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Record of Decision
Source Control Operable Unit

AOC A7, the Old Gravel Pit Landfill
AOC A9, the POL Burn Area

Fort Devens Sudbury Training Annex
Middlesex County, Massachusetts

September 1995

Prepared for:

U.S. Army Environmental Center
Aberdeen Proving Ground, Maryland 21010-5401

Prepared by:

OHM Remediation Services Corp.
A Subsidiary of OHM Corporation

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RECORD OF DECISION

SOURCE CONTROL OPERABLE UNIT

AOC A7, THE OLD GRAVEL PIT LANDFILL
AOC A9, THE POL BURN AREA

FORT DEVENS SUDBURY TRAINING ANNEX
MIDDLESEX COUNTY, MASSACHUSETTS

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The report is a Record of Decision (ROD) for remedial action at AOCs A7 and A9 at the Fort Devens Sudbury Training Annex located in Middlesex County, Massachusetts. This ROD addresses two areas within the Annex which contain both soil and ground watr contaminants in excess of both state and federal standards. The ROD presents the selected remedial alternative to address source control for AOCs A7 and A9 at the Annex. The ROD also presents an evaluation of remedial alternatives considered for AOCs A7 and A9. A total of three source control remedial alternatives were evaluated for AOC A7. A total of five source control remedial alternatives were evaluated for AOC A9. Criteria used for statutory determinations of the selected remedy are also discussed.

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DECISION SUMMARY FOR THE RECORD OF DECISION
AOC A7, The Old Gravel Pit Landfill
AOC A9, The POL Burn Area
Fort Devens Sudbury Training Annex
Middlesex County, Massachusetts

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LIST OF ACRONYMS

AOCs	Areas of Contamination
ARARs	Applicable or Relevant and Appropriate Requirements
AWQC	Ambient Water Quality Criteria
BNAs	Base/neutral/acid extractable compounds
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CMR	Code of Massachusetts Regulations
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenylethane
DDT	Dichlorodiphenyltrichloroethane
FFA	Federal Facility Agreement
FR	Federal Register
FS	Feasibility Study
HHRA	Human Health Risk Assessment
HI	Hazard Index

LIST OF ACRONYMS
(CONTINUED)

HWR	Hazardous Waste Rules
IAG	Interagency Agreement
IRP	Installation Restoration Program
LDRs	Land Disposal Restrictions
MADEP	Massachusetts Department of Environmental Protection
MFFA	Massachusetts Fire Fighting Academy
MCP	Massachusetts Contingency Plan
MOM	Management of Migration
NCP	National Contingency Plan
NPL	National Priority List
OHM	OHM Remediation Services Corp.
O&M	Operation and Maintenance
PA	Preliminary Assessment
PAHs	Polynuclear Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
POL	Petroleum, Oil and Lubricants
RAOs	Remedial Action Objectives
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigations
RfD	Reference Dose
ROD	Record of Decision
SA	Study Area
SARA	Superfund Amendments and Reauthorization Act
SC	Source Control
SI	Site Investigation
SI/RI	Site Investigation/Remedial Investigation Report
TBCs	To Be Considered
TCLP	Toxicity Characteristic Leaching Procedure
TOC	Total Organic Carbon
TRC	Technical Review Committee
UBK	Uptake/Biokinetic (Model)
USAEC	U.S. Army Environmental Center
USEPA	U.S. Environmental Protection Agency
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

AOC A7, the Old Gravel Pit Landfill
AOC A9, the POL Burn Area
Fort Devens Sudbury Training Annex
Middlesex County, Massachusetts

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) document presents the selected source control (SC) remedial action at areas of contamination (AOCs) A7 and A9 at the Fort Devens Sudbury Training Annex (Annex), Middlesex County, Massachusetts. This decision document was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. Through this document, the U.S. Army (Army) plans to remedy, on a permanent basis through excavation, off-site disposal, waste consolidation, and landfill capping, the potential threat to human health, welfare, or the environment posed by contaminated soil and solid waste at AOCs A7 and A9. This decision is based on information contained in the Administrative Record which has been developed in accordance with CERCLA 113(k). Copies of the Administrative Record are located at the Fort Devens Library, and at the Sudbury Town Hall, 322 Old Concord Road, in Sudbury, Massachusetts.

The State of Massachusetts Department of Environmental Protection (MADEP) concurs with the selected remedy. A copy of the state's declaration of concurrence letter is included in Appendix E.

Although additional investigations to fill existing data gaps are required for the ground water operable unit, preliminary management of migration (MOM) remedial alternatives have been developed and are presented in the Feasibility Study (FS) (OHM, 1995a). A subsequent ROD will be issued to address the final MOM remedy for AOCs A7 and A9.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from AOCs A7 and A9, if not addressed by implementing the SC remedy selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy addresses SC at AOCs A7 and A9. After collection of additional data, a MOM remedy for the groundwater operable units at AOCs A7 and A9 will be developed. The potential threat of contaminated groundwater to human health is not immediate because groundwater at or downgradient from AOCs A7 and A9 is not currently used as a drinking water source. The selected remedy addresses remediation of the source of contamination at AOCs A7 and A9 by eliminating or reducing the risks posed by the presence of the landfill at AOC A7 and the contaminated soils at AOC A9.

The major components of the selected remedy for AOCs A7 and A9 include:

- Excavation and off-site treatment and disposal of laboratory waste at AOC A7
- Excavation of contaminated soil from AOC A9 and consolidation at AOC A7
- Consolidation of contaminated soil and solid waste at AOC A7 to within the limits of the landfill cap
- Construction of a Resource Conservation and Recovery Act (RCRA) Subtitle C landfill cap at AOC A7
- Environmental monitoring and operation and maintenance (O&M) at AOC A7
- Institutional controls at AOC A7 to limit future site use and to restrict site access
- Five-year reviews at AOC A7.

Excavated materials from other areas on the Annex may be used at AOC A7 for fill material to meet the subgrade design specifications for the AOC A7 landfill cap. Before material from other sites can be used as subgrade material at AOC A7, the Army will have to comply with CERCLA and the National Contingency Plan (NCP) for any areas which are CERCLA sites, and determine if the material to be consolidated is hazardous and subject to RCRA Land Disposal Restrictions (LDRs), 40 CFR Part 268.

This remedy addresses the principal threat posed by AOCs A7 and A9 by preventing endangerment to public health, welfare, or the environment by implementation of this final SC ROD. The potential threat to human health is not immediate because ground water at AOCs A7 and A9 is not currently used as drinking water.

STATUTORY DETERMINATIONS

The selected remedy meets the mandates of CERCLA §121. It protects human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. The selected remedy does not satisfy the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element because treatment of the entire landfill area is impracticable. The selected remedy will reduce mobility of contaminants at AOC A7 through its containment features. Because this remedy will result in waste remaining on site at AOC A7, a review will be conducted by the Army, the U.S. Environmental Protection Agency (USEPA), and the MADEP in five-year intervals after completion of the landfill cap construction to ensure that the remedy continues to provide adequate protection of human health and the environment.

The method of disposal or treatment of the laboratory waste will be determined during the remedial design phase. The determination will reflect the requirements of CERCLA 120(b)(1) that "remedial actions in which treatment which permanently and significantly reduces the volume, toxicity, or mobility of hazardous substances, pollutants or contaminants, as a principal element, are to be preferred over remedial alternatives not involving such treatment."

The foregoing represents the selection of a final source control remedial action by the U.S. Department of the Army and the U.S. Environmental Protection Agency, Region I, with concurrence of the Massachusetts Department of Environmental Protection.

U.S. Department of the Army

By: _____ Date: 11 Sep 95

Edward R. Nuttall

Title: Colonel, U.S. Army
Commander
Fort Devens, Massachusetts

The foregoing represents the selection of a final source control remedial action by the U.S. Department of the Army and the U.S. Environmental Protection Agency, Region I, with concurrence of the Massachusetts Department of Environmental Protection.

U.S. Environmental Protection Agency

By: Linda M. Murphy
Linda M. Murphy

Date: Sept. 29, 1995

Title: Director
Waste Management Division
U.S. Environmental Protection Agency
Region I

DECISION SUMMARY
SEPTEMBER 1995

I. SITE NAME, LOCATION AND DESCRIPTION

The Annex is a National Priority List (NPL) or Superfund site and is located in Middlesex County, Massachusetts. The 4.3-square-mile Annex reservation comprises sections of the towns of Sudbury, Maynard, Hudson, and Stow. The reservation is divided into two irregularly shaped parcels by Hudson Road. There are currently five AOCs within the Annex that are under investigation. This ROD relates to SC for AOC A7 (the Old Gravel Pit Landfill) and AOC A9 [the Petroleum, Oil and Lubricants (POL) Burn Area], which are located on the northern boundary of the Annex overlooking the Assabet River. The Annex location and the location of AOCs A7 and A9 are shown on Figure 1.

AOC A7 (Figure 2) is located along the northern boundary of the installation overlooking the Assabet River. Access is obtained by traveling north on a dirt track originating at Patrol Road. The track is slightly overgrown and is approximately 200 feet in length. Demolition debris, scrap metal, spent shotgun shells, clay targets, and other solid waste is scattered across much of the area. The central portions of the site are cleared of vegetation, while the peripheral areas are heavily vegetated. The steep northward-dipping slope on the northern boundary of the area overlooking the Assabet River is heavily vegetated and debris is visible on, and protruding from, the slope. A small section of the northeast edge of the Army property lies within the 100-year floodplain, but the landfill extent is at least 160 feet from the floodplain. Prior to enclosing the area with a security fence in October 1991, unauthorized persons used the area for recreational activities such as shooting, hunting, and dirt biking, and as a dumping ground. An unnamed stream east of the area flows north towards the Assabet River.

A surface dump with discarded furniture and debris is located at the east end of AOC A7 in a wooded area approximately 100 feet north of Patrol Road. Previously referred to as Study Area (SA) P8, this surface dump was reported as a possible transformer disposal site. SA P8 is considered part of AOC A7 and was included in the AOC A7 investigation.

AOC A9 is level, nearly square, and covers approximately 7 acres. The area perimeter is enclosed by a fence and a berm. Tall grasses, shrubs, and small pine trees cover the majority of the area. A source removal area within AOC A9 shows signs of vegetation stress. The area is bounded on the south by Patrol Road, and on the east, north, and west by forest. The north side of AOC A9 slopes steeply down to Track Road and the Assabet River.

Building T401 is one of two structures remaining on the site and is located by the entrance gate installed in the southeast corner. Building T402 is also located in the southeastern corner of the area and was reportedly used to store mannequins used for fireproof clothing burn tests. The fireproof clothing test facility is located near the center of the cleared portion of the area. This facility is lined with cinder block walls, has an asphalt base, and is bounded on the north by a large, freestanding, concrete wall with metal doors.

A fenced-in area with a metal shed (SA P12) previously stood to the east of the cloth test pit. The shed was placed on a concrete slab, and was surrounded on four sides and top by a chain-link fence to protect a pump apparatus for an underground storage tank (UST). The shed and fence were removed by

OHM Remediation Services Corp. (OHM), a wholly owned subsidiary of OHM Corporation, to assist in the UST removal performed by Atec Assoc., Inc., an Army contractor. SA P12 is now considered part of AOC A9.

A more complete discussion of the past site histories of AOCs A7 and A9 can be found in Sections 3.1 and 4.1, respectively, of the Draft Final Addendum to the Final Site/Remedial Investigation (SI/RI) Report for the Annex (OHM, 1995b).

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. LAND USE AND RESPONSE HISTORY

The Annex, which was originally known as the Maynard Ordnance Depot, was acquired by the U.S. Government in the early 1940s. During World War II, the Annex was used for holding munitions, and after the war it became known as the Maynard Ordnance Test Station. In 1958, control of the Annex was transferred to the Natick Research and Development Command. At that time, the principal use of the reservation was troop training, but testing and experiments were also conducted. During the Natick Phase (1958-1982), the Annex was utilized by other agencies or operators for a variety of uses, including testing, training, and waste disposal. In 1982, custody of the entire Annex was transferred to Fort Devens, located 17 miles northwest of Sudbury in the Town of Ayer. Fort Devens used the reservation primarily for training active duty, Army Reserve, and Army and Air National Guard personnel. Currently, the Annex remains a part of Fort Devens but portions of the site are used for military housing, the U.S. Air Force Geophysical Radar Station, and the Region I Office of Federal Emergency Management Agency.

AOC A7, the Old Gravel Pit Landfill, was used as a dumping and burial ground for general refuse, demolition debris, drums, and laboratory waste from 1941 to the mid-1980s. Disposal of drums and laboratory waste was reportedly carried out between the late 1950s and 1971. Additionally, this 10-acre site was used by the general public for unauthorized surface dumping during the 1970s until site access was restricted. Barriers were removed during the Dames & Moore remedial investigation (RI), and dumping was re-initiated until the physical barriers were reconstructed.

AOC A9, the POL Burn Area, was used for product testing, and was made available to local jurisdictions and the Massachusetts Fire Fighting Academy (MFFA) for fire prevention training. Natick Laboratory used the area for flame-retardant clothing tests, and the Massachusetts State Police used this area for the destruction of confiscated fireworks. The area is not currently used, but was active since the 1950s. Aerial photographs show that prior to that time the area was used for agricultural purposes.

