



**U.S. Army
Environmental
Center**

**NO FURTHER ACTION DECISION UNDER
CERCLA**

**FORT DEVENS HISTORIC GAS STATIONS
STUDY AREAS 43C, E, F, K, L, M, P, Q, R, S**

DATA ITEM A009

CONTRACT DAAA15-91-D-0008

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

JANUARY 1994

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**NO FURTHER ACTION UNDER CERCLA
STUDY AREA 43C
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 1994

**DRAFT
DECISION DOCUMENT
STUDY AREA 43C
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

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EXECUTIVE SUMMARY

Investigations of Study Area 43C (Historic Gas Station 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 43C 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 Study Area 43C.

Field investigation of Study Area 43C was initiated in 1992 in conjunction with the other 12 Groups 2, 7, and Historic Gas Stations Study Areas at Fort Devens. The Study Area 43C site investigation consisted of surficial geophysical surveys, which included a metal detector and ground penetrating radar survey.

The geophysical surveys indicated that one abandoned underground storage tank was present on the southern side of the existing pumphouse. This tank was removed by ATEC Environmental Consultants on August 27, 1992. ATEC performed field screening for volatile organic compounds and total petroleum hydrocarbons on eight soil samples collected from the walls of the excavation. One soil and one groundwater sample from the bottom of the excavation were collected for confirmatory laboratory analysis. The soil sample was analyzed for total petroleum hydrocarbons and the groundwater sample was analyzed for volatile organic compounds and total petroleum hydrocarbons. No volatile organic compounds were detected in groundwater and total petroleum hydrocarbon results were below the detection limit of the method. ABB Environmental Services, Inc. collected one composite sample from the bottom of the excavation for off-site laboratory analysis. Total petroleum hydrocarbons were detected at 78.2 parts per million. Based on ATEC Environmental Consultants' sampling results, the excavation was backfilled and no further site investigation was conducted.

ABB Environmental Services, Inc.

EXECUTIVE SUMMARY

On the basis of findings at Study Area 43C and the Preliminary Risk Evaluation, there is no evidence or reason to conclude that petroleum contamination due to the former underground storage tank has caused significant environmental contamination or poses a threat to human health. The decision has been made to remove Study Area 43C from further consideration in the Installation Restoration Program.

ABB Environmental Services, Inc.

1.0 INTRODUCTION

This decision document has been prepared to support a no further action decision at Study Area 43C - Historic Gas Station Site (SA 43C) 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. 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 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 43C were conducted to support this overall mission.

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 this function 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, for the Army Readiness Region, for Reserve Components, and for 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 (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 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 43C, are located on the Main Post.

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 dissected by numerous brooks with attendant wetlands. There are also several kettle ponds and one kettle lake located within the installation.

2.4 STUDY AREA DESCRIPTION AND HISTORY

SA 43C, one of the 19 Historic Gas Station Sites, is included in the Group 2 SAs located on the Main Post. This SA is located off Queenstown Road (Figure 2-2). The structures of the historic gas station at SA 43C consisted of a pump island and a small gasoline pumphouse. Based on historic records, the gas station was a Type A station with 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 and therefore, there was no evidence that the UST had been removed. The pumphouse (Building 3459) was still present at this SA prior to the SI field investigation. The pumphouse appeared to be constructed of corrugated steel and some piping was present in the building. The building was secured by a locked metal door. The area around the pumphouse is a gravel parking lot (see Figure 2-2).

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 43C 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

SECTION 3

The SI was conducted by ABB-ES under contract with the USAEC. The Final Site Investigation Report was issued in 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 43C consisted of a surficial geophysical program which included a metal detector and ground penetrating radar (GPR) survey. The geophysical investigation conducted at SA 43C indicated that one abandoned UST was present on the southern side of the existing pumphouse (see Figure 2-2). The metal detector was used first to locate the UST and then the GPR survey identified the ends and the sides of the UST. The geophysical measurements collected in the field are presented in Appendix L of the SI Report (ABB-ES, 1993).

4.0 CONTAMINATION ASSESSMENT

The 5,000-gallon UST at SA 43C was removed by ATEC Environmental Consultants (ATEC) on August 27, 1992. The tank was observed to be severely corroded, without holes or perforations. Associated piping was also corroded (ATEC, 1992). Tank contents at the time of removal consisted of about 1,288 gallons of diesel fuel and sludge. The fuel was removed by Hitchcock Gas Engine Company. The scrap tank was disposed of at John C. Tombarello and Sons on September 1, 1992 (ATEC, 1992). Groundwater was observed in the UST excavation at a depth of approximately 10 feet below ground surface (bgs). Soil and groundwater samples were collected from the excavation to determine whether the contents of the UST had adversely impacted soil or groundwater quality at SA 43C. The results of the analyses are presented in the following paragraphs.

4.1 SOILS

At the time of the tank removal, ATEC performed field screening on eight soil samples (SS-1 through SS-8) collected from the excavation walls at depths of 5 feet to 6 feet bgs (see Figure 4-1). The headspace of the soil samples was screened with a photoionization detector (PID) for total volatile organic compounds (VOCs) and a Non-Dispersive Infrared (NDIR) Analyzer was used to screen for total petroleum hydrocarbons (TPHC). The PID results ranged from nondetect to 0.2 part per million (ppm), and TPHC levels were 20.5 to 287 ppm (ATEC, 1992) (Table 4-1). ATEC also collected one soil sample from the excavation for confirmatory laboratory analysis. The soil sample was analyzed for TPHC. This sample was analyzed by a non-USAEC certified laboratory and the data do not reside in the Installation Restoration Data Management Information System (IRDMIS). TPHC results were below the detection limit of the method (see Table 4-1). ABB-ES collected one composite soil sample from the bottom of the excavation. This sample was analyzed for TPHC using U.S. Environmental Protection Agency (USEPA) Method 418.1 at ABB-ES' Wakefield, Massachusetts laboratory. TPHC was detected at 78.2 ppm (see Table 4-1). Based on ATEC's sampling results, ATEC backfilled the excavation and no further site investigation was conducted (ATEC, 1992).

SECTION 4

4.2 GROUNDWATER

Groundwater was encountered at approximately 10 feet bgs in the former tank excavation. A groundwater sample was collected and analyzed at an off-site laboratory for VOCs and TPHC. This sample was analyzed at a non-USAEC certified laboratory, and the data do not reside in the IRDMIS. VOCs were not detected in the groundwater sample and TPHC results were below the detection limit of the method (see Table 4-1).

5.0 PRELIMINARY HUMAN HEALTH RISK EVALUATION

The UST at SA 43C was discovered by ABB-ES and removed by ATEC during the SI. Prior to backfilling, ATEC collected eight soil samples from the excavation walls, which were screened for TPHC by the NDIR method. TPHC levels ranged from 20.5 ppm to a maximum value of 287 ppm. The TPHC concentration in a confirmatory soil sample collected by ABB-ES for TPHC analysis by USEPA Method 418.1 was 78.2 ppm. A comparison of these results against the calculated risk-based commercial/industrial concentration value of 1,700 ppm for gasoline, and against the Massachusetts Contingency Plan's most conservative concentration of 500 ppm, indicates that there should be no significant risk to public health from soil contamination at SA 43C.

6.0 PRELIMINARY ECOLOGICAL RISK EVALUATION

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

7.0 CONCLUSIONS

Fuel-related soil contamination was not observed or detected in the soil or groundwater after the UST was removed from SA 43C. Based on these results it appears that the contents of the former UST did not adversely impact the soil or groundwater quality at SA 43C. Based on the results of the field investigation and sampling conducted by ABB-ES and by ATEC during the tank removal at SA 43C, no further action is recommended for this historic gas station site.

8.0 DECISION

On the basis of findings at SA 43C, 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 43C from further consideration in the IRP process.

COMMANDER, FORT DEVENS

COLONEL EDWARD NUTTALL
U.S. Army
Installation Commander

Date

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION I, ME AND VT WASTE MANAGEMENT BRANCH

☐ Concur

David M. Webster, Chief

Date

☐ Non-concur (Please provide reasons) _____

ABB Environmental Services, Inc.

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ABB-ES	ABB Environmental Services, Inc.
ATEC	ATEC Environmental Consultants
bgs	below ground surface
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DoD	U.S. Department of Defense
gpm	gallons per minute
GPR	ground penetrating radar
IRDMIS	Installation Restoration Data Management Information System
IRP	Installation Restoration Program
LUST	leaking underground storage tank
MEP	Master Environmental Plan
MSL	mean sea level
NDIR	Non-Dispersive Infrared
PA	Enhanced Preliminary Assessment
PID	photoionization detector
ppm	part per million
SA	Study Area
SI	site investigation
TPHC	total petroleum hydrocarbon compounds
USAEC	U.S. Army Environmental Center
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

ABB Environmental Services, Inc.

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.
- ATEC Environmental Consultants (ATEC), 1992. "Post-Removal Report, Underground Storage Tank Closure, 5,000-Gallon Diesel Fuel, UST No. 0108, Building 3549, Fort Devens, Massachusetts"; ATEC File No. 37.07.91.07451; Norwell, MA; prepared for U.S. Army Directorate of Contracting; Fort Devens, MA; September 25.
- 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.

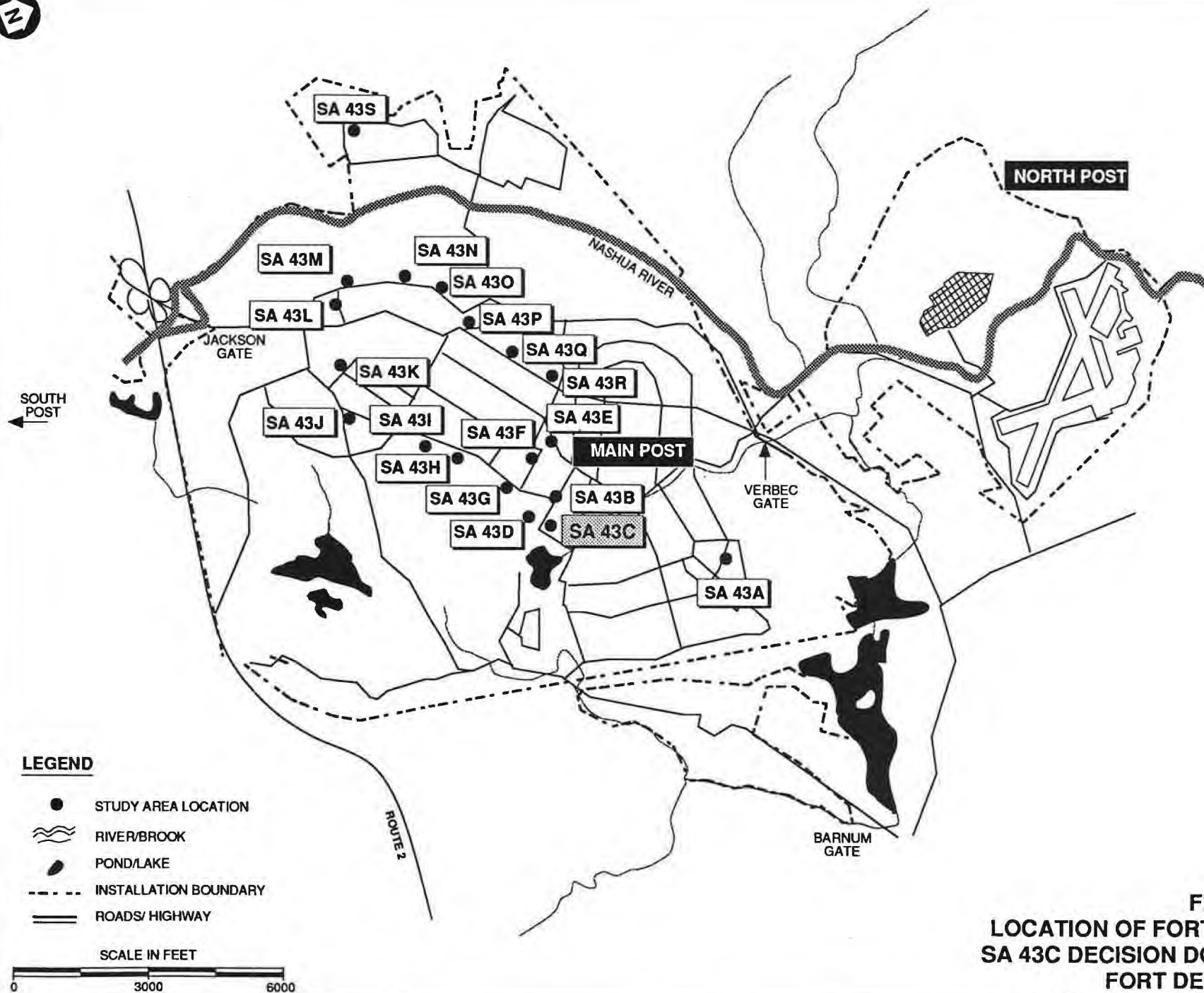


FIGURE 2-1
LOCATION OF FORT DEVENS
SA 43C DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.



QUEENSTOWN ROAD

260

ELCANEY STREET

3545

3546

3547

GRAVEL PARKING LOT

3548

3549

SA 43C

P-170 GASOLINE PUMP
HOUSE (EXISTING)

ABANDONED
UST
LOCATION

AREA OF
SURFICIAL
GEOPHYSICAL
SURVEYS

ACCESS ROAD

SCALE IN FEET

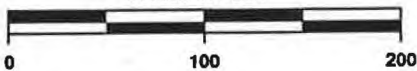


FIGURE 2-2
LOCATION OF SA 43C
SA 43C DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.



3548

3549

P-170 GASOLINE PUMP
HOUSE (EXISTING)

3459

EXCAVATION OF
ABANDONED UST

ACCESS ROAD

AREA OF METAL
DETECTOR AND
GPR SURVEYS

LEGEND



ATEC FIELD SCREENING LOCATIONS



ATEC LABORATORY SOIL SAMPLE LOCATION



ATEC LABORATORY WATER SAMPLE LOCATION

SCALE IN FEET



FIGURE 4-1
LOCATION OF HISTORIC GAS STATION
SA 43C DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

TABLE 4-1
ATEC/ABB-ES FIELD SCREENING RESULTS
SA 43C - HISTORIC GAS STATIONS

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FORT DEVENS

SAMPLE NO.	FIELD SCREENING		LABORATORY	
	PID (ppm)	NDIR (ppm)	VOC (ppm)	TPHC (ppm)
SS-1	0.2	232	N/A	N/A
SS-2	ND	20.5	N/A	N/A
SS-3	ND	29.3	N/A	N/A
SS-4	ND	99.2	N/A	N/A
SS-5	ND	287	N/A	N/A
SS-6	ND	96.7	N/A	N/A
SS-7	0.2	72.5	N/A	N/A
SS-8	ND	42.1	N/A	N/A
LSS-1	N/A	N/A	N/A	0.0
LWS-1	N/A	N/A	ND	0.0
XCE-92-01X	N/A	N/A	N/A	78.2

NOTES:

SS = ATEC field screening soil sample

LSS = ATEC laboratory soil sample

LWS = ATEC laboratory water sample

XCE-92-01X = ABB-ES laboratory composite soil sample

ND = Non detect

N/A = Not analyzed

PID = Photoionization Detector

NDIR = Non-Dispersive Infrared

VOC = Volatile Organic Compound

TPHC = Total Petroleum Hydrocarbon Compounds

PPM = Part Per Million

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8	STUDY AREA 43Q
9	STUDY AREA 43R
10	STUDY AREA 43S

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

Prepared for:

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

Prepared by:

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Portland, Maine
Project No. 7053-12

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4-1	ATEC Field Screening Results

EXECUTIVE SUMMARY

Investigations of Study Area 43E (Historic Gas Station 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 43E 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 Study Area 43E.

Field investigation of Study Area 43E was initiated in 1992 in conjunction with the other 12 Groups 2, 7, and Historic Gas Stations Study Areas at Fort Devens. The Study Area 43E site investigation consisted of surficial geophysical surveys, which included a metal detector and ground penetrating radar survey.

The geophysical surveys indicated that one abandoned underground storage tank was present on the northern side of Building 2020. This tank was removed by ATEC Environmental Consultants on September 3, 1992. No visually contaminated soil was observed in the excavation, and groundwater was not encountered. ATEC Environmental Consultants performed field screening for volatile organic compounds and total petroleum hydrocarbons on 10 soil samples collected from the walls of the excavation. The photoionization detector headspace screening showed volatile organic compound concentrations ranging from 0.2 to 0.5 parts per million. Total petroleum hydrocarbons were detected at concentrations ranging from 4.8 to 43.5 parts per million. ABB Environmental Services, Inc. collected one composite sample from the bottom of the excavation for off-site laboratory analysis. Total petroleum hydrocarbons were detected at 85 parts per million. Based on ATEC Environmental Consultants' sampling results, the excavation was backfilled. Because total petroleum hydrocarbon

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concentrations were below 100 parts per million, no further site investigation was conducted.

On the basis of findings at Study Area 43E and the Preliminary Risk Evaluation, there is no evidence or reason to conclude that petroleum contamination due to the former underground storage tank has caused significant environmental contamination or poses a threat to human health. The decision has been made to remove Study Area 43E from further consideration in the Installation Restoration Program.

ABB Environmental Services, Inc.

1.0 INTRODUCTION

This decision document has been prepared to support a no further action decision at Study Area 43E - Historic Gas Station Site (SA 43E) 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. 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.

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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 43E 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, 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.

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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 43E, are located on the Main Post.

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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.

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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.

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

2.4 STUDY AREA DESCRIPTION AND HISTORY

SA 43E, 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 43E consisted of a pump island and a small gasoline pumphouse. Based on historic records, the gas station was a Type A station and 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 area where SA 43E was reportedly located is currently a paved parking lot for Buildings 2000 and 2020 (Shawmut Bank), located in the central portion of the Main Post (Figure 2-2).

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 43E 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 listed in the MEP.

- SA 13 Landfill No. 9
- SA 43 Historic Gas Stations (19 Sites)
- SA 45 Lake George Street Vehicle Wash Area
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- SA 28 Waste Explosive Detonation Range (Training Area 14)
- SA 41 Unauthorized Dumping Area (Site A)
- SA 42 Popping Furnace

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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 43E consisted of a surficial geophysical program which included a metal detector and ground penetrating radar (GPR) survey. The geophysical investigation conducted at SA 43E indicated that one abandoned UST was present on the northern side of Building 2020 (see Figure 2-2). The metal detector was used first to locate the UST and then the GPR survey identified the ends and the sides of the UST. The geophysical measurements collected in the field are presented in Appendix L of the SI Report (ABB-ES, 1993).

4.0 CONTAMINATION ASSESSMENT

The 5,000-gallon UST at SA 43E was removed by ATEC Environmental Consultants (ATEC) on September 3, 1992. The tank was observed to be in good condition, without holes, perforations, or severe corrosion. Associated piping, however was corroded (ATEC, 1992). Tank contents at the time of removal consisted only of about 2,640 gallons of gasoline and sludges. The gasoline was removed by Cyn Oil Corporation (ATEC, 1992). The scrap tank was disposed of at John C. Tombarello and Sons on September 16, 1992 (ATEC, 1992). No visually contaminated soil was observed in the excavation, and groundwater was not encountered. Soil samples were collected from the excavation to determine whether the contents of the UST had adversely impacted soil or groundwater quality at SA 43E. The results of the analyses are presented in the following paragraphs.

4.1 SOILS

At the time of the tank removal, ATEC performed field screening on 10 soil samples collected from the excavation walls at depths of 5 to 6 feet (Figure 4-1). The headspaces of each soil samples were screened with a photoionization detector (PID) for volatile organic compounds (VOCs). A Non-Dispersive Infrared (NDIR) Analyzer was used to screen for total petroleum hydrocarbons (TPHC). The PID headspace screening showed VOC concentrations ranging from nondetect to 0.5 part per million (ppm). TPHC was detected at concentrations ranging from 4.8 to 43.5 ppm (Table 4-1). ABB-ES collected one composite soil sample from the bottom of the excavation. This sample was analyzed at ABB-ES' Wakefield, Massachusetts laboratory for TPHC using U.S. Environmental Protection Agency (USEPA) Method 418.1, and the concentration was 85 ppm (see Table 4-1). Based on the results of ATEC's sampling and analysis, ATEC backfilled the excavation. Because TPHC concentrations were less than 100 ppm, no further site investigation was conducted.

4.2 GROUNDWATER

Groundwater was not encountered in during the excavation of the UST at SA 43E.

5.0 PRELIMINARY HUMAN HEALTH RISK EVALUATION

The UST at SA 43E was discovered by ABB-ES and removed by ATEC during the SI. Prior to backfilling, ATEC collected eight soil samples from the excavation walls which were screened for TPHC by the NDIR method. TPHC levels ranged from 4.8 ppm to a maximum value of 43.5 ppm in the UST wall samples. The TPHC concentration in a confirmatory soil sample collected by ABB-ES for TPHC analysis by USEPA Method 418.1 was 85 ppm. Based on a comparison of these results against the calculated risk-based commercial/industrial concentration value of 1,700 ppm for gasoline, and against the Massachusetts Contingency Plan's most conservative concentration of 500 ppm, there should be no significant risk to public health from soil contamination at SA 43E.

6.0 PRELIMINARY ECOLOGICAL RISK EVALUATION

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

7.0 CONCLUSIONS

Limited field investigation conducted by ABB-ES and sampling conducted by ATEC during UST removal operations at SA 43E indicated that historical petroleum use at this location has not adversely impacted soil or groundwater. Therefore, no further action is recommended for this historic gas station.

8.0 DECISION

On the basis of findings at SA 43E, 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 43E from further consideration in the IRP process.

COMMANDER, FORT DEVENS

COLONEL EDWARD NUTTALL
U.S. Army
Installation Commander

Date

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION I, ME AND VT WASTE MANAGEMENT BRANCH

☐ Concur

David M. Webster, Chief

Date

☐ Non-concur (Please provide reasons) _____

ABB Environmental Services, Inc.

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ABB-ES	ABB Environmental Services, Inc.
ATEC	ATEC Environmental Consultants
bgs	below ground surface
BRAC	Base Realignment and Closure
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
MEP	Master Environmental Plan
MSL	mean sea level
NDIR	Non-Dispersive Infrared
PA	Enhanced Preliminary Assessment
PID	photoionization detector
ppm	part per million
PRE	Preliminary Risk Evaluation
SA	Study Area
SI	site investigation
TPHC	total petroleum hydrocarbon compounds
USAEC	U.S. Army Environmental Center
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank

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GLOSSARY OF ACRONYMS AND ABBREVIATIONS

VOC volatile organic compound

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.
- ATEC Environmental Consultants (ATEC), 1992. "Post-Removal Report, Underground Storage Tank Closure, 5,000-Gallon Diesel Fuel, UST No. 0111, Building 2000, Fort Devens, Massachusetts"; ATEC File No. 37.07.91.07451; Norwell, MA; prepared for U.S. Army Directorate of Contracting; Fort Devens, MA; September 29.
- 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.

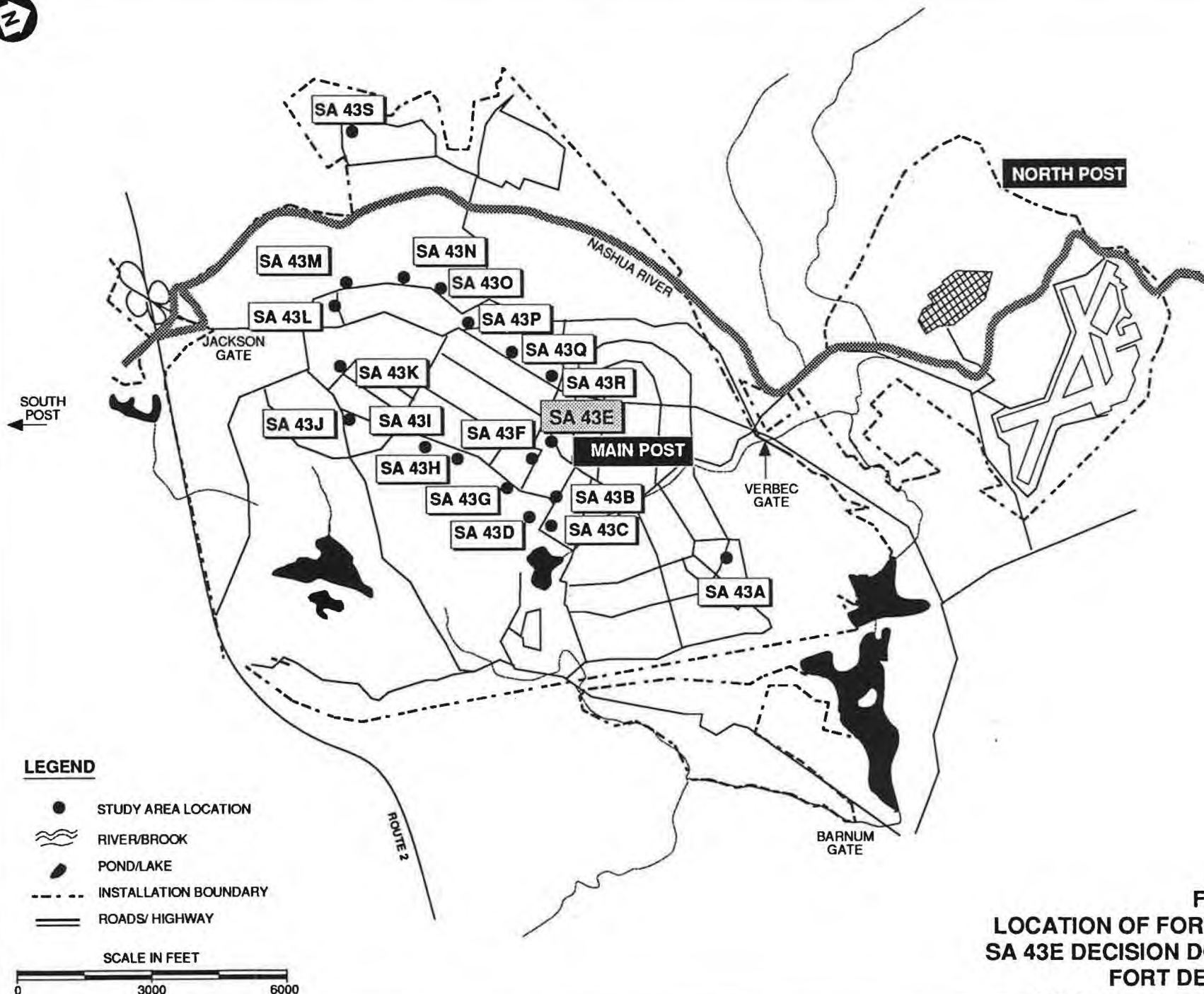
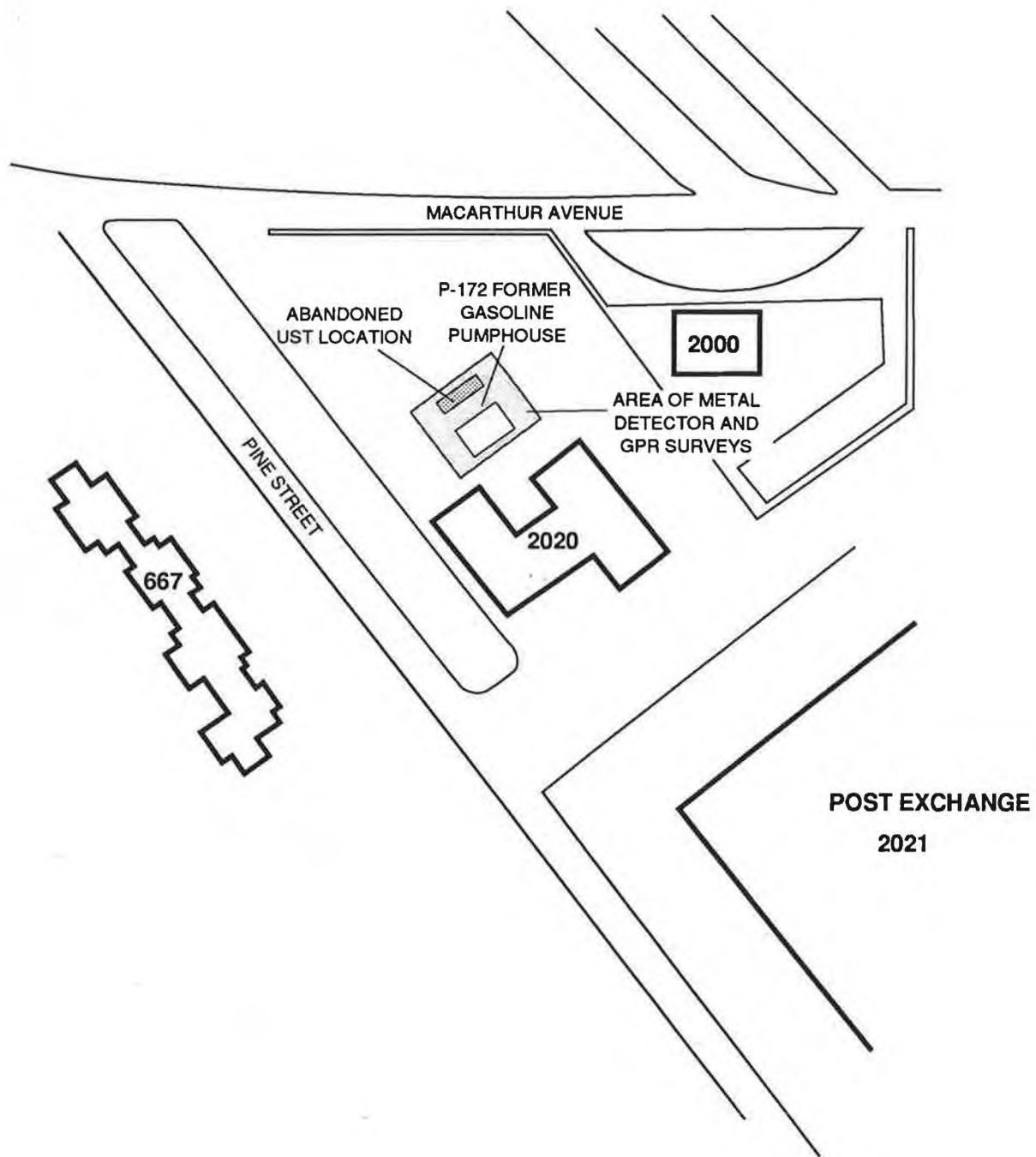


FIGURE 2-1
LOCATION OF FORT DEVENS
SA 43E DECISION DOCUMENT
FORT DEVENS, MA

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**FIGURE 2-2
LOCATION OF SA 43E
SA 43E DECISION DOCUMENT
FORT DEVENS, MA**



MACARTHUR AVENUE

UST
EXCAVATION

SS-02

SS-03

SS-01

SS-10

SS-04

SS-08

SS-09

LRS-2

SS-07

SS-06

P-172
FORMER GASOLINE
PUMPHOUSE

PINE STREET

2020

LEGEND

■ ATEC FIELD SCREENING SAMPLE LOCATION

⊞ ATEC LABORATORY SOIL SAMPLE LOCATION

SCALE IN FEET

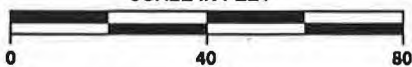


FIGURE 4-1
LOCATION OF HISTORIC GAS STATION
SA 43E DECISION DOCUMENT
FORT DEVENS, MA

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TABLE 4-1
ATEC FIELD SCREENING RESULTS
SA 43E - HISTORIC GAS STATIONS

DECISION DOCUMENT
FORT DEVENS

SAMPLE NO.	FIELD SCREENING		LABORATORY	
	PID (ppm)	NDIR (ppm)	VOC (ppm)	TPHC (ppm)
SS-1	0.5	16.9	N/A	N/A
SS-2	0.2	43.5	N/A	N/A
SS-3	ND	6.2	N/A	N/A
SS-4	ND	17.7	N/A	N/A
SS-5	ND	22.1	N/A	N/A
SS-6	ND	5.6	N/A	N/A
SS-7	ND	4.8	N/A	N/A
SS-8	ND	7.7	N/A	N/A
SS-9	0.5	24.5	N/A	N/A
SS-10	0.5	12.1	N/A	N/A
LSS-1	N/A	N/A	ND	< 21.0
LSS-2	N/A	N/A	ND	127.0
XEE-92-01X	N/A	N/A	N/A	85.0

NOTES:

SS = ATEC field screening soil sample

LSS = ATEC laboratory soil sample

ND = Non-detect

N/A = Not analyzed

PID = Photoionization Detector

NDIR = Non-Dispersive Infrared

VOC = Volatile Organic Compound

TPHC = Total Petroleum Hydrocarbon Compounds

PPM = Part Per Million

**NO FURTHER ACTION DECISION UNDER CERCLA
STUDY AREA 43F
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 1994

**DRAFT
DECISION DOCUMENT
STUDY AREA 43F
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

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DECISION DOCUMENT
STUDY AREA 43F
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

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4-1	Field Screening Results

EXECUTIVE SUMMARY

Investigations of Study Area 43F (Historic Gas Station 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 43F 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 Study Area 43F.

