

Comments & Responses

Nov. 9+10, 1992

DECISION DOCUMENT

NO FURTHER ACTION UNDER
COMPREHENSIVE ENVIRONMENTAL RESPONSE,
COMPENSATION AND LIABILITY ACT
STUDY AREA 24 (BUNKER 187)
FORT DEVENS MASSACHUSETTS

Final

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Prepared By:

United States Army Environmental Center
formerly United States Army
Toxic and Hazardous Materials Agency

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STUDY AREA 24 (BUNKER 187) DECISION DOCUMENT
FORT DEVENS MASSACHUSETTS

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EXECUTIVE SUMMARY

Extensive study of Study Area 24 (Bunker 187) at Fort Devens Massachusetts has resulted in the conclusion that no further studies or remediation are required at this site. Study Area 24 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 21 December 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 24.

Field investigation of Study Area 24 was conducted during 1991 in conjunction with a site investigation of six sites on Fort Devens. The field investigation consisted of an inspection of the structure and the collection of five surface soil samples from the areas around the bunker. The bunker was determined to be structurally sound following a joint Army/Environmental Protection Agency inspection, with no potential for release of contaminants through cracks in the floor. Analysis of the samples did not detect any explosive compounds, the primary contaminant of concern. One sample was analyzed using the Toxicity Characteristics Leaching Procedure for extraction and analysis of the leachate for metals and organic compounds. This analysis resulted in anomalous levels of one compound. Silver was detected at a level of 415 micrograms per liter, which is below the threshold for characterization as a hazardous waste (5000 micrograms per liter). Results of chemical analyses are presented in Appendix J of the Group 1B Site Investigations Report (USATHAMA, 1992c).

Study Area 24 was a portion of a permitted Resource Conservation and Recovery Act Title X Storage and Disposal permitted facility. The facility was operating under an interim permit, which expired in November, 1992. Closure of the facility in accordance with the provisions of the Resource Conservation and Recovery Act is ongoing.

Based upon results of the study, it was determined that there is no evidence or reason to conclude that activities at Bunker 187 have caused environmental impact or pose a threat to human health or the environment.

1.0 INTRODUCTION

This decision document is being prepared to support a no-further action decision at Study Area (SA) 24 (Bunker 187) at Fort Devens, Massachusetts. The report was prepared as a 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 Toxic and Hazardous Materials Agency (USATHAMA) initiated a Master Environmental Plan (MEP) in 1988. SA 24 was identified as potential source of contamination in the MEP. On 21 December, 1989, Fort Devens was placed on the National Priorities List (NPL) under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA). In September 1990, DOD, through USATHAMA, initiated a Site Investigation (SI) for six sites at Fort Devens. The SI was conducted by Ecology and Environment, Inc. SA 24 was included in this SI.

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, the Fort 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 current mission of Fort Devens is to command and train its assigned units and support various tenant activities.

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 conducted at SA 24 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, adjacent to the town of Ayer and within Middlesex and Worcester counties. The installation consists of approximately 9,280 acres and includes portions of the towns of Ayer, Harvard, Lancaster, and Shirley. Cities in the vicinity include Fitchburg, Leominster and Lowell. Land surfaces range from about 200 feet (ft) above mean sea level (MSL) along the Nashua River in the northern portion of the installation to 450 ft above MSL in the southern portion of the installation.

Fort Devens 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, including SA 24, 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 the shoppette, cafeteria, post exchange, commissary, bowling alley, golf course, and hospital), administrative buildings, classrooms and training facilities, maintenance facilities, and ammunition storage facilities (including Bunker 187).