Fire fighting training conducted by the MFFA in AOC A9 involved the use of two fire pits. One pit was approximately 20 feet by 20 feet by no more than 2 feet deep, with a 1- to 1½-foot-high berm composed of soil and cinder blocks. The bottom of the pit was unlined, and the sides were supported with cinder blocks. During fire fighting training, the pits were filled with approximately 6 inches of water, topped off with fuel oil, and ignited. When fuel oil costs began to rise, JP-4 jet fuel was obtained from Jetline, Inc. with MADEP permission and was used in place of the fuel oil. The second pit used for training consisted of two trenches, 18 to 24 inches wide, approximately 24 inches deep, and 10 to 15 feet long in the shape of a "T." The trenches were unlined and used for fire suppression/flashback training. Later, the "T" was backfilled and replaced with a "Z" configuration in the same area.

POL-contaminated soils were excavated and removed from the area of the former fire training pits between September 1987 and January 1988 by Zecco, Inc. Approximately 1,123 cubic yards of soil were transported to a hazardous waste disposal facility. The depth of excavation in one location was reported to be 26 feet, approximately the top of ground water. The excavations were backfilled with soils from an unknown location on the Annex. The material was staged in the POL area until it was used as backfill, and was not certified as clean.

A more complete discussion of the past site histories of AOCs A7 and A9 can be found in Sections 3.1 and 4.1, respectively, of the SI/RI Report.

B. ENFORCEMENT HISTORY

In 1978, the Department of Defense established the Installation Restoration Program (IRP) to identify, investigate, and clean up contamination resulting from the use, handling, storage, or disposal of hazardous substances at federal facilities. Environmental investigations were started at the Annex in 1980 under the IRP in order to address the environmental impact from past land uses.

Under the program, the Army conducted a site assessment which consisted primarily of a detailed records search. The site assessment report indicated that certain portions of the Annex may have been contaminated. Following the site assessment, the Army conducted an RI/FS at the Annex. The Final RI Report by Dames & Moore (Dames & Moore, 1986). Prior to the final publication of the RI report, the USEPA Region I, Waste Management Division, contracted NUS Corporation of Bedford, Massachusetts, to conduct a Site Investigation (SI) of the Annex. On May 26, 1987, NUS Corporation completed the SI report on the Annex for USEPA Region I. In June of 1985, a Preliminary Assessment (PA) of the Annex was also conducted for USEPA Region I by an NUS Corporation Field Investigation Team. The PA included a review of Dames & Moore's final draft RI/FS report. As a result of these investigations, the Annex was placed on the NPL on February 21, 1990.

Investigation and cleanup activities at the Annex are goverened by an interagency agreement (IAG) called a Federal Facility Agreement (FFA). The FFA for the Annex is a two-party agreement between the Army and the USEPA and was signed on November 15, 1991. Under the FFA, the Army, as the lead agency, is responsible for carrying out all work required in accordance with the requirements of CERCLA under USEPA oversight.

III. COMMUNITY PARTICIPATION

Under the IAG, the Army established a Technical Review Committee (TRC) to facilitate technical management and promote public participation through quarterly public information meetings. TRC membership consists of representatives from the U.S. Army Environmental Center (USAEC), Fort Devens Environmental Management Office, USEPA Region I, MADEP, and the U.S. Fish and Wildlife Service, as well as local officials and interest groups, specifically Four Town Families Organized for the Cleanup of Sites. This organization is also known as FOCUS.

Throughout the investigations, the community has been involved in all activities. The Army has kept the community and other interested parties apprised of these activities through informational meetings, fact sheets, press releases, public meetings, and site tours.

From 1990 through 1991, the Army held several informational meetings to describe the plans for the RI/FS process. During December 1991, the Army released a community relations plan that outlined a program to address community concerns and keep citizens informed about and involved in activities during remedial activities. The community has been continuously kept informed regarding the status and activities of the RI/FS through quarterly TRC meetings.

On June 1, 1995, the Army submitted the Final Proposed Plan (OHM, 1995c) to the TRC and the public repositories. The Army published a notice announcing a public meeting to present and discuss the Proposed Plan in several local newspapers on June 7 and June 8, 1995. The plan was made available to the public at the Goodnow Library in Sudbury, Randall Library in Stow, the Hudson Public Library, the Maynard Library, and the Davis Library at Fort Devens.

On June 14, 1995, the Army and USEPA held an informational meeting to discuss the results of the RI at AOCs A7 and A9, the cleanup alternatives presented in the FS, and to present the Army's Proposed Plan. Immediately following this meeting, the Army held a public hearing to accept formal comments on the Proposed Plan. From June 5 to July 5, 1995, the Army held a 30-day public comment period to accept written comments on the alternatives presented in the FS Report, the Proposed Plan, and on any other documents previously released to the public. A transcript of the public meeting is included in the Responsiveness Summary in Appendix B.

IV. SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

The selected remedy for AOCs A7 and A9 is a source control (SC) alternative. The remedy addresses the potential risks to human health and the environment posed by existing site conditions at the Annex, and is intended to be the permanent SC measure for AOCs A7 and A9. The SC action will be consistent with implementation of a future MOM remedy to address ground water contamination at AOCs A7 and A9. The MOM remedy will be addressed in the future in a separate ROD after additional data is gathered.

In summary, the selected remedy involves capping the landfill area at AOC A7 to minimize direct exposure to landfill materials, and to minimize infiltration of precipitation, thereby limiting production of leachate and minimizing possible resultant impacts to ground water quality and the Assabet River. The preferred alternative includes removal of hazardous laboratory waste at AOC A7 followed by off-site treatment and disposal, and removal of contaminated soil within AOCs A7 and A9, and consolidation beneath a landfill cap. Exposures to landfill materials and hotspots would be limited by isolating the waste materials using a RCRA Subtitle C multi-layer cap, and by using institutional controls to limit future site use and restrict site access. The cap would also direct precipitation runoff away from landfill materials and provide a barrier to infiltration. Following construction of the landfill cap at AOC A7, the Army will conduct ground water monitoring, O&M, and five-year reviews as part of the selected remedy.

V. SUMMARY OF SITE CHARACTERISTICS

Chapter 1.0 of the FS Report contains an overview of the RI. The significant findings of the RI are summarized below.

Results of RI of AOCs A7 and A9

RIs were performed to assess the nature and extent of contamination at AOCs A7 and A9. OHM conducted field activities for the RI that included the collection and analysis of soil, ground water, surface

water, sediment, and solid waste samples. Most of the samples collected at AOCs A7 and A9 were analyzed for Target Compound List volatile organic compounds (VOCs), base/neutral/acid extractables (BNAs), polychlorinated biphenyls (PCBs), and pesticides; Target Analyte List metals; herbicides; and explosives. For a detailed assessment of AOCs A7 and A9, refer to the Addendum to the SI/RI Report, which is included in the Administrative Record and Information Repositories.

Nature and Extent of Contamination: This section summarizes the nature and extent of contamination at AOCs A7 and A9. The contaminants identified in this section have been detected at concentrations in excess of either maximum background values, State and Federal standards, or other criteria.

In AOC A7, 14 surface soil samples were analyzed for VOCs, BNAs, PCBs, pesticides, chlorinated herbicides, explosives, and metals. BNAs were detected at two locations, one of which contained 12 BNAs. The pesticides, dieldrin, dichlorodiphenylethane (DDE), and dichlorodiphenyltrichloroethane (DDT) were detected at several sample locations. The PCB, Aroclor 1260, was present in one sample. Two herbicides, silvex and dacthal, were also found. Lead was detected at one sample location at a concentration greater than a standard.

Subsurface soil samples were collected from 19 test pits, 27 borings, and 2 hand auger locations. Many of the pesticides and BNAs found in surface soil samples were also detected in the subsurface. The pesticides detected included dichlorodiphenyldichloroethane (DDD), DDE, DDT, dieldrin, lindane, endrin, heptachlor epoxide, and chlordane.

Test pitting, soil boring, and visual observation were used to estimate the areal extent and volume of the landfill, SA P8, and the laboratory waste disposal area. The landfill area is estimated to be 1.3 acres and 11,000 cubic yards. SA P8 (along with visually-contaminated surrounding soil) is estimated to 0.35 acres and 2,235 cubic yards. The buried laboratory debris area is estimated to be 0.54 acres and 800 cubic yards. A plan view of these areas is presented on Figure 2.

Thirty ground water samples were collected from ten monitoring wells in AOC A7. The VOCs tetrachloroethylene or perchloroethylene, 1,1,2,2-tetrachloroethane or perchloroethane, trichloroethylene, and chloroform, along with the pesticide lindane, were detected at concentrations above their drinking water standards. These exceedances were limited to three wells, OHM-A7-8, OHM-A7-51, and OHM-A7-46. Lead was also detected at a concentration above its drinking water standard in one of three samples collected from monitoring well OHM-A7-12.

Surface water and sediment samples were collected from the unnamed stream located adjacent to the landfill to assess whether contaminants from the site had entered the stream. The analytical results show that the site is not contaminating the stream. Arsenic concentrations in surface water were below the freshwater chronic Ambient Water Quality Criteria (AWQC), but exceeded the human health AWQC. Arsenic, barium, nickel, and selenium were detected in sediment samples at concentrations above screening levels.

The behavior of the contaminants in AOC A7 depends on both the chemical compound and the local environment. Contaminants have been in place at AOC A7 for over 20 years and their behavior will be influenced by the environmental weathering that has occurred over that time. For example, it is unlikely that VOCs will be present in surface soils because these compounds will either volatilize into the atmosphere or leach downward with infiltrating water. Pesticides and metals may occur at the surface, but may be more tightly bound than freshly applied chemicals. Overburden in the area consists of fill over

fairly low permeability tills. Water and chemicals will move fairly readily through the fill material, but the characteristics of the till will serve to limit the flow of water, and consequently, the flow of associated contaminants. However, some migration of chemicals with ground water is occurring at the site.

In AOC A9, 11 surface soil samples were analyzed for VOCs, BNAs, PCBs, pesticides, explosives, and metals. VOCs, BNAs, and pesticides were all detected at concentrations below screening levels. Arsenic, lead, and thallium concentrations exceeded their standards at several locations.

Forty-six subsurface soil samples were collected from AOC A9 during the RI. Arsenic was the only inorganic contaminant present at concentrations above its standard. Elevated arsenic concentrations were limited to an area outside of the southwest corner of AOC A9 and were confined to the upper soil layers. However, results from preliminary field screening of SA P9 (which is located apart from and outside the fenced area of AOC A9) indicate that arsenic is present in the soil starting from the southwest corner of AOC A9 (outside the fence) and continuing downgradient to SA P9. This large area of arsenic contamination is probably not related to AOC A9, and has been attributed to the basewide application of arsenic-based herbicides along the security perimeter and former railroad beds.

Twenty-five ground water samples were collected from 15 monitoring wells in AOC A9. Ground water data indicate that VOCs, BNAs, and lead are present at concentrations above drinking water standards. Explosive residues were found at one sampling location. There are no drinking water standards for the explosive residues detected.

The transformation of the chemicals present in AOC A9 depends on both the chemicals and the local environment. Chemicals have been in place at AOC A9 for many years and their transformation will be influenced by the environmental weathering that is likely to have occurred over that time. Although chlorinated VOCs have been detected in the ground water, some of these compounds detected may be degradation products of other chlorinated VOCs. The soils in the area generally consist of fairly sandy soils (and some fill) at the surface, grading to much finer materials with depth. Water and chemicals will move fairly readily through the surface material, but the characteristics of the finer soils will serve to limit the flow at deeper levels and consequently the migration of associated contaminants will also be inhibited.

A complete discussion of site characteristics can be found in Chapters 3.0 and 4.0 of the Addendum to the SI/RI Report.

VI. SUMMARY OF SITE RISKS

A Baseline Risk Assessment was performed to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with the Annex. The public health risk assessment followed a four step process: 1) contaminant identification, which identified those hazardous substances which, given the specific conditions of the site were of significant concern; 2) exposure assessment, which identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure; 3) toxicity assessment, which considered the types and magnitude of adverse health effects associated with exposure to hazardous substances, and 4) risk characterization, which integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the site, including carcinogenic and non-carcinogenic risks. Except for chemicals that are obviously not site-related (e.g., laboratory contaminants), all detected chemicals were considered in the risk assessment. The results of the public health risk assessment for the Annex are discussed below followed by the conclusions of the environmental risk assessment.

Human Health Risk Assessment

A Human Health Risk Assessment (HHRA) was prepared in January 1994 for the Annex. Some additional sampling and analysis was conducted in AOCs A7 and A9 following completion of the HHRA and an addendum to the HHRA was also prepared. The purpose of the HHRA addendum was to evaluate the new data to determine if they affected the findings of the original HHRA. Based on the review described in the addendum, the results of the HHRA were not materially affected. The HHRA addendum is included as Appendix C to the SI/RI Report. The primary objectives of the HHRA included the following:

- Examine exposure pathways and contaminant concentrations in soil and ground water at the Annex;
- Estimate the potential for adverse effects associated with the contaminants of concern at the Annex under current and future land use conditions;
- Identify site or land use conditions that present unacceptable risks; and,
- Provide a risk assessment basis on which decisions can be made and from which recommendations for future activities which are protective of human health can be determined.

The HHRA estimated present and future potential risks to human health posed by exposure to contaminated soil, based on conditions as described in the SI/RI Report. The HHRA addressed risks that could occur on AOCs A7 and A9 as they currently exist, and under a scenario that assumes land use may change in the future. Under current conditions, the greatest potential exposure is associated with unauthorized use by school age children who were assumed to be exposed for a 10-year period (between the ages of 8 and 18). Exposure under current use conditions is most likely to occur via direct contact with, and subsequent ingestion or dermal absorption of, chemicals in site soils.

If sections of the Annex are excessed (sold by the military), future use could include residential housing. Because this scenario posed the highest future use exposure potential, residential use of the facility was evaluated to estimate maximum risks. Under this scenario, exposure could occur for a 30-year period (reasonable maximum estimate of the time and individual remains in the same house) through direct contact with soils and sediment (ingestion or dermal absorption), use of on-site ground water or surface water, or by consumption of fish.