Field investigation of Study Area 43F was initiated in 1992 in conjunction with the other 12 Groups 2, 7, and Historic Gas Stations Study Areas at Fort Devens. The Study Area 43F site investigation consisted of collecting subsurface soil samples and soil gas samples for field analysis. Surficial geophysical surveys were not conducted at SA 43F because the historic gas station is located under the current Post Exchange building.

Nine TerraProbe points were advanced along the three accessible sides of the Post Exchange building to seek evidence of possible migration of residual contamination away from the site of the historic gas station (see Figure 2-2).

Seven soil samples were collected from 9 feet and three soil samples were collected from 15 feet. Only one sample was collected from 20 feet due to subsurface obstructions. All of the soil samples collected from SA 43F were analyzed in the field for benzene, toluene, ethylbenzene, and xylenes and total petroleum hydrocarbons. Because the water table was not reached in any of the soil sampling TerraProbe points, soil gas samples were collected from all nine locations and field-screened for benzene, toluene, ethylbenzene, and xylenes only. No soil borings or monitoring wells were completed at this site.

EXECUTIVE SUMMARY

On the basis of findings at Study Area 43F and the Preliminary Risk Evaluation, there is no evidence or reason to conclude that petroleum contamination due to the former underground storage tank has caused significant environmental contamination or poses a threat to human health. The decision has been made to remove Study Area 43F from further consideration in the Installation Restoration Program.

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1.0 INTRODUCTION

This decision document has been prepared to support a no further action decision at Study Area 43F - Historic Gas Station Site (SA 43F) 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. 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.

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SECTION 2

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3.0 RELATED INVESTIGATIONS

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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).

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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 43F consisted of collecting subsurface soil samples and soil gas samples for field analysis. Surficial geophysical surveys were not conducted at SA 43F because the historic gas station is located under the current PX building.

Nine TerraProbe points were advanced along the three accessible sides of the PX building to seek evidence of possible migration of residual contamination away from the site of the historic gas station (see Figure 2-2).

Seven soil samples were collected from 9 feet and three soil samples were collected from 15 feet. Only one sample was collected from 20 feet due to subsurface obstructions. All of the soil samples collected from SA 43F were analyzed in the field for benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbon compounds (TPHC). Because the water table was not reached in any of the soil sampling TerraProbe points, soil gas samples were collected from all nine locations and field-screened for BTEX only. No soil borings or monitoring wells were completed at this site.

4.0 CONTAMINATION ASSESSMENT

Subsurface soils and soil gas were sampled and analyzed on site during the SI field investigation. These results are summarized in the following paragraphs.

4.1 SOILS AND SOIL GAS

The objective of the TerraProbe subsurface soil sampling and field screening program was to determine if the historic gas station activities had adversely impacted the soil or groundwater quality in the area around SA 43F. Seven subsurface soil samples were collected from 9 feet to analyze the shallow soil for fuel-related contaminants. BTEX was not detected in any of the samples and TPHC was detected in TP-04 at 87 parts per million (ppm) (Figure 4-1). Three soil samples were collected from 15 feet and one soil sample was collected from 20 feet. BTEX was not detected in any of the samples and TPHC was detected at 250 ppm in the sample collected from 15 feet below ground surface at TP-05 (Figure 4-2).

Because the TerraProbe borings met refusal without encountering groundwater, the sampling logic established for SA 43 required that soil gas samples be collected. Nine soil gas samples were collected and field-screened for BTEX only. BTEX was not detected in any of the soil gas samples collected from SA 43F (Figure 4-3). The field screening results are presented in Table 4-1.

4.2 GROUNDWATER

Groundwater was not encountered at SA 43F.

5.0 PRELIMINARY HUMAN HEALTH RISK EVALUATION

The UST at SA 43F was removed around 1973. Field screening of 11 TerraProbe soil samples revealed no measurable concentrations of BTEX to a depth of 20 feet. No measurable concentrations of BTEX were detected in the nine TerraProbe soil gas sampling stations. TPHC was detected above the method detection limit in two of the 11 soil samples, at 87 ppm and 250 ppm. Comparing the measured TPHC results against the calculated risk-based commercial/industrial concentration value of 1,700 ppm for gasoline, and against the Massachusetts Contingency Plan's most conservative concentration of 500 ppm, there should be no significant risk to public health from soil contamination at SA 43F.

6.0 PRELIMINARY ECOLOGICAL RISK EVALUATION

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

7.0 CONCLUSIONS

The objective of the field investigation at SA 43F was to determine if the former historic gas station activities had adversely impacted the soil or groundwater quality in the area around SA 43F. Based on the results of the subsurface soil sampling program and the field analyses, it does not appear that the past activities at SA 43F have impacted soil quality in the vicinity of the former UST location. Therefore, no further action is recommended for this historic gas station.

8.0 DECISION

On the basis of findings at SA 43F, 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 43F from further consideration in the IRP process.

COMMANDER, FORT DEVENS

COLONEL EDWARD NUTTALL
U.S. Army
Installation Commander

Date

**U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION I, ME AND VT WASTE MANAGEMENT BRANCH**

☐ Concur

David M. Webster

Date

☐ Non-concur (Please provide reasons) _____

ABB Environmental Services, Inc.

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

AAFES	Army and Air Force Exchange Service
ABB-ES	ABB Environmental Services, Inc.
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
IRP	Installation Restoration Program
LUST	leaking underground storage tank
MEP	Master Environmental Plan
MSL	mean sea level
PA	Enhanced Preliminary Assessment
ppm	part per million
PX	Post Exchange
SA	Study Area
SI	site investigation
TPHC	total petroleum hydrocarbon compounds
USAEC	U.S. Army Environmental Center
UST	underground storage tank
VOC	volatile organic compound

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REFERENCES

- Army and Air Force Exchange Service (AAFES), 1993. "Community Center Main Store & Warehouse, Fort Devens, Mass., Demolition Plan (As-Built)"; Drawing No. 73-EN-C-03, Sheet C-3; November 11.
- 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.

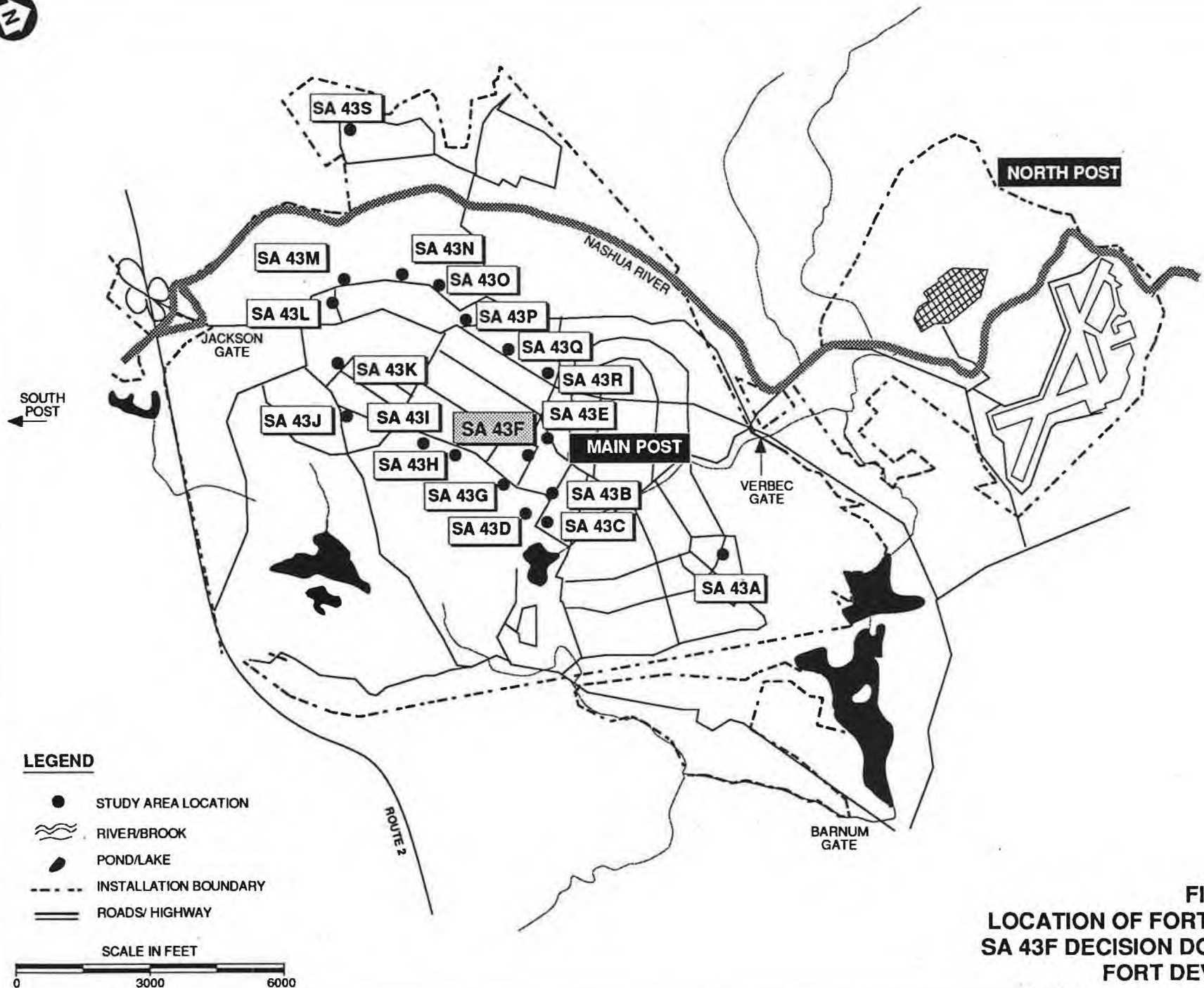
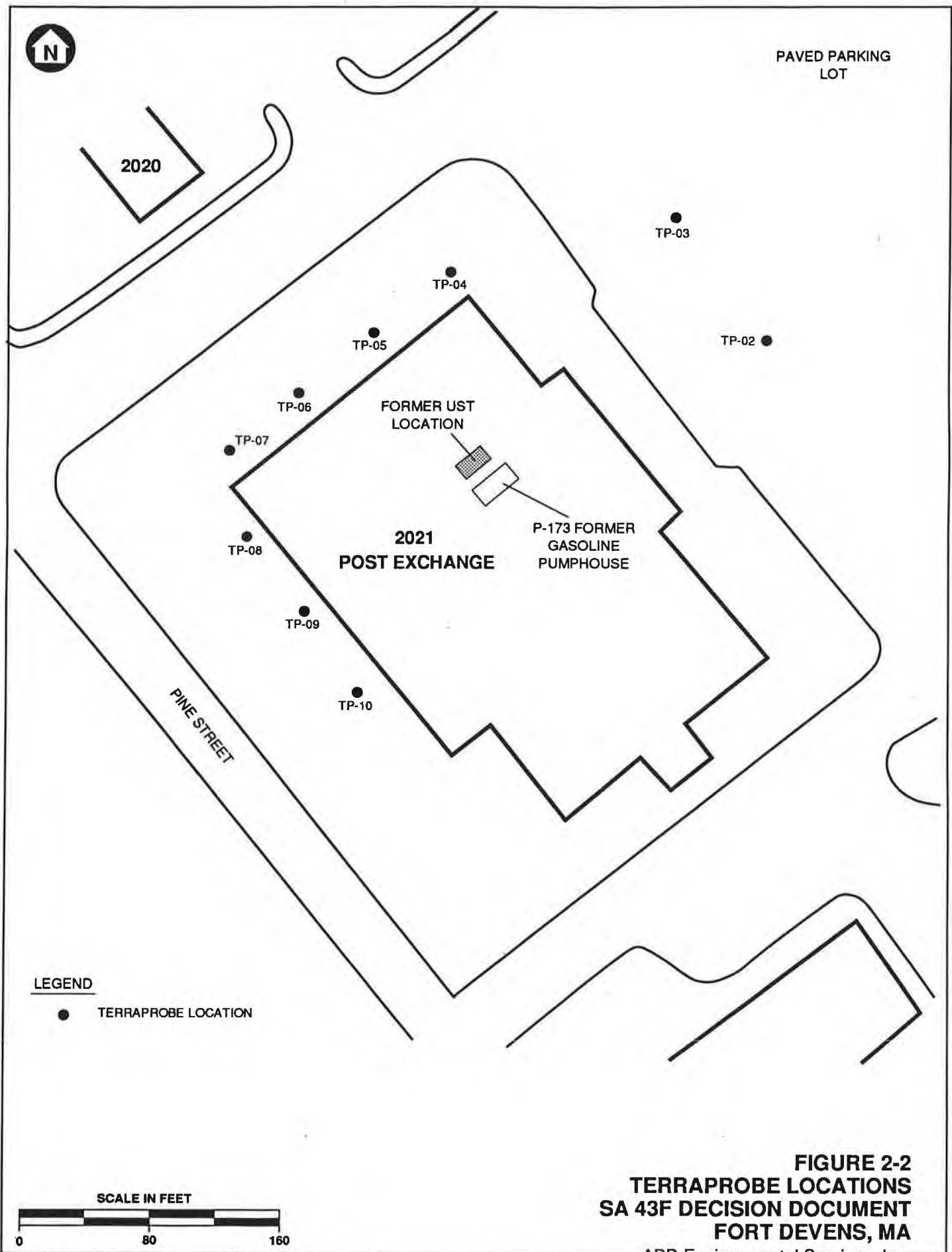


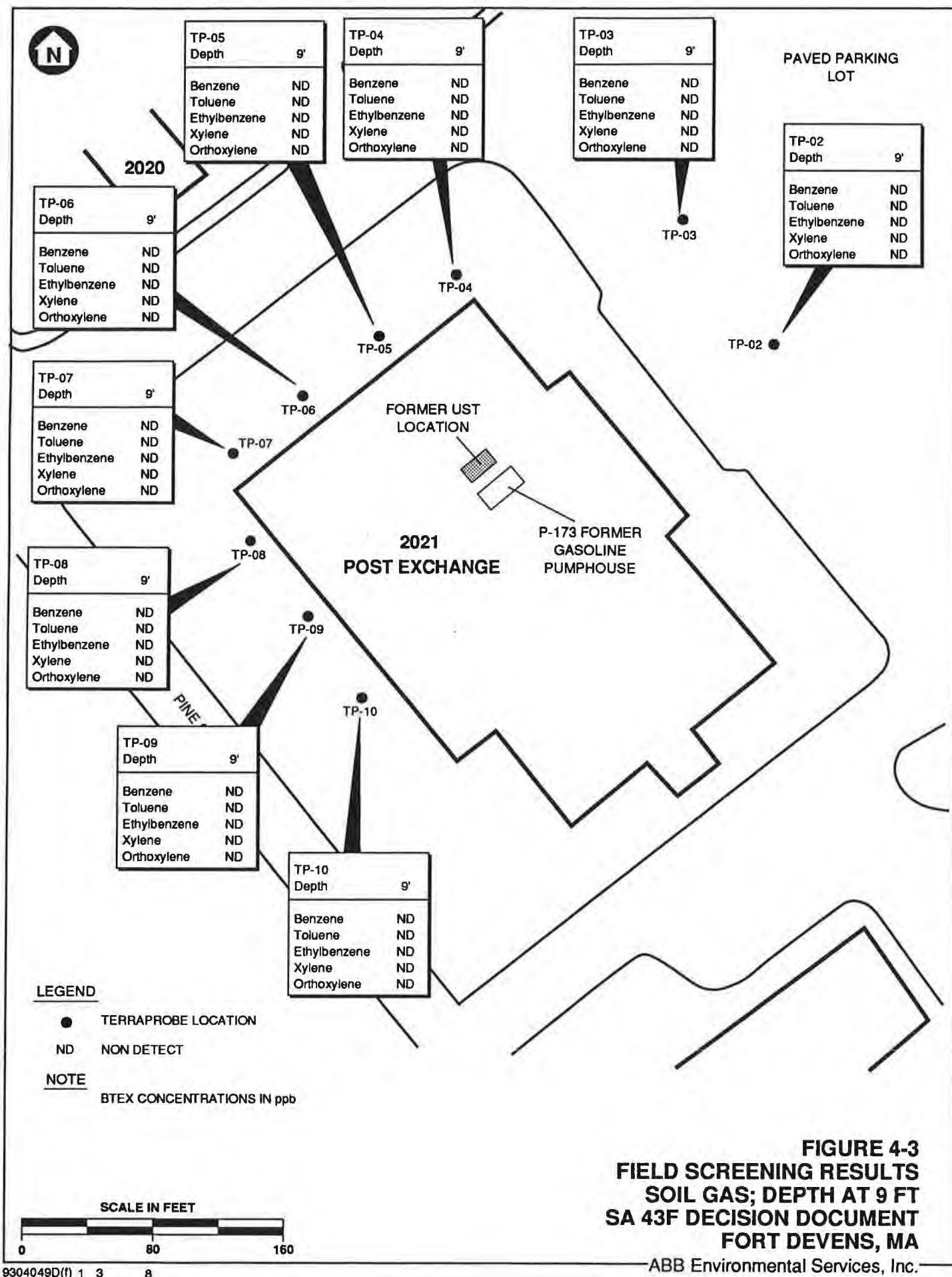
FIGURE 2-1
LOCATION OF FORT DEVENS
SA 43F DECISION DOCUMENT
FORT DEVENS, MA

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**FIGURE 2-2
TERRAPROBE LOCATIONS
SA 43F DECISION DOCUMENT
FORT DEVENS, MA**

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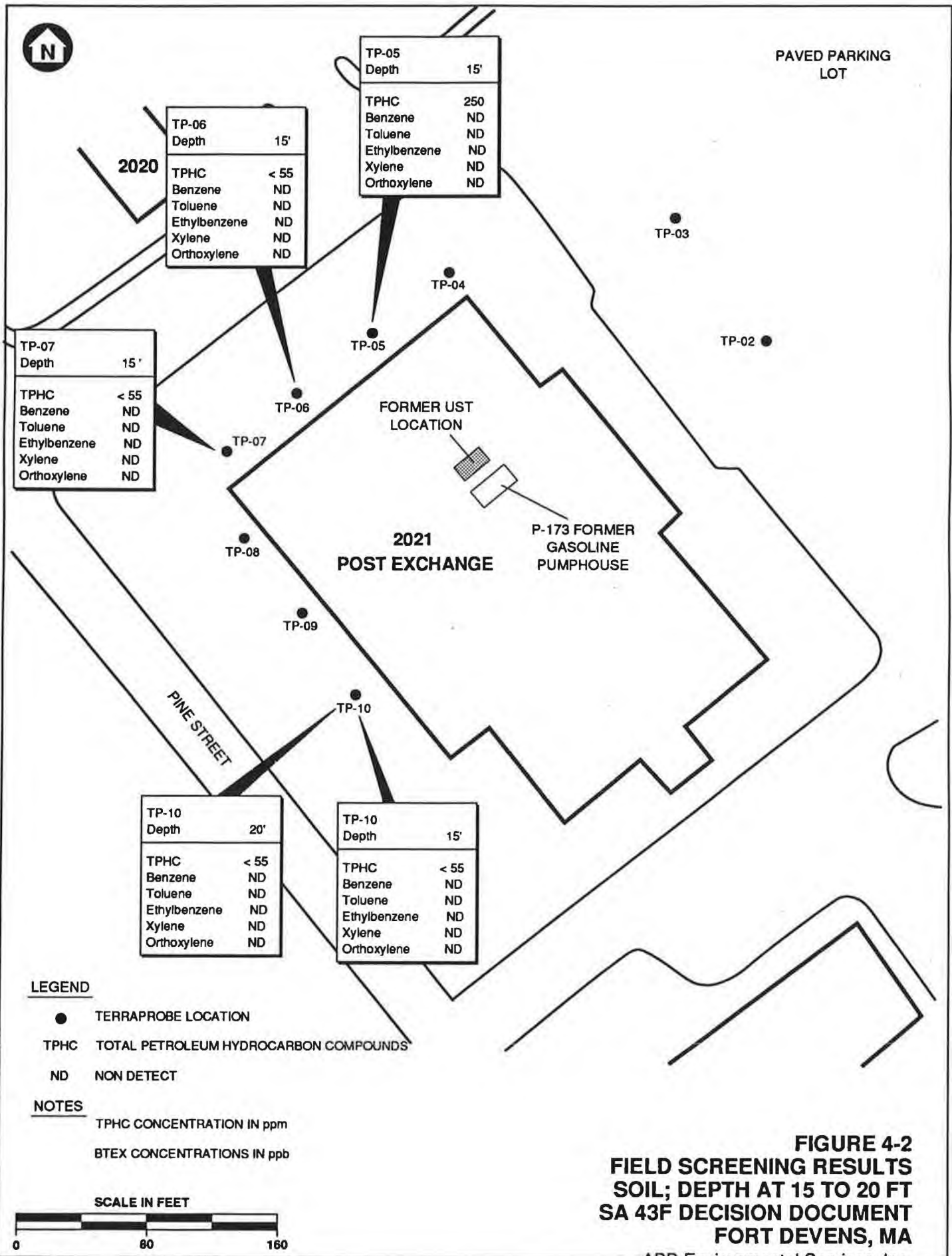


FIGURE 4-2
FIELD SCREENING RESULTS
SOIL; DEPTH AT 15 TO 20 FT
SA 43F DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

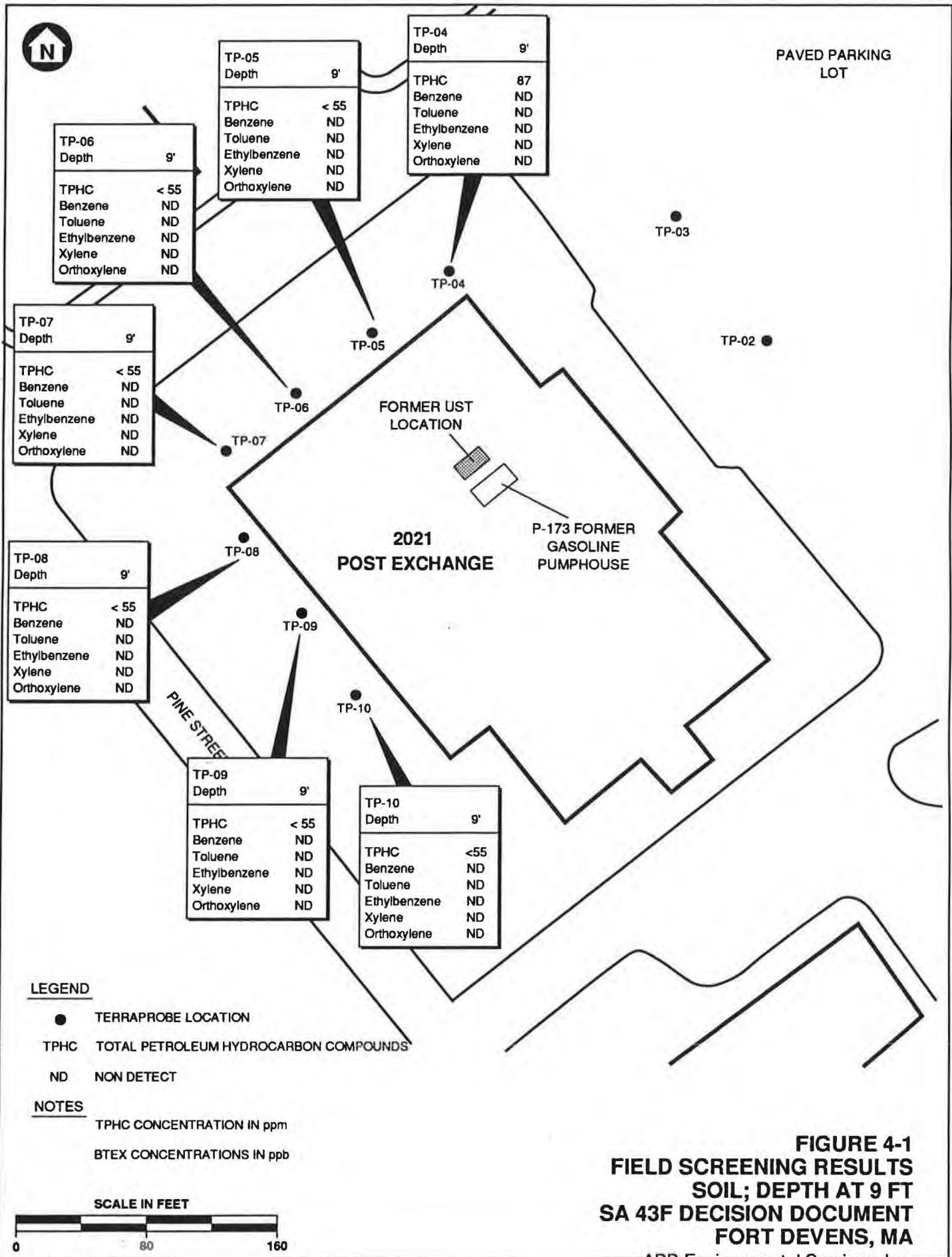


TABLE 4-1
FIELD SCREENING RESULTS
SA 43F – HISTORIC GAS STATIONS

DECISION DOCUMENT
FORT DEVENS

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
43TSF04XX901XF	43F	SOIL	TP-04	9	87	ND	ND	ND	ND	ND	ND	
43TSF05XX901XF	43F	SOIL	TP-05	9	< 55	ND	ND	ND	ND	ND	ND	
43TSF05X1501XF	43F	SOIL	TP-05	15	250	ND	ND	ND	ND	ND	ND	
43TSF06XX901XF	43F	SOIL	TP-06	9	< 55	ND	ND	ND	ND	ND	ND	
43TSF06XX901XF	43F	SOIL	TP-06	15	< 55	ND	ND	ND	ND	ND	ND	
43TSF07XX901XF	43F	SOIL	TP-07	9	< 55	ND	ND	ND	ND	ND	ND	
43TSF07X1501XF	43F	SOIL	TP-07	15	< 55	ND	ND	ND	ND	ND	ND	
43TSF08XX901XF	43F	SOIL	TP-08	9	< 55	ND	ND	ND	ND	ND	ND	
43TSF09XX901XF	43F	SOIL	TP-09	9	< 55	ND	ND	ND	ND	ND	ND	
43TSF10XX901XF	43F	SOIL	TP-10	9	< 55	ND	ND	ND	ND	ND	ND	
43TSF10X2001XF	43F	SOIL	TP-10	20	< 55	ND	ND	ND	ND	ND	ND	
43TGF02XX801XF	43F	SG	TP-02	9	NA	ND	ND	ND	ND	ND	ND	
43TGF03XX801XF	43F	SG	TP-03	9	NA	ND	ND	ND	ND	ND	ND	
43TGF04XX801XF	43F	SG	TP-04	9	NA	ND	ND	ND	ND	ND	ND	
43TGF05XX801XF	43F	SG	TP-05	9	NA	ND	ND	ND	ND	ND	ND	
43TGF06XX801XF	43F	SG	TP-06	9	NA	ND	ND	ND	ND	ND	ND	
43TGF07XX801XF	43F	SG	TP-07	9	NA	ND	ND	ND	ND	ND	ND	
43TGF08XX801XF	43F	SG	TP-08	9	NA	ND	ND	ND	ND	ND	ND	
43TGF09XX801XF	43F	SG	TP-09	9	NA	ND	ND	ND	ND	ND	ND	
43TGF10XX801XF	43F	SG	TP-10	9	NA	ND	ND	ND	ND	ND	ND	

NOTES:

* = ND denotes a non detect or concentrations below 5 ppb.

** = ND denotes a non detect or concentrations below 10 ppb

= Study area

SG = Soil gas

NA = Not applicable

PPM = Part Per Million

PPB = Part Per Billion

TP = TerraProbe

TPHC = Total Petroleum Hydrocarbon Compounds

BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes

BEN = Benzene

TOL = Toluene

E-BEN = Ethylbenzene

M/P XYL = M/P Xylenes

O - XYL = O - Xylenes

**NO FURTHER ACTION DECISION UNDER CERCLA
STUDY AREA 43K
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 1994

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DECISION DOCUMENT
STUDY AREA 43K
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

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

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

REFERENCES

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

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EXECUTIVE SUMMARY

Investigations of Study Area 43K (Historic Gas Station 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 43K 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 Study Area 43K.

Field investigation of Study Area 43K was initiated in 1992 in conjunction with the other 12 Groups 2, 7, and Historic Gas Stations Study Areas at Fort Devens. The Study Area 43K site investigation consisted of a surficial geophysical survey, subsurface soil sampling using ABB Environmental Services, Inc.'s TerraProbe unit, field analysis of the subsurface soil samples, and one soil boring to collect samples for laboratory analysis.

The geophysical survey indicated that one abandoned underground storage tank was present at the site. This tank was removed by ATEC Environmental Consultants on September 3, 1992. ATEC performed field screening for volatile organic compounds and total petroleum hydrocarbons on eight soil samples collected from the walls of the excavation. Volatile organic compound concentrations ranged from 0.5 to 190 parts per million, and total petroleum hydrocarbon concentrations ranged from 22 to 89 parts per million. Based on these results, ATEC removed more soil from the excavation and collected four additional soil samples. Volatile organic compounds ranged from 1 to 4 parts per million in the soil headspace and total petroleum hydrocarbon concentrations (measured in the laboratory) ranged from 15 to 58 parts per million. The 58 parts per million of total petroleum hydrocarbons was found in the southeast corner of the excavation. No volatile organic compounds were detected in the one soil sample analyzed in the laboratory for volatile organic compounds. One groundwater sample was collected from the excavation and analyzed in the laboratory for total petroleum

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EXECUTIVE SUMMARY

hydrocarbons only. A concentration of 22 milligrams per liter of total petroleum hydrocarbons was detected in this sample. Due to these results, ATEC lined the southeast corner of the excavation with polyethylene sheeting and backfilled the entire excavation with clean fill. Based on the results of the ATEC field screening, this underground storage tank removal was classified as a successful removal and no further soil removal or remediation was conducted.

