U.S. Army Environmental Center

NO FURTHER ACTION DECISION UNDER CERCLA

STUDY AREA 43Q
HISTORIC GAS STATION SITES

FORT DEVENS, MASSACHUSETTS

CONTRACT DAAA15-91-D-0008

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

JANUARY 1995

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Prepared for:

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

Prepared by:

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

JANUARY 1995

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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

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.

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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, 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

ammunition storage facilities. The Historic Gas Station Sites, including SA 43Q, 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 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.

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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

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.

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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.

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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.

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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.

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8.0 DECISION

On the basis of the 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 pose a threat to human health or the environment. The decision has been made to remove SA 43Q from further consideration in the IRP process. In accordance with CERCLA 120 (h) (3), all remedial actions necessary have taken place, and the USEPA and MADEP signatures constitute concurrence in accordance with the same.

James C Chambers

JAMES C. CHAMBERS
BRAC Environmental Coordinator

18 JAN 95
Date

U.S. ENVIRONMENTAL PROTECTION AGENCY

James P. Byrne

JAMES P. BYRNE
Fort Devens Remedial Project Manager

1/18/95
Date

[X] Concur

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

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

D. Lynne Welsh

D. LYNNE WELSH
Section Chief, Federal Facilities - CERO

1/18/95
Date

[X] Concur

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

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

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.

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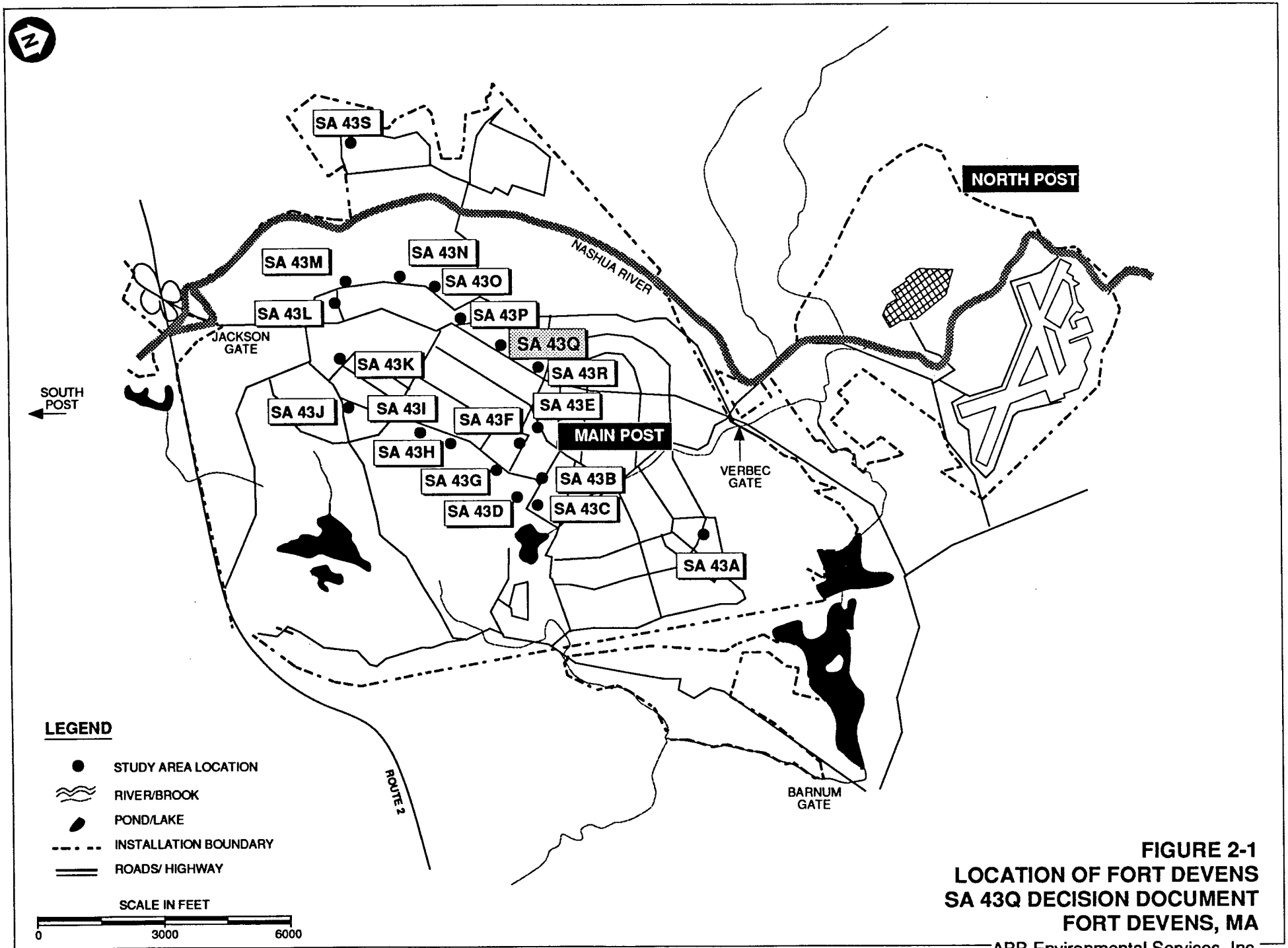