Risks were assessed using USEPA Region I guidance (USEPA, 1991a), which considers both average and maximum concentrations of chemicals in different environmental media at AOCs A7 and A9. The maximum concentrations represent exposure associated with repeated contact with the most contaminated portions of the Annex. The average concentration assumes an individual receives an exposure from a wider distribution of sources. USEPA uses a target excess cancer risk goal of one in one million (10^{-6}) for exposure to carcinogenic substances, and typically regulates within a range of one in 10,000 to one in 1,000,000 (10^{-4} to 10^{-6}).

For noncarcinogens, USEPA assumes adverse health effects are unlikely if the estimated exposure dose is lower than the reference toxicity criteria [called the reference dose (RfD)]. The ratio of exposure dose to RfD is termed the Hazard Quotient, and the sum of these ratios for multiple chemical exposure is called the Hazard Index (HI). An HI over 1.0 means that adverse non-cancer effects may occur by continuous contact with a particular chemical of concern.

To ensure public health is adequately protected, conservative (unlikely to underestimate risk) assumptions were used in deriving both the exposure estimate and the toxicity values. Because of the use of these conservative assumptions, it is likely that actual risks are considerably lower than risks estimated in this report.

For a complete explanation of risks posed by contamination at the Annex, please refer to the HHRA Addendum presented in the Addendum to the SI/RI Report. The Addendum to the SI/RI Report is part of the Administrative Record and is also included in the Information Repositories.

Health Risks Associated With AOC A7: Risks associated with current and future use scenarios at AOC A7 are as follows:

- Current Use - Soil Ingestion

	Average	Maximum
HI	0.09	0.9
Cancer Risk	3×10^{-6}	3×10^{-5}

- Future Use (Residential - Includes Soil and Sediment Ingestion and Ground Water Use)

	Average	Maximum
HI	0.2	1
Cancer Risk	7×10^{-5}	5×10^{-4}

Exposure to lead at AOC A7 was evaluated separately using USEPA's Uptake/Biokinetic (UBK) Model. Results from the model were compared with an USEPA blood action level of 10 μg/dl. Based on the UBK model, lead does not pose a health risk in AOC A7.

Much of the risk estimated for AOC A7 is associated with the presence of hotspots (areas of localized contamination) and contaminated ground water. For risks of the magnitude estimated above to occur would require frequent contact with these spots. Because frequent contact is unlikely, and the hotspots will be excavated and removed from AOC A7, actual future risks are probably substantially lower than risk estimates that are based on maximum exposure point concentrations.

Laboratory waste buried in the west-central portion of the site consists of glassware containing unknown chemicals. Hazards posed by this material are undefined but potentially significant, including risks associated with leaching of materials from the site to the river and contact with the chemicals if excavation occurs in the area. Consequently, action to address this potential hazard is warranted. Further, due to exceedance in cancer risk under the future use scenario, action at AOC A7 is warranted.

Health Risks Associated With AOC A9: Risks associated with current and future use scenarios at AOC A9 are as follows:

- Current Use - Soil Ingestion

	Average	Maximum
HI	0.03	0.1
Cancer Risk	2×10^{-6}	7×10^{-6}

- Future Use (Residential - Includes Soil and Sediment Ingestion and Ground Water Use)

	Average	Maximum
HI	1	10
Cancer Risk	6×10^{-5}	2×10^{-4}

Much of the risk estimated for AOC A9 is associated with the presence of soil hotspots containing elevated levels of arsenic and thallium. For risks of the magnitude estimated above to occur would require frequent contact with these points. Because frequent contact is unlikely and the hotspots will be excavated and removed from AOC A9, actual future risks are probably substantially lower than risk estimates based on maximum exposure point concentrations. However, removal of soil contaminated with arsenic and thallium is warranted because cancer risk number and HI, respectively, exceed acceptable levels under the future land use scenario.

Exposure to lead at AOC A9 was evaluated separately using USEPA's UBK Model. Results from the model were compared with an USEPA blood action level of 10 μg/dl. Based on the UBK model, lead does not pose a health risk in AOC A9.

Supplemental Ecological Risk Assessment

A supplemental ecological risk assessment was conducted as part of the Addendum to the SI/RI Report to determine whether risk estimates from the January 1994 risk assessment require modification and to specifically evaluate ecological risk in AOCs A7 and A9. For a complete explanation of these assessments, please refer to Appendix C of the Addendum to the SI/RI Report. A summary of the ecological assessment follows.

Results of investigation at the Annex reveal a complex area containing several interrelated ecosystems. In AOCs A7 and A9, chemicals of concern for ecological receptors can be separated into three categories:

- Chemicals present in AOCs A7 and A9 ground water that may pose a risk to aquatic organisms in the Assabet River;
- Organochlorine pesticides, metals, and polynuclear aromatic hydrocarbons (PAHs) present in soils that may pose a risk to terrestrial wildlife (these chemicals are present in hotspots in both AOCs, and are not widely distributed); and,
- Metals present at elevated concentrations in sediments in the intermittent stream east of AOC A7; these chemicals may pose a risk to aquatic organisms.

Ecological Risks Associated with AOC A7: Soil contaminants at AOC A7 include lead, DDT, DDE, DDD, and chlordane. These contaminants exist at several hotspots, with most spots concentrated in the central portion of the site. There is no visual evidence of ecological damage at AOC A7. For a complete explanation of risks posed by contamination at AOC A7, please refer to the supplemental ecological risk assessment presented in Appendix C of the Addendum to the SI/RI Report. At AOC A7, contaminants in ground water are associated with a ground water plume originating from the laboratory waste disposal area, and possibly migrating to the Assabet River. Elevated levels of lindane and chlorinated solvents have been found in ground water. Results of the ecological risk assessment indicate ground water migration to the Assabet River is unlikely to adversely affect aquatic organisms. The assessment also indicates soil hotspots are unlikely to pose an adverse risk to terrestrial wildlife. Biological assessment of the stream on the east side of AOC A7 showed no impairment attributable to site contaminants.

Ecological Risks Associated with AOC A9: At AOC A9, contaminants in ground water are associated with two plumes, one containing chlorinated VOCs and the other containing petroleum-related VOCs. The plumes extend from the AOC toward, and possibly, to the Assabet River. At some monitoring wells, VOCs were found at concentrations above their ground water standards. Concentrations of VOCs in wells closer to the river were much lower. Consequently, these compounds were not considered further in the assessment. Soil contaminants exist at two primary hotspots, with elevated arsenic found in the southeast corner of the AOC, and lead and thallium associated with an old drum in the northwest corner of the AOC.

Results of the screening-level risk assessment indicate ground water migration to the Assabet River is unlikely to adversely affect aquatic organisms. It also suggests the contamination hotspots are unlikely to pose a risk to terrestrial wildlife. Vegetation in the area represents early-stage successional recovery, which is consistent with removal of topsoil and associated nutrients. Topsoil removal occurred frequently as a consequence of earlier site activities at AOC A9.

Ecological Risks to the Assabet River:

OHM collected and analyzed sediment samples from three depths at three points in the river; upstream near Crow Island (FWISW/SD14); adjacent to the Annex near the mouth of the stream that flows between AOCs A7 and A9 (FWISW/SD15); and downstream (FWISW/SD16). Chemical concentrations were compared with screening level criteria for sediments, and many chemicals exceeded these criteria. In particular, several metals exceeded the criteria at all depths at all locations, PAHs were detected at elevated concentrations in upstream samples, and organochlorine pesticides were detected in samples collected at all depths from the location adjacent to the site. In addition to chemical analyses, total organic carbon (TOC) levels were measured in all samples. TOC concentrations tended to decrease with depth (as would be expected), but were quite variable among the three sample points. The upstream sample had the lowest TOC (an average of 0.5 percent), the downstream sample had the mid range value (7 percent), and the sample adjacent to the site had by far the highest TOC level (35 percent).

The distribution of chemicals laterally and at depth indicates the elevated concentrations are probably the result of past releases to the river from sources other than the Annex. For example, pesticides are concentrated in sediments near the mouth of the small stream that separates AOCs A7 and A9, and might appear to be site related. However, these chemicals are not widespread in AOCs A7 and A9, and are only present in hotspots. In other words, there is no evidence that contamination from AOCs A7 and A9 has impacted the stream or has migrated to the Assabet River. Lindane, the only pesticide which appears to be slowly migrating in ground water, was not present in river sediment samples. Furthermore, pesticide concentrations were found at depths up to 3 feet below the sediment surface. It seems likely that pesticides in deep sediments may be the result of the historical use of agricultural pesticides. Based on examination of the chemicals found in Assabet River sediments and their relationship to site chemicals, it seems unlikely that the Annex is adversely affecting water quality in the Assabet River.

Conclusion

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment. The objectives of the selected remedial action are to remove the presumed hazardous laboratory waste from the site, provide containment and isolation of the landfill contents, and control potential leachate generation due to infiltration.

VII. DEVELOPMENT AND SCREENING OF ALTERNATIVES

A. STATUTORY REQUIREMENTS/RESPONSE OBJECTIVES

Under its legal authorities, the Army's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences, including: a requirement that USEPA's remedial action, when complete, must comply with all federal and more stringent state environmental standards, requirements, criteria or limitations, unless a waiver is invoked; a requirement that USEPA select a remedial action that is cost-effective and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a preference for remedies in which treatment which permanently and significantly reduces the volume, toxicity or mobility of the hazardous substances is a principal element over remedies not involving such treatment. Response alternatives were developed to be consistent with these Congressional mandates.

Based on preliminary information relating to types of contaminants, environmental media of concern, and potential exposure pathways, remedial action objectives (RAOs) were developed to aid in the development and screening of alternatives. These RAOs were developed to mitigate existing and future potential threats to public health and the environment. For AOC A7, the primary RAOs are:

- Eliminate potential risk to human health and the environment associated with exposure to contaminated wastes
- Minimize off-site migration of contaminants; and,
- Limit infiltration of precipitation to the underlying waste within the landfill area, thereby minimizing leachate generation and ground water degradation.

For AOC A9, the primary RAO is:

- Reduce potential risk to human health associated with exposure to contaminated soil.

B. TECHNOLOGY AND ALTERNATIVE DEVELOPMENT AND SCREENING

CERCLA and the NCP set forth the process by which remedial actions are evaluated and selected. In accordance with these requirements, a range of alternatives were developed for the site.

The FS for AOCs A7 and A9 identified and analyzed the SC and MOM alternatives to address soil and ground water contamination, respectively. However, during the evaluation process, it was determined that additional ground water data were needed to be collected prior to selecting an MOM remedy for both AOCs. Further, based on the potential risks to human health and the environment posed by existing site conditions, and the proximity to the Assabet River, stabilization of site conditions at AOCs A7 and A9 was determined to be of high priority. Because AOC A7 contains a landfill for which many remedial alternatives are impracticable due to implementability and cost, a remedial action to stabilize existing conditions and provide SC was determined to be appropriate. The MOM remedy will be addressed in a separate ROD after additional data is gathered.

With respect to SC, the FS developed a range of alternatives--from one that would eliminate or minimize, to the extent feasible, the need for long-term management (including monitoring) at the site (e.g., excavation and off-site disposal) to one that would employ treatment as a primary component (e.g.,

solidification/stabilization). The range also included alternatives that involved containment of waste with minimal or no treatment but protecting human health and the environment by preventing potential exposure and/or reducing the mobility of contaminants, and the no-action alternative.

VIII. DESCRIPTION OF ALTERNATIVES

This section provides a narrative summary of each SC alternative evaluated for AOCs A7 and A9. A detailed assessment of each alternative can be found in Section 4.0 of the FS Report.

AOC A7 Remedial Alternatives

The Army considered three remedial alternatives to address SC at AOC A7. Each of these alternatives is described below. A detailed presentation and analysis of the alternatives can be found in Section 4.0 of the FS.

Alternative 1 - No Action: This alternative was evaluated in the FS to serve as a baseline for comparison to other alternatives under consideration. Under this alternative, no containment, engineering controls, or land use restrictions would be used.

Alternative 2 - Laboratory Waste Excavation and Off-Site Disposal, Containment with RCRA Subtitle C Landfill Cap: Alternative 2 consists of excavation of buried laboratory wastes and associated soil within AOC A7, with off-site treatment and disposal of this waste, and construction of an impermeable RCRA cap to contain the remaining contaminants. During excavation and transportation of the laboratory wastes, all federal and state requirements pertaining to identification, handling, transport, storage, and disposal of hazardous wastes will be attained in this alternative.

Prior to construction of the cap, AOC A7 would be regraded to eliminate depressions and steep sidewalls to the extent practicable so that precipitation will run off instead of ponding on the surface or infiltrating into the landfill. This process would require excavating some solid waste along the steep northern slope, and replacing the waste closer to the center of the area to be capped. During site preparation and grading, contaminated materials within AOC A7 will be consolidated as part of the necessary subgrade for the proposed cap. The cap would be designed to meet the requirements applicable to closure of a hazardous waste landfill (RCRA Subtitle C).

Following construction, the cap and associated systems will be inspected periodically and maintained to assure integrity and proper operation. Long-term O&M will include maintenance of the cap, site fencing, drainage, and landfill gas control systems. Ground water and storm water discharge monitoring programs will also be implemented. Five-year reviews will also be conducted.

A summary of estimated costs, time for design, construction, and operation is presented below.

- Estimated Time for Design and Construction: 2 years
- Estimated Time of Operation: 30 years
- Estimated Capital Cost: $1,614,350
- Estimated O&M Costs (present worth): $595,360
- Estimated Total Cost, Including 20% Contingency (present worth): $2,418,860.