To determine whether contamination had migrated laterally along the water table, 11 soil samples were collected at ten TerraProbe points around the excavation at SA 43K. The results of the field analyses indicated that no benzene, toluene, ethylbenzene, and xylene compounds or total petroleum hydrocarbons were present in the subsurface soil samples around the excavation.

One soil boring (43K-92-01X) was drilled to the water table to confirm the field screening results. No volatile organic compounds or total petroleum hydrocarbons were detected in the soil sample collected from the water table, and lead was present below established Fort Devens background concentrations.

On the basis of findings at Study Area 43K and the Preliminary Risk Evaluation, there is no evidence or reason to conclude that petroleum contamination due to the former underground storage tank has caused significant environmental contamination or poses a threat to human health. The decision has been made to remove Study Area 43K from further consideration in the Installation Restoration Program.

1.0 INTRODUCTION

This decision document has been prepared to support a no further action decision at Study Area 43K - Historic Gas Station Site (SA 43K) 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. 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 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 43K 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, 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 this function 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, for the Army Readiness Region, for Reserve Components, and for 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 (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 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 43K, are located on the Main Post.

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 dissected by numerous brooks that are associated with attendant wetlands. There are also several kettle ponds and one kettle lake located within the installation.

2.4 STUDY AREA DESCRIPTION AND HISTORY

SA 43K, 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 43K consisted of a pump island and a small gasoline pumphouse. This gas station was a Type A station which had one 5,000 gallon underground storage tank (UST) located between the gasoline pumphouse and 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. SA 43K is located on an access road off Patton Road. The area around SA 43K is currently a recreational vehicle storage yard and maintenance facility for Fort Devens Directorate of Logistics. The pumphouse associated with the historic gas station (Building T-2514) appears to still be present at the site. The yard and maintenance facility is paved and surrounded by a chain-link fence with a locked gate located on the northeast side of the yard (Figure 2-2).

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). The MEP reports that a 1,000-gallon waste oil UST was removed from SA 43K in February 1989. The tank and associated piping had no visible leaks or damage. The tank contained 300 gallons of waste oil and 28 gallons of sediment. Approximately 10 cubic yards of contaminated soil was removed, screened for volatile organic compounds (VOCs) and was disposed of at an off-site facility. VOCs were detected at 1.4 to 9.0 parts per million (ppm). A composite soil sample was collected from the bottom of the excavation was analyzed for total petroleum hydrocarbon compounds (TPHC). A confirmation sample was also collected. The composite soil sample contained 3,539 ppm TPHC and the confirmation sample contained 663 ppm TPHC. Groundwater, which was encountered at 3.5 feet and pumped during the removal, was sampled and contained 4.8 ppm TPHC. Two soil borings were drilled near the excavation in May 1989. Soil samples were collected at depths of zero to 2 feet, 5 to 7 feet, and 10 to 12 feet and analyzed for VOCs and TPHC. Samples contained TPHC at 663 ppm and VOCs at 0.6 ppm. There is no information to indicate that further soil sampling was done in this area (Biang, et al., 1992). This UST removal (No. 2517-U-1) was further investigated under the AREE 62 AX program. The results of this investigation can be found in the Draft Underground Storage Tank, "AREE 62 Memorandum Work Plan, BRAC Fort Devens, October 8, 1993."

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 43K were provided in the PA.

SECTION 3

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

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.

A field investigation was conducted at SA 43K to determine if any abandoned USTs were present at the site, and if any residual contamination was present in the subsurface soil. The program consisted of a surficial geophysical survey, subsurface soil sampling using ABB-ES' TerraProbe unit, field analysis of the subsurface soil samples, and one soil boring to collect subsurface soil samples for laboratory analysis.

The geophysical survey at SA 43K consisted of a metal detector and ground penetrating radar survey. The results of the geophysical survey at SA 43K indicated that one abandoned UST was present at the site (Figure 3-1). The results of the geophysical surveys are presented in Appendix L of the SI Report (ABB-ES, 1993).

Ten TerraProbe points were advanced to the water table and a single subsurface soil sample was collected from each point (see Figure 3-1). All of the subsurface soil

samples collected with the TerraProbe unit were analyzed in the field for benzene, toluene, ethylbenzene, and xylenes (BTEX) and TPHC.

One soil boring (43K-92-01X) was drilled to the water table and a single soil sample was collected to confirm the field screening results. This soil sample was collected from the water table (5 feet) and was analyzed in the laboratory for VOCs, TPHC, and lead. Bedrock was not encountered in the soil boring drilled at the site.

4.0 CONTAMINATION ASSESSMENT

The abandoned UST detected at SA 43K was added to the installation's UST removal program and on September 3, 1992 ATEC Environmental Consultants (ATEC) removed a 5,000-gallon UST from SA 43K. The tank was observed to be in good condition with no holes, perforations, or corrosion. Associated piping was intact and in good condition (ATEC, 1992). The scrap tank was disposed of at John C. Tombarello & Sons. At the time of the removal, the tank was full of gasoline and water which was removed by Cyn Oil Corporation (ATEC, 1992). The UST was half submerged in the groundwater, which was observed at approximately 7.5 feet in the excavation (ATEC, 1992). Visually contaminated soil and groundwater were observed at and above the water in the excavation.

4.1 SOILS

Subsurface soils were sampled and analyzed both on site and at an off-site laboratory during the tank removal program at SA 43K. These results are summarized in the following paragraphs.

ATEC performed field screening on eight soil samples (SS-1 through SS-8) collected from the excavation at 5 to 6 feet below ground surface (bgs) (Figure 4-1). VOC concentrations (measured by photoionization detector in soil headspace) ranged from 0.5 to 190 parts per million (ppm), and TPHC levels, measured on a Non-Dispersive Infrared (NDIR) Analyzer, were from 22.1 to 88.7 ppm (ATEC, 1992) (Table 4-1). Based on these results, ATEC removed approximately 140 tons of soil from the excavation and collected four additional soil samples (LRS-1 through LRS-4) (see Figure 4-1). VOCs ranged from 1 to 4 ppm in the soil headspace and TPHC concentrations (measured in the laboratory) ranged from 15 to 58 ppm (see Table 4-1). The 58 ppm of TPHC was found in the southeast corner of the excavation. No VOCs were detected in the one soil sample (LRS-3) analyzed in the laboratory for VOCs. Due to these results, ATEC lined the southeast corner of the excavation with polyethylene sheeting and backfilled the entire excavation with approximately 600 tons of clean fill. Based on the results of the ATEC field screening, this UST removal was classified as a successful UST removal and no further soil removal or remediation was conducted.

SECTION 4

To determine whether contamination had migrated laterally along the water table, 11 soil samples were collected at ten TerraProbe points around the excavation at SA 43K (see Figure 3-1). The results of the field analyses indicated that no BTEX or TPHC was present in the subsurface soil samples around the excavation (Table 4-2; Figure 4-2).

One soil boring (43K-92-01X) was drilled to the water table to confirm the field screening results. No VOCs or TPHC were detected in the soil sample collected from the water table, and lead was present below established Fort Devens background concentrations (Table 4-3; Figure 4-3).

4.2 GROUNDWATER

One groundwater sample (LWS-1) was collected from the excavation and analyzed in the laboratory for TPHC only (see Figure 4-1). A concentration of 22 milligrams per liter of TPHC was detected in LWS-1 (Table 4-1).

5.0 PRELIMINARY HUMAN HEALTH RISK EVALUATION

A 5,000-gallon UST was discovered by ABB-ES and removed by ATEC during the SI field program. Groundwater was encountered at 7.5 feet bgs (ATEC, 1992). Prior to backfilling, ATEC collected eight soil samples from the excavation walls which were screened for TPHC by the NDIR method. TPHC levels ranged from 22 ppm to a maximum value of 89 ppm in the tank wall samples. Laboratory results of confirmatory soil samples showed concentrations of TPHC ranging from 15 to 58 ppm. The excavation was backfilled by ATEC and ABB-ES conducted follow-up SI activity.

Field analysis of 11 TerraProbe soil samples immediately below the water table revealed no measurable concentrations of BTEX to a depth of 9 feet. TPHC was not detected above the method detection limit in any of 8 samples analyzed. A soil sample from a confirmatory boring 43K-92-01X showed no evidence of residual TPHC contamination at 5 feet bgs.

These results indicate that little residual contamination exists at SA 43K in the saturated zone from petroleum products. Comparing the measured TPHC results against the calculated risk-based commercial/industrial concentration value of 1,700 ppm for gasoline, and against the Massachusetts Contingency Plan's most conservative concentration of 500 ppm, there should be no significant risk to public health from soil contamination at SA 43K.

6.0 PRELIMINARY ECOLOGICAL RISK EVALUATION

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

7.0 CONCLUSIONS

The objective of the field investigation at SA 43K was to determine if the former historic gas station activities had adversely impacted the soil or groundwater quality in the area around SA 43K. Based on the results of the field and laboratory analysis conducted by ATEC and ABB-ES, it appears that the contamination detected during the UST removal at SA 43K was removed by ATEC during the remediation phase of the UST removal. No further action is recommended for this historic gas station.

8.0 DECISION

On the basis of findings at SA 43K, 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 43K from further consideration in the IRP process.

COMMANDER, FORT DEVENS

COLONEL EDWARD NUTTALL
U.S. Army
Installation Commander

Date

**U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION I, ME AND VT WASTE MANAGEMENT BRANCH**

☐ Concur

David M. Webster, Chief

Date

☐ Non-concur (Please provide reasons)

ABB Environmental Services, Inc.

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ABB-ES	ABB Environmental Services, Inc.
ATEC	ATEC Environmental Consultants
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
IRP	Installation Restoration Program
LUST	leaking underground storage tank
MEP	Master Environmental Plan
MSL	mean sea level
NDIR	Non-Dispersive Infrared
PA	Enhanced Preliminary Assessment
ppm	part per million
SA	Study Area
SI	site investigation
TPHC	total petroleum hydrocarbons
USAEC	U.S. Army Environmental Center
UST	underground storage tank
VOC	volatile organic compound

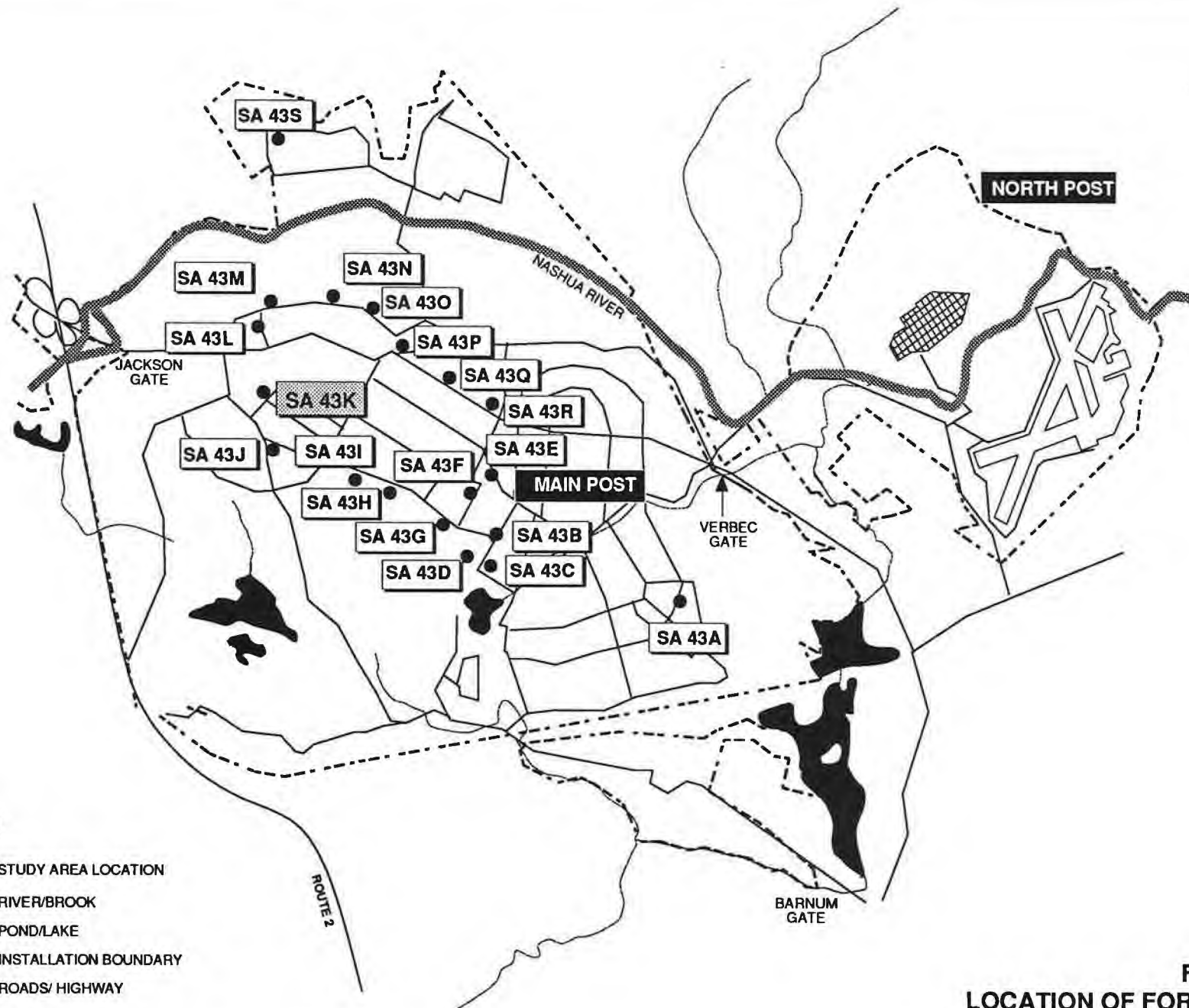
ABB Environmental Services, Inc.

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.
- ATEC Environmental Consultants, Inc. (ATEC), 1992. "Post-Removal Report, Underground Storage Tank Closure, 5,000 Gallon Gasoline, UST No. 0113, Building 2514, Fort Devens, Massachusetts"; ATEC File No. 37.07.91.07451; Norwell, MA; prepared for U.S. Army Directorate of Contracting; Fort Devens, MA; October 8.
- 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.



SOUTH
POST



LEGEND

- STUDY AREA LOCATION
- ~ RIVER/BROOK
- POND/LAKE
- - - INSTALLATION BOUNDARY
- == ROADS/ HIGHWAY

SCALE IN FEET

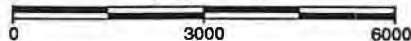
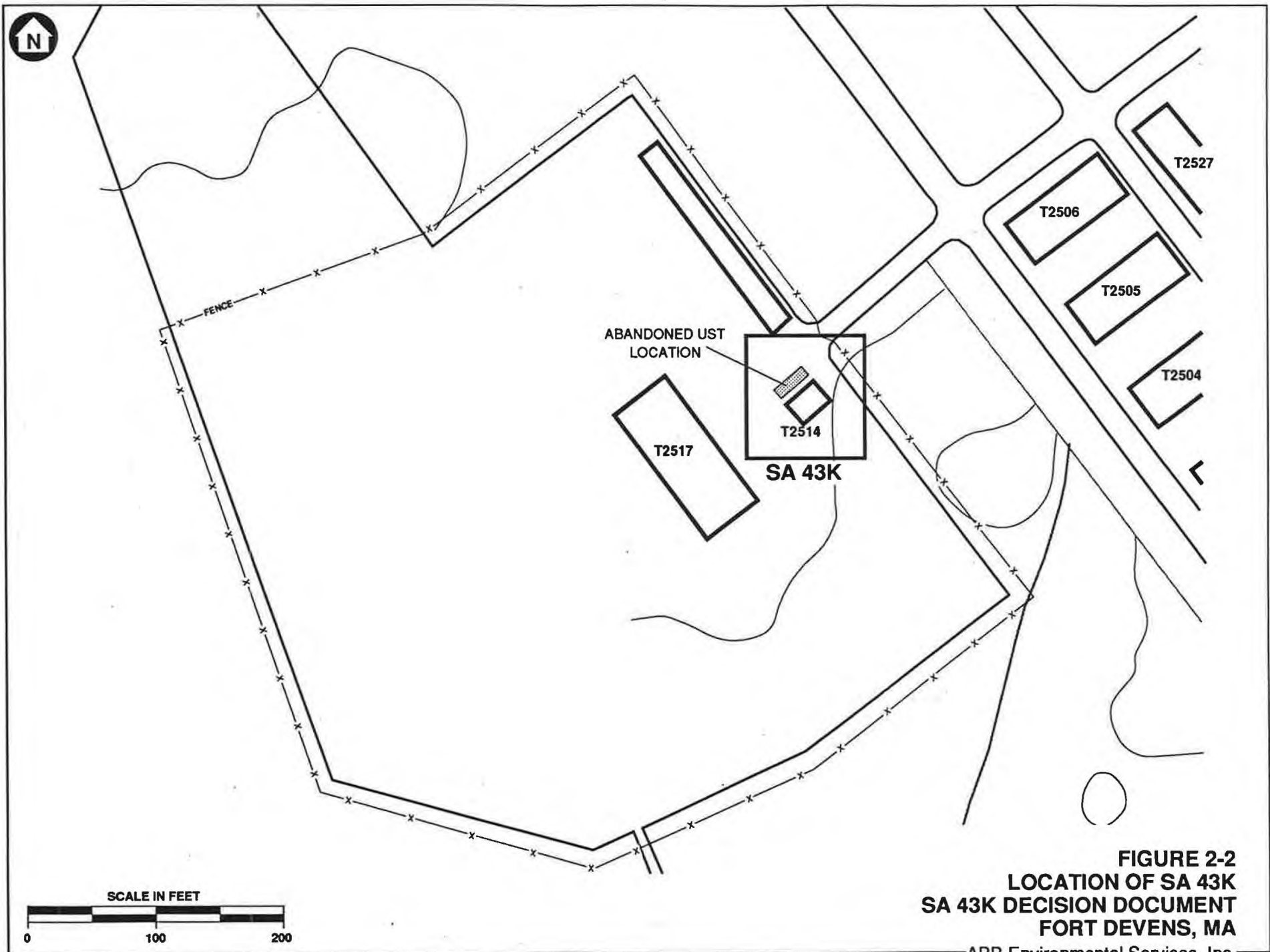


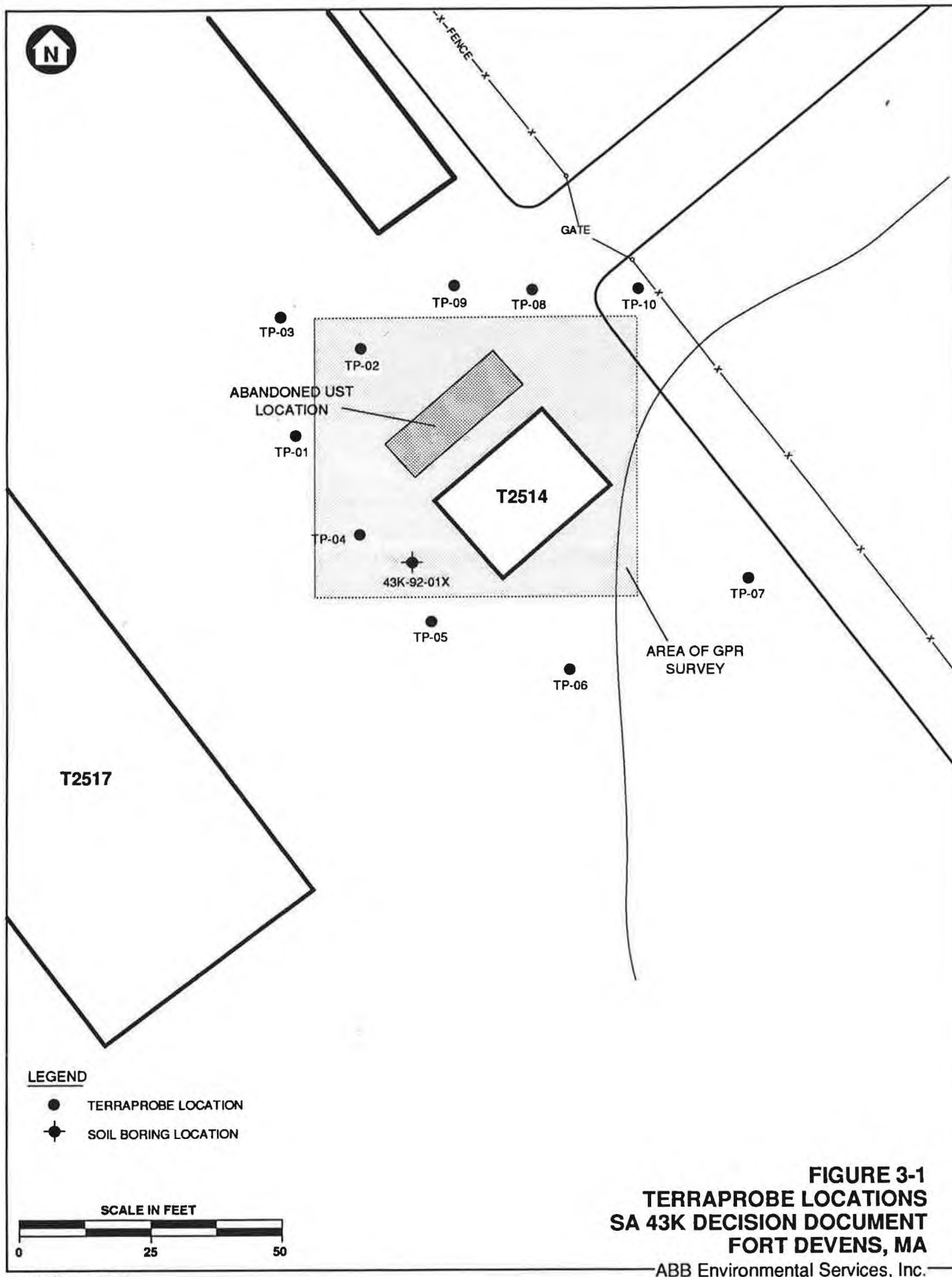
FIGURE 2-1
LOCATION OF FORT DEVENS
SA 43K DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.



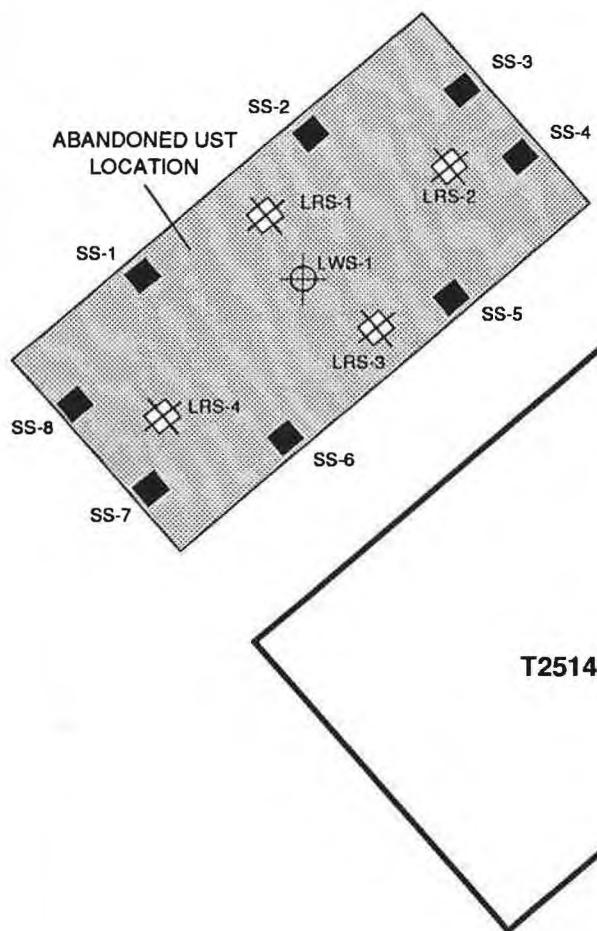
**FIGURE 2-2
LOCATION OF SA 43K
SA 43K DECISION DOCUMENT
FORT DEVENS, MA**

ABB Environmental Services, Inc.






**FIGURE 3-1
TERRAPROBE LOCATIONS
SA 43K DECISION DOCUMENT
FORT DEVENS, MA**

ABB Environmental Services, Inc.



LEGEND

-  ATEC FIELD SCREENING LOCATIONS
-  ATEC LABORATORY SOIL SAMPLE LOCATION
-  ATEC LABORATORY WATER SAMPLE LOCATION

SCALE IN FEET



FIGURE 4-1
ATEC FIELD SCREENING LOCATIONS
SA 43K DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

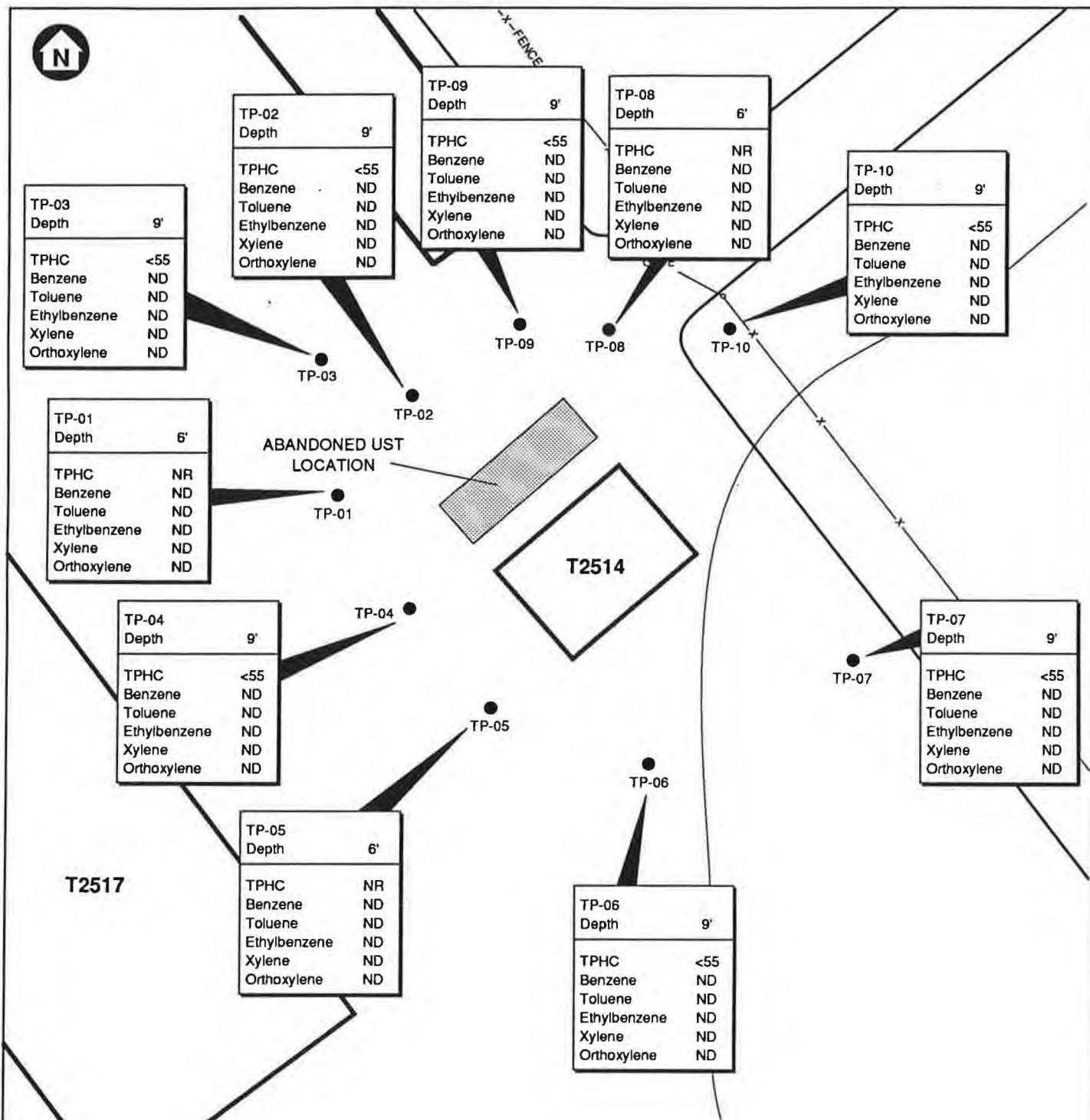


FIGURE 4-2
FIELD SCREENING RESULTS
DEPTH AT 6 TO 9 FT
SA 43K DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

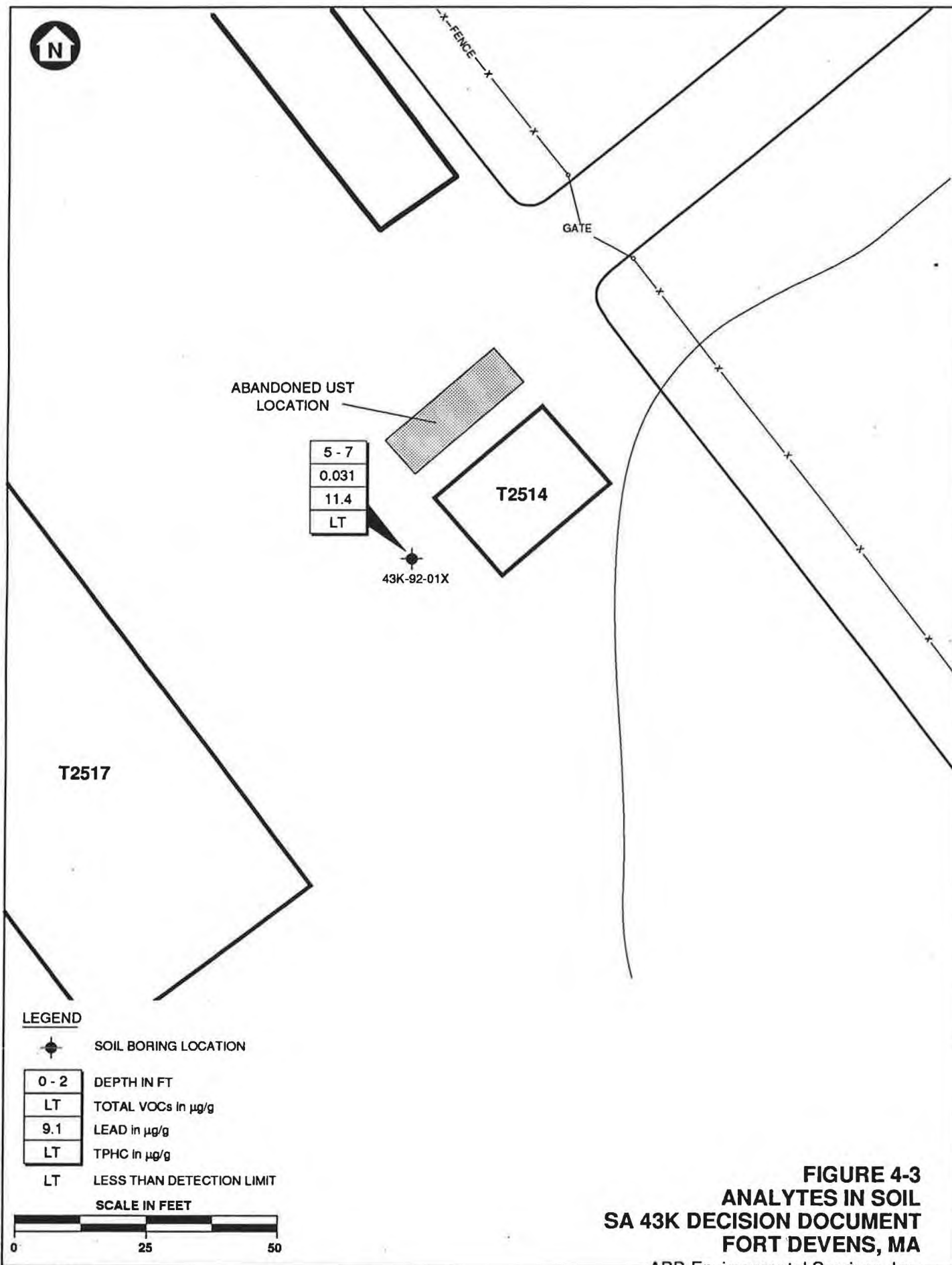


FIGURE 4-3
ANALYTES IN SOIL
SA 43K DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