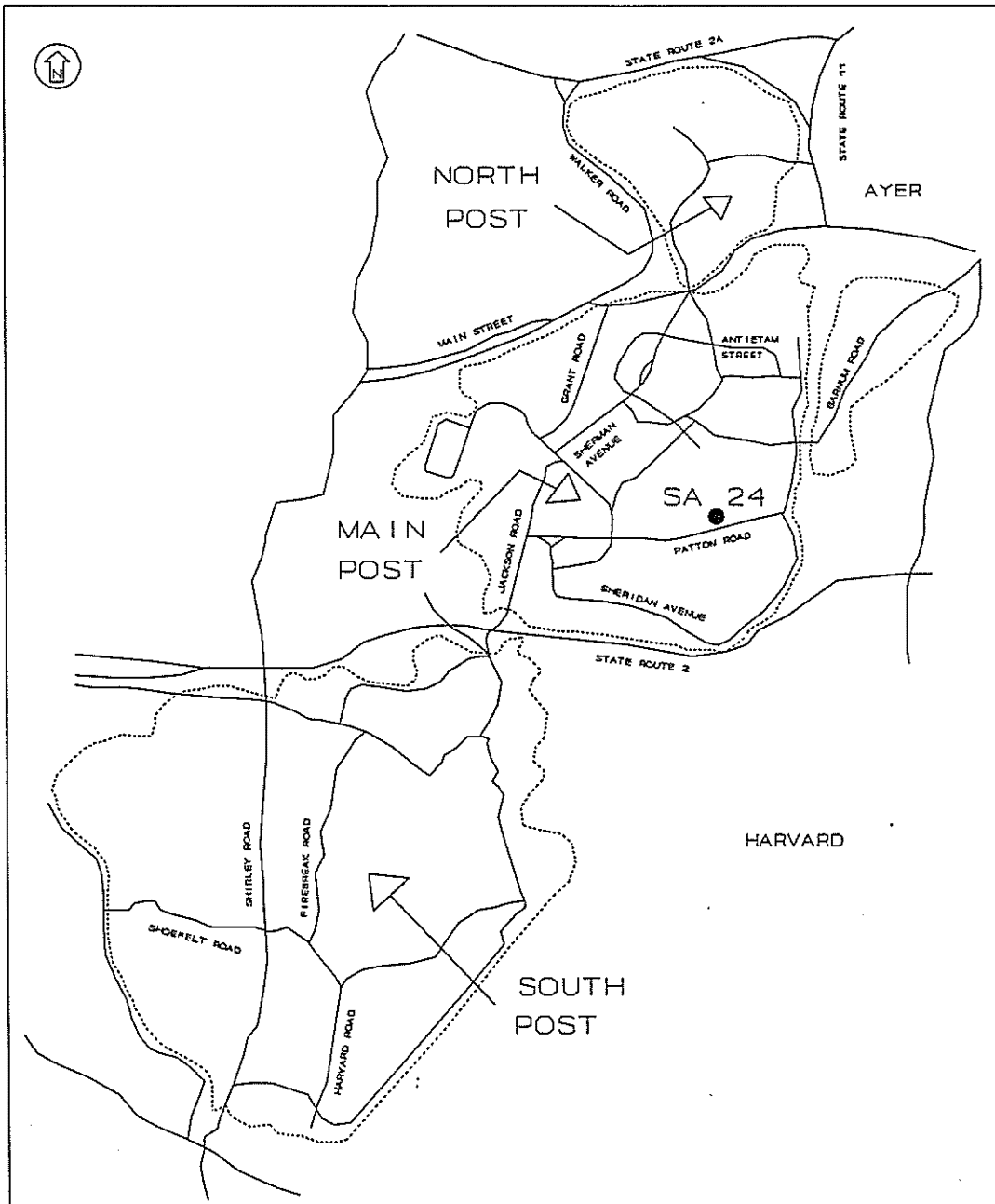
The South Post is located south of Massachusetts Highway 2 and contains individual training areas designated for troop training, range activities, and a drop zone. The Nashua River bounds the South Post on the northeast side.

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. 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.

2.2 CLIMATE

The climate of Fort Devens is typical of the northeastern United States, with long cold winters and short, moderately warm summers. Average temperatures vary from a low of 17 degrees

FIGURE 2-1, LOCATION OF SA 24



LEGEND:

— ROAD

- - - - - INSTALLATION BOUNDARY

SCALE IN MILES



Fahrenheit in January to a high of 83 degrees Fahrenheit in July, with an annual mean temperature of about 50 degrees Fahrenheit.