Alternative 3, Laboratory Waste Excavation and Off-Site Disposal, Consolidation, Containment with RCRA Subtitle C Landfill Cap: Alternative 3 will consist of the same primary components as Alternative 2. In addition, Alternative 3 will include importation of contaminated soil from AOC A9, subsequent consolidation of this waste with contaminated soil from AOC A7, and final placement under the RCRA Subtitle C landfill cap. The proposed areal extent of the cap, subject to change during design, is indicated on Figure 3. The cap will consist of multiple layers, each with a specific purpose. The proposed cap design is consistent with state-of-the-art requirements for hazardous waste landfill caps, providing a high degree of isolation and control. As shown on Figure 4, the cap consists of the following layers (described from top of waste to top of finished cap):

- Passive gas vent layer over existing waste, if necessary, based on site-specific conditions, to vent and/or control landfill gases generated in the landfill;
- Lower very low permeability barrier, consisting of a geosynthetic clay liner, comprised of a layer of bentonite clay sandwiched between an upper and lower geotextile layers;
- Upper impermeable barrier, consisting of a synthetic membrane, to stop infiltration of percolating water;
- Drainage layer, consisting of a geonet, to divert precipitation that infiltrates through the surficial vegetative and protective layer off of and away from the impermeable barrier layers; and,
- Vegetative and protective layer, approximately 24 inches thick and including 6 inches of topsoil, to protect underlying cap components and control erosion by providing a suitable medium for vegetative growth.

Landfill gas controls, such as passive gas vents or extraction wells, will be utilized (if necessary) to manage landfill gases generated beneath the cap, thereby preventing accumulation of gas beneath the cap and potential disruption of cap integrity.

The cap and drainage system would be connected to a system of drainage swales around the landfill to control run-on and run-off. Along the north side of the landfill, facing the Assabet River, additional engineering controls would be utilized to protect landfill materials and the landfill cap from potential damage from erosion. The slope will be regraded and, if necessary, a revetment (gabion wall) will be installed along this north slope to provide additional protection against erosion of soil and debris. Access to the area would be further restricted by the existing fence along the perimeter of AOC A7. Long-term O&M, ground water monitoring, and five-year reviews will be implemented.

A summary of estimated costs, time for design, construction, and operation is presented below.

- Estimated Time for Design and Construction: 2 years
- Estimated Time of Operation: 30 years
- Estimated Capital Cost: $1,614,700
- Estimated O&M Costs (present worth): $595,360
- Estimated Total Cost Including 20% Contingency (present worth): $2,419,235.

<u>AOC A9 Remedial Alternatives</u>

Alternative 1 - No Action: This alternative was evaluated in the FS to serve as a baseline for comparison to other alternatives under consideration. Under this alternative, no containment, engineering controls or land use restrictions would be used.

Alternative 2 - Limited Action: Alternative 2 is a limited action consisting of a fence, warning signs, and deed restrictions. A fence would be installed around each of the two contaminated areas within AOC A9. The fencing would consist of a 6-foot-high, gated, chain-link fence topped with three strands of barbed wire. Warning signs would be mounted on the fence. Deed restrictions would be imposed, prohibiting residential development or recreational use. Monitoring would be performed at regular intervals for 30 years.

A summary of estimated costs, time for design, construction, and operation is presented below.

- Estimated Time for Design and Construction: 3 months
- Estimated Time of Operation: 30 years
- Estimated Capital Cost: $15,730
- Estimated O&M Costs (present worth): $462,280
- Estimated Total Cost, Including 20% Contingency (present worth): $548,620.

Alternative 3 - Off-Site Disposal: Alternative 3 involves the excavation of 50 cubic yards of soil contaminated above the risk-based cleanup levels for arsenic and thallium, and transportation to an off-site facility for final treatment and disposal. Soil from AOC A9 is not expected to exhibit a hazardous toxicity characteristic [by Toxicity Characteristic Leaching Procedure (TCLP) Test] for either lead, arsenic, beryllium, or thallium, based on the relatively low levels of these contaminants in soil, and their relatively strong adsorption properties. Because the lack of toxicity has not been confirmed, this alternative presents disposal costs for both hazardous and non-hazardous soil. If soil is non-hazardous, it is acceptable for disposal at a non-hazardous waste (RCRA Subtitle D) facility. If soil exhibits toxicity for any of the aforementioned contaminants, it will require treatment using solidification/stabilization technologies, followed by disposal at a hazardous waste (RCRA Subtitle C) facility. When soil excavation is complete, borrow material from the Annex will be placed within the excavated area. A minimum of 6 inches of soil cover will be placed on top of the fill to support vegetation.

- For soil which is hazardous:

  - Estimated Time for Design and Construction: 3 months
  - Estimated Time of Operation: 30 years
  - Estimated Capital Cost: $61,360
  - Estimated O&M Costs (present worth): $25,020
  - Estimated Total Cost, Including 20% Contingency (present worth): $125,650.

- For soil which is non-hazardous:

  - Estimated Time for Design and Construction: 3 months
  - Estimated Time of Operation: 30 years
  - Estimated Capital Cost: $41,010
  - Estimated O&M Costs (present worth): $25,020
  - Estimated Total Cost, Including 20% Contingency (present worth): $103,680.

Alternative 4, Off-Site Disposal at AOC A7: This alternative involves excavation of 50 cubic yards of contaminated soil at AOC A9 within the fenced area. This contaminated soil is assumed to be non-hazardous and will be transported to AOC A7, approximately 1/4 mile away. Soil will be consolidated beneath a 2-acre RCRA Subtitle C multi-layer cap along with contaminated soil excavated from AOC A7.

Soil from AOC A9 is not expected to exhibit a hazardous toxicity characteristic (TCLP Test) for either lead, arsenic, beryllium, or thallium based on the relatively low levels of these contaminants, and their relatively strong adsorption properties. However, the lack of toxicity has not been confirmed. If, as a result of testing, soil is found to be hazardous, it will be transported off site to a hazardous (RCRA Subtitle C) facility for treatment and disposal. When soil excavation is complete, borrow material from the Annex will be placed within the excavated area. A minimum of 6 inches of soil cover will be placed on top of the fill to support vegetation.

A summary of estimated costs, time for design, construction, and operation is presented below.

- Estimated Time for Design and Construction: 3 months
- Estimated Time of Operation: 30 years
- Estimated Capital Cost: $26,870
- Estimated O&M Costs (present worth): $25,020
- Estimated Total Cost, Including 20% Contingency (present worth): $56,035.

Alternative 5 - Solidification/Stabilization: Alternative 5 involves the excavation of contaminated soil, consolidation on site, and addition of solidification/stabilization agents. An estimated 50 cubic yards of soil will be excavated from two locations. These two small hotspots of soil containing slightly elevated levels of arsenic, lead, beryllium, and thallium would be transported to the consolidation area prior to the treatment process. Pozzolan/Portland cement would be placed in the mixing area. The Pozzolan/Portland cement and soils would then be mixed using a backhoe. After hardening, the mixture would form a relatively impermeable monolith. Treated soil would be cured within the consolidation area, and solidified material would remain on site. The consolidation and treatment area will be covered with 6 inches of topsoil and seeded. Monitoring would be performed at regular intervals for 30 years.

A summary of estimated costs, time for design, construction, and operation is presented below.

- Estimated Time for Design and Construction: 6 months
- Estimated Time of Operation: 30 years
- Estimated Capital Cost: $53,925
- Estimated O&M Costs (present worth): $347,730
- Estimated Total Cost, Including 20% Contingency (present worth): $466,160.

Solidification/stabilization has been shown to be effective for immobilizing inorganic compounds. However, a treatability study is proposed for Alternative 5 to account for variability in site-specific conditions.

IX. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

Section 121(b)(1) of CERCLA presents several factors that, at a minimum, the Army is required to consider in its assessment of alternatives. Building upon these specific statutory mandates, the NCP articulates nine evaluation criteria to be used in assessing the individual remedial alternatives.

A detailed analysis was performed on the alternatives using the nine evaluation criteria in order to select a site remedy. The following is a summary of the comparison of each alternative's strength and weakness with respect to the nine evaluation criteria. These criteria are summarized as follows:

Threshold Criteria

The two threshold criteria described below must be met in order for the alternatives to be eligible for selection in accordance with the NCP.

1. **Overall protection of human health and the environment** addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced or controlled through treatment, engineering controls, or institutional controls.

2. **Compliance with applicable or relevant and appropriate requirements (ARARS)** addresses whether or not a remedy will meet all of the ARARs of other Federal and State environmental laws and/or provide grounds for invoking a waiver.

Primary Balancing Criteria

The following five criteria are utilized to compare and evaluate the elements of one alternative to another that meet the threshold criteria.

3. **Long-term effectiveness and permanence** addresses the criteria that are utilized to assess alternatives for the long-term effectiveness and permanence they afford, along with the degree of certainty that they will prove successful.

4. **Reduction of toxicity, mobility, or volume through treatment** addresses the degree to which alternatives employ recycling or treatment that reduces toxicity, mobility, or volume, including how treatment is used to address the principal threats posed by the site.

5. **Short-term effectiveness** addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until cleanup goals are achieved.

6. **Implementability** addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7. **Cost** includes estimated capital and O&M costs, as well as present-worth costs.

Modifying Criteria

The modifying criteria are used on the final evaluation of remedial alternatives generally after the Army has received public comment on the RI/FS and Proposed Plan.

8. **State acceptance** addresses the State's position and key concerns related to the preferred alternative and other alternatives, and the State's comments on ARARs or the proposed use of waivers.

9. **Community acceptance** addresses the public's general response to the alternatives described in the Proposed Plan and RI/FS Reports.

A detailed assessment of each alternative according to the nine criteria can be found in Section 4.0 of the FS Report.

Following the detailed analysis of each individual alternative, a comparative analysis, focusing on the relative performance of each alternative against the nine criteria, was conducted. Comparative analysis for the threshold criteria and the primary balancing criteria can be found in Tables 5-1 and 5-2 of the FS Report for AOC A7 and AOC A9, respectively.

The section below presents the nine criteria and a brief narrative summary of the alternatives and their strengths and weaknesses according to the detailed and comparative analysis. The comparative analysis discussion integrates alternatives for AOCs A7 and A9 because the preferred alternative involves moving contaminated soils from AOC A9 into AOC A7. A detailed assessment of each alternative can be found in the FS Report.

Overall Protection of Human Health and the Environment

The preferred alternative (Alternative 3 for AOC A7 combined with Alternative 4 for AOC A9) is most protective of human health and the environment. Protection is provided by removal of laboratory waste which is presumed to be hazardous. It also provides protection against exposures to surficial contaminants through the placement of a physical barrier over them. The preferred alternative utilizes a RCRA Subtitle C multi-layer landfill cap, which stringently controls infiltration of precipitation and subsequent leachate generation. The cap is designed to prevent surficial leachate seeps.

Off-site disposal of contaminated soils (Alternative 2 for AOC A7, and Alternative 3 for AOC A9) is similar to the preferred alternative, except that contaminated soil from AOC A9 is disposed of off site. The off-site disposal alternatives are equally effective as the preferred alternative on both short-term and long-term bases, since the same technology is employed. Effective containment in both alternatives would provide overall protection by preventing direct contact, ingestion, and inhalation of site contaminants.

The No Action alternative (Alternative 1 for both AOCs A7 and A9) would not meet this criterion in its entirety. It is not considered protective because it provides no reduction in potential risks or control of exposure pathways.

The limited action alternative for the AOC A9, Alternative 2, provides a degree of protection of human health and the environment by utilizing institutional controls to limit site access and future use. However, it would not be as effective in the long term as the excavation and removal alternatives, Alternatives 3 and 4.

Alternative 5 (AOC A9) involves encapsulation of soil contaminants in a cementitious material which would remain on site. This process is considered equally effective to the preferred alternative in protection of human health and the environment.

Compliance with ARARs

Compliance with State and Federal ARARs pertaining to hazardous waste and municipal solid waste landfill closure at AOC A7 would be achieved under the preferred alternative only. Material excavated from the laboratory waste disposal areas will comply with action-specific off-site disposal requirements. For AOC A7, a no-action alternative would not meet landfill closure requirements.

At AOC A9, Alternatives 3 and 4 (the preferred alternative), will comply with action-specific off-site disposal requirements for the material excavated from the hotspots. Since contaminated materials will remain on site after stabilization in Alternative 5 at AOC A9, an action-specific requirement which covers vadose zone monitoring would have to be implemented.

Long-Term Effectiveness and Permanence

At AOC A7, the preferred alternative involves excavation and off-site disposal of hazardous laboratory wastes, and placement of a cap over the landfill area and all contaminated soil from both AOCs A7 and A9. The preferred alternative provides an effective method of long-term containment of contaminated soil and debris. However, the effectiveness of containment is dependent on adequate maintenance of the landfill cap. The preferred alternative is distinct from Alternative 2 because it consolidates contaminated soil from AOC A9 beneath the cap. At both AOCs, the No Action alternative provides no long-term effectiveness because of the continuous potential for contaminant migration and/or direct contact to contaminants.

At AOC A9, Alternative 2, the Limited Action alternative, provides a moderately effective method of preventing direct contact exposure to contaminated soils. Alternative 3, which involves off-site disposal, is permanent for the site. Alternative 5, solidification, is a proven treatment process for inorganic contaminants; however, a treatability study and a long-term monitoring program would be required to determine effectiveness.