TABLE 4-1
ATEC/ABB-ES FIELD SCREENING RESULTS
SA 43K - HISTORIC GAS STATIONS

DECISION DOCUMENT
FORT DEVENS

SAMPLE NO.	FIELD SCREENING		LABORATORY	
	PID (ppm)	NDIR (ppm)	VOC (ppm)	TPHC (ppm)
SS-1	5.0	88.7	N/A	N/A
SS-2	30.0	36.2	N/A	N/A
SS-3	0.5	44.7	N/A	N/A
SS-4	5.0	22.1	N/A	N/A
SS-5	50.0	26.9	N/A	N/A
SS-6	190.0	32.5	N/A	N/A
SS-7	60.0	43.4	N/A	N/A
SS-8	50.0	22.2	N/A	N/A
LRS-1	1.0	N/A	N/A	ND
LRS-2	1.3	N/A	N/A	58
LRS-3	4.0	N/A	ND	15
LRS-4	1.1	N/A	N/A	18
LWS-1	N/A	N/A	N/A	22

NOTES:

SS = ATEC FIELD SCREENING SOIL SAMPLE

LRS = POST-REMEDIATION LABORATORY SOIL SAMPLE

LWS = ATEC LABORATORY WATER SAMPLE (FROM THE EXCAVATION)

ppm = PARTS PER MILLION

ND = NON-DETECT

N/A = NOT APPLICABLE

PID = PHOTOIONIZATION DETECTOR

NDIR = NON-DISPERSIVE INFRARED

TPHC = TOTAL PETROLEUM HYDROCARBON COMPOUNDS

VOC = VOLATILE ORGANIC COMPOUND

TABLE 4-2
FIELD SCREENING RESULTS
SA 43K – HISTORIC GAS STATIONS

DECISION DOCUMENT
FORT DEVENS

SAMPLE ID	SA#	MEDIUM	SITE ID	DEPTH (feet)	TPHC ppm	TOTAL BTEX ppb	BEN*	TOL*	E-BEN*	M/P XYL**	O-XYL*	COMMENTS
43TSK01XX601XF	43K	SOIL	TP-01	6	NR	0	ND	ND	ND	ND	ND	
43TSK02XX901XF	43K	SOIL	TP-02	9	< 55	0	ND	ND	ND	ND	ND	
43TSK03XX901XF	43K	SOIL	TP-03	9	< 55	0	ND	ND	ND	ND	ND	
43TSK04XX901XF	43K	SOIL	TP-04	9	< 55	0	ND	ND	ND	ND	ND	
43TSK05XX601XF	43K	SOIL	TP-05	6	NR	0	ND	ND	ND	ND	ND	
43TSK06XX901XF	43K	SOIL	TP-06	9	< 55	0	ND	ND	ND	ND	ND	
43TSK07XX901XF	43K	SOIL	TP-07	9	< 55	0	ND	ND	ND	ND	ND	
43TSK08XX601XF	43K	SOIL	TP-08	6	NR	0	ND	ND	ND	ND	ND	
43TSK08XX901XF	43K	SOIL	TP-08	9	< 55	0	ND	ND	ND	ND	ND	
43TSK09XX901XF	43K	SOIL	TP-09	9	< 55	0	ND	ND	ND	ND	ND	*** PHCs Detected
43TSK10XX901XF	43K	SOIL	TP-10	9	< 55	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

NR = Not requested

TPHC = total petroleum hydrocarbon compounds

BEN = benzene

TOL = toluene

PHCs = petroleum hydrocarbons

TP = TerraProbe

ND = Not Detected

E-BEN = ethylbenzene

M/P XYL = m- and p-xylene isomers

O XYL = o-xylene isomer

TABLE 4-3
INORGANIC AND ORGANIC COMPOUNDS IN SOIL
SA 43K - HISTORIC GAS STATIONS

DECISION DOCUMENT
FORT DEVENS

ANALYTE	BACK – GROUND	BORING	43K–92–01X
		DEPTH	5
ORGANICS (ug/g)			
ACETONE			0.031
INORGANICS (ug/g)			
LEAD		48.4	11.4
OTHER (ug/g)			
TOTAL ORGANIC CARBON			NA
TOTAL PETROLEUM HYDROCARBONS			< 27.9

NOTES:

TABLE LISTS DETECTED ANALYTES ONLY -
SEE PROJECT ANALYTE LIST FOR SUMMARY
< = LESS THAN DETECTION LIMIT SHOWN
NA = NOT ANALYZED

**NO FURTHER ACTION DECISION UNDER CERCLA
STUDY AREA 43L
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 1994

**DRAFT
DECISION DOCUMENT
STUDY AREA 43L
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

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ABB Environmental Services, Inc.

**DRAFT
DECISION DOCUMENT
STUDY AREA 43L
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

REFERENCES

ABB Environmental Services, Inc.

**DRAFT
DECISION DOCUMENT
STUDY AREA 43L
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

LIST OF FIGURES

Figure	Title
2-1	Location of Fort Devens
2-2	Location of SA 43L

EXECUTIVE SUMMARY

Investigations of Study Area 43L (Historic Gas Station 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 43L 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 an underground storage tank removal program, have been conducted which address Study Area 43L.

An investigation of subsurface soil at Study Area 43L was conducted by Kurz Associates in 1989 as part of an underground storage tank removal program at Fort Devens. The three underground storage tanks were removed, and were observed to be in good condition. The headspace of nine soil samples from each excavation were screened for total volatile organic compounds with a photoionization detector. Concentrations ranged from 0.4 to 6.8 parts per million. Four composite soil samples were collected from the excavations for total petroleum hydrocarbon analysis. The concentrations ranged from 57 to 108 parts per million.

After assessing the distribution and migration potential of the contaminants at the station, it was concluded by Fort Devens personnel that groundwater was not being impacted and that current site conditions, at the time, posed no significant risk to potential receptors. Based on this assessment, the excavations were backfilled, and no additional investigation was conducted.

Based on the recommendations in the Kurz report, ABB Environmental Services, Inc. did not conduct a site investigation at SA 43L during the 1992 field program. Based on the results of the work by Kurz Associates, it does not appear that the past activities at SA 43L have impacted the soil quality in the vicinity of the former underground storage

EXECUTIVE SUMMARY

tank locations. The decision has been made to remove Study Area 43L from further consideration in the Installation Restoration Program.

1.0 INTRODUCTION

This decision document has been prepared to support a no further action decision at Study Area 43L - Historic Gas Station Site (SA 43L) 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. 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.

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.

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 this function 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, for the Army Readiness Region, for Reserve Components, and for 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 (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 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 43L, are located on the Main Post.

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 dissected by numerous brooks that are associated with attendant wetlands. There are also several kettle ponds and one kettle lake located within the installation.

2.4 STUDY AREA DESCRIPTION AND HISTORY

SA 43L, one of the 19 Historic Gas Station Sites, is located on the corner of Lake George Street and Hattonsville Road, adjacent to Building 2601, in the southwestern portion of the Main Post (Figure 2-2). The structures of the historic gas station at SA 43L consisted of a pump island and a small gasoline pumphouse. The station was a Type B station which had two 5,000-gallon underground storage tanks (USTs), located on each side of the pump island and oriented parallel to it, and one UST located about 30 feet south of Building T2601. 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; however, it did appear that the USTs were not removed at that time. The tanks were ultimately removed in 1989. The area around the reported location of SA 43L is currently used as storage yard for military vehicles and Building T 2601 appears to be a maintenance facility for the vehicles stored in the yard. The pumphouse associated with the historic gas station (Building P-179) is still present at the site. The yard and maintenance facility are paved and surrounded by chain-link fence with a locked gate located on the northern side of the yard (see Figure 2-2).

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).

The MEP reports that three 5,000-gallon USTs were removed from SA 43L by Franklin Environmental Services. Tanks #5 and #6 were removed on November 29 and 30, 1989. The tanks were observed to be in good condition. Both tanks contained about 100 gallons of fuel and water which was removed by Franklin Environmental Services (Kurz Associates, 1991). Approximately 150 cubic yards of contaminated soil was removed. Nine soil samples were collected from each tank excavation and screened for volatile organic compounds (VOCs) with a photoionization detector (PID). Two composite soil samples were collected from each excavation and analyzed for total petroleum hydrocarbon compounds (TPHC). VOCs were detected in the tank #5 samples at 0.4 to 3.4 parts per million (ppm). VOCs ranged from 0.8 to 6.8 ppm in tank #6 samples. The composite soil samples from the tank #5 excavation contained 57 and 95 ppm TPHC and the composite samples from tank #6 contained 98 and 108 ppm TPHC. Based on these results, the excavations were backfilled and closed (Biang, et al., 1992).

The third UST, tank #13, was removed on December 5, 1989. The tank was found to be in good condition. The tank contained about 48 inches of water and waste oil which was removed by Franklin Environmental Services (Kurz Associates, 1991). Approximately 3 cubic yards of soil was removed. Groundwater was not encountered during the removal. Nine soil samples were collected from each tank excavation and screened for VOCs with a PID. Two composite soil samples were collected from the excavation and analyzed for TPHC. VOC concentrations ranged from nondetect to 1.0 ppm. The composite soil samples from the tank #13 excavation contained 280 and 300 ppm TPHC. Based on these results, more soil was excavated on January 11, 1990. Two composite samples were collected from the excavation. TPHC was detected in one sample at a concentration of 80 ppm. The excavation was then backfilled and closed (Biang, et al., 1992). A copy of the Kurz Associates report is available from Fort Devens EMO.

SECTION 3

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 43L were provided in the PA.

3.3 SITE INVESTIGATION REPORT

The site investigation (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

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.

Based on the recommendations in the Kurz Associates report (Kurz Associates, 1991), ABB-ES did not conduct a field investigation at SA 43L during the 1992 field program (ABB-ES, 1993).

4.0 CONTAMINATION ASSESSMENT

An investigation of subsurface soil at Study Area 43L was conducted by Kurz Associates in 1989 as part of a UST removal program at Fort Devens. Soil samples were collected from each excavation. The results of the analyses are presented in the following paragraphs.

4.1 SOILS

The headspace of nine soil samples from each tank excavation were screened for total volatile organic compounds with a photoionization detector. Concentrations ranged from 0.4 to 6.8 ppm. Four composite soil samples were collected from the excavations for TPHC analysis. The concentrations ranged from 57 to 108 ppm.

After assessing the distribution and migration potential of the contaminants at the station, it was concluded by Fort Devens personnel that groundwater was not being impacted and that current site conditions, at the time, posed no significant risk to potential receptors. Based on this assessment, the excavations were backfilled, and no additional investigation was conducted.

4.2 GROUNDWATER

Groundwater data is not available for SA 43L, as groundwater was not encountered during the tank excavations performed.

5.0 PRELIMINARY HUMAN HEALTH RISK EVALUATION

After assessing the distribution and migration potential of the contaminants at the station, it was concluded by Fort Devens personnel that groundwater was not likely impacted by the petroleum concentrations detected in unsaturated soil at the site and that site conditions did not pose a significant risk to potential receptors. Based on this assessment, the excavations were backfilled, and no additional investigation was conducted. Prior to backfilling, Kurz Associates collected four composite soil samples from the excavation walls which were analyzed for TPHC. TPHC levels ranged from 57 to 108 ppm. Based on a comparison of these results against the calculated risk-based commercial/industrial concentration value of 1,700 ppm for gasoline, and against the Massachusetts Contingency Plan's most conservative concentration of 500 ppm, there should be no significant risk to public health from soil contamination at SA 43L.

6.0 PRELIMINARY ECOLOGICAL RISK EVALUATION

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

7.0 CONCLUSIONS

ABB-ES used the results of previous field investigations at SA 43L to determine if the historic gas station activities had adversely impacted the soil or groundwater quality in the area around SA 43L. Based on the results of the work by Kurz Associates, it does not appear that the past activities at SA 43L have impacted the soil and groundwater quality in the vicinity of the former UST locations. Therefore, no further action is recommended for this historic gas station.

8.0 DECISION

On the basis of findings at SA 43L, 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 43L from further consideration in the IRP process.

COMMANDER, FORT DEVENS

COLONEL EDWARD NUTTALL

U.S. Army

Installation Commander

Date

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION I, ME AND VT WASTE MANAGEMENT BRANCH

☐ Concur

David M. Webster, Chief

Date

☐ Non-concur (Please provide reasons)

ABB Environmental Services, Inc.

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ABB-ES	ABB Environmental Services, Inc.
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOD	U.S. Department of Defense
gpm	gallons per minute
IRP	Installation Restoration Program
LUST	leaking underground storage tank
MEP	Master Environmental Plan
MSL	mean sea level
PA	Enhanced Preliminary Assessment
PID	photoionization detector
ppm	part per million
SA	Study Area
SI	site investigation
TPHC	total petroleum hydrocarbon compounds
USAEC	U.S. Army Environmental Center
UST	underground storage tank
VOC	volatile organic compound

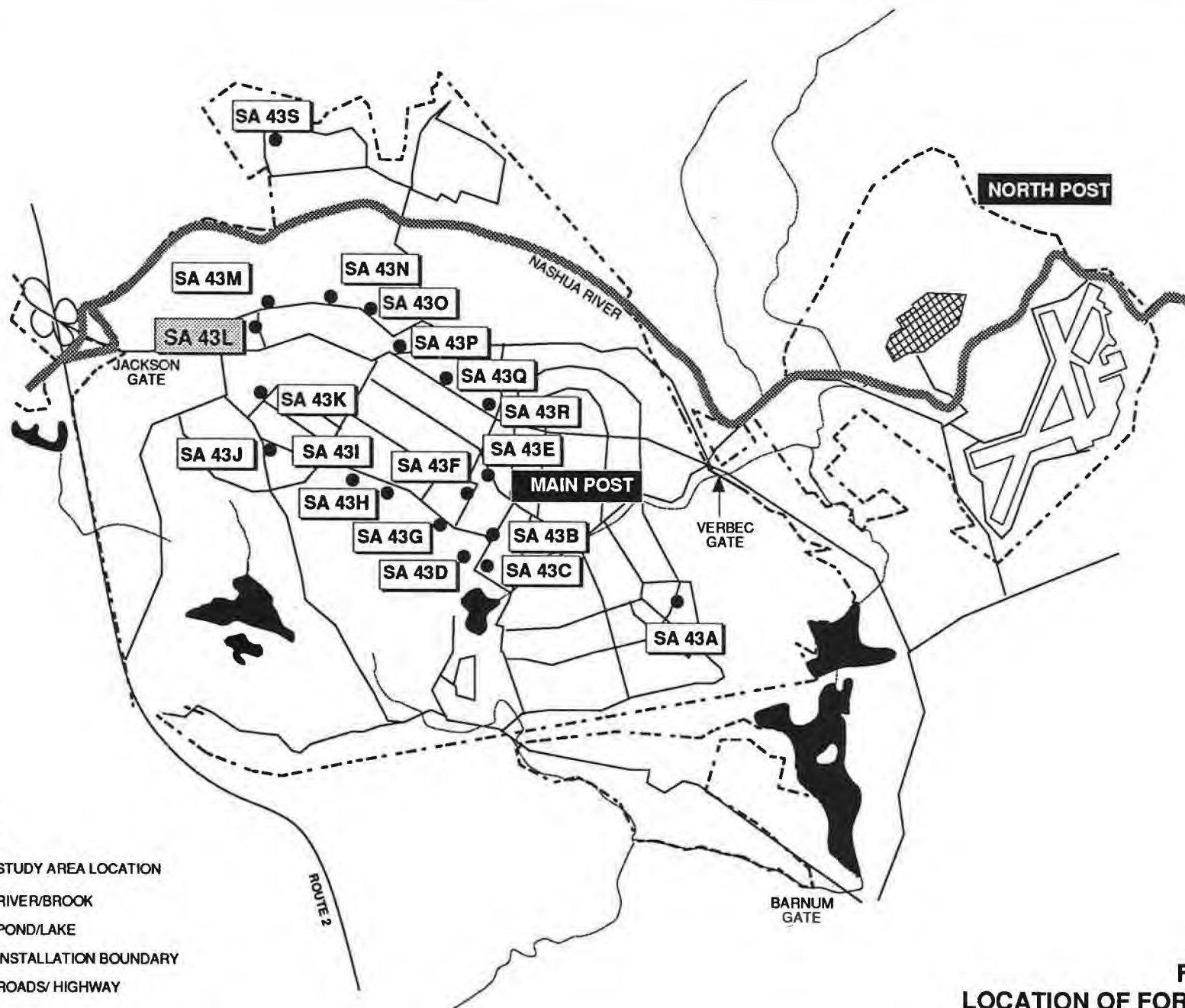
ABB Environmental Services, Inc.

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.
- Kurz Associates Inc., 1991. "Underground Storage Tank Removal and Related Environmental Investigations, Fort Devens Military Reservation, Harvard, Massachusetts"; prepared for Franklin Environmental Services, Inc., Wrentham, MA; Bridgewater, MA; January.



SOUTH
POST



LEGEND

- STUDY AREA LOCATION
- ~ RIVER/BROOK
- POND/LAKE
- - - INSTALLATION BOUNDARY
- == ROADS/ HIGHWAY

SCALE IN FEET

0 3000 6000

FIGURE 2-1
LOCATION OF FORT DEVENS
SA 43L DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

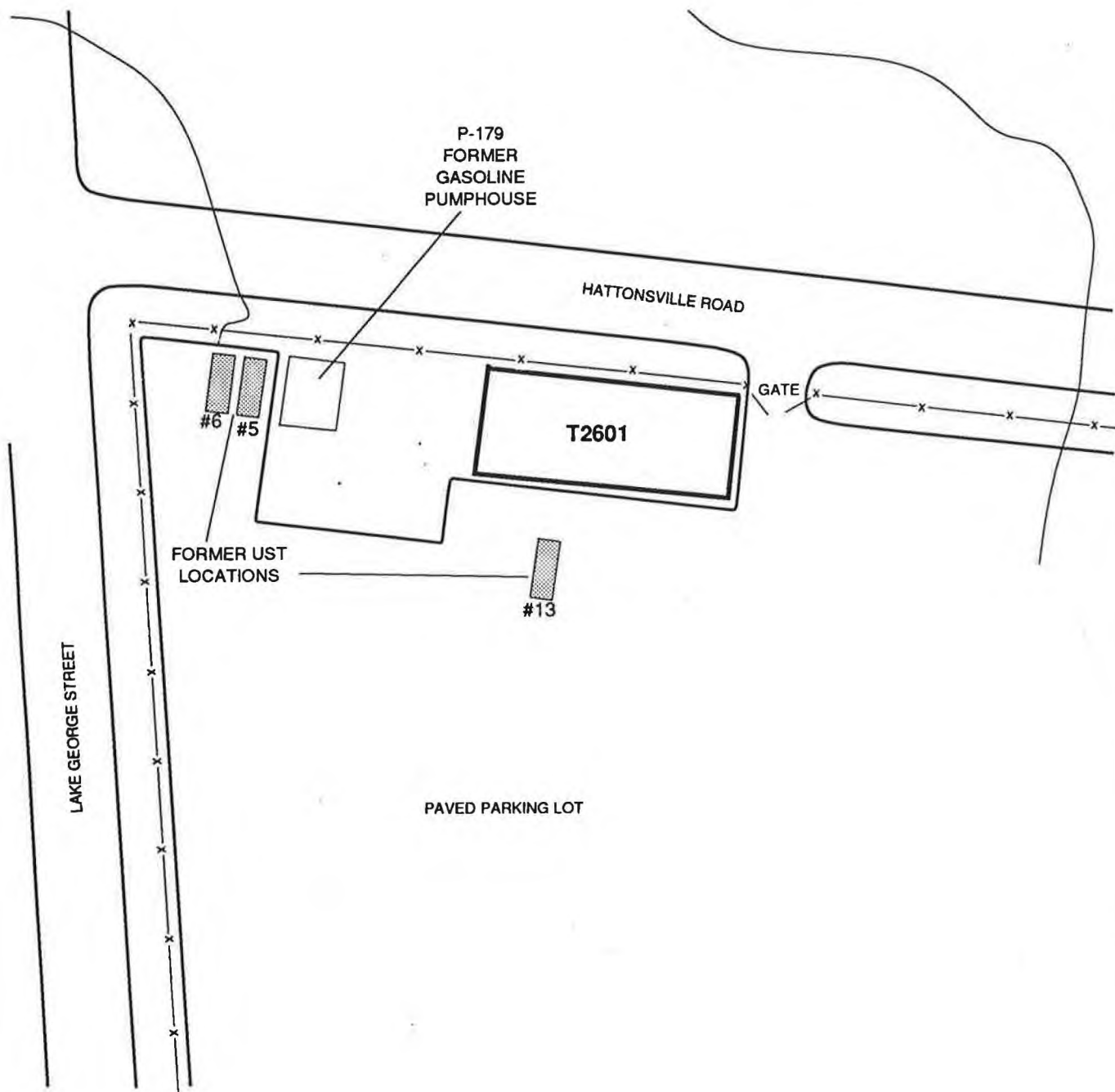


FIGURE 2-2
LOCATION OF SITE SA 43L
SA 43L DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

**NO FURTHER ACTION DECISION UNDER CERCLA
STUDY AREA 43M
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 1994

**DRAFT
DECISION DOCUMENT
STUDY AREA 43M
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

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ABB Environmental Services, Inc.

**DRAFT
DECISION DOCUMENT
STUDY AREA 43M
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

REFERENCES

ABB Environmental Services, Inc.

**DRAFT
DECISION DOCUMENT
STUDY AREA 43M
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

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ABB Environmental Services, Inc.

EXECUTIVE SUMMARY

Investigations of Study Area 43M (Historic Gas Station 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 43M 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 an underground storage tank removal program, have been conducted which address Study Area 43M.

An investigation of subsurface soil at Study Area 43M was conducted by Kurz Associates in 1989 as part of an underground storage tank removal program at Fort Devens. Two USTs were removed, and were observed to be in good condition. The headspace of nine soil samples from each excavation were screened for total volatile organic compounds with a photoionization detector. Concentrations ranged from 1.0 to 7.4 parts per million. Four composite soil samples were collected from the excavations for total petroleum hydrocarbon analysis. The total petroleum hydrocarbon compound concentrations ranged from 73 to 101 parts per million.

After assessing the distribution and migration potential of the contaminants at Study Area 43M, it was concluded by Fort Devens personnel that groundwater was not being impacted by the concentration detected and that current site conditions pose no significant risk to potential receptors. Based on this assessment, the excavations were backfilled, and no additional investigation was conducted.

Based on the recommendations in the Kurz report, ABB Environmental Services, Inc. did not conduct a site investigation at SA 43M during the 1992 field program. Based on the results of the work by Kurz Associates, it does not appear that the past activities at SA 43M have impacted the soil quality in the vicinity of the former underground storage

EXECUTIVE SUMMARY

tank location. The decision has been made to remove Study Area 43M from further consideration in the Installation Restoration Program.

1.0 INTRODUCTION

This decision document has been prepared to support a no further action decision at Study Area 43M - Historic Gas Station Site (SA 43M) 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. 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.

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.

2.0 BACKGROUND AND PHYSICAL SETTING

2.1 DESCRIPTION AND LAND USE

Fort Devens is located approximately 35 miles northwest of Boston, Massachusetts, 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 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 this function 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, for the Army Readiness Region, for Reserve Components, and for 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 (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 shoppette, cafeteria, post exchange, commissary, bowling alley, golf course, and hospital), administrative buildings, classrooms and training facilities, maintenance facilities, and

SECTION 2

ammunition storage facilities. The Historic Gas Station Sites, including SA 43M, are located on the Main Post.

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 dissected by numerous brooks with attendant wetlands. There are also several kettle ponds and one kettle lake located within the installation.

2.4 STUDY AREA DESCRIPTION AND HISTORY

SA 43M, one of the 19 Historic Gas Station Sites, is located on the west side of Lake George Street adjacent to Building 2613 (Figure 2-2). The structures of the historic gas station at SA 43M consisted of a pump island and a small gasoline pumphouse. The station was a Type B station which had two 5,000-gallon underground storage tanks (USTs), located on either side of the pump island and oriented parallel to it. 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; however, it did appear that the USTs had not been removed at that time. The tanks were ultimately removed in 1989. The area around the reported location of SA 43M is currently used as storage yard for installation contractors. The pumphouse associated with the historic gas station (Building P-180) is still present at the site. The yard is paved and surrounded by chain-link fence with a locked gate located on the eastern side of the yard (Figure 2-2).

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 43M 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

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.

Based on the recommendations in the Kurz Associates report (1991), ABB Environmental Services, Inc. did not conduct a field investigation at SA 43M during the 1992 field program (ABB-ES, 1993).

4.0 CONTAMINATION ASSESSMENT

An investigation of subsurface soil at Study Area 43M was conducted by Kurz Associates in 1989 as part of a UST removal program at Fort Devens. Two USTs were removed on November 30 and December 1, 1989 (Kurz Associates, 1991). These USTs (referred to as tanks #7 and #8) were inspected after removal, and were observed to be in good condition with no evidence of holes or pitting. The USTs at SA 43M were originally used for gasoline storage. During excavation, tank #8 contained a mixture of water and what appeared to be fuel oil, and tank #7 contained a mixture of what appeared to be water and mogas (gasoline). Contents of the tanks were removed by Franklin Environmental Services. (Kurz Associates, 1991). Soil samples were collected from each excavation. The results of the analyses are summarized in the following paragraphs. A copy of Kurz Associates report is available from the Fort Devens EMO.

4.1 SOILS

The headspace of nine soil samples from each excavation were screened for total volatile organic compounds with a photoionization detector. Concentrations ranged from 1.0 to 7.4 parts per million (ppm). Four composite soil samples were collected from the excavations for total petroleum hydrocarbon compound (TPHC) analysis. The TPHC concentrations ranged from 73 to 101 ppm.

After assessing the distribution and migration potential of the contaminants at the station, it was concluded by Fort Devens personnel that groundwater was not being impacted by the concentrations detected and that current site conditions pose no significant risk to potential receptors. Based on this assessment, the excavations were backfilled, and no additional investigation was conducted.

4.2 GROUNDWATER

Groundwater was not encountered at SA 43M during tank removal operations (Kurz Associates, 1991).

5.0 PRELIMINARY HUMAN HEALTH RISK EVALUATION

After assessing the distribution and migration potential of the contaminants at the station, it was concluded by Fort Devens personnel that groundwater was not being impacted by the concentration detected and that current site conditions pose no significant risk to potential receptors. Based on this assessment, the excavations were backfilled, and no additional investigation was conducted. Prior to backfilling, Kurz Associates collected four composite soil samples from the excavation walls which were analyzed for TPHC. TPHC concentrations levels ranged from 73 to 101 ppm. Based on a comparison of these results against the calculated risk-based commercial/industrial concentration value of 1,700 ppm for gasoline, and against the Massachusetts Contingency Plan's most conservative concentration of 500 ppm, there should be no significant risk to public health from soil contamination at SA 43M.

6.0 PRELIMINARY ECOLOGICAL RISK EVALUATION

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

7.0 CONCLUSIONS

ABB-ES used the results of previous field investigations at SA 43M to determine if the historic gas station activities had adversely impacted the soil or groundwater quality in the area around SA 43M. Based on the results of the work by Kurz Associates, it does not appear that the past activities at SA 43M have impacted the soil quality in the vicinity of the former UST locations. Therefore, no further action is recommended for this historic gas station.

8.0 DECISION

On the basis of findings at SA 43M, 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 43M from further consideration in the IRP process.

COMMANDER, FORT DEVENS

COLONEL EDWARD NUTTALL
U.S. Army
Installation Commander

Date

**U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION I, ME AND VT WASTE MANAGEMENT BRANCH**

☐ Concur

David M. Webster, Chief

Date

☐ Non-concur (Please provide reasons) _____

ABB-ES

ABB Environmental Services, Inc.

ABB Environmental Services, Inc.

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DoD	U.S. Department of Defense
gpm	gallons per minute
IRP	Installation Restoration Program
LUST	leaking underground storage tank
MEP	Master Environmental Plan
MSL	mean sea level
PA	Enhanced Preliminary Assessment
ppm	part per million
SA	Study Area
SI	site investigation
TPHC	total petroleum hydrocarbon compounds
USAEC	U.S. Army Environmental Center
UST	underground storage tank
VOC	volatile organic compound

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.
- Kurz Associates Inc., 1991. "Underground Storage Tank Removal and Related Environmental Investigations, Fort Devens Military Reservation, Harvard, Massachusetts"; prepared for Franklin Environmental Services, Inc., Wrentham, MA; Bridgewater, MA; January.