The area receives about 39 inches of precipitation a year. Average annual snowfall is 65 inches per year.

On an annual basis, westerly winds predominate, with a mean annual wind speed of about 5 miles per hour.

2.3 REGIONAL GEOLOGY AND HYDROGEOLOGY

2.3.1 Regional Geology

Fort Devens is near the western boundary of the Seaboard Lowland Section of the New England-Maritime Physiographic province (Jahns, 1952). 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.

2.3.2 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 dependant upon the hydraulic characteristics of the aquifer and can range from 2 to >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 the installation is the Nashua River, which flows through the installation in a south to north direction, with a 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

Study Area 24 consists of the Waste Explosives Storage Bunker, also known as Bunker 187 or building 3644. The bunker is located within the magazine area, which is located north of Patton Road, on the Main Post area of Fort Devens (Figures 2-1 and 2-2). The

bunker is a small (approximately 60 ft by 60 ft), in-ground Quonset hut with cement floors.

The U.S. Army 14th Explosives Ordnance Disposal (EOD) Detachment commands Bunker 187. Explosives that are designated for disposal at the EOD Range (SA 25) are stored in the bunker prior to disposal. The 14th EOD detachment provides explosives disposal for the entire New England area, both civilian and military. The source of waste explosives ranges from on-site finds during excavation to explosives found, confiscated, or otherwise removed by the state police. About 1,000 pounds of explosives are destroyed annually (DEH, 1985).

The types of explosives stored in the bunker include a broad range of materials that vary with time. Table 2-1 lists typical items that are stored in the bunker and detonated at the range (DEH, 1985, Fox, 1988)

TABLE 2-1

WASTE EXPLOSIVES STORED AND DISPOSED OF AT FORT DEVENS

Small Arms	PETN
Artillery/mortar	(pentaerythritoltetranitrate)
Grenades	RDX (cyclotrimethylene
Rockets	trinitroamine)
Pyrotechnic compound	C-4 (RDX, polysibutylene)
Bulk Explosives	Compound B (RDX, TNT, Wax)
Photoflash powder	Octol (cyclotetramethylene,
Lead azide	tetranitroamine)
Black powder	White Phosphorous
Hazardous explosives material	TNT (trinitrotoluene)