Reduction of Toxicity, Mobility, or Volume Through Treatment

None of the alternatives at AOC A7 involve treatment or destruction. The preferred alternative provides the greatest reduction in potential mobility of site-related contaminants through a multi-layer cap. The cap minimizes infiltration and subsequent leaching of contaminants from wastes in the unsaturated zone to the ground water, as well as erosion of surficial contamination and the potential formation of leachate seeps through the side slope of the cap. Alternative 2 at AOC A7 is similar to the preferred alternative except that soil from AOC A9 is not placed beneath the cap. There is no reduction in toxicity, mobility or volume associated with Alternative 1, the No Action alternative, at either AOC A7 or AOC A9.

At AOC A9, Alternatives 1 and 2, the No Action and Limited Action alternatives, provide no reduction in toxicity, mobility, or volume. Alternative 3 does reduce toxicity, mobility, and volume of soil contaminants by removing contaminated soil from the Annex. Alternative 5, which involves solidification, reduces both the toxicity and mobility of inorganic contaminants, but the volumes of these contaminants remain unchanged.

Short-Term Effectiveness

At AOC A7, the SC alternatives (Alternatives 2 and 3, the preferred alternative) would be effective in the short term. Because of the potential for release of contaminants during the excavation activities, however, engineering precautions would be taken to lessen the potential for contaminant emissions, to ensure short-term protection of workers and area residents.

At both AOCs A7 and A9, the No Action alternatives (Alternative 1 at both AOCs) pose no risk to remedial workers or the community because there is no remedial action; however, it provides no short-term effectiveness because of the continuous potential for contaminant migration. At AOC A9, alternatives that

involve soil excavation and transport (Alternatives 3 and 4), or excavation and mixing (Alternative 5) would require engineering precautions to prevent or minimize short-term exposure of site workers to soil contaminants. Alternative 5 requires addition of alkaline materials to contaminated soil, which slightly increases the likelihood of injury or dust exposure.

Implementability

At both AOCs A7 and A9, the No Action alternative (Alternative 1) is easiest to implement because no remedial action is required. At AOC A7, Alternatives 2 and 3, which involve construction of a multi-layer cap, are equal in implementability, although placement of the geomembrane liner requires some skilled labor.

At AOC A9, Alternative 2 is easily implementable because it only involves limited actions. Alternatives 3 and 4, which involve excavation and disposal either off site or at AOC A7, respectively, are also easily implementable. Alternative 5, soil solidification, is a proven technology which is easily implemented technically and administratively.

Cost

The costs of an alternative include the capital cost of implementing an alternative, as well as the O&M costs over a 30-year period. The total cost of a remedial action is expressed as the present worth of both capital and O&M costs. The estimated costs of the alternatives increase incrementally with the increasing sophistication of the remedial action, from the No Action alternative to the preferred alternative, which involves construction of a multi-layer cap. The preferred alternative (Alternative 4) for AOC A9 is the least costly among the alternatives evaluated, excluding the No Action Alternative.

State Acceptance

State acceptance addresses whether, based on its review of the Addendum to the SI/RI Report, FS Report, and Proposed Plan, the State concurs with, opposes, or has no comment on the alternative the Army is proposing as the remedy for AOCs A7 and A9. The State has reviewed and commented on the Proposed Plan and the Army has taken the State's comments into account. The State concurs with the selected remedy for AOCs A7 and A9. A copy of the State's declaration of concurrence letter is included in Appendix E.

Community Acceptance

Community acceptance addresses whether the public concurs with the Army's Proposed Plan. Community acceptance of the Proposed Plan has been evaluated based on comments received at the public hearing (dated June 14, 1995) and during the public comment period. This is documented in the transcript of the public meeting in Appendix B. Based on the public comments, the public is in agreement regarding the preferred remedial alternative as presented in the Proposed Plan.

X. THE SELECTED REMEDY

Based on the potential risks to human health and the environment posed by existing site conditions at the Annex, and the proximity to the Assabet River, stabilization of site conditions at AOCs A7 and A9 was determined to be of high priority. Because AOC A7 contains a landfill for which many remedial

alternatives are impracticable due to implementability or cost, a remedial action to stabilize existing conditions and provide SC was determined to be appropriate. This approach is consistent with the long-term cleanup goals at the Annex and is supported by the expectations of the Superfund program, as listed in the NCP, 40 CFR 300.430(a)(1). The NCP indicates that the principal threats posed by a site should be treated wherever practicable (such as in the remediation of a hotspot) and that engineering controls, such as containment, are appropriate for waste that poses a relatively low long-term threat or where treatment is impracticable.

A. CLEANUP LEVELS

To meet the RAOs identified in Section VII, the Army proposes to conduct an action intended to provide SC and stabilize existing site conditions. For the laboratory waste at AOC A7, no specific cleanup levels were developed since the waste will be excavated and transported off site for treatment and disposal.

For the contaminated soil at AOC A9, the Army has established a cleanup level of 30 parts per million (ppm) for arsenic and 20 ppm for thallium. These cleanup levels are based on risk and will be protective of public health and the environment. A letter from USEPA dated May 19, 1995, presented the development of the risk-based cleanup level for thallium (USEPA, 1995). Cleanup levels for ground water will be developed as appropriate within the MOM operable unit for AOCs A7 and A9.

B. DESCRIPTION OF THE REMEDIAL COMPONENTS

The Army's preferred SC alternative (Alternatives 3 and 4 for AOCs A7 and A9, respectively, as presented in the FS) is summarized as follows. The selected alternative involves isolating the landfill area at AOC A7 to minimize direct exposure to landfill materials and infiltration of precipitation, thereby limiting production of leachate and impacts to ground water quality and the Assabet River. The alternative also involves eliminating any future direct contact to contaminated soils at AOC A9. Major components of the selected alternative for AOCs A7 and A9 are described below.

PREFERRED ALTERNATIVE SUMMARY

- Site Preparation and Grading
- Excavation and Off-Site Treatment and Disposal of Laboratory Waste at AOC A7
- Excavation of Contaminated Soil from AOC A9 and Consolidation at AOC A7
- Construction of RCRA Subtitle C Landfill Cap at AOC A7
- Environmental Monitoring and O&M at AOC A7
- Institutional Controls at AOC A7
- Five-Year Reviews at AOC A7

Estimated Cost to Implement:

Estimated Capital Cost:	$1,641,570
Estimated O&M Costs (present worth):	$620,380
Estimated Total Cost Including 20% Contingency (present worth)*:	$2,475,270

*Cost for five-year reviews at AOC A7 only.

Excavation and Off-Site Treatment and Disposal of Laboratory Waste at AOC A7

Prior to construction of the landfill cap, laboratory waste will be excavated and transported off site for treatment and disposal at an approved facility. The laboratory waste is being removed because it is considered to be the primary source of ground water contamination.

The method of disposal or treatment of the laboratory waste will be determined during the remedial design phase. The determination will reflect the requirements of CERCLA 120(b)(1) that "remedial actions in which treatment which permanently and significantly reduces the volume, toxicity, or mobility of hazardous substances, pollutants or contaminants, as a principal element, are to be preferred over remedial alternatives not involving such treatment."

Excavation of Contaminated Soil from AOC A9 and Consolidation at AOC A7

Prior to construction of the landfill cap, contaminated soil from AOC A9 will be excavated and consolidated at AOC A7. Excavated materials from other areas on the Annex may be used at AOC A7 as fill material to meet the subgrade design specifications for the AOC A7 landfill cap. Before material from other sites is used as subgrade material at AOC A7, the Army will be required to comply with CERCLA and the NCP for any areas which are CERCLA sites, and determine if the material to be consolidated is hazardous and subject to RCRA LDRs, 40 CFR Part 268.

Construction of RCRA Subtitle C Landfill Cap at AOC A7

A multi-layer cap will be placed over the landfill area, as indicated on Figure 3. To minimize the size of the final cap, contaminated soil and other solid waste at AOC A7 will be consolidated to within the extent of the cap. The cap will cover approximately two acres and be designed in accordance with USEPA guidance (USEPA, 1991b). Site-specific factors will be evaluated in determining an effective cap design. The cap will provide a barrier to infiltration and direct precipitation runoff away from landfill materials. The north side of the landfill, along the Assabet River at AOC A7, is very steep and requires stabilizing. Options to address the steep slope are regrading, or construction of a revetment or gabion wall. The determination of the option for the steep slope will be made during the remedial design phase.

Environmental Monitoring and O&M

Following construction of the landfill cap, the Army will conduct ground water monitoring and O&M of the containment system. The environmental monitoring program would be submitted for regulatory review and approval, and will identify the sampling locations and frequencies. O&M of the landfill cap will include inspections and, if needed, repair and/or maintenance of portions of the cap, fencing, and monitoring wells.

Institutional Controls

The selected alternative requires institutional controls and land use restrictions to prevent future use of the land at AOC A7. Restrictions on land use at AOC A7 will be implemented by the Army to limit future use.

Five-Year Reviews at AOC A7

The Army will review the conditions at AOC A7 at least once every five years. The purpose of the five-year review is to ensure that the remedial action continues to protect human health and the environment, and is functioning as designed.

XI. STATUTORY DETERMINATIONS

The remedial action selected for implementation at AOC A7 and AOC A9 of the Annex is consistent with CERCLA and, to the extent practicable, the NCP. The selected remedy is protective of human health and the environment, attains ARARs and is cost effective. The selected remedy meets USEPA expectations regarding Superfund remedial actions, including mitigation of the principal threat (i.e., removal and off-site disposal of the laboratory waste) to human health and the environment, and the use of engineering controls such as containment of contaminated soil that poses a relatively low long-term threat, or for which treatment is impracticable.

A. THE SELECTED REMEDY IS PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT

The remedy at AOC A7 and AOC A9 of the Annex will permanently reduce the risks posed to human health and the environment by eliminating, reducing or controlling exposures to human and environmental receptors through engineering and institutional controls. Removal and off-site disposal of the laboratory waste from AOC A7, construction of a RCRA Subtitle C multilayer cap over the solid waste at AOC A7, and removal of several hotspots from AOC A7 and AOC A9 and consolidation under the cap will all act to prevent exposure to the contaminants. The cap will also prevent infiltration of precipitation through unsaturated waste materials and the resultant generation of leachate. Moreover, the selected remedy will achieve potential human health risk levels that attain the 10^{-4} to 10^{-6} incremental cancer risk range and a level protective of noncarcinogenic endpoints, and will comply with To Be Considered (TBC) criteria and guidance.

B. THE SELECTED REMEDY ATTAINS ARARS

The remedy at AOCs A7 and A9 will attain all federal and state ARARs. Where no ARARs were available, policies, criteria, and guidance were listed with status as TBC. ARARs and TBCs for AOCs A7 and A9 were identified during both the RI and FS. Appendix C presents tabular summaries of all ARARs and TBCs previously identified, including a regulatory citation, a requirement synopsis, and the action to be taken to attain the requirement. The following narrative presents a summary of the key ARARs and their applicability to the selected combined remedy for AOCs A7 and A9.

Chemical-Specific ARARs

These ARARs are numerical values or procedures that, when applied to a specific site, establish numerical limits for individual chemicals or groups of chemicals. Chemical-specific ARARs are generally health- or risk-based standards limiting the concentration of a chemical found in or discharged to the environment.

AOC A7: There are no chemical-specific ARARs for AOC A7 for this SC ROD since the area will be covered with a landfill cap.

AOC A9: At AOC A9, arsenic and thallium are the contaminants that have been detected at levels that pose a risk. Since no federal and state chemical-specific ARARs for soils exist, the Army and the USEPA have developed risk-based cleanup levels for arsenic and thallium using a guidance document (USEPA, 1991a). This guidance is listed as TBC in the ARARs table for AOC A9 in Appendix C.

Location-Specific ARARs

Location-specific ARARs set restrictions on the types of remedial activities that can be performed based on site-specific characteristics and location. No location-specific ARARs were identified for AOC A9.

Action-Specific ARARs

Action-specific requirements set controls or restrictions on the design, implementation, and performance of waste management actions. They are triggered by the particular types of treatment or remedial actions that are selected to accomplish the cleanup. After remedial alternatives are developed, action-specific ARARs and TBC guidance that specify performance levels, as well as specific levels for discharges or residual chemicals, will provide a basis for assessing the feasibility and effectiveness of the remedial actions.

Landfill Closure: The following is a list of the federal and state ARARs that pertain to the construction of the landfill cap, to storm water management, to environmental monitoring, to consolidation, and to other various activities at AOC A7.

Prior to construction of the landfill cap, excavated materials from other areas on the Annex may be used at AOC A7 for fill material to meet the subgrade design specifications for the AOC A7 landfill cap. Before material from other sites can be used as subgrade material at AOC A7, the Army will be required to comply with CERCLA and the NCP for any areas which are CERCLA sites, and determine if the material to be consolidated is hazardous and subject to RCRA LDRs, 40 CFR Part 268. If the material is non-hazardous, it may be used for subgrade fill at AOC A7. If it is determined to be hazardous, it may not be used for subgrade fill at AOC A7 unless it is treated in accordance with LDR requirements prior to usage.

Although AOC A7 will be receiving contaminated soil from AOC A9, it is not necessary for AOC A7 to obtain any Federal or State permits. AOCs A7 and A9 may be viewed as separate CERCLA facilities which are noncontiguous, as defined in CERCLA §101(9). Therefore, AOC A7 is exempt from the permit requirements because, under the NCP, it is appropriate to aggregate these facilities for the purpose of the response action since they are related based on the threat posed and geography, and on the compatibility of the selected disposal approach [55 Federal Register (FR) 8690, March 8, 1990].