FIGURE 2-1
LOCATION OF FORT DEVENS
SA 43Q DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

9304049D(wm) 23

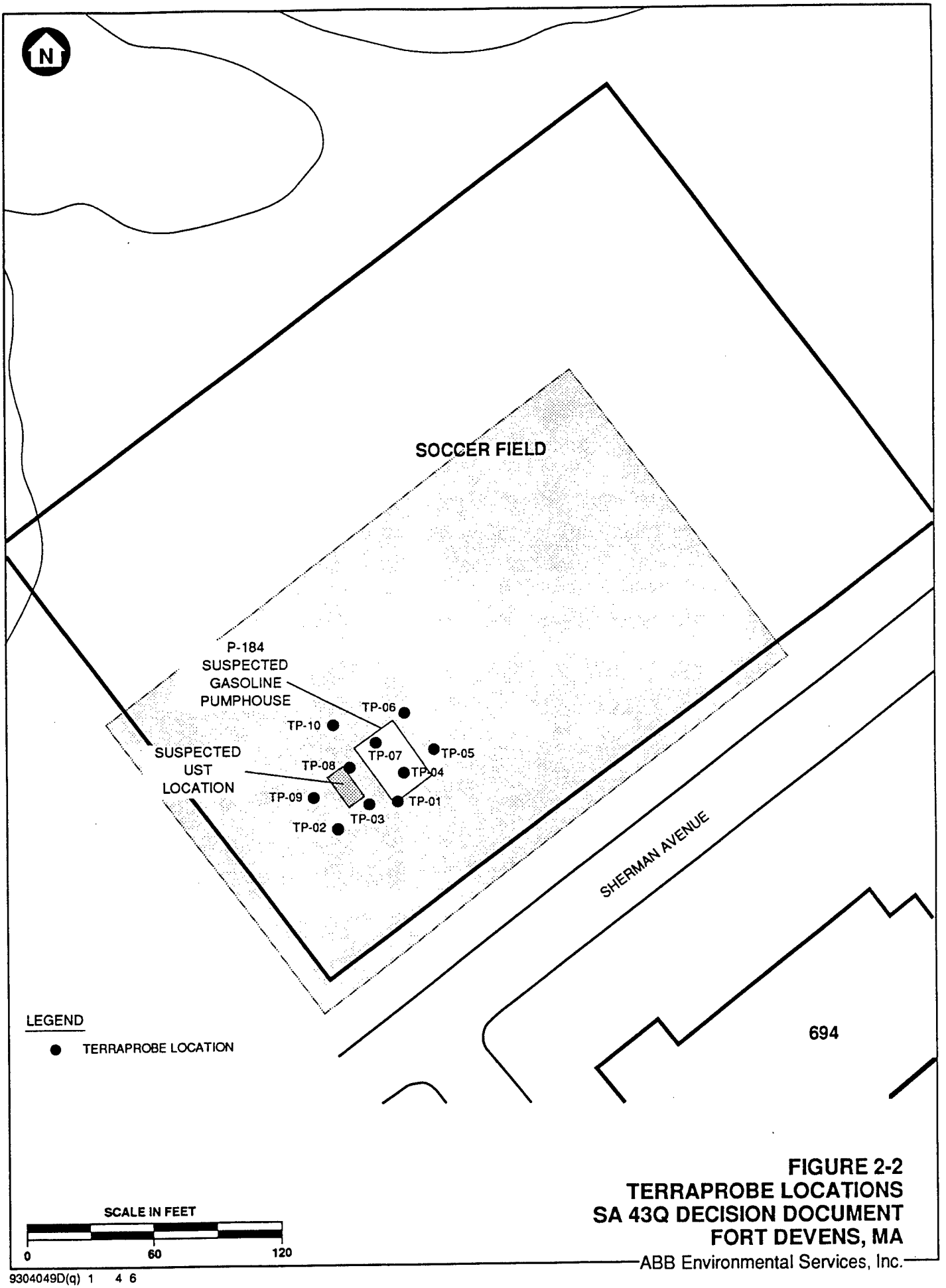

FIGURE 2-2
TERRAPROBE LOCATIONS
SA 43Q DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

