XF	43B	SOIL	TP-04	5	< 60	0	ND	ND	ND	ND	ND	
43TSB04XX901XF	43B	SOIL	TP-04	9	< 54	0	ND	ND	ND	ND	ND	
43TSB04X1501XF	43B	SOIL	TP-04	15	< 60	0	ND	ND	ND	ND	ND	
43TSB05XX501XF	43B	SOIL	TP-05	5	< 60	0	ND	ND	ND	ND	ND	
43TSB05XX901XF	43B	SOIL	TP-05	9	130	0	ND	ND	ND	ND	ND	
43TSB05X1501XF	43B	SOIL	TP-05	15	< 59	0	ND	ND	ND	ND	ND	
43TSB06XX501XF	43B	SOIL	TP-06	5	< 60	0	ND	ND	ND	ND	ND	
43TSB06XX901XF	43B	SOIL	TP-06	9	< 55	0	ND	ND	ND	ND	ND	

TABLE 4-1
 FIELD ANALYTICAL RESULTS
 HISTORIC GAS STATION - SITE 43B

DECISION DOCUMENT
 FORT DEVENS, MA

SAMPLE ID	SA #	MEDIUM	SITE ID	DEPTH (feet)	TPHC ppm	TOTAL BTEX ppb	BEN* ppb	TOL* ppb	E-BEN* ppb	M/P XYL** ppb	O-XYL* ppb	COMMENTS
43TSB06X150IXF	43B	SOIL	TP-06	15	< 60	0	ND	ND	ND	ND	ND	
43TSB07XX50IXF	43B	SOIL	TP-07	5	1200	0	ND	ND	ND	ND	ND	ASPHALT CHIPS IN SAM
43TSB07XX90IXF	43B	SOIL	TP-07	9	< 55	0	ND	ND	ND	ND	ND	
43TSB07X150IXF	43B	SOIL	TP-07	15	< 60	0	ND	ND	ND	ND	ND	
43TSB08XX50IXF	43B	SOIL	TP-08	5	2000	72	ND	9.4	6.4	37	19	ASPHALT CHIPS IN SAM *** PHC's Detected
43TSB08XX90IXF	43B	SOIL	TP-08	9	1500	0	ND	ND	ND	ND	ND	ASPHALT CHIPS IN SAM
43TSB08X150IXF	43B	SOIL	TP-08	15	< 60	0	ND	ND	ND	ND	ND	
43TSB09X150IXF	43B	SOIL	TP-09	15	< 56	0	ND	ND	ND	ND	ND	
43TSB10X150IXF	43B	SOIL	TP-10	15	< 56	0	ND	ND	ND	ND	ND	

NOTES:

* = ND DENOTES A NON DETECT OR CONCENTRATION BELOW 5 PPB.

** = ND DENOTES A NON DETECT OR CONCENTRATION BELOW 10 PPB.

*** = DETECTION OF NONCALIBRATED PETROLEUM HYDROCARBON PEAKS

= STUDY AREA

TABLE 4-2
 ORGANIC ANALYTES IN SUBSURFACE SOIL
 HISTORIC GAS STATION - SITE 43B

DECISION DOCUMENT
 FORT DEVENS, MA

ANALYTE	SSI					SI	
	BACKGROUND	XBB-93-02X 4 FT	XBB-93-02X 10 FT	XBB-93-02X DUP 10 FT	XBB-93-02X 14 FT	43B-92-01X 8 FT	43B-92-01X 14 FT
ORGANICS ($\mu\text{g/g}$)							
TRICHLOROFLUOROMETHANE		< 0.006	0.006	0.007	< 0.006	< 0.006	< 0.006
*XYLENES		0.004	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
INORGANICS ($\mu\text{g/g}$)							
LEAD		13	0.4	10.2	7.49	14	5.42
OTHER ($\mu\text{g/g}$)							
TOTAL ORGANIC CARBON		NA	NA	NA	NA	NA	501
TPHC		84.2	85.4	393	< 28.7	177	< 27.9

NOTES:

< = LESS THAN DETECTION LIMIT

TABLE 5-1
HUMAN HEALTH PRE EVALUATION OF SUBSURFACE SOIL
HISTORIC GAS STATION - SITE 43B

DECISION DOCUMENT
FORT DEVENS, MA

ANALYTE	FREQUENCY OF DETECTION	DETECTED CONCENTRATION [a]		SOIL BACKGROUND CONCENTRATION [b] ($\mu\text{g/g}$)	MAXIMUM EXCEEDS BACKGROUND ?	REGION III COMMERCIAL/ INDUSTRIAL CONCENTRATION ($\mu\text{g/g}$)	MCP S-2 ($\mu\text{g/g}$)	MAXIMUM EXCEEDS GUIDELINE CONCENTRATION ?
		AVERAGE ($\mu\text{g/g}$)	MAXIMUM ($\mu\text{g/g}$)					
ORGANICS								
TRICHLOROFLUOROMETHANE	2/6	0.007	0.007	NA	-	310000	NA	NO
XYLENES	1/6	0.004	0.004	NA	-	1000000	500	NO
INORGANICS								
LEAD	6/6	8.418	14	48.4	NO	500	600	NO
OTHER								
TPHC	4/6	184.9	393	NA	-	1680	2500	NO

NOTES:

[a] SUBSURFACE SOIL (3 TO 15 FEET) FROM SAMPLE LOCATIONS 43B-92-01X (2 DEPTHS) AND XBB-93-02X (3 DEPTHS, 1 DUPLICATE)

[b] BASE-WIDE BACKGROUND SOIL INORGANICS DATABASE

NA = NOT AVAILABLE

$\mu\text{g/g}$ = MICROGRAMS PER GRAM

- = NOT APPLICABLE

MCP = MASSACHUSETTS CONTINGENCY PLAN