Federal

- RCRA, Subtitle C, Subpart B - General Facility Standards (40 CFR §264.10 - 264.18);
- RCRA Subtitle C, Subpart B - Construction Quality Assurance Program (40 CFR §264.19);
- RCRA Subtitle C, Subpart C - Preparedness and Prevention (40 CFR §264.30 - 264.37);
- RCRA Subtitle C, Subpart D - Contingency Plan and Emergency Procedures (40 CFR §264.50 - 264.56);
- RCRA Subtitle C, Subpart F - Releases from Solid Waste Management Units (40 CFR §264.90 - 264.101);
- RCRA Subtitle C, Subpart G - Closure and Post-Closure (40 CFR §264.117 - 264.120);

- RCRA - Subpart N, Landfill Closure and Post-Closure Care (40 CFR §264.310);
- RCRA Land Disposal Restriction (40 CFR 268); and
- Clean Water Act: Final National Pollutant Discharge Elimination System General Permits for Storm Water Discharges from Construction Sites; Notice (57 FR 44412-44435).

State

- Hazardous Waste Rules (HWR) - General Management Standards for All Facilities (310 CMR 30.510);
- HWR - Contingency Plan, Emergency Procedures, Preparedness, and Prevention (310 CMR 30.520);
- HWR - Landfill Closure and Post-Closure Care [310 CMR 30.633(1) & (2B)];
- HWR - Post-Closure [310 CMR 30.591(b) & 30.592(b)];
- HWR - Land Disposal Restrictions (310 CMR 30.750);
- Massachusetts Surface Water Quality Standards (310 CMR 4.00); and
- Massachusetts Ambient Air Quality Standards (310 CMR 6.00).

The following policies, criteria, and guidance (i.e., TBCs) will also be considered during the implementation of the landfill closure remedial action:

- RCRA Proposed Amendments for Landfill Closure (52 FR 8712);
- USEPA Guidance: Design and Construction of RCRA/CERCLA Final Covers (EPA/625/4-91/025); and
- USEPA Guidance: Quality Assurance and Quality Control for Waste Containment Facilities (EPA/600/R-93/182).

Laboratory Waste: During the RI at AOC A7, buried laboratory wastes were identified during test pit excavations. Based on interviews, these wastes were dumped by Natick Laboratory employees in the 1970s. Removal of this laboratory waste and associated contaminated soil will trigger RCRA LDRs which require treatment of wastes prior to disposal. Since the wastes have been classified as F002 spent halogenated solvents, they will be transported off site for treatment and disposal in accordance with the requirements of the LDRs.

Soils subject to off-site disposal require hazardous waste characterization per 310 CMR 30.1245, and 40 CFR 261. Under these state and federal regulations, soils that are to be disposed off-site will be subject to TCLP testing. TCLP characterizes soils as hazardous or non-hazardous depending on the leaching characteristics of certain chemical constituents. The test is only applicable to wastes, but it is relevant and appropriate to soils.

A detailed list of action-specific ARARs and their status are presented in Appendix C.

C. THE SELECTED REMEDIAL ACTION IS COST-EFFECTIVE

In the Army's judgment, the selected remedy is cost effective, i.e., the remedy affords overall effectiveness proportional to its costs. In selecting this remedy, the Army first identified alternatives that are protective of human health and the environment and that attain, or, as appropriate, waive ARARs. The Army evaluated the overall effectiveness of each alternative by assessing the relevant three criteria–long-term effectiveness and permanence; reduction in toxicity, mobility, or volume through treatment; and short-term

effectiveness, in combination. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs. The costs of this remedial alternative are:

AOC A7

- Estimated Time for Design and Construction: 2 years
- Estimated Time of Operation: 30 years
- Estimated Capital Cost: $1,614,700
- Estimated O&M Costs (present worth)[1]: $595,360
- Estimated Total Cost Including 20% Contingency (present worth): $2,419,235.

AOC A9

- Estimated Time for Design and Construction: 3 months
- Estimated Capital Cost: $26,870
- Estimated O&M Costs (present worth): $25,020
- Estimated Total Cost, Including 20% Contingency (present worth): $56,035.

D. THE SELECTED REMEDY UTILIZES PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE

Once the Army identified those alternatives that attain or, as appropriate, waive ARARs and that are protective of human health and the environment, the Army identified which alternative utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. This determination was made by deciding which one of the identified alternatives provides the best balance of trade-offs among alternatives in terms of: 1) long-term effectiveness and permanence; 2) reduction of toxicity, mobility or volume through treatment; 3) short-term effectiveness; 4) implementability; and 5) cost. The balancing test emphasized long-term effectiveness and permanence and the reduction of toxicity, mobility or volume through treatment; and considered the preference for treatment as a principal element, the bias against off-site land disposal of untreated waste, and community and state acceptance.

The selected remedy provides the best balance of trade-offs among the alternatives. Excavation and off-site treatment and disposal of the hazardous laboratory waste will provide reduction of toxicity, mobility, or volume of the most contaminated material at the site. Residual soils contain much lower contaminant levels. Capping of this material will substantially reduce the contaminant mobility within and away from the source area. Capping coupled with institutional controls is an effective measure for eliminating long-term hazards associated with direct contact with the contaminants in soil. The long-term effectiveness of this alternative will be monitored by management and maintenance of the cap system. This alternative is relatively easy to implement. A relatively short duration is required to implement this alternative, thus short-term risk to remedial workers would be minimal.

[1]The net present worth cost is based on a 7 percent discount rate and 30 years O&M.

E. THE SELECTED REMEDY DOES NOT SATISFY THE PREFERENCE FOR TREATMENT WHICH PERMANENTLY AND SIGNIFICANTLY REDUCES THE TOXICITY, MOBILITY OR VOLUME OF THE HAZARDOUS SUBSTANCES AS A PRINCIPAL ELEMENT

The selected remedy does not satisfy the statutory preference for treatment as a principal element due to the impracticability of treating the landfill area (i.e., the implementability problems and prohibitive costs which would be associated with treatment of the entire landfill). The selected remedy involves the removal of the laboratory waste from AOC A7 and, eventual treatment and disposal off site. This permanently and significantly reduces the toxicity, mobility, and volume of the laboratory waste. For the remaining contaminated soil from both AOCs A7 and A9, the selected remedy provides only containment beneath a RCRA Subtitle C landfill cap. This will result in a significant reduction of the mobility of contaminants, but not their toxicity and volume. However, this material did not show the characteristics of toxicity based on the TCLP results. The use of a RCRA cap for containing such waste will be protective of human health and the environment to the maximum extent practicable. This approach is supported by the expectations of the Superfund program, which indicates that for waste that poses a relatively low long-term threat or where treatment is impracticable, engineering controls, such as containment, are appropriate.

XII. DOCUMENTATION OF NO SIGNIFICANT CHANGES

The Army released the Proposed Plan for the SC remediation of AOCs A7 and A9 on June 1, 1995. The preferred alternative included removal and off-site disposal of buried laboratory waste from AOC A7, containment of the solid waste landfill area at AOC A7 with a RCRA Subtitle C cap, removal of several hotspots from AOCs A7 and A9 and consolidation of this material under the AOC A7 cap. Since the remedial action is identical to the remedy proposed in the Proposed Plan, no significant changes need to be addressed.

XIII. STATE ROLE

The MADEP has reviewed the various alternatives and has indicated its support for the selected remedy. The State has also reviewed the RI, Risk Assessment and FS to determine if the selected remedy is in compliance with applicable or relevant and appropriate State Environmental laws and regulations. The State of Massachusetts concurs with the selected remedy for the Annex. A copy of the declaration of concurrence is attached as Appendix E.

XIV. REFERENCES

Dames & Moore, 1986. *Remedial Investigation of Sudbury Annex, Massachusetts*; Report No. AMXTH-IR-CR86094, November.

OHM, 1995a. *Final Feasibility Study Report for the Fort Devens Sudbury Training Annex, Areas of Contamination A7 and A9*; Pittsburgh, PA; May.

OHM, 1995b. *Draft Final Addendum to the Final Report Site/Remedial Investigation;* Pittsburgh, PA; April.

OHM, 1995c. *Proposed Plan, AOC A7, the Old Gravel Pit Landfill, AOC A9, the POL Burn Area*; Pittsburgh, PA; June.

USEPA, 1991a. *Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remedial Goals) Interim;* Office of Emergency and Remedial Response, Washington, DC; Publication 9285.7-01B; October.

USEPA, 1991b. *Design and Construction of RCRA/CERCLA Final Covers;* USEPA/625/4-91/025, USEPA Office of Research and Development, Washington, DC; May.

USEPA, 1995. *Letter Regarding Fort Devens Sudbury Training Annex Area of Contamination A9, Risk Based Soil Cleanup Level for Thallium;* Boston, MA; May.