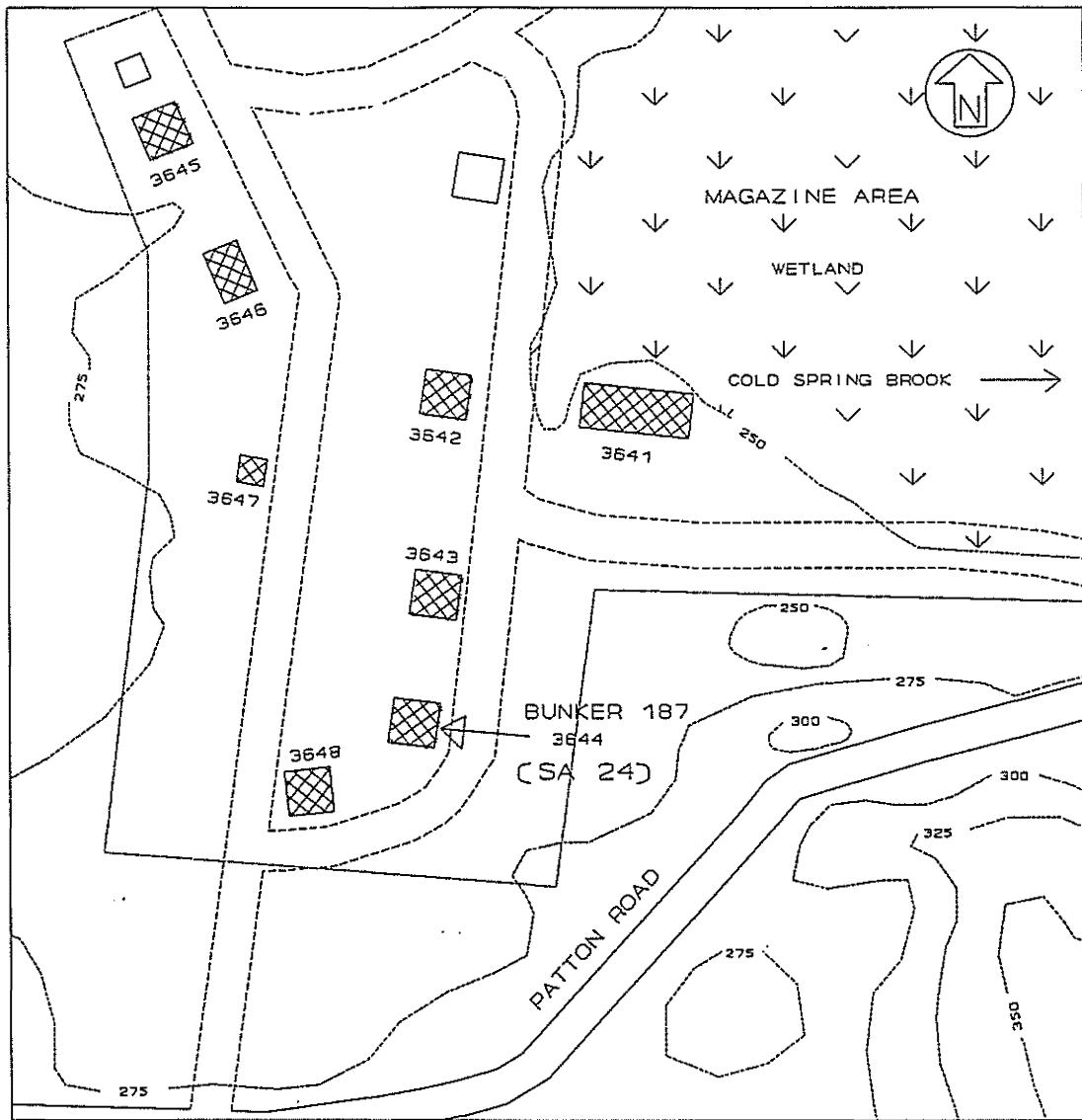
2.5 RELATED INVESTIGATIONS

2.5.1 Master Environmental Plan



The Master Environmental Plan (MEP) was initiated in 1988 as a part of the Army IRP action at Fort Devens. The MEP was completed by Argonne National Laboratory in April 1992, under contract to USATHAMA, and listed 58 SAs. Bunker 187 was designated as SA 24.

The study conducted under the MEP consisted primarily of a review of existing studies and identification of potential environmentally significant areas. Bunker 187 was designated as a possible source for release of contaminants into the environment and the collection of three surface soil samples near the bunker entrance with analysis for explosives and Toxicity





FIGURE 2-2, ILLUSTRATION OF STUDY AREA 24



LEGEND:

- 275 — CONTOUR (feet)
- 3648
 BUILDING, PERMANENT
-  BUILDING, TEMPORARY

SCALE IN FEET

- 
- 0 100 200 400
 -  ROAD, SURFACED
 -  ROAD, UNIMPROVED
 -  FENCE

2.5.2 Enhanced Preliminary Assessment

The Enhanced Preliminary Assessment (PA) was initiated in 1991 as a result of the inclusion of Fort Devens on the Base Closure listing pursuant to Public Law 101-510, the Defense Base Realignment and Closure Act of 1990. The Enhanced PA was completed by Roy F. Weston, Inc. in April 1992, under contract to USATHAMA.