9304049D(q) 1 4 6

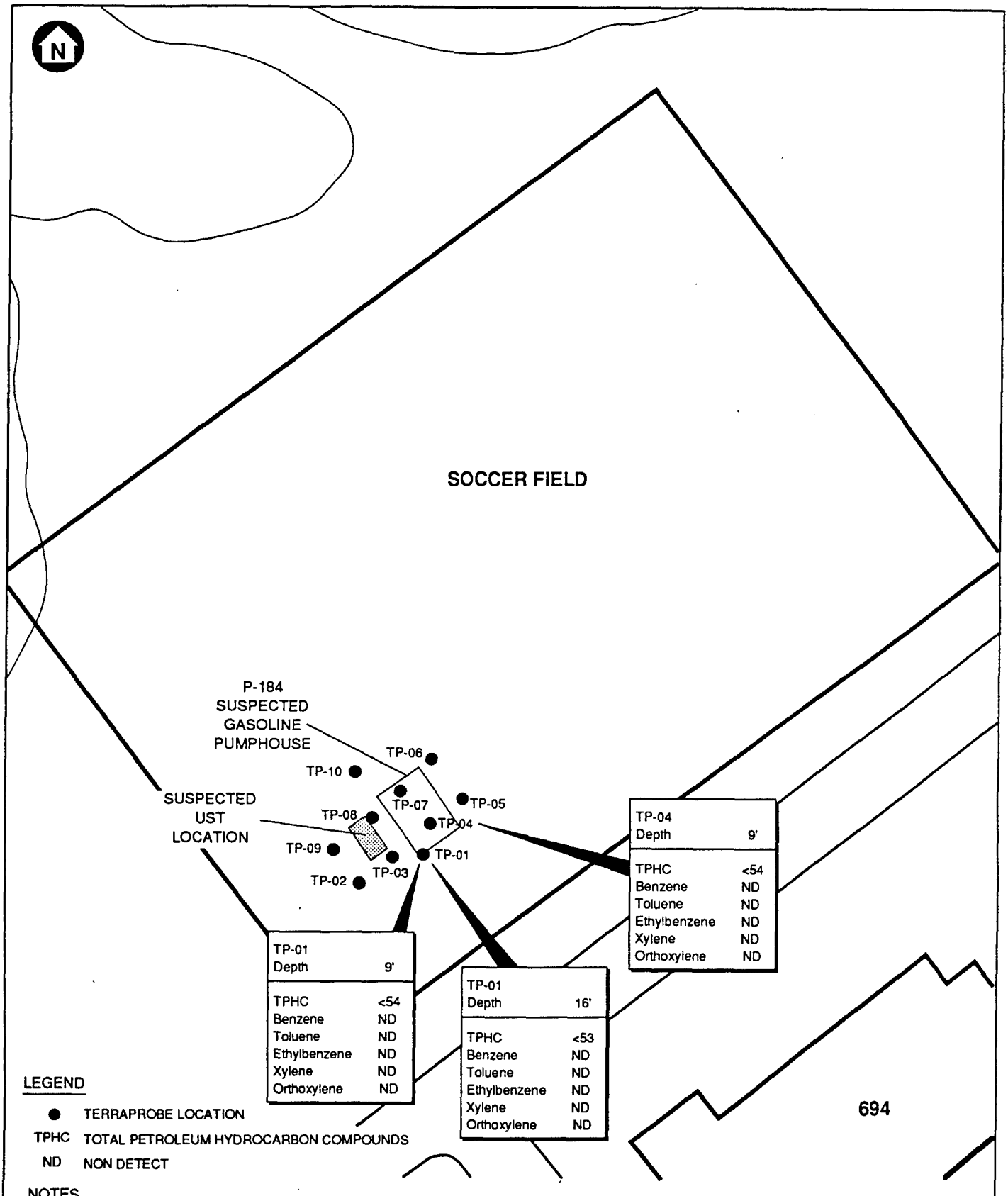

FIGURE 4-1
FIELD SCREENING RESULTS
SOIL; DEPTH AT 9 TO 16 FT
SA 43Q DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