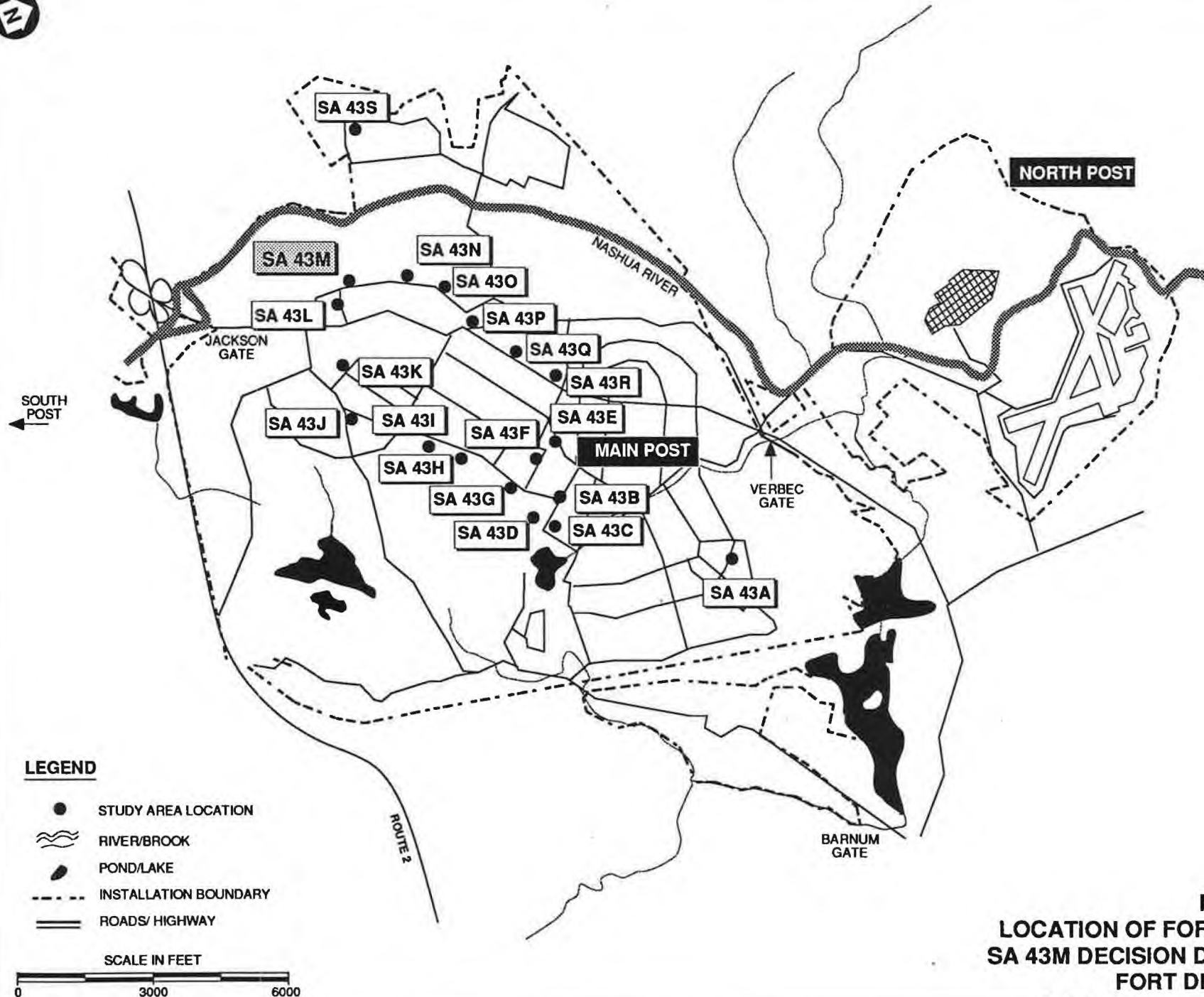


FIGURE 2-1
LOCATION OF FORT DEVENS
SA 43M DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

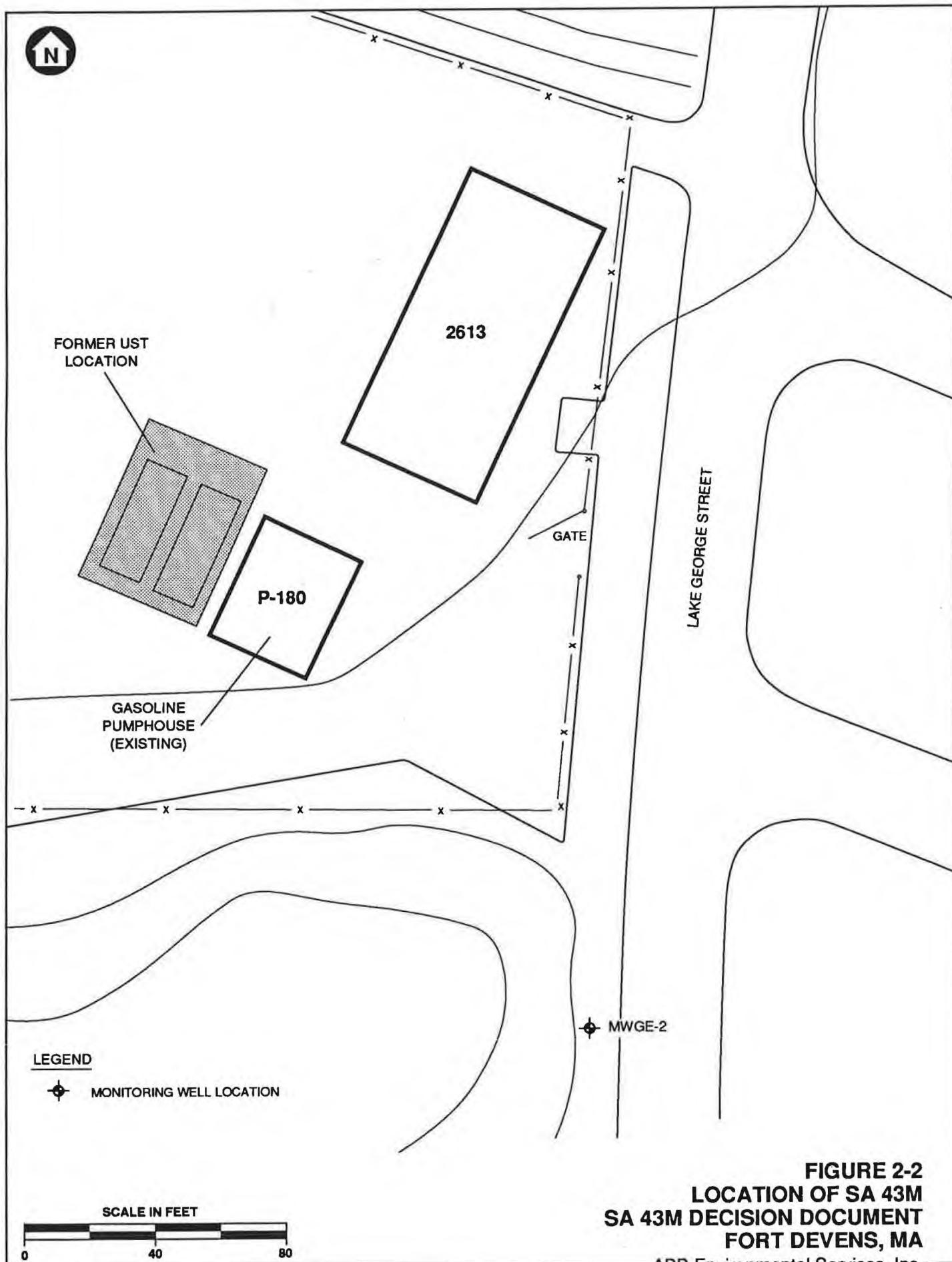


FIGURE 2-2
LOCATION OF SA 43M
SA 43M DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

**NO FURTHER ACTION DECISION UNDER CERCLA
STUDY AREA 43P
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 1994

**DRAFT
DECISION DOCUMENT
STUDY AREA 43P
HISTORIC GAS STATION SITES
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ABB Environmental Services, Inc.

**DRAFT
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FORT DEVENS, MASSACHUSETTS**

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**DRAFT
DECISION DOCUMENT
STUDY AREA 43P
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

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EXECUTIVE SUMMARY

Investigations of Study Area 43P (Historic Gas Station 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 43P 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 Study Area 43P.

Field investigation of Study Area 43P was initiated in 1992 in conjunction with the other 12 Groups 2, 7, and Historic Gas Stations Study Areas at Fort Devens. The Study Area 43P site investigation consisted of collecting subsurface soil samples, field analysis of those samples, and one soil boring.

Eleven TerraProbe points were advanced to refusal at each location and up to three subsurface soil samples per point (21 total) were collected for field analysis. The samples were analyzed for benzene, toluene, ethylbenzene, and xylenes and total petroleum hydrocarbons. Benzene, toluene, ethylbenzene, and xylenes were not detected in any of the samples, and total petroleum hydrocarbon compounds were detected in only one sample at 220 parts per million.

One soil boring was advanced to refusal, apparently bedrock, and two subsurface soil samples were collected for laboratory analysis. The samples were analyzed for volatile organic compounds, total petroleum hydrocarbons, and lead. No volatile organic compounds or total petroleum hydrocarbon compounds were detected, and lead was present below the established Fort Devens background concentration.

The water table was not reached in any of the TerraProbe points or the soil boring.

EXECUTIVE SUMMARY

On the basis of findings at Study Area 43P and the Preliminary Risk Evaluation, there is no evidence or reason to conclude that petroleum contamination due to the former underground storage tank has caused significant environmental contamination or poses a threat to human health. The decision has been made to remove Study Area 43P from further consideration in the Installation Restoration Program.

ABB Environmental Services, Inc.

1.0 INTRODUCTION

This decision document has been prepared to support a no further action decision at Study Area 43P - Historic Gas Station Site (SA 43P) 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. 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 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 43P were conducted to support this overall mission.

2.0 BACKGROUND AND PHYSICAL SETTING

2.1 DESCRIPTION AND LAND USE

Fort Devens is located approximately 35 miles northwest of Boston, Massachusetts, 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 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 this function 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, for the Army Readiness Region, for Reserve Components, and for 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 (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 shoppette, cafeteria, post exchange, commissary, bowling alley, golf course, and hospital), administrative buildings, classrooms and training facilities, maintenance facilities, and

SECTION 2

ammunition storage facilities. The Historic Gas Station Sites, including SA 43P, are located on the Main Post.

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 dissected by numerous brooks with attendant wetlands. There are also several kettle ponds and one kettle lake located within the installation.

2.4 STUDY AREA DESCRIPTION AND HISTORY

SA 43P, one of the 19 Historic Gas Station Sites, is included in the Group 2 SAs located on the Main Post. SA 43P is located on Sherman Avenue, approximately 150 feet northeast of the intersection of Givory Road and Sherman Avenue (Figure 2-2). The structure of the historic gas station at SA 43P consisted of a pump island and a small gasoline pumphouse. The gas station at SA 43P was a Type A station with 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. The gasoline UST at SA 43P was excavated and removed before 1952. Reportedly, this UST was moved to SA 43I and installed there as a second UST at that station. Records on the exact location of the station at SA 43P were not available prior to the commencement of the 1992 field investigation. Currently, the area around the reported location of SA 43P is an open grassy area with Building T-622 and a paved parking lot on the southern portion of the site and bedrock outcrop to the north (Figure 2-2). Building T-622 is currently an administrative office. A 1,000-gallon heating oil UST is located on the north side of Building T-622 and appears to still be in use. This heating oil UST is included in the Fort Devens UST inventory and management program and its future use will be managed through this program.

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 43P 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

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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 43P consisted of 11 TerraProbe points, collection of subsurface soil samples, field analysis of those soil samples, and one soil boring with laboratory analysis on selected soil samples.

The TerraProbe points were advanced to refusal at each location and as many as three subsurface soil samples per point were collected for field analysis. The samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbon compounds (TPHC).

One soil boring (43P-92-01X) was advanced to refusal (apparently bedrock), and two subsurface soil samples were collected for laboratory analysis. The samples were collected from 5 to 7 feet below ground surface (bgs) and 12 to 14 feet bgs. The samples were analyzed for volatile organic compounds (VOCs), TPHC, and lead.

4.0 CONTAMINATION ASSESSMENT

The soil encountered at SA 43P consisted of silty well-graded sand with gravel. Refusal (apparently bedrock), was reached at 13 feet to 15 feet bgs in both the TerraProbe points and the soil boring. Groundwater was not encountered; however, the deepest soil sample collected from 43P-92-01X was moist to wet indicating that groundwater may be present in the bedrock. The boring log for 43P-92-01X is provided in Appendix B of the SI Report (ABB-ES, 1993). Subsurface soils were sampled and analyzed during the SI field investigation. These results are summarized in the following paragraphs.

4.1 SOILS

The objective of the TerraProbe subsurface soil sampling and field screening program was to determine if the historic gas station activities had adversely impacted the soil or groundwater quality in the area around SA 43P. A total of 21 subsurface soil samples from the TerraProbe points were collected and analyzed in the field. BTEX compounds were not detected in any of the samples, and TPHC was detected in only one soil sample (220 parts per million [ppm] at 5 feet bgs on TP-02). Field screening results are presented in Table 4-1 and Figures 4-1 through 4-3.

Boring 43P-92-01X was drilled adjacent to TP-02 to confirm the TPHC field analytical result. Two soil samples were collected from 5 to 7 feet bgs and 12 to 14 feet bgs for laboratory analysis of VOCs, TPHC, and lead. No VOCs or TPHC were detected in either sample and lead was present below the established background concentration (Table 4-2 and Figure 4-4).

4.2 GROUNDWATER

Because the TerraProbe borings met refusal without encountering groundwater, groundwater was not sampled at SA 43P.

5.0 PRELIMINARY HUMAN HEALTH RISK EVALUATION

The tank at this location was removed before 1952. The groundwater table was not encountered at this SA. Field analysis of 21 shallow and intermediate depth TerraProbe soil samples revealed no measurable concentrations of BTEX to a depth of 9 feet. TPHC was detected above the method detection limit in only one of these 21 samples, at 220 ppm. Comparing this result against the calculated risk-based commercial/industrial concentration value of 1,700 ppm for gasoline, and against the Massachusetts Contingency Plan's most conservative concentration of 500 ppm, indicates that there should be no significant risk to public health from soil contamination at SA 43P.

6.0 PRELIMINARY ECOLOGICAL RISK EVALUATION

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

7.0 CONCLUSIONS

The objective of the field investigation at SA 43P was to determine if residual soil contamination was present at this historic gas station. Based on the results of the field screening, which detected TPHC at 220 ppm in only one soil sample, and the human health PRE, it does not appear that an unacceptable level of residual contamination exists at this historic gas station. Therefore, no further action is recommended for this historic gas station.

8.0 DECISION

On the basis of findings at SA 43P, 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 43P from further consideration in the IRP process.

COMMANDER, FORT DEVENS

COLONEL EDWARD NUTTALL
U.S. Army
Installation Commander

Date

**U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION I, ME AND VT WASTE MANAGEMENT BRANCH**

☐ Concur

David M. Webster, Chief

Date

☐ Non-concur (Please provide reasons) _____

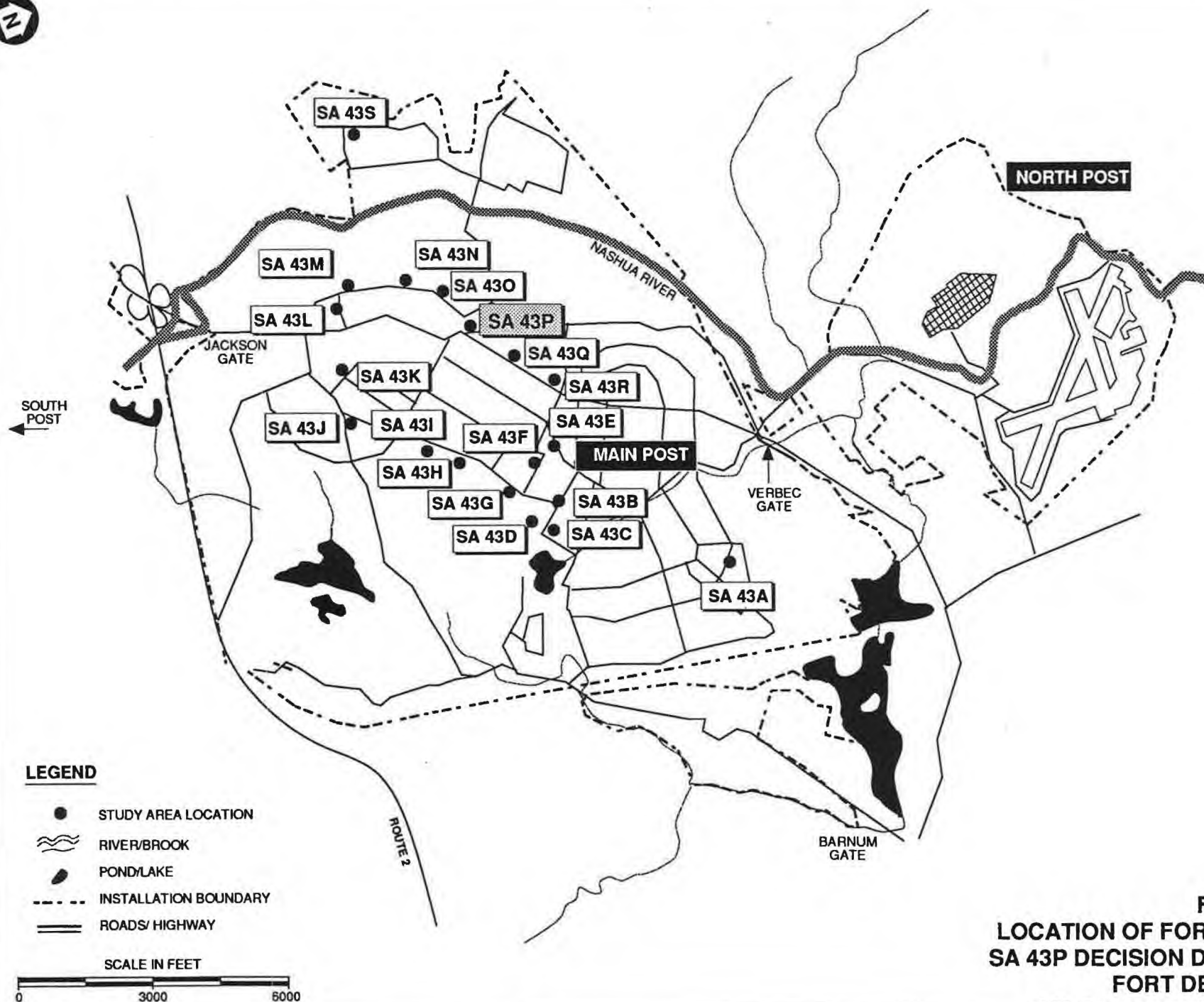
ABB Environmental Services, Inc.

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ABB-ES	ABB Environmental Services, Inc.
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
IRP	Installation Restoration Program
MEP	Master Environmental Plan
MSL	mean sea level
PA	Enhanced Preliminary Assessment
ppm	part per million
SA	Study Area
SI	site investigation
TPHC	total petroleum hydrocarbon compounds
USAEC	U.S. Army Environmental Center
UST	underground storage tank
VOC	volatile organic compound

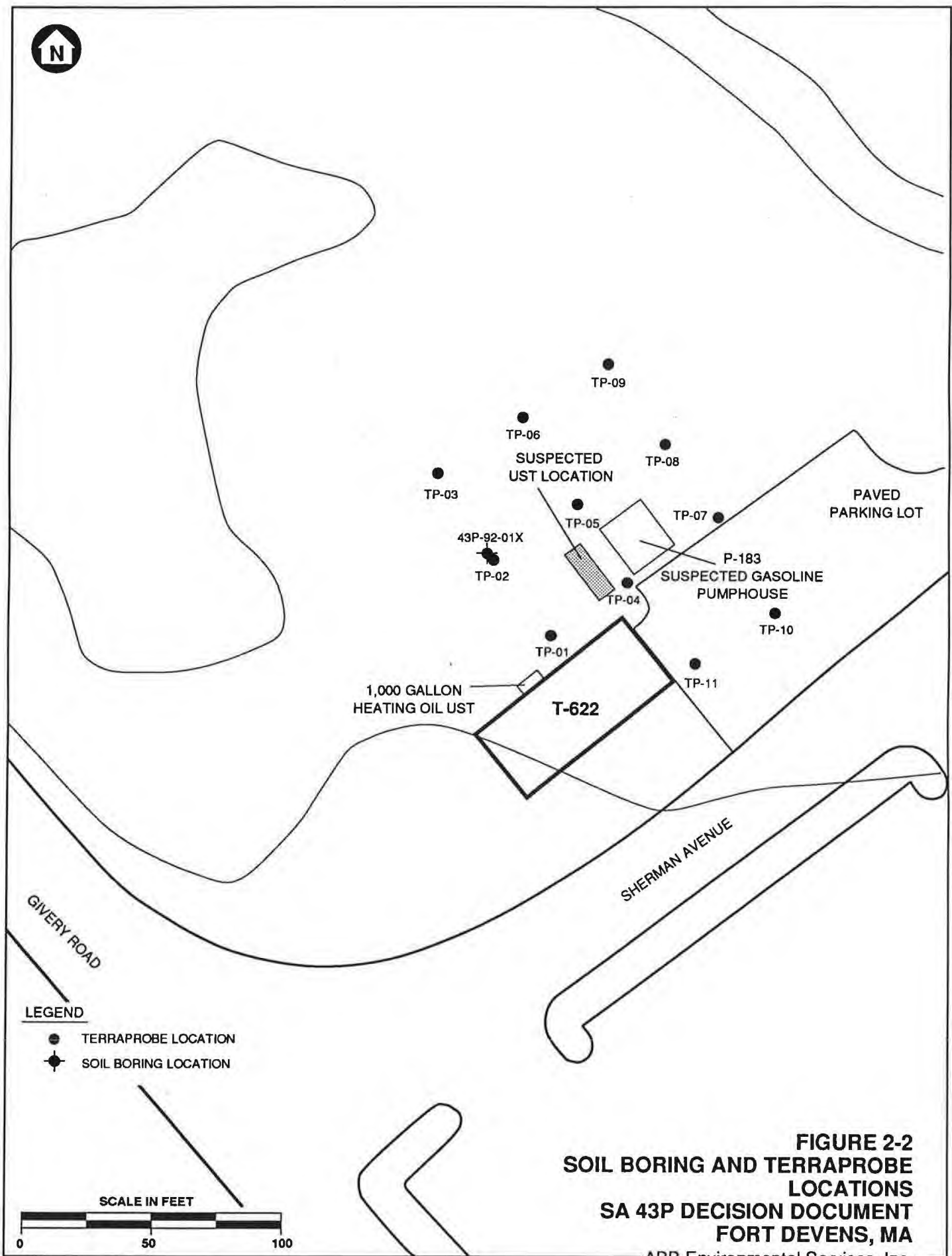
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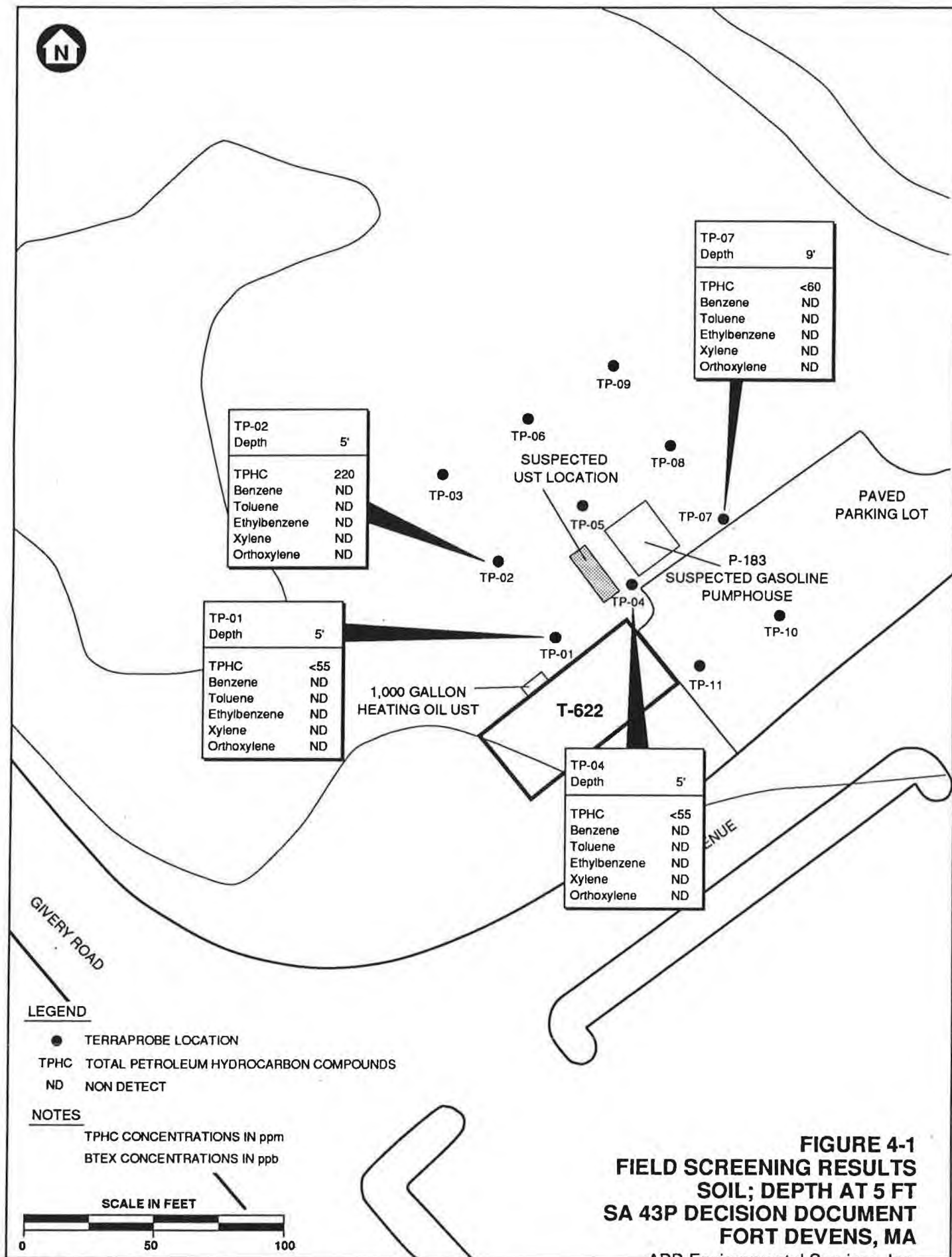
- ABB Environmental Services, Inc. (ABB-ES), 1993. "Final Site Investigation Report - Groups 2, 7, and Historic Gas Stations, Fort Devens, Massachusetts"; Data Item A009; prepared for the U.S. Army Environmental Center by ABB Environmental Services, Inc., Portland, ME, May.
- Barbour, F.A., c. 1941. "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.



**FIGURE 2-1
LOCATION OF FORT DEVENS
SA 43P DECISION DOCUMENT
FORT DEVENS, MA**

ABB Environmental Services, Inc.





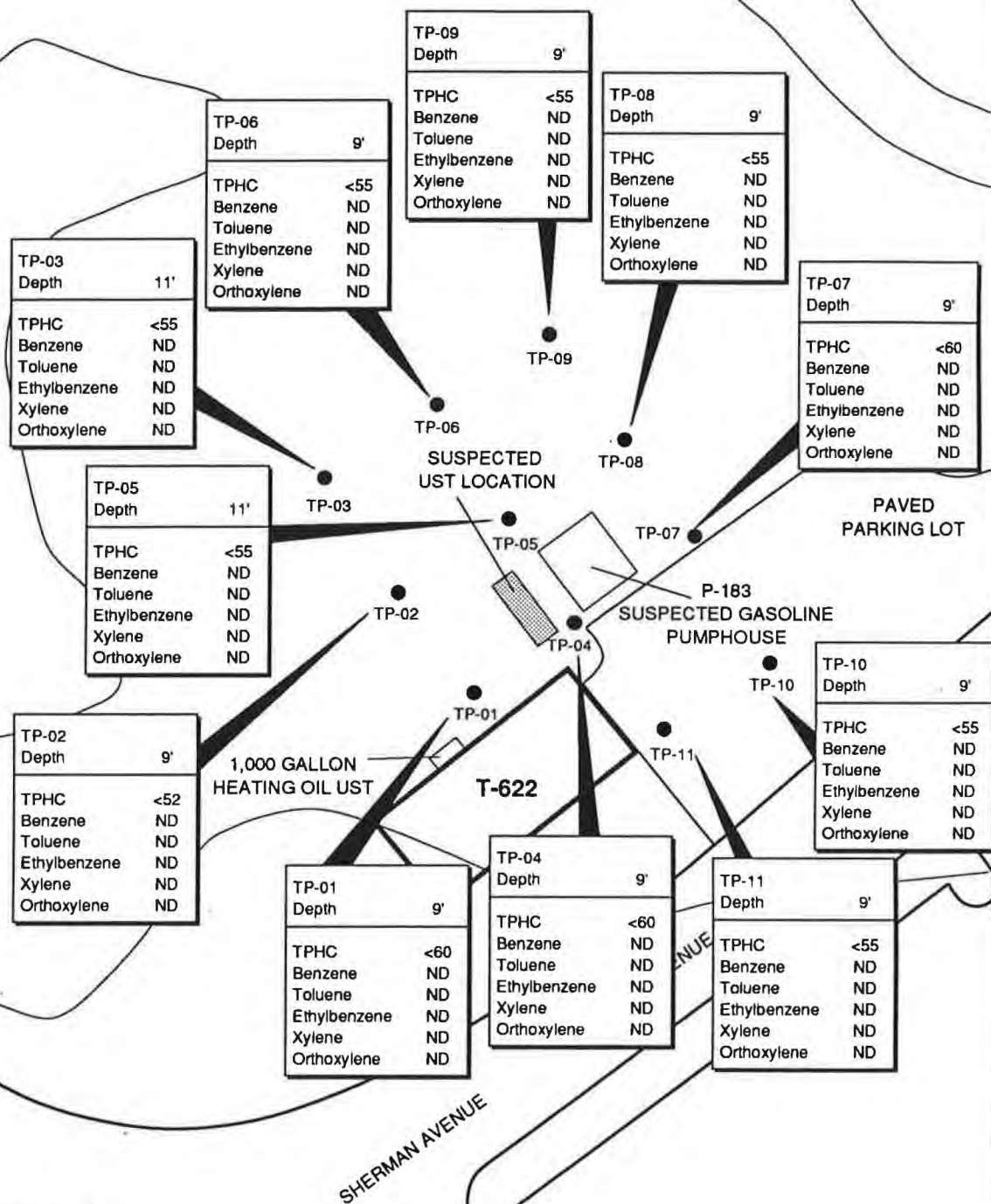
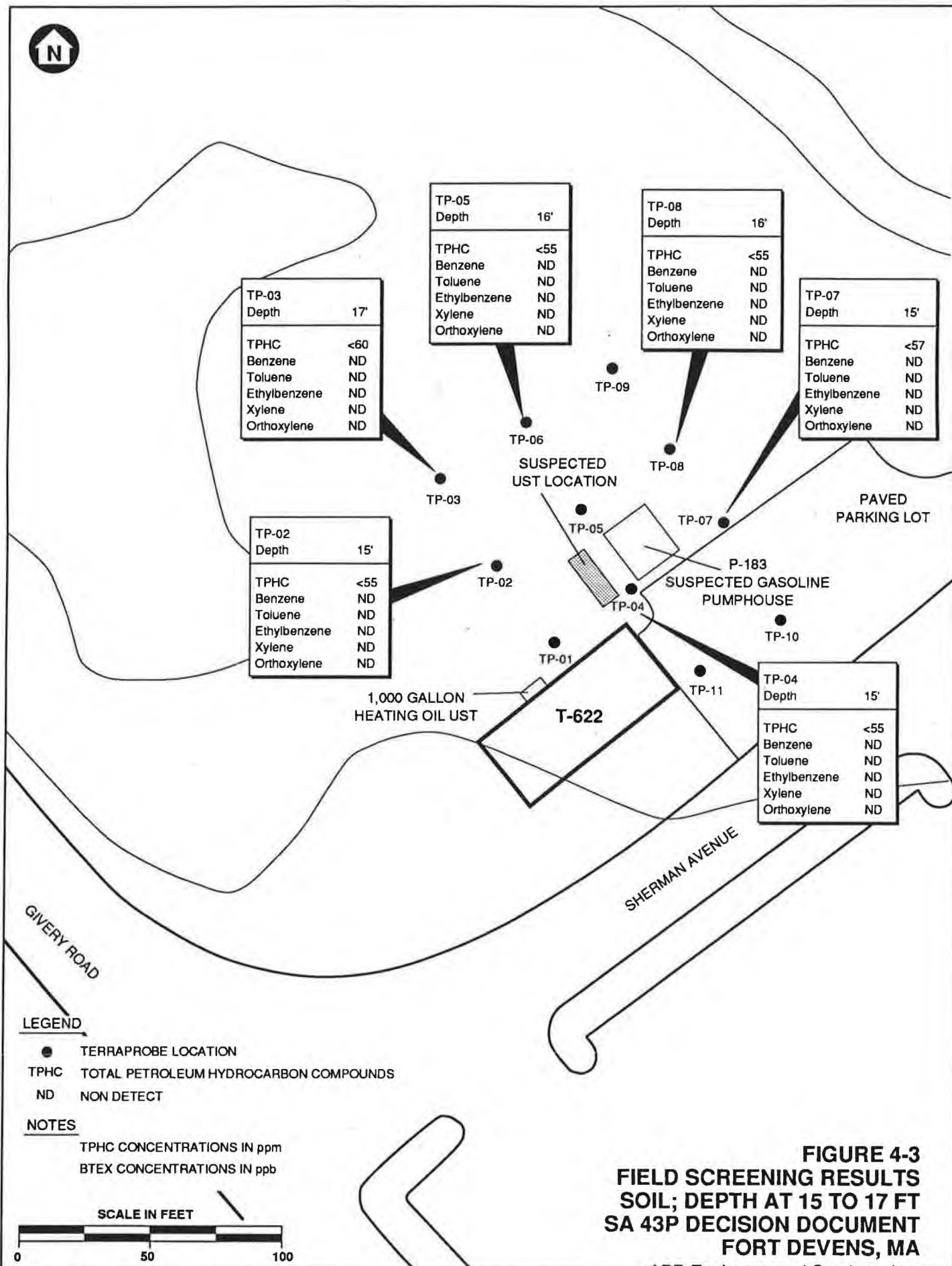


FIGURE 4-2
FIELD SCREENING RESULTS
SOIL; DEPTH AT 9 TO 11 FT
SA 43P DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.