The purpose of the Enhanced PA was to review the study and recommendations of the MEP and consider other areas that might require evaluation due to the closure of Fort Devens. The only additional recommendation for SA 24 was that the facility undergo a Resource Conservation and Recovery Act (RCRA) closure in conjunction with the closure of the EOD range (SA 25). The interim permit of the facility expired in November 1992, and the facility is currently undergoing closure procedures.

2.5.3 Site Investigations Report

The Site Investigation (SI) of the area was initiated in 1990 and included six of the SAs listed in the MEP:

- SA 15 (Landfill 11)
- SA 24 (Bunker 187)
- SA 25 (EOD Range)
- SA 26 (Zulu I and Zulu II Ranges)
- SA 32 (Defense Re-utilization and Marketing Office storage yard)
- SA 28 (Underground Storage Tank Leak at Building 202)

The SI was conducted by Ecology and Environment, Inc., under contract to USATHAMA. The purpose of the site investigation was to verify the presence or absence of contaminants associated with the study areas and determine if further studies were required. Field work was completed in the summer of 1991. The regulatory draft final version of the report was issued in September 1992. The work conducted and results are described in section 4.0 of this document.

3.0 PHYSICAL SETTING AND CHARACTERISTICS

Bunker 187 (SA 24) is located within the magazine area, which lies within the Main Post area, north of Patton Road (Figure 2-2). The bunker is situated on a flat topped terrace of glacial outwash. Excavation to construct the bunker, and small cuts along the unsurfaced roads, indicate that the soils are predominantly sandy and gravelly. There is little evidence of run-off in the form of gullying or erosion. A wetland occurs 600 feet to the northeast of the bunker and discharge from the wetland is the source of Cold Spring Brook. Bunker 187 is located approximately 1,600 feet to the west of Area of Contamination (AOC) 40 (Cold Spring Brook Landfill). The Patton Well, which is a water supply well for Fort Devens, is 1,000 feet to the south.

The soils at Bunker 187 belong to the Quonset-Hinckley-Windsor Association. They are well to excessively drained and infiltration from rainfall probably discharges to the wetland northeast of the bunker.

4.0 CONTAMINATION ASSESSMENT

The concern at the SA was to determine whether the explosives stored at this bunker were handled properly, and to investigate the possibility of spills and other releases occurring in the general area of the bunker. To accomplish this, five surface soil samples (0 to 6 inches) were taken from the area around the bunker during the SI. The location of the samples is shown in Figure 4-1. After collection, all five samples were analyzed for explosives compounds. Additionally, one sample was further analyzed using the TCLP and analyzing the extract for metals and organics. Appendix J of the Group 1B SI Report (USATHAMA, 1992c) shows results for all sampling. Table 4-1 shows the sample scheme for the SI. Additionally, the interior of the bunker was inspected to determine if there was a potential for release through floor drains or cracks in the concrete.