9304049D(q) 1 3 7

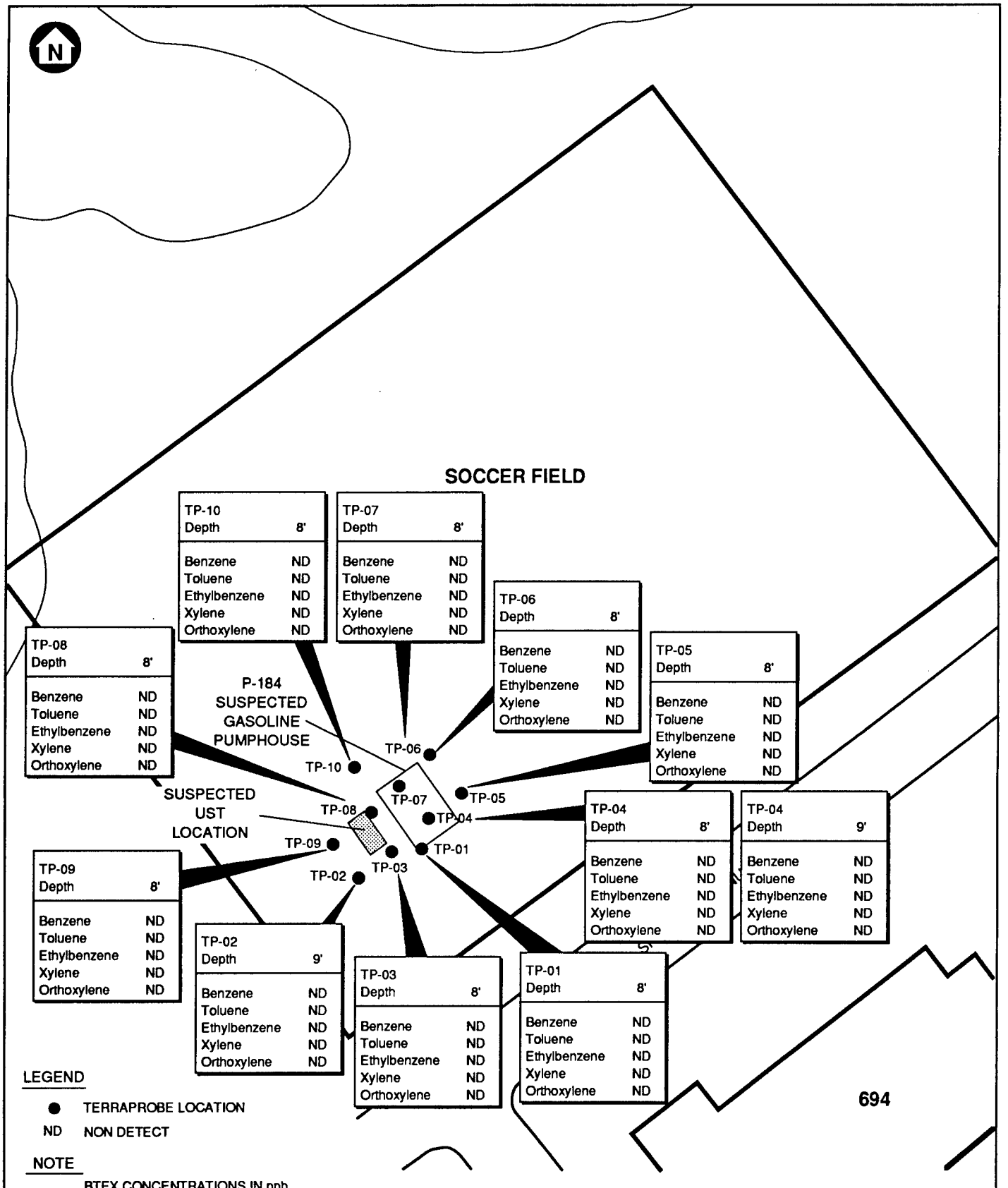

FIGURE 4-2
FIELD SCREENING RESULTS
SOIL GAS; DEPTH AT 8 TO 9 FT
SA 43Q DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

9304049D(q) 1 2 8

TABLE 4–1
FIELD SCREENING RESULTS
SA 43Q – 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
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	
43TGQ01XX801XF	43Q	SG	TP–01	8	NA	ND	ND	ND	ND	ND	ND	
43TGQ02XX901XF	43Q	SG	TP–02	9	NA	ND	ND	ND	ND	ND	ND	
43TGQ03XX801XF	43Q	SG	TP–03	8	NA	ND	ND	ND	ND	ND	ND	
43TGQ04XX801XF	43Q	SG	TP–04	8	NA	ND	ND	ND	ND	ND	ND	
43TGQ04XX901XF	43Q	SG	TP–04	9	NA	ND	ND	ND	ND	ND	ND	
43TGQ05XX801XF	43Q	SG	TP–05	8	NA	ND	ND	ND	ND	ND	ND	
43TGQ06XX801XF	43Q	SG	TP–06	8	NA	ND	ND	ND	ND	ND	ND	
43TGQ07XX801XF	43Q	SG	TP–07	8	NA	ND	ND	ND	ND	ND	ND	
43TGQ08XX801XF	43Q	SG	TP–08	8	NA	ND	ND	ND	ND	ND	ND	
43TGQ09XX801XF	43Q	SG	TP–09	8	NA	ND	ND	ND	ND	ND	ND	
43TGQ10XX801XF	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