FIGURES

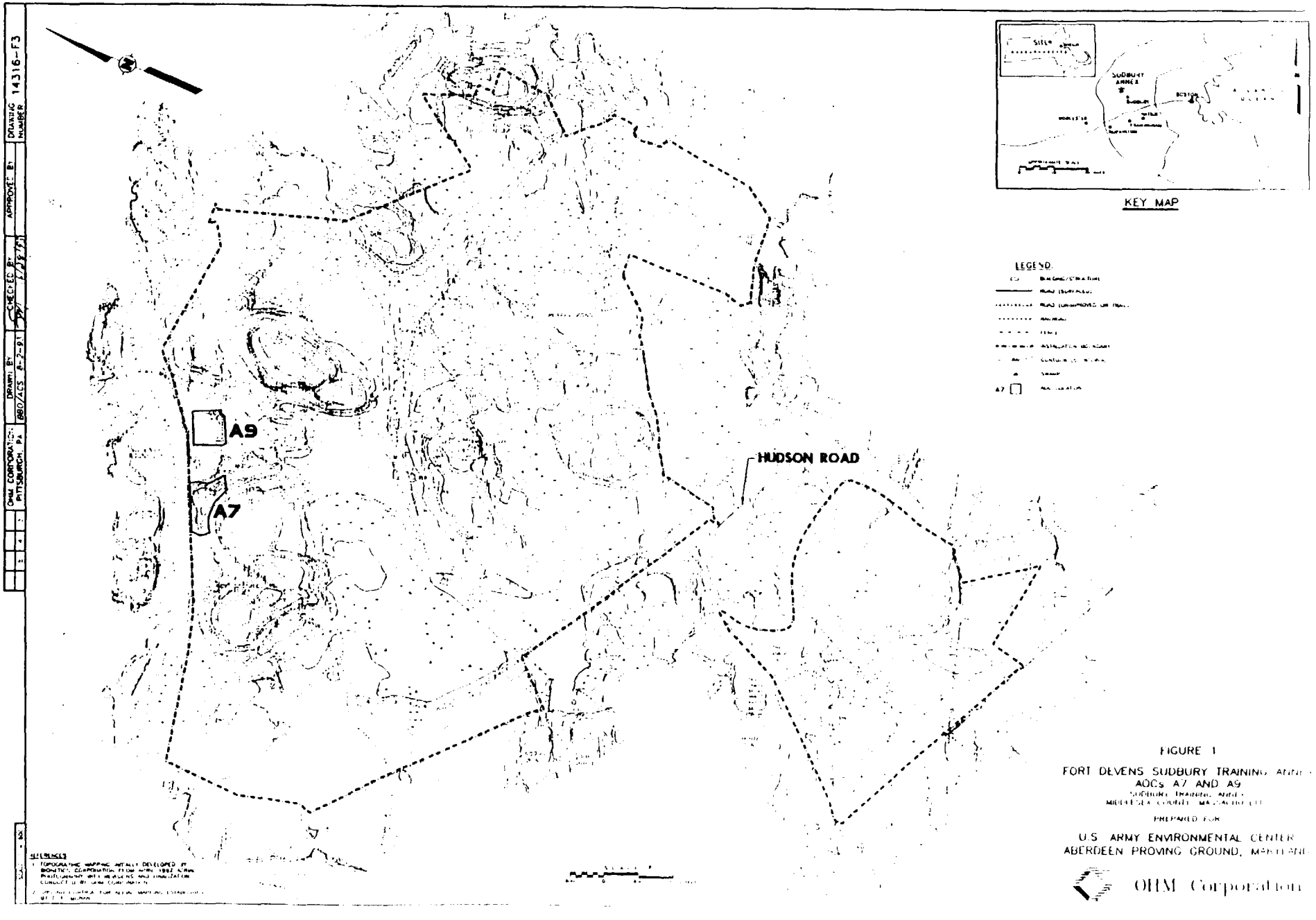


FIGURE 1

FORT DEVENS SUDBURY TRAINING ANNEX
AOCs A7 AND A9
SUDBURY TRAINING ANNEX
MIDDLESEX COUNTY, MASSACHUSETTS

PREPARED FOR

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

OHM Corporation

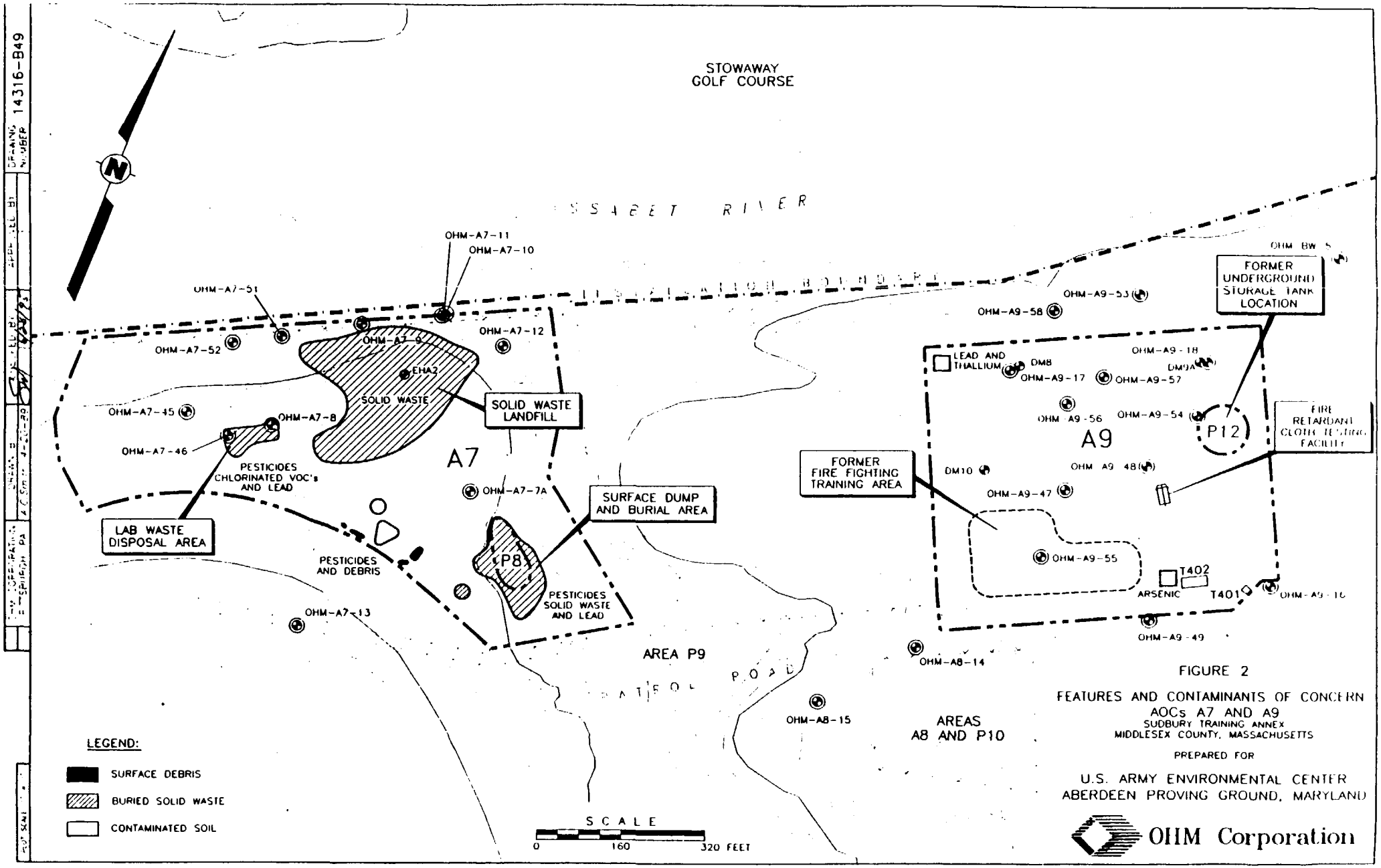


FIGURE 2

FEATURES AND CONTAMINANTS OF CONCERN
AOCs A7 AND A9
SUDBURY TRAINING ANNEX
MIDDLESEX COUNTY, MASSACHUSETTS

PREPARED FOR

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

DRAWING NUMBER 14316-B49

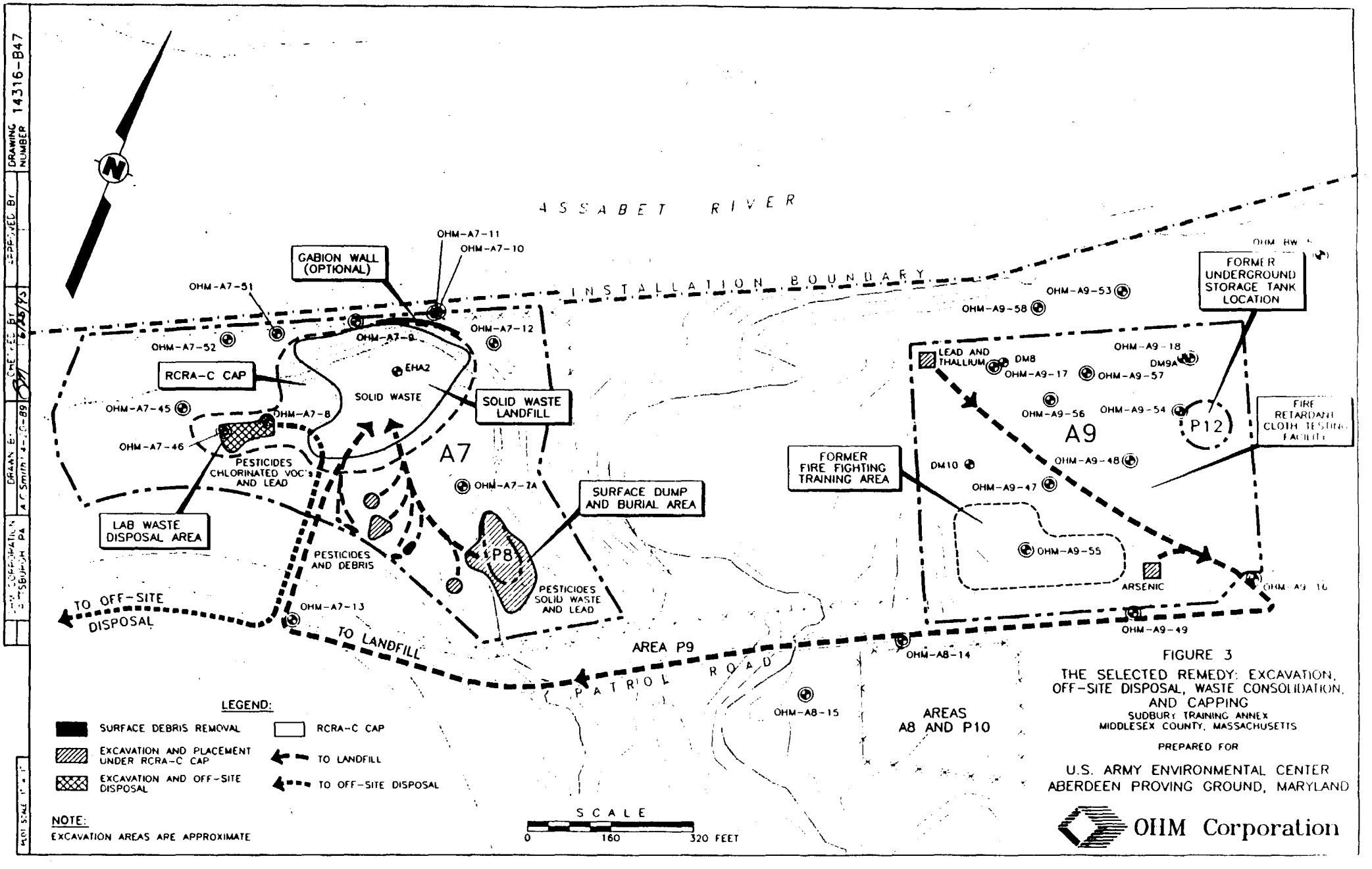


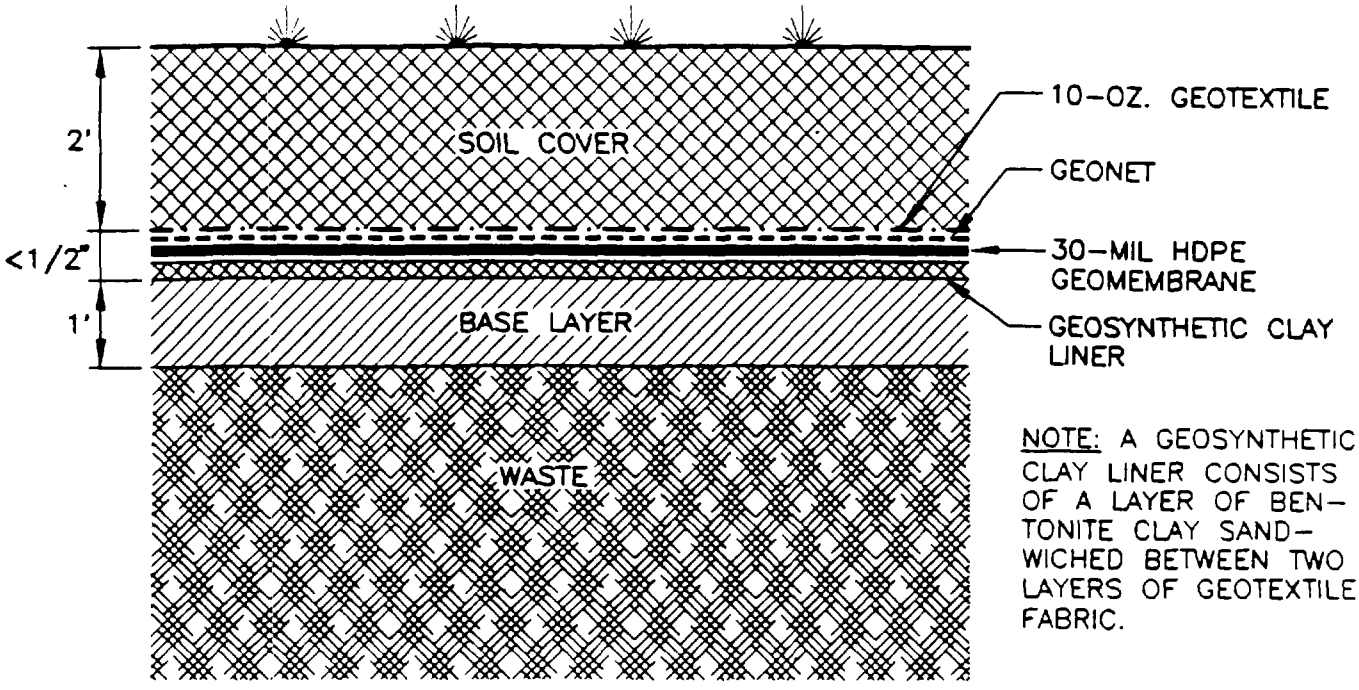
FIGURE 3

THE SELECTED REMEDY: EXCAVATION, OFF-SITE DISPOSAL, WASTE CONSOLIDATION, AND CAPPING

SUDBURY TRAINING ANNEX
MIDDLESEX COUNTY, MASSACHUSETTS

PREPARED FOR

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



NOTE: A GEOSYNTHETIC CLAY LINER CONSISTS OF A LAYER OF BENTONITE CLAY SANDWICHED BETWEEN TWO LAYERS OF GEOTEXTILE FABRIC.

CAP LAYER FUNCTIONS			
LAYER	FUNCTION	LAYER	FUNCTION
SOIL COVER	TO PROVIDE A PLACE FOR GRASS TO GROW AND TO PROTECT THE LAYERS BELOW FROM DAMAGE.	30-MIL HDPE GEOMEMBRANE	AN IMPERMEABLE BARRIER TO PREVENT INFILTRATION OF RAIN WATER AND SNOW MELT.
GEOTEXTILE	TO KEEP SAND AND SOIL OUT OF THE DRAINAGE LAYER. CAN BE BONDED TO GEONET LAYER BELOW.	GEOSYNTHETIC CLAY LINER	ANOTHER VERY LOW PERMEABILITY BARRIER.
		BASE LAYER	COVERS THE WASTE AND PROVIDES THE FOUNDATION FOR THE CAP ABOVE.
GEONET (LATERAL DRAIN)	A LAYER TO PROVIDE A CONDUIT FOR WATER DRAINAGE.	WASTE	SOLID WASTE AND CONTAMINATED SOIL FROM AOCs A7 AND A9.

FIGURE 4

RCRA SUBTITLE C LANDFILL CAP
SUDBURY TRAINING ANNEX
MIDDLESEX COUNTY, MASSACHUSETTS

PREPARED FOR

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

OHM Corporation

DRAWING NUMBER 14316-A90
APPROVED BY
CHECKED BY 6/26/95
DRAWN BY B. O'Connor 4-26-95
OHM CORPORATION PITTSBURGH, PA
PLOT SCALE: 1" = 1'

APPENDIX A

RISK ASSESSMENT TABLES

APPENDIX A

SUMMARIES OF SOIL SAMPLING RESULTS FOR AOCs A7 AND A9

The seven tables contained in this appendix present summaries of the soil sampling results for AOCs A7 and A9. These data have been used as the basis for the human health risk assessment.

The source of these tables is Appendix C of the Draft Final Addendum to the Site/Remedial Investigation Report submitted by OHM in April, 1995. The original table numbers have been retained. A complete discussion of both the human health and ecological risk assessments for the Annex can be found in Appendix C. Sections 3.0 and 4.0 of the Draft Final Addendum Report present area-specific risk assessments for AOCs A7 and A9, respectively.