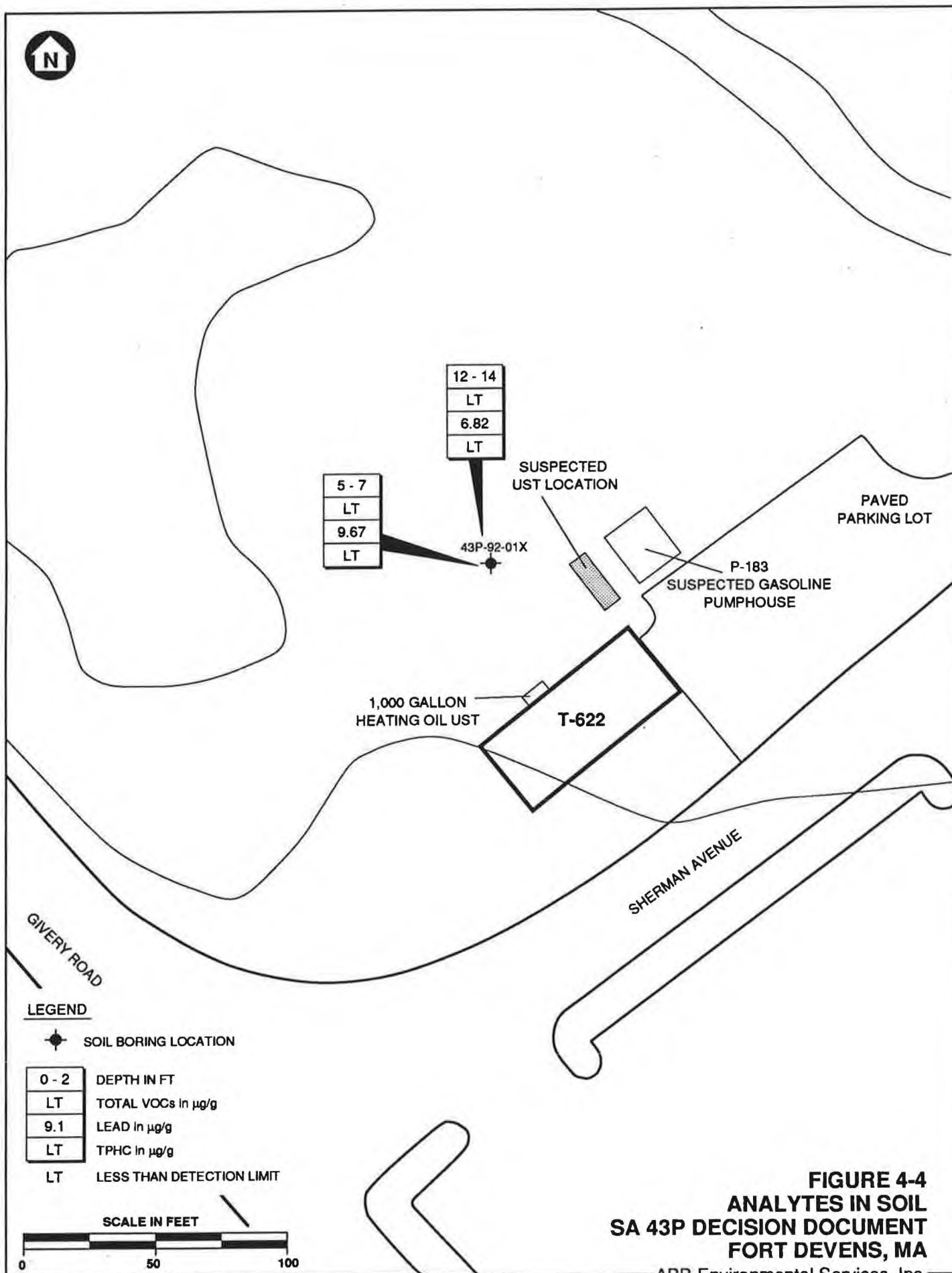


TABLE 4-1
FIELD SCREENING RESULTS
SA 43P – HISTORIC GAS STATIONS

DECISION DOCUMENT
FORT DEVENS

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
43TSP01XX501XF	43P	SOIL	TP-01	5	< 55	ND	ND	ND	ND	ND	ND	
43TSP01XX901XF	43P	SOIL	TP-01	9	< 60	ND	ND	ND	ND	ND	ND	
43TSP02XX501XF	43P	SOIL	TP-02	5	220	ND	ND	ND	ND	ND	ND	
43TSP02XX901XF	43P	SOIL	TP-02	9	< 52	ND	ND	ND	ND	ND	ND	
43TSP02X1501XF	43P	SOIL	TP-02	15	< 55	ND	ND	ND	ND	ND	ND	
43TSP03X1101XF	43P	SOIL	TP-03	11	< 55	ND	ND	ND	ND	ND	ND	
43TSP03X1701XF	43P	SOIL	TP-03	17	< 60	ND	ND	ND	ND	ND	ND	
43TSP04XX501XF	43P	SOIL	TP-04	5	< 55	ND	ND	ND	ND	ND	ND	
43TSP04XX901XF	43P	SOIL	TP-04	9	< 60	ND	ND	ND	ND	ND	ND	
43TSP04X1501XF	43P	SOIL	TP-04	15	< 55	ND	ND	ND	ND	ND	ND	
43TSP05X1101XF	43P	SOIL	TP-05	11	< 55	ND	ND	ND	ND	ND	ND	
43TSP05X1601XF	43P	SOIL	TP-05	16	< 55	ND	ND	ND	ND	ND	ND	
43TSP06XX901XF	43P	SOIL	TP-06	9	< 55	ND	ND	ND	ND	ND	ND	
43TSP07XX501XF	43P	SOIL	TP-07	5	< 55	ND	ND	ND	ND	ND	ND	
43TSP07XX901XF	43P	SOIL	TP-07	9	< 60	ND	ND	ND	ND	ND	ND	
43TSP07X1501XF	43P	SOIL	TP-07	15	< 57	ND	ND	ND	ND	ND	ND	
43TSP08XX901XF	43P	SOIL	TP-08	9	< 55	ND	ND	ND	ND	ND	ND	
43TSP08X1601XF	43P	SOIL	TP-08	16	< 55	ND	ND	ND	ND	ND	ND	
43TSP09XX901XF	43P	SOIL	TP-09	9	< 55	ND	ND	ND	ND	ND	ND	
43TSP10XX901XF	43P	SOIL	TP-10	9	< 55	ND	ND	ND	ND	ND	ND	
43TSP11XX901XF	43P	SOIL	TP-11	9	< 55	ND	ND	ND	ND	ND	ND	

NOTES:

* = ND denotes a non detect or concentrations below 5 ppm
 ** = ND denotes a non detect or concentrations below 10 ppm
 # = Study area
 TP = TerraProbe
 ppm = parts per million
 ppb = parts per billion

TPHC = total petroleum hydrocarbon compounds
 BTEX = benzene, toluene, ethylbenzene, and xylenes
 BEN = benzene
 TOL = toluene
 E-BEN = ethylbenzene
 M/P-XYL = m- and p-xylene isomers
 O-XYL = o-xylene isomer

TABLE 4-2
INORGANIC AND ORGANIC COMPOUNDS IN SOIL
SA 43P - HISTORIC GAS STATIONS

DECISION DOCUMENT
FORT DEVENS

ANALYTE	BACK – GROUND	BORING	43P-92-01X	
		DEPTH	5	12
INORGANICS (ug/g)				
LEAD	48.4		9.67	6.82
OTHER (ug/g)				
TOTAL ORGANIC CARBON			NA	854.0
TOTAL PETROLEUM HYDROCARBON COMPOUNDS			< 27.9	< 27.9

NOTES:

TABLE LISTS DETECTED ANALYTES ONLY -
SEE PROJECT ANALYTE LIST FOR SUMMARY
< = LESS THAN DETECTION LIMIT SHOWN
NA = NOT ANALYZED

**NO FURTHER ACTION DECISION UNDER CERCLA
STUDY AREA 43Q
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 1994

**DRAFT
DECISION DOCUMENT
STUDY AREA 43Q
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

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STUDY AREA 43Q
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FORT DEVENS, MASSACHUSETTS**

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

REFERENCES

ABB Environmental Services, Inc.

**DRAFT
DECISION DOCUMENT
STUDY AREA 43Q
HISTORIC GAS STATION SITES
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**DRAFT
DECISION DOCUMENT
STUDY AREA 43Q
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

LIST OF TABLES

Table	Title
4-1	Field Screening Results

EXECUTIVE SUMMARY

Investigations of Study Area 43Q (Historic Gas Station 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 43Q 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 Study Area 43Q.

Field investigation of Study Area 43Q was initiated in 1992 in conjunction with the other 12 Groups 2, 7, and Historic Gas Stations Study Areas at Fort Devens. The Study Area 43Q site investigation consisted of a geophysical survey program, TerraProbe points to collect subsurface soil and soil gas samples, and field analysis of these soil and soil gas samples.

The surficial geophysical program consisted of metal detector, magnetometer, and ground penetrating radar surveys. This program was designed to determine if any abandoned underground storage tanks were present at this site. The results of the surficial geophysical surveys did not indicate the presence of an abandoned underground storage tank, but several small magnetic anomalies were detected in the reported area of the historic gas station. These anomalies were believed to be construction debris from the former pumphouse and pump island.

Three soil samples were collected, from two locations, because refusal was reached at approximately 9 feet. Refusal was encountered at each TerraProbe point prior to reaching the water table. The soil samples were analyzed in the field for benzene, toluene, ethylbenzene, and xylenes and total petroleum hydrocarbons. No benzene, toluene, ethylbenzene, and xylenes or total petroleum hydrocarbons were detected in any of the soil samples collected. Because each of the TerraProbe points met refusal before

EXECUTIVE SUMMARY

encountering groundwater, 11 soil gas samples were collected between 8 and 9 feet from 10 points. These depths were estimated to be at or below the bottom of the former underground storage tank. Two soil gas samples were collected from TP-04. All of the soil gas samples were analyzed for benzene, toluene, ethylbenzene, and xylenes, only. No benzene, toluene, ethylbenzene, and xylenes compounds were detected in the soil gas samples collected from SA 43Q.

On the basis of findings at Study Area 43Q and the Preliminary Risk Evaluation, there is no evidence or reason to conclude that petroleum contamination due to the former underground storage tank has caused significant environmental contamination or poses a threat to human health. The decision has been made to remove Study Area 43Q from further consideration in the Installation Restoration Program.

1.0 INTRODUCTION

This decision document has been prepared to support a no further action decision at Study Area 43Q - Historic Gas Station Site (SA 43Q) 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. 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 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 43Q were conducted to support this overall mission.

2.0 BACKGROUND AND PHYSICAL SETTING

2.1 DESCRIPTION AND LAND USE

Fort Devens is located approximately 35 miles northwest of Boston, Massachusetts, 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 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 this function occurred during World Wars I and II, the Korean and Vietnam conflicts, and operations Desert Shield and Desert Storm.

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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

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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.

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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 dissected by numerous brooks with attendant wetlands. There are also several kettle ponds and one kettle lake located within the installation.

2.4 STUDY AREA DESCRIPTION AND HISTORY

SA 43Q, one of the 19 Historic Gas Station Sites, is included in the Group 2 SAs located on the Main Post. The structure of the historic gas station at SA 43Q consisted of a pump island and a small gasoline pumphouse. Based on available documentation, the gas station at SA 43Q was a Type A station with 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 of the decommissioning of the gas station or the removal of the associated UST. This historic gas station was located on the northern side of Sherman Avenue across from the existing Building 694 (Figure 2-2). Currently, the area around where SA 43Q was located is used by installation personnel as a soccer field.

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.

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 43Q 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

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 field investigation program consisted of surficial geophysical surveys, 10 TerraProbe points to collect subsurface soil and soil gas samples, and field analysis of these soil and soil gas samples.

The surficial geophysical program consisted of a metal detector, magnetometer, and ground penetrating radar (GPR) survey. This program was designed to determine if any abandoned USTs were present at this site. The metal detector and magnetometer surveys covered the majority of the existing soccer field, while the GPR survey was used to investigate magnetic anomalies detected in the other two surveys. The results of the surficial geophysical surveys did not indicate the presence of an abandoned UST, but several small magnetic anomalies were detected in the reported area of the historic gas station. These anomalies were believed to be construction debris from the former pumphouse and/or pump island. The results of the surveys are presented in Appendix L of the SI Report (ABB-ES, 1993).

A total of three soil samples and 11 soil gas samples were collected from 10 TerraProbe points. The number of recovered soil samples was limited by the dense soil conditions and subsurface obstructions. The soil samples were analyzed in the field for benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbons (TPHC), while the soil gas samples were analyzed for BTEX, only.

4.0 CONTAMINATION ASSESSMENT

Results of subsurface soils and soil gas analyses are presented below.

4.1 SOILS AND SOIL GAS

Three soil samples were collected, from two locations. Refusal was encountered at each TerraProbe point prior to reaching the water table. No BTEX or TPHC were detected in any of the soil samples collected (Table 4-1; Figure 4-1).

Because each of the TerraProbe points met refusal before encountering groundwater, soil gas samples were collected between 8 and 9 feet from all 10 proposed points. These depths were estimated to be at or below the bottom of the former UST. Two soil gas samples were collected from TP-04. All of the soil gas samples were analyzed for BTEX, only. No BTEX was detected in the soil gas sample collected from SA 43Q (see Table 4-1; Figure 4-2).

4.2 GROUNDWATER

Groundwater was not encountered at SA 43Q.

5.0 PRELIMINARY HUMAN HEALTH RISK EVALUATION

No abandoned USTs was detected during the geophysical survey conducted at SA 43Q. Field analysis of three TerraProbe soil samples revealed no measurable concentrations of BTEX to a depth of 16 feet. TPHC was not detected above the method detection limit in any of these samples. Eleven TerraProbe soil gas samples were collected, and no measurable concentrations of BTEX were encountered. There should be no significant risk to public health from soil contamination at SA 43Q.

6.0 PRELIMINARY ECOLOGICAL RISK EVALUATION

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

7.0 CONCLUSIONS

The objective of the field sampling program at SA 43Q was to determine if residual soil contamination was present at this historic gas station. Based on the results of the field investigation program and a human health Preliminary Risk Evaluation (PRE), it does not appear that the past activities at SA 43Q have adversely impacted the soil or the groundwater quality. Because the investigation has focused on the subsurface, no ecological PRE was conducted. Therefore, no further action is recommended at this historic gas station.

8.0 DECISION

On the basis of findings at SA 43Q, 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 43Q from further consideration in the IRP process.

COMMANDER, FORT DEVENS

COLONEL EDWARD NUTTALL
U.S. Army
Installation Commander

Date

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION I, ME AND VT WASTE MANAGEMENT BRANCH

☐ Concur

David M. Webster

Date

☐ Non-concur (Please provide reasons) _____

ABB Environmental Services, Inc.

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ABB-ES	ABB Environmental Services, Inc.
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
MEP	Master Environmental Plan
MSL	mean sea level
PA	Enhanced Preliminary Assessment
PRE	Preliminary Risk Evaluation
SA	Study Area
SI	site investigation
TPHC	total petroleum hydrocarbon compounds
USAEC	U.S. Army Environmental Center
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

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.

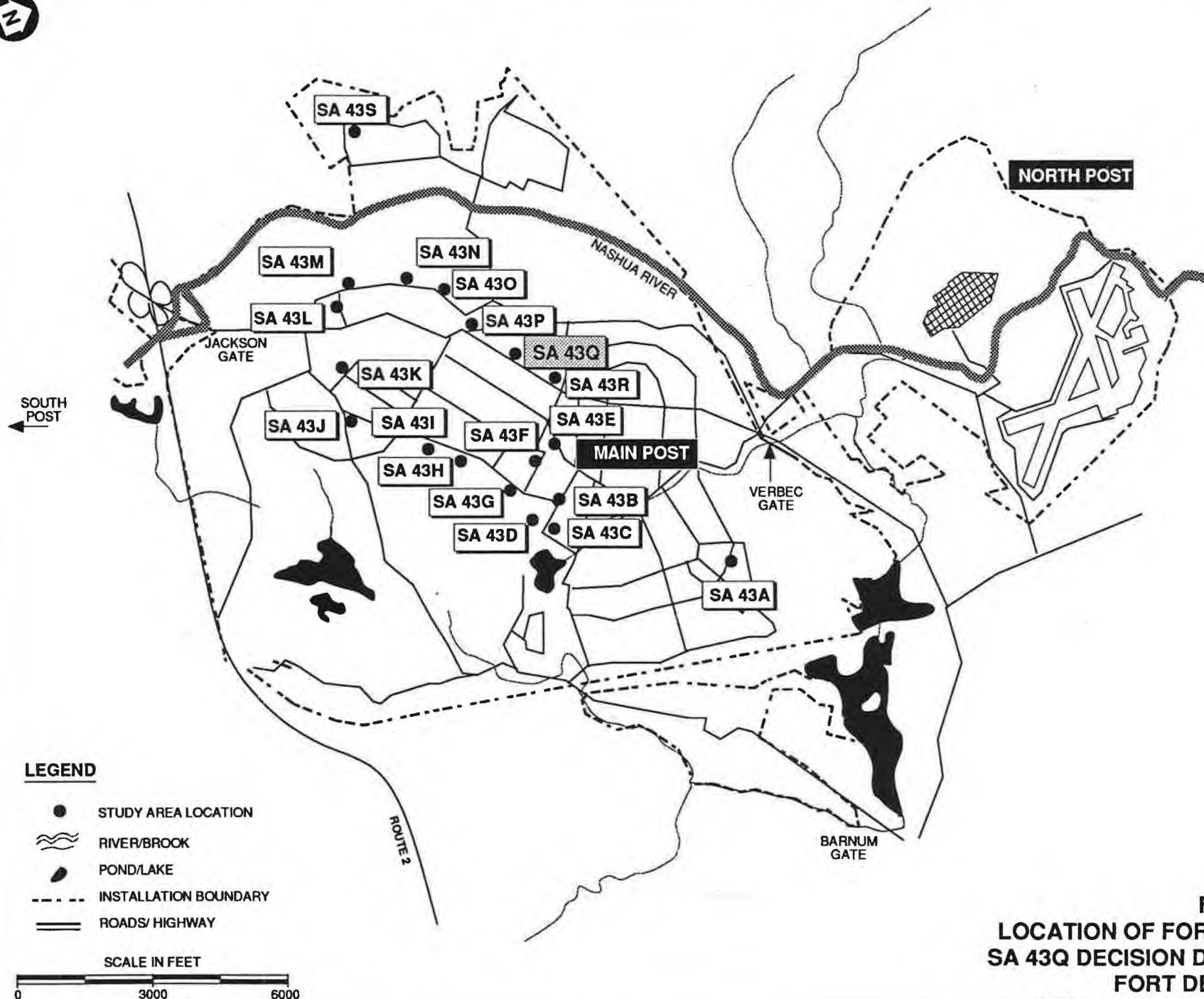
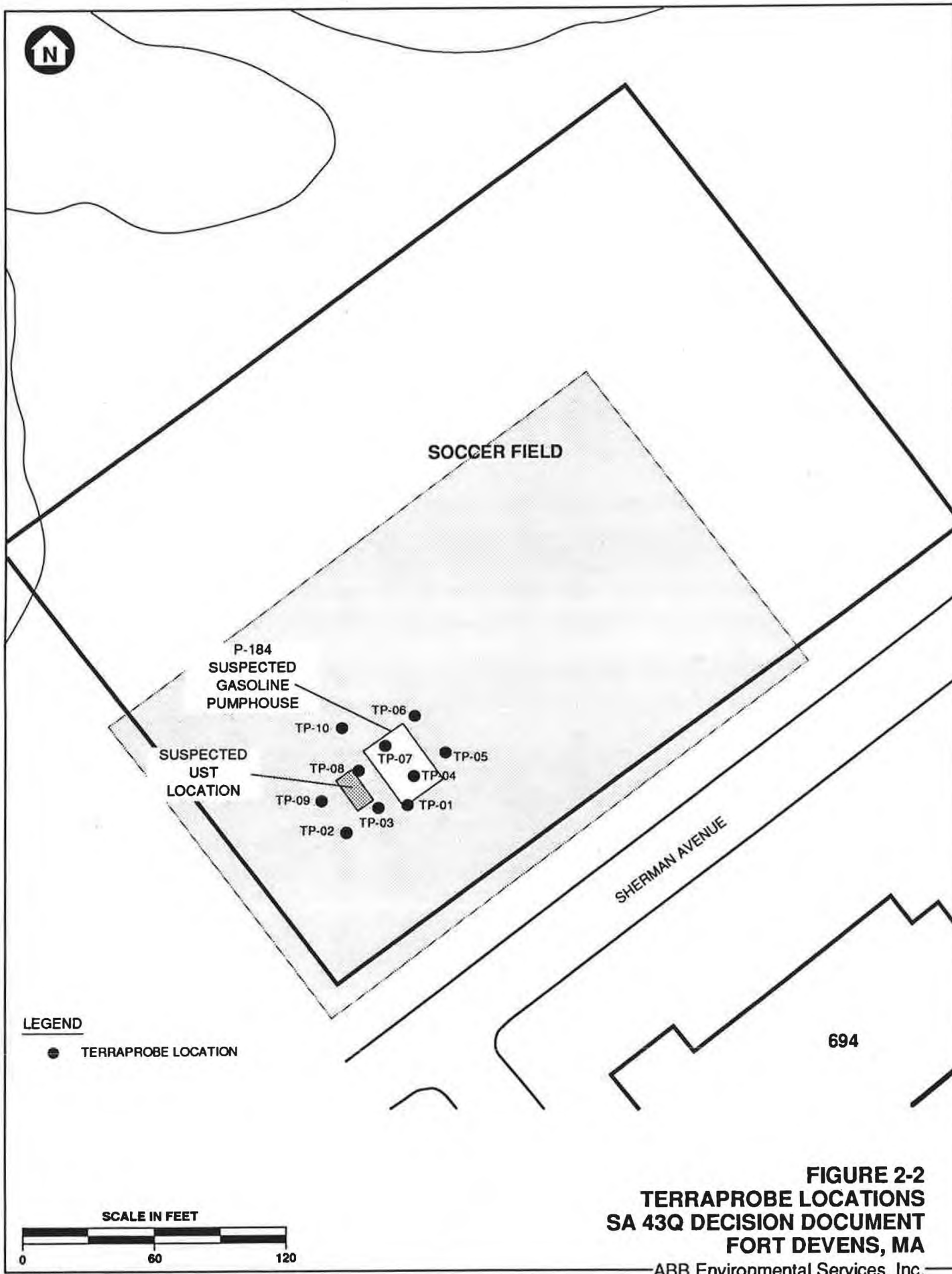


FIGURE 2-1
LOCATION OF FORT DEVENS
SA 43Q DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.



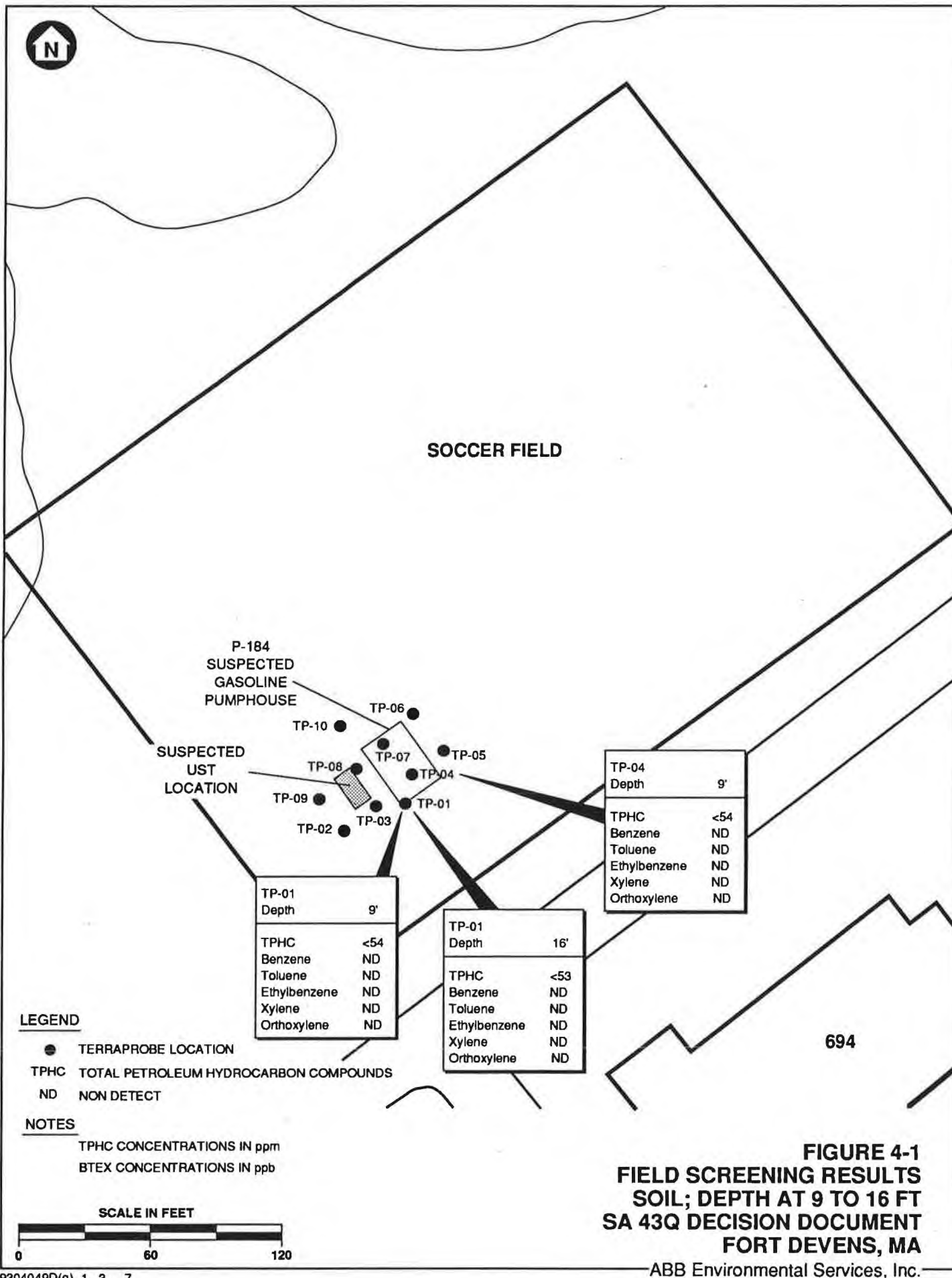


FIGURE 4-1
FIELD SCREENING RESULTS
SOIL; DEPTH AT 9 TO 16 FT
SA 43Q DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

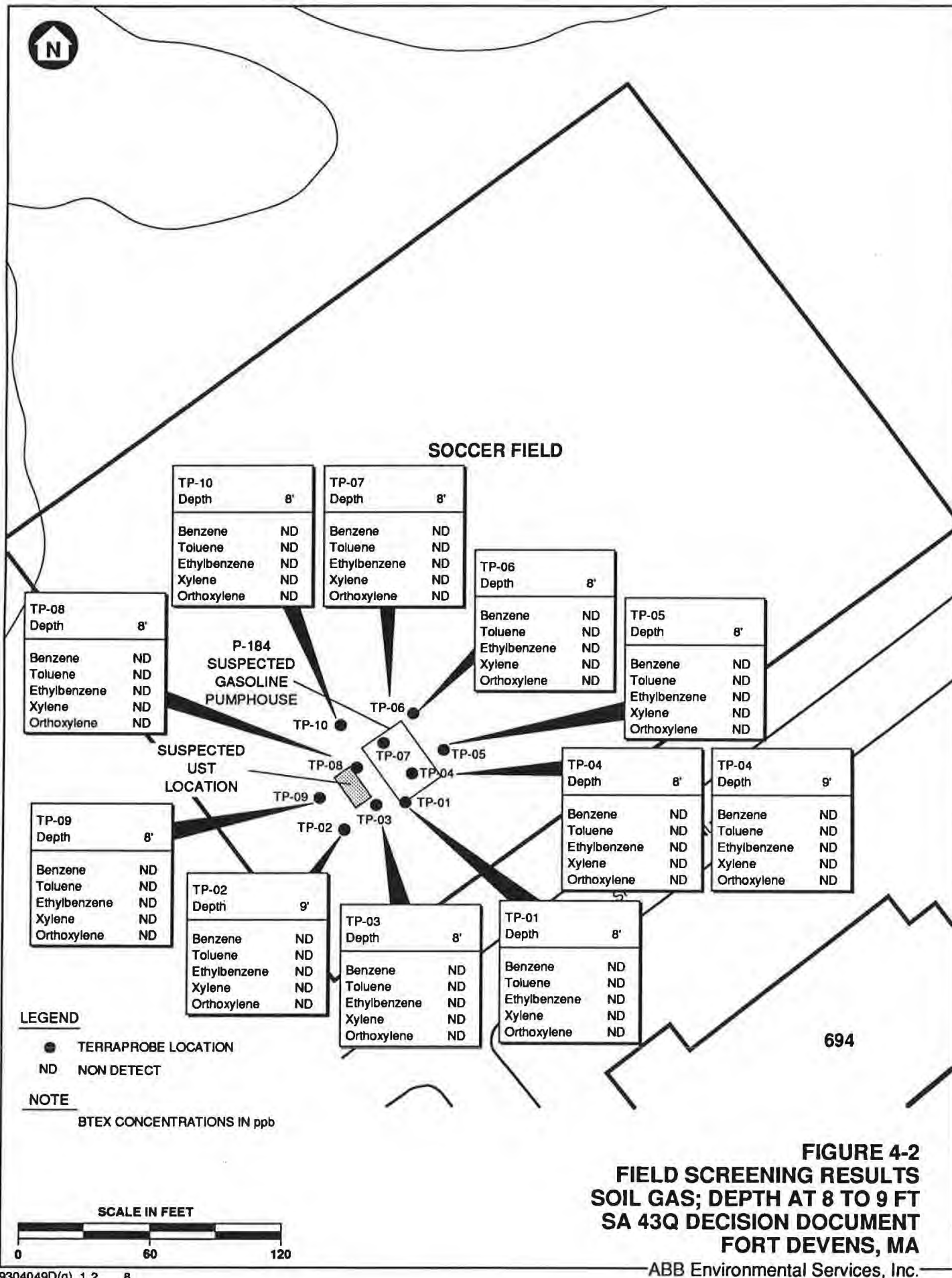


TABLE 4-1
FIELD SCREENING RESULTS
SA 43Q - HISTORIC GAS STATIONS

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FORT DEVENS

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
43TSQ01XX901XF	43Q	SOIL	TP-01	9	<54	ND	ND	ND	ND	ND	ND	
43TSQ01X1601XF	43Q	SOIL	TP-01	16	<53	ND	ND	ND	ND	ND	ND	
43TSQ04XX901XF	43Q	SOIL	TP-04	9	<54	ND	ND	ND	ND	ND	ND	
43TGG01XX801XF	43Q	SG	TP-01	8	NA	ND	ND	ND	ND	ND	ND	
43TGG02XX901XF	43Q	SG	TP-02	9	NA	ND	ND	ND	ND	ND	ND	
43TGG03XX801XF	43Q	SG	TP-03	8	NA	ND	ND	ND	ND	ND	ND	
43TGG04XX801XF	43Q	SG	TP-04	8	NA	ND	ND	ND	ND	ND	ND	
43TGG04XX901XF	43Q	SG	TP-04	9	NA	ND	ND	ND	ND	ND	ND	
43TGG05XX801XF	43Q	SG	TP-05	8	NA	ND	ND	ND	ND	ND	ND	
43TGG06XX801XF	43Q	SG	TP-06	8	NA	ND	ND	ND	ND	ND	ND	
43TGG07XX801XF	43Q	SG	TP-07	8	NA	ND	ND	ND	ND	ND	ND	
43TGG08XX801XF	43Q	SG	TP-08	8	NA	ND	ND	ND	ND	ND	ND	
43TGG09XX801XF	43Q	SG	TP-09	8	NA	ND	ND	ND	ND	ND	ND	
43TGG10XX801XF	43Q	SG	TP-10	8	NA	ND	ND	ND	ND	ND	ND	

NOTES:

* = ND denotes a non detect or concentrations below 5 ppb

** = ND denotes a non detect or concentrations below 10 ppb

= Study Area

NA = Not applicable

SG = Soil gas

TP = TerraProbe

PPM = Part Per Million

PPB = Part Per Billion

BEN = Benzene

BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes

TPHC = Total Petroleum Hydrocarbon Compounds

TOL = Toluene

E - BEN = Ethylbenzene

M/P XYL = M/P Xylenes

O - XYL = O - Xylenes

**NO FURTHER ACTION DECISION UNDER CERCLA
STUDY AREA 43R
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 1994

**DRAFT
DECISION DOCUMENT
STUDY AREA 43R
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

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FORT DEVENS, MASSACHUSETTS**

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

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EXECUTIVE SUMMARY

Investigations of Study Area 43R (Historic Gas Station 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 43R 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 Study Area 43R.