TABLE 4-1

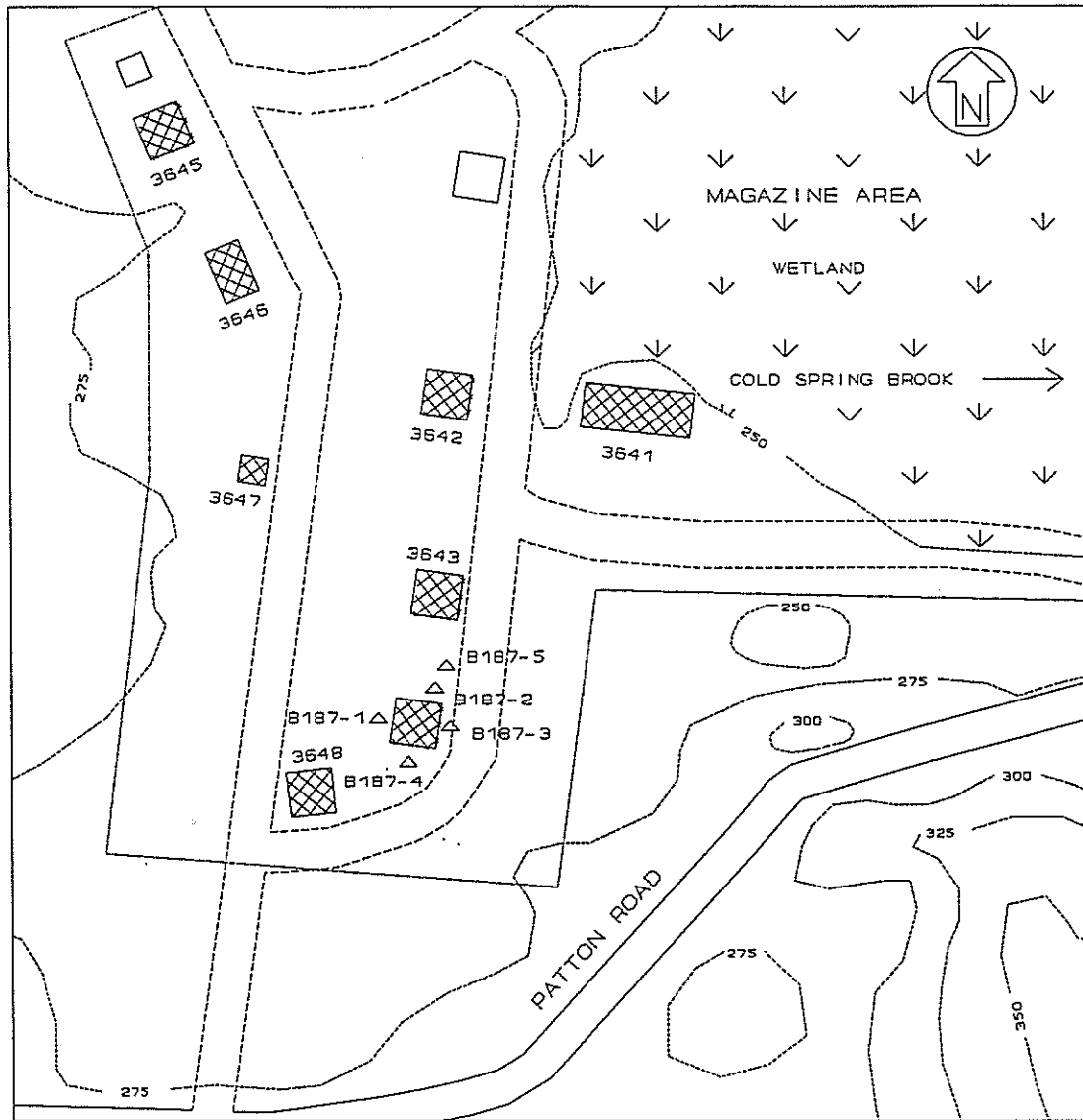
SAMPLE SCHEME FOR SA 24

SITE TYPE	SITE ID	ANALYSIS
Surface Soil	B187-1	Explosives
Surface Soil	B187-2	Explosives
Surface Soil	B187-3	Explosives
Surface Soil	B187-4	Explosives
Surface Soil	B187-5	Explosives, TCLP Metals/Organics




Analysis of all five soil samples showed no explosives above the detection limits. The only contaminant noted in the soils at this site was 415 µg/L (micrograms per liter) of silver in the TCLP extract from sample B187-5. This is below the level that would characterize the soil as a hazardous waste (5000 µg/L) in accordance with RCRA (40 CFR §261.24(a) & (b)). Also, silver was not detected in a down-gradient groundwater monitoring well (CSB-1) sampled during the Remedial Investigation of AOC 40 (Cold Spring Brook Landfill)

Inspection of the bunker resulted in the conclusion that the bunker itself was structurally sound. There were no floor drains or cracks in the floor that would allow spilled materials to be released through the floor into the soil below. Also, storage and handling practices observed involved containerization and other measures to minimize the potential of release.