Field investigation of Study Area 43R was initiated in 1992 in conjunction with the other 12 Groups 2, 7, and Historic Gas Stations Study Areas at Fort Devens. The Study Area 43R site investigation consisted of a geophysical survey program, TerraProbe points to collect subsurface soil and soil gas samples, field analysis of these soil and soil gas samples, and one soil boring to collect soil samples for laboratory analysis.

The geophysical surveys determined that one abandoned underground storage tank was present at the site. This tank was removed by ATEC Environmental Consultants on June 26, 1992. ATEC performed field screening for volatile organic compounds and total petroleum hydrocarbons on 10 soil samples collected from the walls of the excavation and two samples from the bottom of the excavation. ABB Environmental Services, Inc. collected one composite sample from the bottom of the excavation for off-site laboratory analysis. Based on the results of the field screening, the soils were deemed uncontaminated and the excavation was backfilled. However, based on the results of the composite sample collected and analyzed by ABB Environmental Services, Inc., an additional investigation was conducted to confirm the nature and distribution of fuel contamination detected in the bottom of the excavation.

A total of two soil samples were collected from two TerraProbe points, and one soil gas sample was collected from each of 10 TerraProbe points. The soil samples were

EXECUTIVE SUMMARY

analyzed in the field for benzene, toluene, ethylbenzene, and xylenes and total petroleum hydrocarbon compounds while the soil gas samples were analyzed for benzene, toluene, ethylbenzene, and xylenes, only. Benzene, toluene, ethylbenzene, xylenes, and total petroleum hydrocarbon compounds were not detected in the soil or soil gas samples, indicating that residual fuel contamination was not present outside of the former underground storage tank excavation.

One soil boring was drilled through the middle of the backfilled excavation. Two soil samples were collected from two depth intervals in the boring and analyzed for volatile organic compounds, total petroleum hydrocarbon compounds, and lead. No volatile organic compounds or total petroleum hydrocarbon compounds were detected in the subsurface soil samples. Lead concentrations were below the established Fort Devens background concentration.

On the basis of findings at Study Area 43R and the Preliminary Risk Evaluation, there is no evidence or reason to conclude that petroleum contamination due to the former underground storage tank has caused significant environmental contamination or poses a threat to human health. The decision has been made to remove Study Area 43R from further consideration in the Installation Restoration Program.

1.0 INTRODUCTION

This decision document has been prepared to support a no further action decision at Study Area 43R - Historic Gas Station Site (SA 43R) 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. 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 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 43R were conducted to support this overall mission.

2.0 BACKGROUND AND PHYSICAL SETTING

2.1 DESCRIPTION AND LAND USE

Fort Devens is located approximately 35 miles northwest of Boston, Massachusetts, 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 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 this function 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, for the Army Readiness Region, for Reserve Components, and for 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 (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 shoppette, cafeteria, post exchange, commissary, bowling alley, golf course, and hospital), administrative buildings, classrooms and training facilities, maintenance facilities, and

SECTION 2

ammunition storage facilities. The Historic Gas Station Sites, including SA 43R, are located on the Main Post.

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 dissected by numerous brooks with attendant wetlands. There are also several kettle ponds and one kettle lake located within the installation.

2.4 STUDY AREA DESCRIPTION AND HISTORY

SA 43R, one of the 19 Historic Gas Station Sites, is included in the Group 2 SAs located on the Main Post. The structure of the historic gas station at SA 43R consisted of a pump island and a small gasoline pumphouse. Based on available documentation, the gas station at SA 43R was a Type A station with 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 of the decommissioning of the gas station or the removal of the associated UST. This historic gas station was located on the northern side of Sherman Avenue across from the existing Building 696 and approximately 600 feet northeast of SA 43Q (Figure 2-2). Presently, the area surrounding SA 43R is a grassy area bordered on the south-southwest by a parking lot and Sherman Avenue (see Figure 2-2).

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 43R 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

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 field investigation program consisted of surficial geophysical surveys, TerraProbe points to collect subsurface soil and soil gas samples, field analysis of these soil and soil gas samples, and one soil boring to collect soil samples for laboratory analysis.

The surficial geophysical program consisted of a metal detector, magnetometer, and ground penetrating radar (GPR) survey. This program was designed to determine if any abandoned USTs were present at this site. The metal detector and magnetometer surveys covered an area approximately 250 feet long and 150 feet wide, while the GPR survey was used to investigate magnetic anomalies detected in the other two surveys (see Figure 2-2). The geophysical surveys determined that one abandoned UST was present at the site.

A total of two soil samples were collected from two TerraProbe points, and one soil gas sample was collected from each of the 10 TerraProbe points. The soil samples were analyzed in the field for benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbon compounds (TPHC), while the soil gas samples were analyzed for BTEX, only.

One soil boring (43R-92-01X) was drilled through the former UST excavation, and two subsurface soil samples were collected for laboratory analysis. The samples were analyzed for volatile organic compounds (VOCs), TPHC, and lead.

4.0 CONTAMINATION ASSESSMENT

The geophysical surveys determined that one abandoned UST was present at the site. The UST was added to the installation's tank removal program, and on June 26, 1992 ATEC Environmental Consultants (ATEC) removed a 5,000 gallon UST. The tank was observed to be in good condition, with no holes, perforations, or severe corrosion (ATEC, 1992). At the time of the removal, tank contents consisted of 275 gallons of fuel and sludge (ATEC, 1992). There was no visibly contaminated soil observed in the excavation, and groundwater was not encountered.

During the SI field program, one soil boring was drilled through the UST excavation after the tank had been removed. Soil below the UST excavation consisted of poorly graded sand and gravel grading to a sandy silt. Groundwater was encountered at 12 feet below ground surface (bgs). Bedrock was not encountered in the soil boring.

4.1 SOILS AND SOIL GAS

Subsurface soils were sampled and analyzed both on site and at an off-site laboratory during the tank removal program at SA 43R. These results are summarized in the following paragraphs.

ATEC performed field screening on eight soil samples (SS-1 through SS-8) collected from the walls of the excavation at 5 feet to 6 feet bgs, and two soil samples (SS-9 and SS-10) from the bottom of the excavation (Figure 4-1). VOC concentrations (measured by photoionization detector in soil headspace) ranged from 0.1 to 17.0 parts per million (ppm), and TPHC levels, measured using a Non-Dispersive Infrared (NDIR) Analyzer ranged from 9.9 to 90.3 ppm (ATEC, 1992; Table 4-1). One composite soil sample was collected from the bottom of the excavation by ABB-ES and submitted for laboratory analysis at ABB-ES' Wakefield, Massachusetts laboratory. The results of this analysis indicated a TPHC concentration of 168 ppm (Table 4-1). Based on the results of ATEC's sampling and screening, the soils in the excavation were deemed to be uncontaminated and the excavation was backfilled (ATEC, 1992). However, based on the results of the sample collected and analyzed by ABB-ES, an additional investigation was conducted to confirm the nature and distribution of fuel-related contamination detected in the bottom of the abandoned UST excavation.

SECTION 4

After the excavation was backfilled 10 TerraProbe points were advanced at SA 43R (Figure 2-2). Only two soil samples were collected due to the dense soil, and subsurface obstructions. No BTEX or TPHC were detected in these soil samples (Figure 4-2). Groundwater was not encountered in the first two TerraProbe points so 10 soil gas samples were collected from the 5 foot depth interval from 10 TerraProbe points. This interval was chosen due to the dense soil and subsurface obstruction encountered below this depth. BTEX was not detected in any of the soil gas samples collected (Table 4-2; Figure 4-3).

Soil boring 43R-92-01X was drilled through the middle of the backfilled UST excavation in an attempt to reach the water table directly below the excavation. Groundwater was encountered at 12 feet bgs, and soil samples were collected for laboratory analysis from depths 11 feet to 13 feet and 15 feet to 17 feet bgs. No VOCs or TPHC were detected in either sample and lead was present below the established Fort Devens background concentration (Table 4-3; Figure 4-4).

4.2 GROUNDWATER

Although groundwater was encountered at 12 feet bgs beneath the former tank location, groundwater was not sampled because VOCs and TPHC were not detected in the laboratory analyses of soil samples collected from this boring.

5.0 PRELIMINARY HUMAN HEALTH RISK EVALUATION

A 5,000-gallon UST at SA 43R was discovered by ABB-ES and removed by ATEC during the SI field investigation. The groundwater table was encountered at 12 feet bgs. Prior to backfilling, ATEC collected 10 soil samples from the excavation walls which were screened in the field for TPHC by the NDIR method, and analyzed for TPHC in the laboratory. TPHC levels ranged from 10 ppm to a maximum value of 90 ppm on the NDIR, and from less than 10 ppm to 63 ppm in the laboratory. The TPHC level in a confirmatory soil sample collected by ABB-ES for TPHC analysis by USEPA Method 418.1 was 168 ppm. The excavation was backfilled by ATEC and ABB-ES conducted follow-up SI activity.

Field analysis of two TerraProbe soil samples in the unsaturated zone revealed no measurable concentrations of BTEX or TPHC to a depth of 15 feet bgs. Ten TerraProbe soil gas samples were collected, and no measurable concentrations of BTEX were encountered. A confirmatory boring by ABB-ES supports ABB-ES' field analysis results. Soil samples at 11 feet and 15 feet in the boring through the former UST location (43R-92-01X) showed no residual TPHC contamination. Lead was detected at concentrations below site-specific background (ABB-ES, 1993). Comparing the TPHC results to the calculated risk-based commercial/industrial concentration value of 1,700 ppm for gasoline, and against the Massachusetts Contingency Plan's conservative concentration of 500 ppm, indicates that there should be no significant risk to public health from soil contamination at SA 43R.

6.0 PRELIMINARY ECOLOGICAL RISK EVALUATION

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

7.0 CONCLUSIONS

ATEC's findings during removal of a UST at SA 43R and ABB-ES' field investigation and human health PRE indicate that little residual petroleum contamination exists in soils and that it poses no significant risk to public health. Since the investigation has focused on the subsurface, no ecological PRE was conducted. Therefore, no further action is recommended at this historic gas station.

8.0 DECISION

On the basis of findings at SA 43R, 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 43R from further consideration in the IRP process.

COMMANDER, FORT DEVENS

COLONEL EDWARD NUTTALL
U.S. Army
Installation Commander

Date

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION I, ME AND VT WASTE MANAGEMENT BRANCH

☐ Concur

David M. Webster, Chief

Date

☐ Non-concur (Please provide reasons) _____

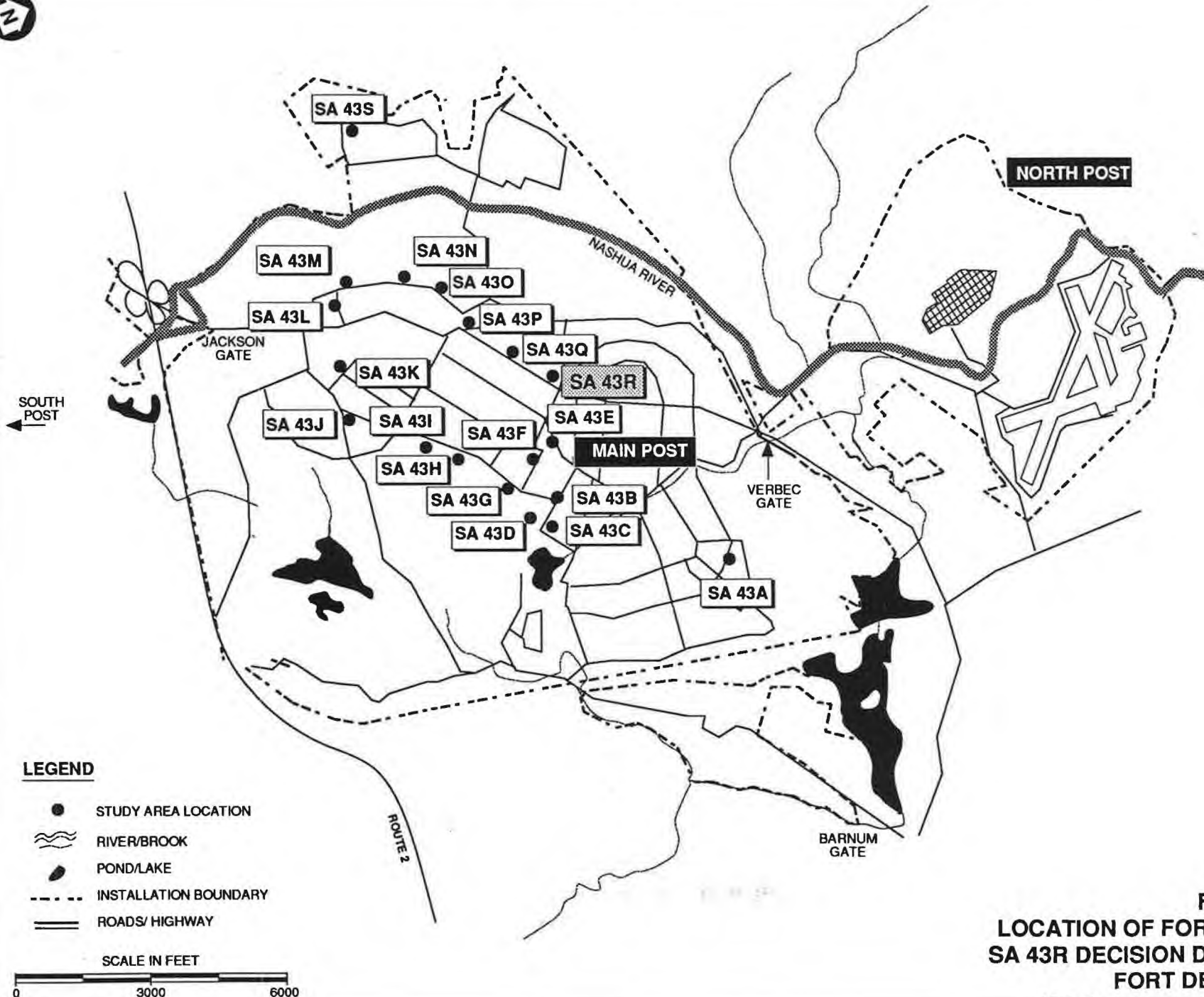
ABB Environmental Services, Inc.

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ABB-ES	ABB Environmental Services, Inc.
ATEC	ATEC Environmental Consultants
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
MEP	Master Environmental Plan
mg/L	milligrams per liter
MSL	mean sea level
NDIR	Non-Dispersive Infrared
PA	Enhanced Preliminary Assessment
ppm	part per million
PRE	Preliminary Risk Evaluation
SA	Study Area
SI	site investigation
TPHC	total petroleum hydrocarbon compounds
USAEC	U.S. Army Environmental Center
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

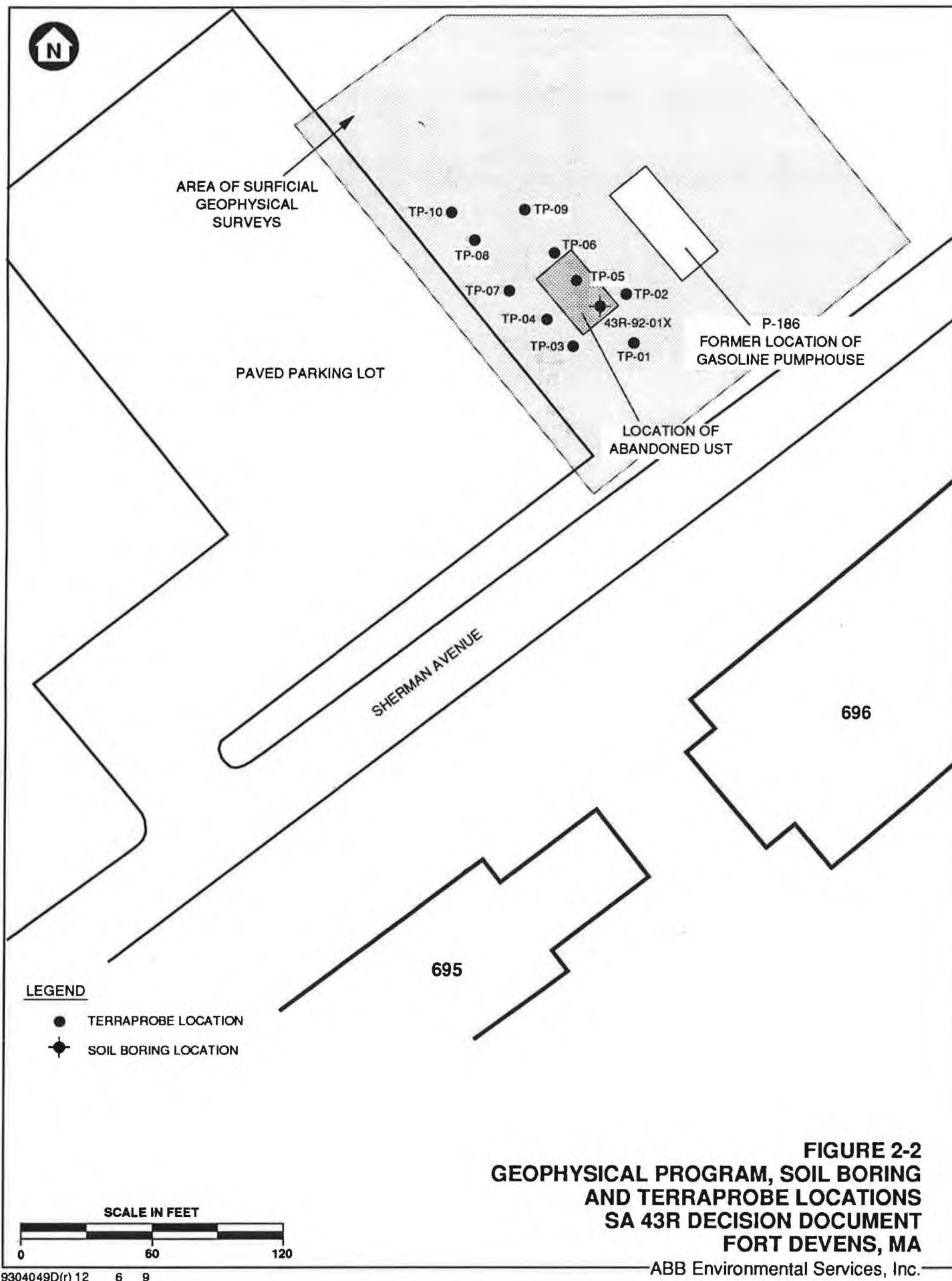
REFERENCES

- 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.
- ATEC Environmental Consultants (ATEC), 1992. "Post-Removal Report, Underground Storage Tank Closure, 5,000-Gallon Diesel Fuel, UST No. 0115, P-185/Sherman Avenue, Fort Devens, Massachusetts"; ATEC File No. 37.07.91.07451; Norwell, MA; prepared for U.S. Army Directorate of Contracting; Fort Devens, MA; July 14.
- 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.



**FIGURE 2-1
LOCATION OF FORT DEVENS
SA 43R DECISION DOCUMENT
FORT DEVENS, MA**

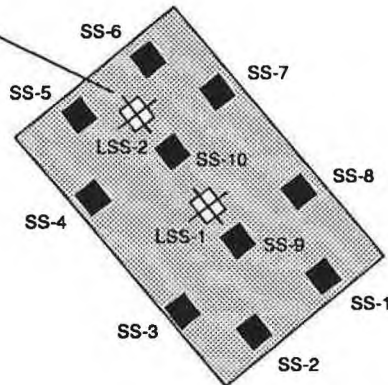
ABB Environmental Services, Inc.







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FORMER LOCATION OF
GASOLINE PUMPHOUSE

LOCATION OF
ABANDONED UST



PAVED PARKING LOT

LEGEND

-  ATEC FIELD SCREENING LOCATIONS
-  ATEC LABORATORY SAMPLE LOCATION

SCALE IN FEET

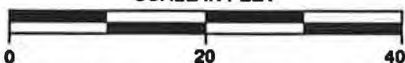


FIGURE 4-1
ATEC FIELD SCREENING LOCATIONS
SA 43R DECISION DOCUMENT
FORT DEVENS, MA



PAVED PARKING LOT

SHERMAN AVENUE

695

696

TP-02	
Depth	15'
TPHC	<55
Benzene	ND
Toluene	ND
Ethylbenzene	ND
Xylene	ND
Orthoxylene	ND

TP-01	
Depth	15'
TPHC	<54
Benzene	ND
Toluene	ND
Ethylbenzene	ND
Xylene	ND
Orthoxylene	ND

P-186
FORMER LOCATION OF
GASOLINE PUMPHOUSE

LOCATION OF
ABANDONED UST

LEGEND

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

NOTES

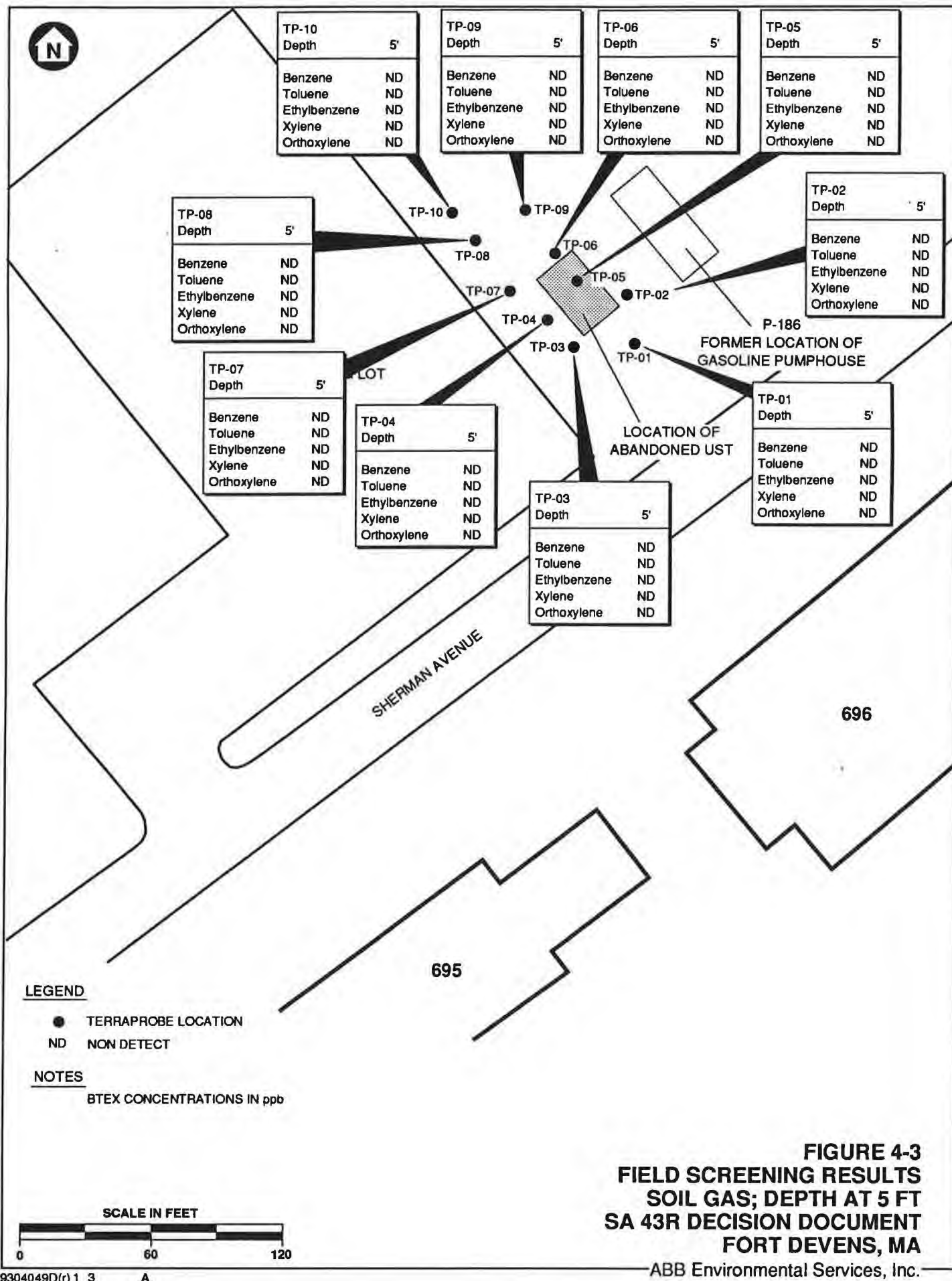
TPHC CONCENTRATIONS IN ppm
BTEX CONCENTRATIONS IN ppb

SCALE IN FEET



FIGURE 4-2
FIELD SCREENING RESULTS
SOIL; DEPTH AT 15 FT
SA 43R DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.