FIGURE 4-1, SAMPLING LOCATIONS AT SA 24



LEGEND:

- 275 — CONTOUR (feet)
- 3648
 BUILDING, PERMANENT
-  BUILDING, TEMPORARY
-  SURFACE SOIL SAMPLE
 B187-4

SCALE IN FEET

- 
-  ROAD, SURFACED
 -  ROAD, UNIMPROVED
 -  FENCE

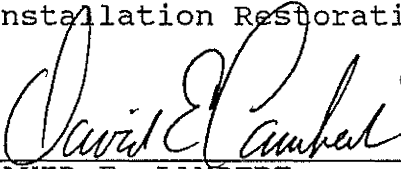
5.0 CONCLUSIONS

Based upon the results of studies at SA 24 (Bunker 187), it is concluded that no further investigation or remediation is required at this SA. The bunker was determined to be structurally sound and there is no evidence that possible mishandling of explosives has resulted in a release of hazardous substances to the environment. The one anomalous level (silver at 415 $\mu\text{g}/\text{L}$) of contaminants was below the threshold for characterization as a hazardous waste.

The decision of no further action is protective of human health and the environment due to the fact that contamination resulting from operations at the bunker was not detected.

6.0 DECISION

On the basis of study at Study Area 24 (Bunker 187), there is no reason or evidence to conclude that operations at the bunker involving the storage and handling of waste explosives have caused significant environmental contamination or pose a threat to human health or the environment. The decision has been made to remove Study Area 24 from further consideration in the Installation Restoration process.



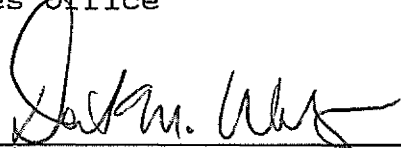
DAVID E. LAMBERT
Colonel, U.S. Army
Acting Installation Commander

COMMANDER, FORT DEVENS

22 Feb 93
Date

U.S. Environmental Protection Agency
Region I, Federal Facilities Office

Concur



Signature
3/8/93
Date

Non-concur (Please provide reasons) _____

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

AOC	Area of Contamination
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DEH	Directorate of Engineering and Housing
DOD	Department of Defense
EOD	Explosive Ordnance Disposal
ft	feet
gpm	gallons per minute
IRP	Installation Restoration Program
MCL	Maximum Contaminant Level
MEP	Master Environmental Plan
MSL	Mean Sea Level
NPL	National Priorities List
PA	Preliminary Assessment
RCRA	Resource Conservation and Recovery Act
SA	Study Area
SARA	Superfund Amendments and Reauthorization Act
SI	Site Investigation
$\mu\text{g/L}$	micrograms per liter
USAEC	U.S. Army Environmental Center formerly U.S. Army Toxic and Hazardous Materials Agency (USATHAMA)
TCLP	Toxicity Characteristics Leaching Procedure

REFERENCES

DEH, 1985, Solid Waste Management Unit Report, submitted to Massachusetts Department of Environmental Quality Engineering by DEH Environmental Management Office, Fort Office, Fort Devens.

Fox, W.A. 1988, Geohydrologic Study No. 36-26-0326-89, Fort Devens, Massachusetts, 11-19 July 1988, U.S. Army Environmental Hygiene Agency, Aberdeen Proving Ground, Maryland.

Jahns, R.H., 1952, Surficial Geology of the Ayer Quadrangle, Massachusetts, U.S. Geological Survey.

Koteff, C., 1966, Surficial Geology of the Clinton Quadrangle, Massachusetts, U.S. Geological Survey.

USATHAMA, 1992a, Final Report, Master Environmental Plan for Fort Devens, Massachusetts, Aberdeen Proving Ground, Maryland.

USATHAMA, 1992b, Final Report, Enhanced Preliminary Assessment for Fort Devens, Massachusetts, Aberdeen Proving Ground, Maryland.

USATHAMA, 1992c, Final Report, Site Investigations Report for Study Areas 15, 24, 25, 26, 32, 48, Fort Devens, Massachusetts, Aberdeen Proving Ground, Maryland.