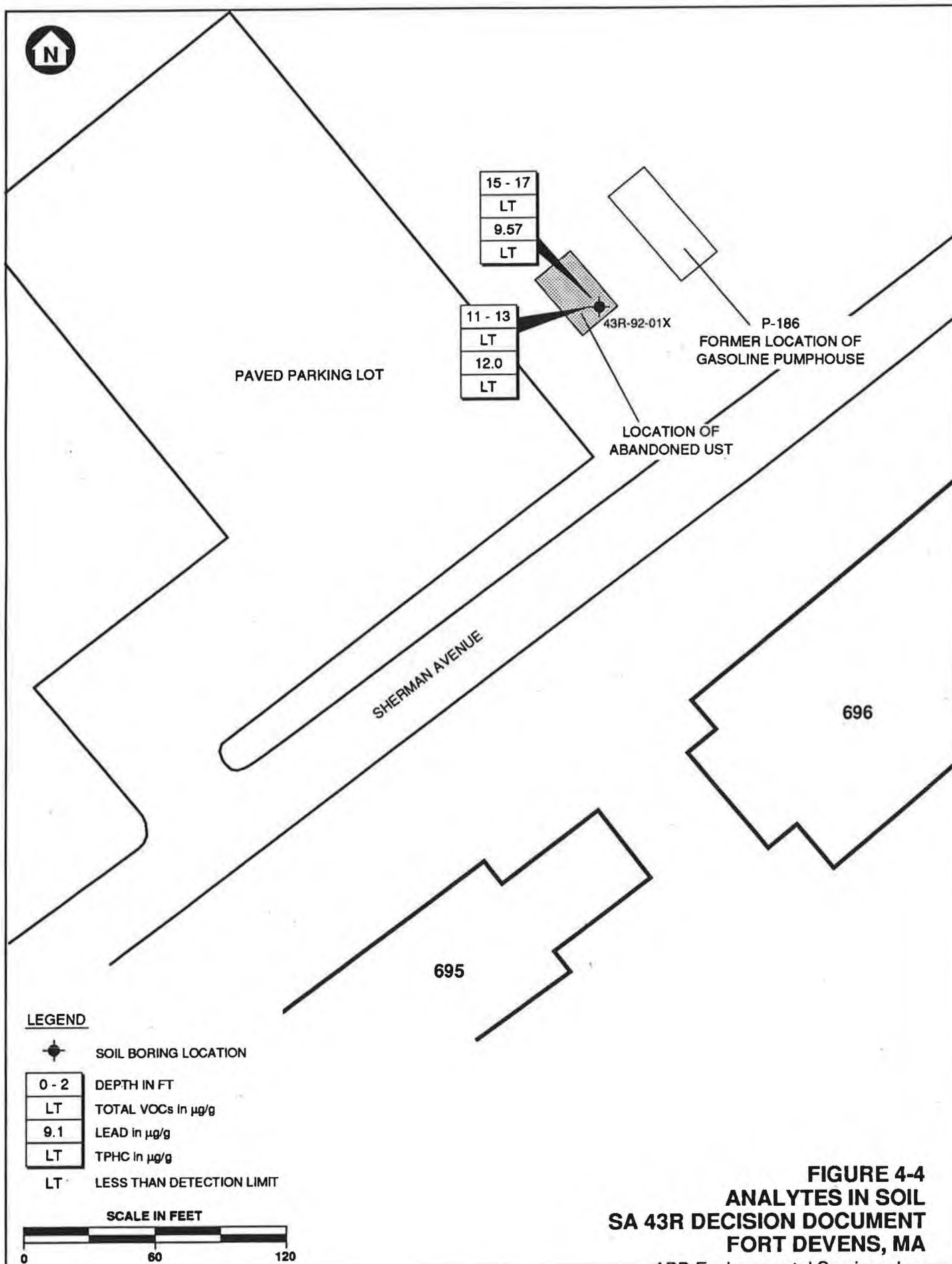


FIGURE 4-4
ANALYTES IN SOIL
SA 43R DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

TABLE 4-1
ATEC/ABB-ES FIELD SCREENING RESULTS
SA 43R - HISTORIC GAS STATIONS

DECISION DOCUMENT
FORT DEVENS

SAMPLE NO.	FIELD SCREENING		LABORATORY
	PID (ppm)	NDIR (ppm)	TPHC (ppm)
SS-1	0.1	18	N/A
SS-2	1.5	53	N/A
SS-3	0.2	28.3	N/A
SS-4	1.1	22.1	N/A
SS-5	17	41.7	N/A
SS-6	1	9.9	N/A
SS-7	1.8	13.9	N/A
SS-8	0.5	31.3	N/A
SS-9	5.2	90.3	N/A
SS-10	0.8	51.3	N/A
LSS-1	N/A	N/A	< 10
LSS-2	N/A	N/A	63
XRE-92-01X	N/A	N/A	168

NOTES:

SS = ATEC FIELD SCREEN SOIL SAMPLE

LSS = ATEC LABORATORY SOIL SAMPLE

XRE-92-01X = ABB-ES COMPOSITE LABORATORY SOIL SAMPLE

N/A = NOT APPLICABLE

PID = Photoionization Detector

NDIR = Non-Dispersive Infrared

TPHC = Total Petroleum Hydrocarbon Compounds

PPM = Part Per Million

TABLE 4-2
FIELD SCREENING RESULTS
SA 43R – HISTORIC GAS STATIONS

DECISION DOCUMENT
FORT DEVENS

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
43TSR01X1501XF	43R	SOIL	TP-01	15	<54	ND	ND	ND	ND	ND	ND	*** TPHCs Detected
43TSR02X1501XF	43R	SOIL	TP-02	15	<55	ND	ND	ND	ND	ND	ND	*** TPHCs Detected
43TGR01XX501XF	43R	SG	TP-01	5	NA	ND	ND	ND	ND	ND	ND	
43TGR02XX501XF	43R	SG	TP-02	5	NA	ND	ND	ND	ND	ND	ND	
43TGR03XX501XF	43R	SG	TP-03	5	NA	ND	ND	ND	ND	ND	ND	
43TGR04XX501XF	43R	SG	TP-04	5	NA	ND	ND	ND	ND	ND	ND	
43TGR05XX501XF	43R	SG	TP-05	5	NA	ND	ND	ND	ND	ND	ND	
43TGR06XX501XF	43R	SG	TP-06	5	NA	ND	ND	ND	ND	ND	ND	
43TGR07XX501XF	43R	SG	TP-07	5	NA	ND	ND	ND	ND	ND	ND	
43TGR08XX501XF	43R	SG	TP-08	5	NA	ND	ND	ND	ND	ND	ND	
43TGR09XX501XF	43R	SG	TP-09	5	NA	ND	ND	ND	ND	ND	ND	
43TGR10XX501XF	43R	SG	TP-10	5	NA	ND	ND	ND	ND	ND	ND	

NOTES:

* = ND denotes a non detect or concentrations below 10 ppb

** = ND denotes a non detect or concentrations below 5 ppb

*** = Detection of Noncalibrated Petroleum Hydrocarbon Peaks

= Study area

TPHC = Total Petroleum Hydrocarbon Compounds

O-XYL = O Xylene

SG = Soil gas

BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes

NA = Not applicable

BEN = Benzene

PPM = Part Per Million

TOL = Toluene

PPB = Part Per Billion

E-BEN = Ethylbenzene

TP = TerraProbe

M/P XYL = M/P Xylene

ND = Not Detected Above Detection Limits

TABLE 4-3
INORGANIC AND ORGANIC COMPOUNDS IN SOIL
SA 43R - HISTORIC GAS STATIONS

DECISION DOCUMENT
FORT DEVENS

ANALYTE	BACK – GROUND	BORING	43R – 92 – 01X	
		DEPTH	11	15
INORGANICS (ug/g)				
LEAD	48.4		12.0	9.57
OTHER (ug/g)				
TOTAL ORGANIC CARBON	–		NA	854.0
TOTAL PETROLEUM HYDROCARBONS			< 27.9	< 27.9

NOTES:

TABLE LISTS DETECTED ANALYTES ONLY -
SEE PROJECT ANALYTE LIST FOR SUMMARY

< = LESS THAN DETECTION LIMIT SHOWN

NA = NOT ANALYZED

**NO FURTHER ACTION DECISION UNDER CERCLA
STUDY AREA 43S
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 1994

**DRAFT
DECISION DOCUMENT
STUDY AREA 43S
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

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DECISION DOCUMENT
STUDY AREA 43S
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

REFERENCES

ABB Environmental Services, Inc.

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DECISION DOCUMENT
STUDY AREA 43S
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

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**DRAFT
DECISION DOCUMENT
STUDY AREA 43S
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

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4-1	Field Screening Results

EXECUTIVE SUMMARY

Investigations of Study Area 43S (Historic Gas Station 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 43S 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 Study Area 43S.

Field investigation of Study Area 43S was initiated in 1992 in conjunction with the other 12 Groups 2, 7, and Historic Gas Stations Study Areas at Fort Devens. The Study Area 43S site investigation consisted of surficial geophysical surveys, 10 TerraProbe points to collect subsurface soil and soil-gas samples, and field analysis of these soil and soil-gas samples.

The surficial geophysical program consisted of a metal detector, magnetometer, and ground penetrating radar surveys. This program was designed to determine if any abandoned underground storage tanks were present at this site. The results of the surficial geophysical surveys did not indicate the presence of an abandoned underground storage tank.

Three soil samples were collected from one locations, because the groundwater table was not encountered. The soil samples were analyzed in the field for benzene, toluene, ethylbenzene, and xylenes and total petroleum hydrocarbons. No benzene, toluene, ethylbenzene, and xylenes were detected in any of the soil samples collected. Total petroleum hydrocarbons were detected at 140 parts per million in the soil sample collected from 21 feet. Because each of the TerraProbe points met refusal before encountering groundwater, soil-gas samples were collected at 8 feet from all 10 TerraProbe points. All of the soil-gas samples were analyzed for benzene, toluene,

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EXECUTIVE SUMMARY

ethylbenzene, and xylenes, only. No benzene, toluene, ethylbenzene, and xylenes compounds were detected in the soil-gas samples collected from SA 43S.

On the basis of findings at Study Area 43S and the Preliminary Risk Evaluation, there is no evidence or reason to conclude that petroleum contamination due to the former underground storage tank has caused significant environmental contamination or poses a threat to human health. The decision has been made to remove Study Area 43S from further consideration in the Installation Restoration Program.

1.0 INTRODUCTION

This decision document has been prepared to support a no further action decision at Study Area 43S - Historic Gas Station Site (SA 43S) 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. 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 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 43S were conducted to support this overall mission.

2.0 BACKGROUND AND PHYSICAL SETTING

2.1 DESCRIPTION AND LAND USE

Fort Devens is located approximately 35 miles northwest of Boston, Massachusetts, 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 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 this function 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, for the Army Readiness Region, for Reserve Components, and for 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 (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 shoppette, cafeteria, post exchange, commissary, bowling alley, golf course, and hospital), administrative buildings, classrooms and training facilities, maintenance facilities, and

SECTION 2

ammunition storage facilities. The Historic Gas Station Sites, including SA 43S, are located on the Main Post.

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 dissected by numerous brooks with attendant wetlands. There are also several kettle ponds and one kettle lake located within the installation.

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2.4 STUDY AREA DESCRIPTION AND HISTORY

SA 43S, one of the 19 Historic Gas Station Sites, is included in the Group 2 SAs located on the Main Post. The structure of the historic gas station at SA 43S consisted of a pump island and a small gasoline pumphouse. Based on available documentation, the gas station at SA 43S was a Type A station with 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 of the decommissioning of the gas station or the removal of the associated UST. This historic gas station was located on the portion of the Main Post that is west of the Nashua River. Currently, the area around this historic gas station is used as a storage and training facility for a U.S. Army communication unit. This facility is approximately 15 acres in size. SA 43S was reportedly located on the western side of the training facility. During the field investigation, a concrete fuel spill containment pad was built approximately 50 feet east of the reported location of SA 43S. The area where the gas station was reportedly located is currently a grassy area bordered on the west by Gorgas Street and on the east by an access road. The entire communications training facility is surrounded by a chain-link fence with a locked gate on the eastern side of the area (Figure 2-2).

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 43S 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

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 field investigation program consisted of a surficial geophysical survey program, 10 TerraProbe points to collect subsurface soil and soil gas samples, and field analysis of these soil and soil gas samples.

The surficial geophysical program consisted of a metal detector, magnetometer, and ground penetrating radar (GPR) survey. This program was designed to determine if any abandoned USTs were present at this site. The metal detector and magnetometer surveys (performed first) covered the majority of the lawn area around SA 43S, while the GPR survey was used to investigate magnetic anomalies detected in the other two surveys (see Figure 2-2). The results of the surficial geophysical surveys did not indicate the presence of any abandoned USTs at the site. The results of the surveys are presented in Appendix L of the SI Report (ABB-ES, 1993).

A total of three soil samples were collected from TP-01, and one soil gas sample was collected from each of the 10 TerraProbe points. The soil samples were analyzed in the field for benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbon compounds (TPHC), while the soil gas samples were analyzed for BTEX, only.

4.0 CONTAMINATION ASSESSMENT

Results of subsurface soil and soil gas analyses are presented below.

4.1 SOILS AND SOIL GAS

Terraprobe location TP-01 was advanced in an attempt to reach the water table. Three soil samples were collected from this location. No other soil samples were collected from the other nine points, because groundwater was not reached in TP-01. BTEX was not detected in any of the soil samples. TPHC was detected at 140 parts per million (ppm) in the soil sample collected from 21 feet (Table 4-1; Figure 4-1). Because each of the TerraProbe points met refusal before encountering groundwater, soil gas samples were collected at a depth of 8 feet below ground surface (bgs) from all 10 TerraProbe points. BTEX was not detected in any of the soil gas samples collected from SA 43S (see Table 4-1; Figure 4-2).

4.2 GROUNDWATER

Groundwater was not encountered at SA 43S.

5.0 PRELIMINARY HUMAN HEALTH RISK EVALUATION

No abandoned USTs was detected by ABB-ES at this location during the geophysical surveys. The groundwater table was not encountered during the SI. Field analysis of three TerraProbe soil samples revealed no measurable concentrations of BTEX to a depth of 21 feet bgs. TPHC was detected in one of these samples at 21 feet bgs (140 ppm). Ten TerraProbe soil gas samples were collected, and no measurable concentrations of BTEX were encountered. There should be no significant risk to public health from soil contamination at SA 43S.

6.0 PRELIMINARY ECOLOGICAL RISK EVALUATION

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

7.0 CONCLUSIONS

The objective of the field sampling program at SA 43S was to determine if residual soil contamination was present at this historic gas station. Based on the results of the field investigation program and human health PRE, it does not appear that the past activities at this site have adversely impacted the soil or groundwater quality. Since the investigation has focused on the subsurface, no ecological PRE was conducted.

TPHC was detected in one soil sample; however, no other residual soil or soil gas contaminants were detected at SA 43S. Therefore, no further action is recommended at this historic gas station.

8.0 DECISION

On the basis of findings at SA 43S, 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 43S from further consideration in the IRP process.

COMMANDER, FORT DEVENS

COLONEL EDWARD NUTTALL
U.S. Army
Installation Commander

Date

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION I, ME AND VT WASTE MANAGEMENT BRANCH

☐ Concur

David M. Webster, Chief

Date

☐ Non-concur (Please provide reasons) _____

ABB Environmental Services, Inc.

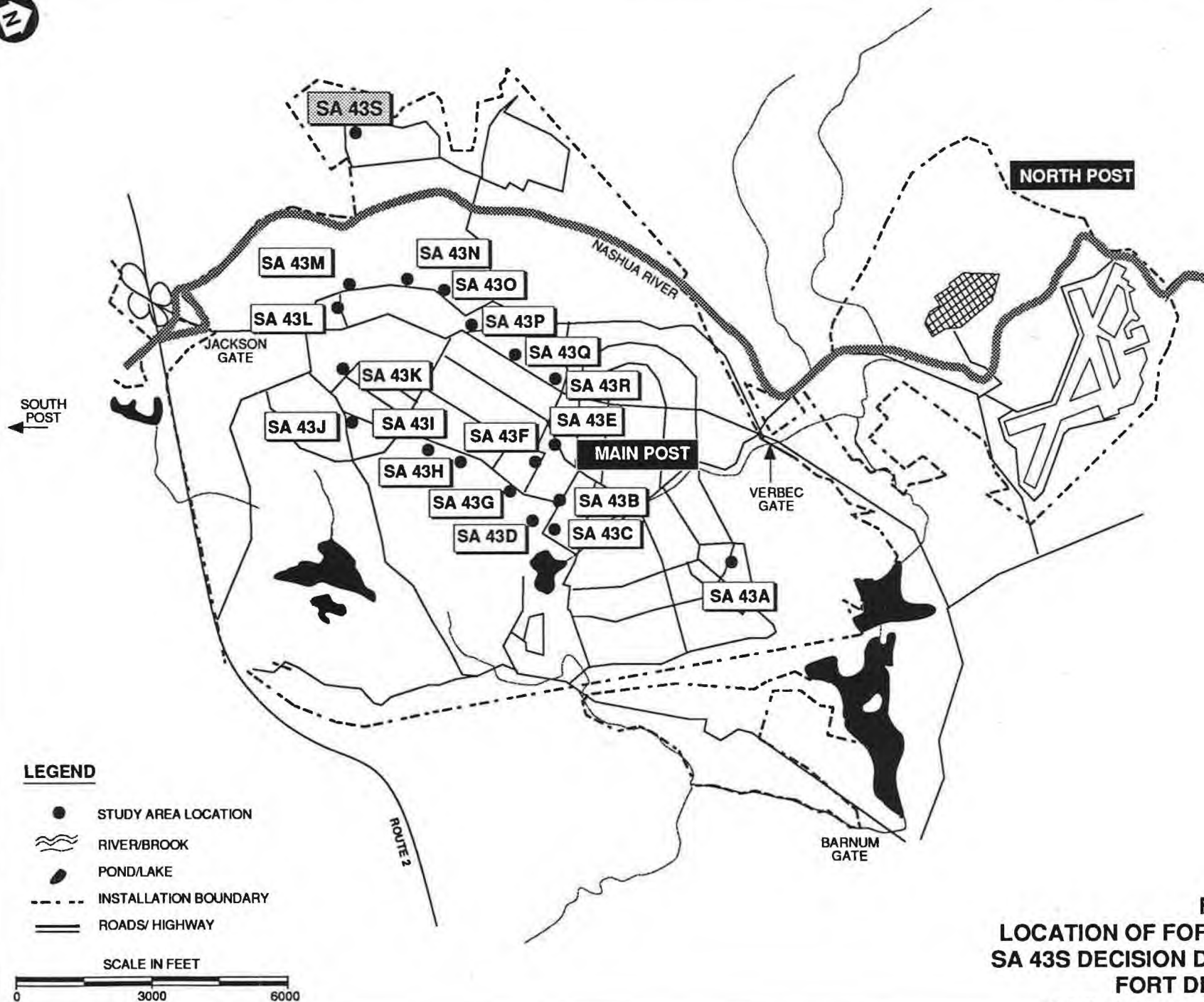
GLOSSARY OF ACRONYMS AND ABBREVIATIONS

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
MEP	Master Environmental Plan
MSL	mean sea level
PA	Enhanced Preliminary Assessment
ppm	part per million
PRE	Preliminary Risk Evaluation
SA	Study Area
SI	site investigation
TPHC	total petroleum hydrocarbon compounds
USAEC	U.S. Army Environmental Center
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

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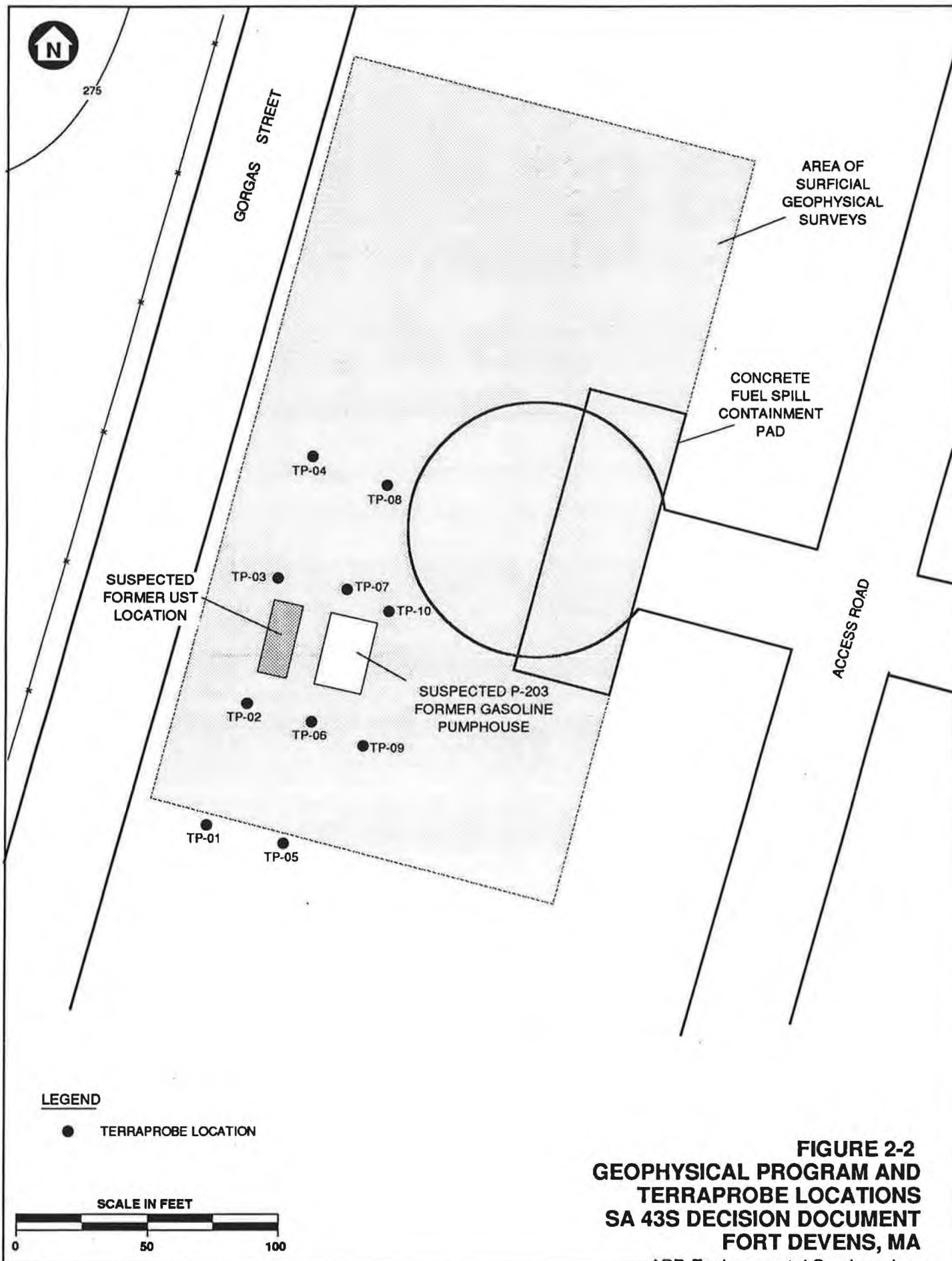
REFERENCES

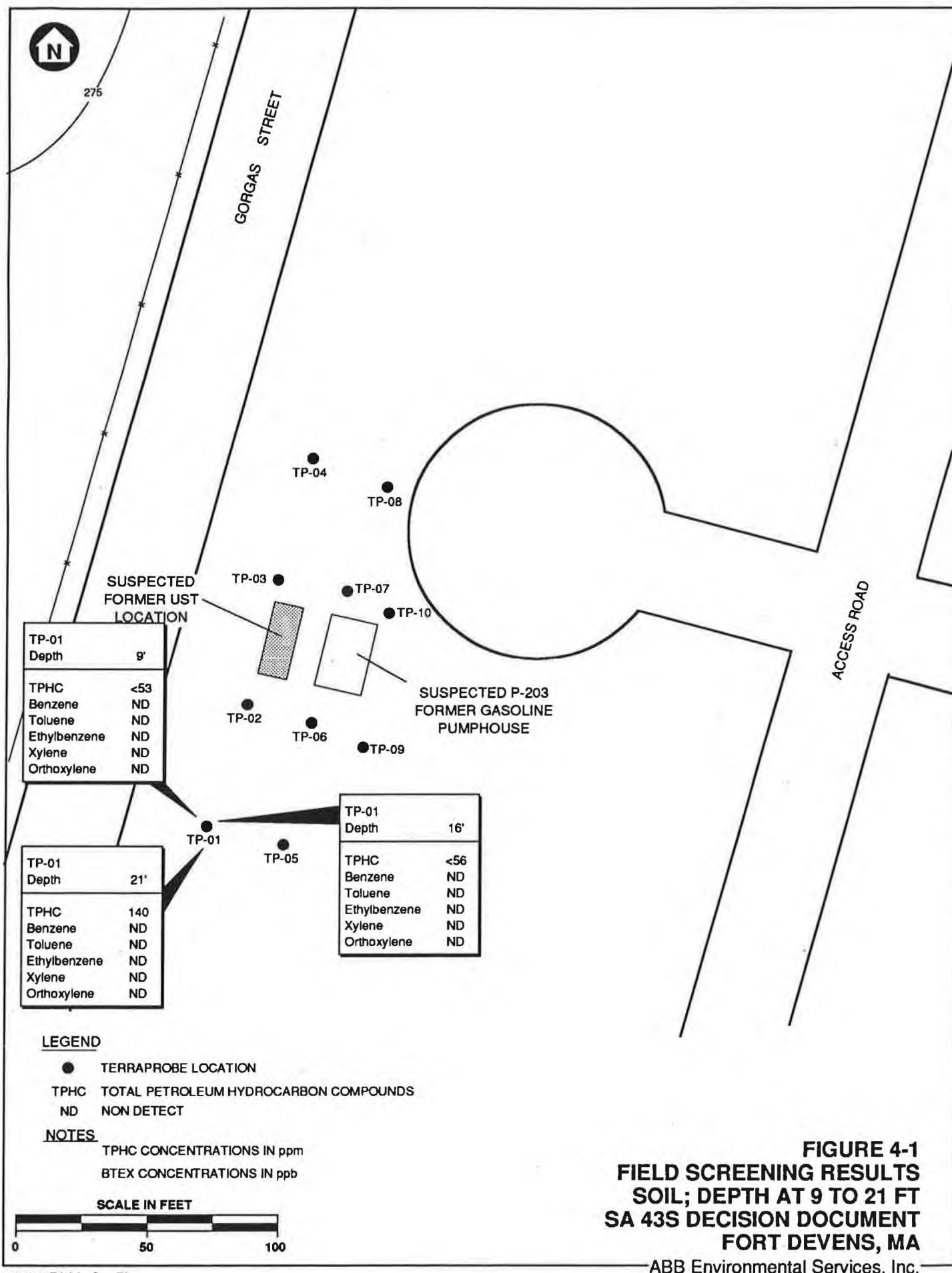
- ABB Environmental Services, Inc. (ABB-ES), 1993. "Final Site Investigation Report - Groups 2, 7, and Historic Gas Stations, Fort Devens, Massachusetts"; Data Item A009; prepared for the U.S. Army Environmental Center by ABB Environmental Services, Inc., Portland, ME, May.
- Barbour, F.A., c. 1941. "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.



**FIGURE 2-1
LOCATION OF FORT DEVENS
SA 43S DECISION DOCUMENT
FORT DEVENS, MA**

ABB Environmental Services, Inc.





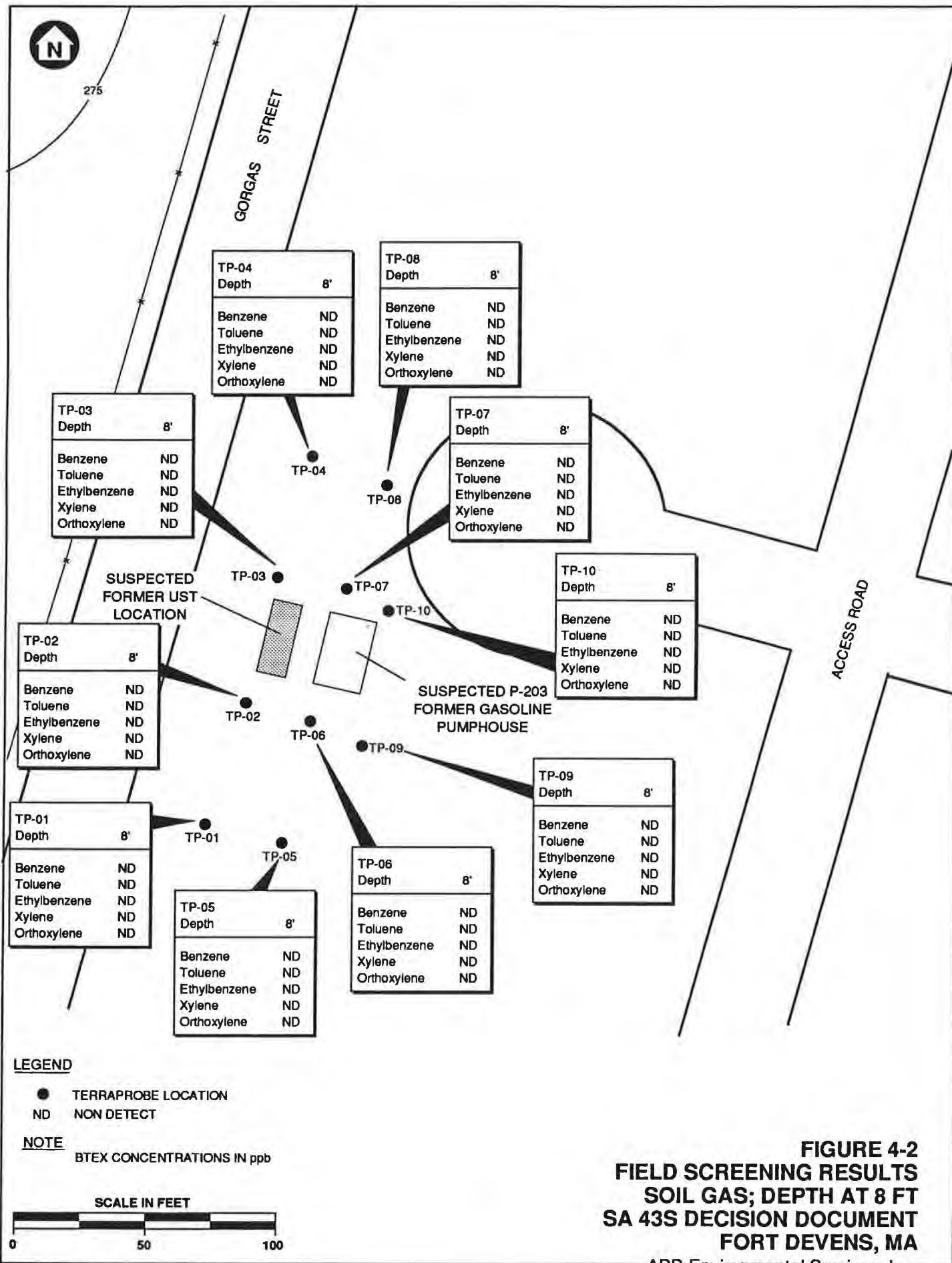


FIGURE 4-2
FIELD SCREENING RESULTS
SOIL GAS; DEPTH AT 8 FT
SA 43S DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

TABLE 4-1
FIELD SCREENING RESULTS
SA 43S - HISTORIC GAS STATIONS

DECISION DOCUMENT
FORT DEVENS

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
43TSS01XX901XF	43S	SOIL	TP-01	9	<53	ND	ND	ND	ND	ND	ND	
43TSS01X1601XF	43S	SOIL	TP-01	16	<56	ND	ND	ND	ND	ND	ND	
43TSS01X2101XF	43S	SOIL	TP-01	21	140	ND	ND	ND	ND	ND	ND	
43TGS01XX801XF	43S	SG	TP-01	8	NA	ND	ND	ND	ND	ND	ND	
43TGS02XX801XF	43S	SG	TP-02	8	NA	ND	ND	ND	ND	ND	ND	
43TGS03XX801XF	43S	SG	TP-03	8	NA	ND	ND	ND	ND	ND	ND	
43TGS04XX801XF	43S	SG	TP-04	8	NA	ND	ND	ND	ND	ND	ND	
43TGS05XX801XF	43S	SG	TP-05	8	NA	ND	ND	ND	ND	ND	ND	
43TGS06XX801XF	43S	SG	TP-06	8	NA	ND	ND	ND	ND	ND	ND	
43TGS07XX801XF	43S	SG	TP-07	8	NA	ND	ND	ND	ND	ND	ND	
43TGS08XX801XF	43S	SG	TP-08	8	NA	ND	ND	ND	ND	ND	ND	
43TGS09XX801XF	43S	SG	TP-09	8	NA	ND	ND	ND	ND	ND	ND	
43TGS10XX801XF	43S	SG	TP-10	8	NA	ND	ND	ND	ND	ND	ND	

NOTES:

* = ND denotes a non detect or concentrations below 5 ppb

** = ND denotes a non detect or concentrations below 10 ppb

= Study area

NA = Not applicable

SG = Soil gas

TP = TerraProbe

ND = Not Detected Above Detection Limit

TPHC = Total Petroleum Hydrocarbon Compounds

BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes

BEN = Benzene

TOL = Toluene

E-BEN = Ethylbenzene

M/P - XYL = M/P Xylenes

O - XYL = O Xylenes