Table 4-2
Phase I Total Soil Sampling Results - Area A7

Chemical	Frequency (No. Detect/Total)	Maximum Detection (mg/kg)
METALS:		
Aluminum	58/58	18000.00
Arsenic	58/58	27.00
Barium	56/58	353.00
Beryllium	4/58	0.36
Cadmium	44/58	27.50
Calcium	50/58	5420.00
Chromium	58/58	270.00
Cobalt	43/58	11.90
Copper	58/58	250.00
Iron	58/58	22000.00
Lead	58/58	400.00
Magnesium	58/58	6670.00
Manganese	58/58	480.00
Mercury	16/58	0.92
Nickel	58/58	18.70
Potassium	58/58	6720.00
Silver	2/58	19.00
Vanadium	58/58	63.40
Zinc	58/58	840.00
VOLATILE ORGANICS:		
1,1,2-Trichloroethane	1/83	20.00
1,2-Dichloroethane	1/83	1.00
Acetone	8/83	0.30
Chlorobenzene	2/83	0.56
Chloroform	2/83	20.00
Methylene chloride	21/83	0.03
Nonane	1/83	0.03
Octane	1/83	6.00
Propylbenzene	1/83	0.01
Tetrachloroethylene (PCE)	2/83	20.00
Toluene	3/83	0.002
Trichloroethylene (TCE)	1/83	0.10
Trichlorofluoromethane	1/83	0.11
Xylenes, total combined	2/83	0.10
alpha-Pinene	2/83	0.16
BNAs:		
1,2,3,4-Tetramethylbenzene	1/58	3.00
1,3,5-Trimethylbenzene	1/58	3.00
1-Ethyl-2-methylbenzene	1/58	2.00
2-Methylnaphthalene	3/58	10.00
Anthracene	2/58	2.00
Benzo[a]anthracene	2/58	3.00
Benzo[a]pyrene	2/58	2.00
Benzo[b]fluoranthene	1/58	1.20
Benzo[g,h,i]perylene	1/58	0.39
Bis (2-ethylhexyl) phthalate	13/58	8.00
Chrysene	1/58	0.79
Di-N-butyl phthalate	33/58	10.00

Table 4-2 (continued)
Phase I Total Soil Sampling Results - Area A7

Chemical	Frequency (No. Detect/Total)	Maximum Detection (mg/kg)
BNAs (cont.):		
Fluoranthene	3/58	3.00
Fluorene	1/58	0.91
Hexadecanoic acid	1/58	13.00
Indeno[1,2,3-c,d]pyrene	1/58	0.54
Naphthalene	1/58	2.00
Octadecanoic acid	1/58	6.50
Phenanthrene	3/58	5.00
Pyrene	2/58	4.00
Sulfur	1/58	1.60
PCB/PESTICIDES:		
DDT	25/54	380.00
DDD	10/54	64.00
DDE	14/54	86.00
Dieldrin	5/54	0.26
Endosulfan sulfate	1/54	0.08
Heptachlor	4/54	0.06
Heptachlor epoxide	4/54	0.06
Lindane	3/54	0.52
PCB 1242	1/54	0.17
PCB 1248	1/54	0.04
PCB 1254	5/54	2.00
PCB 1260	1/54	1.63
alpha-Chlordane	7/54	0.91
alpha-Endosulfan	1/54	0.01
beta-Benzenehexachloride	1/54	0.02
beta-Endosulfan	2/54	0.19
gamma-Chlordane	6/54	1.70
HERBICIDES:		
Dacthal (DCPA)	1/56	0.08
Silvex	1/56	0.01
EXPLOSIVES:		
Cyclonite (RDX)	1/56	4.72
ORGANIC CARBON:		
Total Organic Carbon	7/7	2480.00

NOTES:

DDT = 2,2-Bis(p-chlorophenyl)-1,1,1-trichloroethane
DDD = 2,2-Bis(p-chlorophenyl)-1,1-dichloroethane
DDE = 2,2-Bis(p-chlorophenyl)-1,1-dichloroethene
Dacthal = 2,3,5,6-tetrachloro-1,4-benzenecarboxylic acid dimethyl ester

Table 4-5
Summary of Phase II Boring Results - Area A7
(values are in mg/kg unless otherwise noted)

Chemical	Phase I Background Soil 95% UCL	A7SB51B	A7SB52B	A7SB16B	A7SB18B	A7SB19B	A7SB17B (ug/l)	DUPSB02C (ug/l)
METALS:								
Barium	25.39	61.3	NA	NA	NA	NA	1700	600
Beryllium	0.30	0.517	NA	NA	NA	NA	ND	ND
Cadmium	0.77	ND	NA	NA	NA	NA	5	5.8
Chromium	25.55	26.9	NA	NA	NA	NA	28	7.9
Cobalt	2.96	3.67	NA	NA	NA	NA	ND	ND
Copper	10.56	18.8	NA	NA	NA	NA	ND	ND
Iron	15381.77	18000	NA	NA	NA	NA	ND	ND
Lead	40.71	7.2	NA	NA	NA	NA	1100	810
Magnesium	2391.06	3910	NA	NA	NA	NA	ND	ND
Nickel	11.26	12.3	NA	NA	NA	NA	ND	ND
Potassium	471.17	2960	NA	NA	NA	NA	ND	ND
Sodium	ND	94.7	NA	NA	NA	NA	ND	ND
Vanadium	27.22	29.9	NA	NA	NA	NA	ND	ND
VOLATILE ORGANICS:								
Methyl ethyl ketone	ND	0.004	NA	NA	NA	NA	ND	ND
BNAs:								
Bis (2-ethylhexyl) phthalate	ND	1.6	NA	NA	NA	NA	ND	ND
PCB/PESTICIDES:								
2,2-Bis(p-chlorophenyl)-1,1,1-trichloroethane (DDT)	0.05	ND	ND	0.033	1.4	3.8	ND	ND
2,2-Bis(p-chlorophenyl)-1,1-dichloroethane (DDD)	0.02	ND	ND	0.023	0.228	1.2	ND	ND
2,2-Bis(p-chlorophenyl)-1,1-dichloroethene (DDE)	0.03	ND	ND	ND	0.064	0.065	ND	ND
Lindane	ND	ND	ND	0.015	ND	ND	56	23
ORGANIC CARBON:								
Total Organic Carbon	NA	5850	3470	NA	NA	NA	NA	NA

NOTES:

A7SB17B and DUPSB02C are leachate samples (full TCLP extraction analysis). Therefore, concentrations are reported as ug/l.

There were no positive detections for samples A7SB13B, A7SB14B, A7SB15B, and A7SB20B, which were analyzed for PCB/pesticides and organophosphorus pesticides only.

NA = Not analyzed
ND = Compound was not detected

Table 5-2
Phase I Total Soil Sampling Results - Area A9

Chemical	Frequency (No. Detect/Total)	Maximum Detection (mg/kg)
METALS:		
Aluminum	40/40	12000.00
Arsenic	40/40	70.00
Barium	40/40	50.60
Beryllium	2/40	0.34
Cadmium	21/40	1.64
Calcium	31/40	1550.00
Chromium	40/40	24.50
Cobalt	19/40	6.10
Copper	40/40	75.00
Iron	40/40	17000.00
Lead	40/40	450.00
Magnesium	40/40	4070.00
Manganese	40/40	410.00
Mercury	1/40	0.11
Nickel	40/40	13.90
Potassium	40/40	2870.00
Vanadium	40/40	26.70
Zinc	40/40	109.00
VOLATILE ORGANICS:		
1,1,1-Trichloroethane (1,1,1-TCA)	3/40	0.20
1,1,3-Trimethylcyclohexane	1/40	0.03
1,3-Dimethylcyclohexane	1/40	0.04
1,4-Dimethylcyclohexane	1/40	0.01
Acetone	4/40	0.03
Ethylbenzene	2/40	0.01
Methylene chloride	14/40	0.02
Methylethyl ketone	1/40	0.01
Xylenes, total combined	4/40	0.50
alpha-Pinene	4/40	0.32
BNAs:		
2-Methylnaphthalene	1/40	10.00
Benzo[a]pyrene	1/40	0.29
Bis (2-ethylhexyl) phthalate	18/40	5.00
Chrysene	1/40	0.31
Di-N-octyl phthalate	1/40	0.50
Dibenzofuran	1/40	1.40
Fluoranthene	4/40	1.40
Fluorene	1/40	2.40
Indeno[1,2,3-c,d]pyrene	1/40	0.23
Naphthalene	1/40	2.30
Phenanthrene	3/40	10.00
Pyrene	1/40	0.39

Table 5-2 (continued)
Phase I Total Soil Sampling Results - Area A9

Chemical	Frequency (No. Detect/Total)	Maximum Detection (mg/kg)
PCB/PESTICIDES:		
DDT	5/40	0.06
DDD	1/40	0.09
DDE	2/40	0.03
Heptachlor epoxide	1/40	0.02
EXPLOSIVES:		
2,6-Dinitrotoluene	1/40	1.10
ORGANIC CARBON:		
Total Organic Carbon	15/15	19700.00

NOTES:

DDT = 2,2-Bis(p-chlorophenyl)-1,1,1-trichloroethane
DDD = 2,2-Bis(p-chlorophenyl)-1,1-dichloroethane
DDE = 2,2-Bis(p-chlorophenyl)-1,1-dichloroethene

Table 5-4
Summary of Phase II Surface Soil Results - Area A9 (mg/kg)

Chemical	Phase I Background Soil 95% UCL	A9SO7B	A9SO8B	A9SO9B	A9SO10B
METALS:					
Aluminum	13204.18	14000	11000	7100	11000
Arsenic	8.24	20	4.1	6.9	9.3
Barium	25.39	32.8	75.8	38.5	31.5
Beryllium	0.30	0.547	ND	ND	0.547
Calcium	633.50	474	2010	926	460
Chromium	25.55	16.2	53.9	13.7	15.4
Cobalt	2.96	3.76	3.96	ND	3.76
Copper	10.56	7.14	11.7	6.92	5.63
Iron	15381.77	12000	16000	9900	9900
Lead	40.71	26	31	35	270
Magnesium	2391.06	2020	5720	2260	1830
Nickel	11.26	ND	12	ND	ND
Potassium	471.17	766	2990	1020	608
Selenium	ND	0.45	0.33	0.35	0.51
Sodium	ND	61.7	280	66.6	ND
Thallium	ND	304	ND	ND	ND
Vanadium	27.22	22.9	48.7	20.3	20.8
Zinc	39.75	28	42.3	28.6	28.2

NOTES:

ND = Compound was not detected

Table 5-6
Summary of Phase II Hand Auger and Soil Boring Results - Area A9 (mg/kg)

Chemical	Phase I Background Soil 95% UCL	A9HA5B	A9HA6B	A9HA7B	A9HA8B	A9SB10B	A9SB11B
METALS:							
Aluminum	13204.18	15000	17000	5200	7300	4440	4960
Arsenic	8.24	140	14	6.4	7.6	3.7	4.1
Barium	25.39	42.7	31.5	18.1	20.6	19.1	22.7
Beryllium	0.30	0.676	0.692	ND	ND	ND	ND
Calcium	633.50	369	241	601	373	510	865
Cobalt	2.96	4.86	4.85	ND	ND	ND	ND
Magnesium	2391.06	2030	2170	2150	2730	1820	1810
Potassium	471.17	547	411	1110	1250	1100	1020
Selenium	ND	0.54	0.49	0.27	0.23	ND	ND

NOTES:

These samples were analyzed for metals only
ND = Compound was not detected

Table 5-6

Summary of Phase II Hand Auger and Soil Boring Results - Area A9 (mg/kg)

Chemical	Phase I Background Soil 95% UCL	A9HA5B	A9HA6B	A9HA7B	A9HA8B	A9SB10B	A9SB11B
METALS:							
Aluminum	13204.18	15000	17000	5200	7300	4440	4960
Arsenic	8.24	140	14	6.4	7.6	3.7	4.1
Barium	25.39	42.7	31.5	18.1	20.6	19.1	22.7
Beryllium	0.30	0.676	0.692	ND	ND	ND	ND
Calcium	633.50	369	241	601	373	510	865
Cobalt	2.96	4.86	4.85	ND	ND	ND	ND
Magnesium	2391.06	2030	2170	2150	2730	1820	1810
Potassium	471.17	547	411	1110	1250	1100	1020
Selenium	ND	0.54	0.49	0.27	0.23	ND	ND

NOTES:

These samples were analyzed for metals only

ND = Compound was not detected

APPENDIX B

RESPONSIVENESS SUMMARY

APPENDIX B

RESPONSIVENESS SUMMARY FOR THE RECORD OF DECISION
AOC A7 - The Old Gravel Pit Landfill
AOC A9 - The POL Burn Area
Fort Devens Sudbury Training Annex
Middlesex County, Massachusetts

The purpose of the Responsiveness Summary is to review public response to the Proposed Plan for AOCs A7 and A9 at the Fort Devens Sudbury Training Annex. This summary also reviews public comment on other remedial alternatives considered but not recommended. In addition, it documents the Army's consideration of such comments during the decision-making process and provides answers to any major comments raised during the public comment period for the Proposed Plan.

The responsiveness summary for the preferred alternative is divided into the following sections:

- Overview - This section briefly describes the remedial alternative recommended in the Proposed Plan and any changes to the Proposed Plan due to public comment:

- Background on Community Involvement - This section provides a summary of community interest in the proposed remedial alternative and identifies key public issues. It also describes community relations activities conducted with respect to these issues.

- Summary of Major Questions and Comments - This section summarizes verbal and written comments received during the public meeting and public comment period, respectively.

- Remedial Design/Remedial Action concerns - This section describes public concerns that are directly related to design and implementation of the selected remedial alternative.

OVERVIEW

At the time of the public comment period, the Army had selected a preferred source control remedial alternative for AOCs A7 and A9 at the Fort Devens Sudbury Training Annex in Middlesex County, Massachusetts. The Army's preferred alternative addressed the problem of source control with respect to the presence of buried laboratory waste, solid waste, and soil contaminated with metals and pesticides. The preferred alternative involved excavating the laboratory waste and transporting the waste off site to an approved facility, excavation of contaminated soil and solid waste followed by consolidation in the central landfill area of AOC A7, capping the landfill area with a RCRA Subtitle C multi-layer cap, fencing and institutional controls, environmental monitoring, operation and maintenance, site monitoring and inspections, and 5-year reviews. This preferred alternative was selected in coordination with the USEPA and MADEP.

Oral comments were received at the public hearing, however, no written comments were received during the public comment period.

APPENDIX B
(CONTINUED)

BACKGROUND ON COMMUNITY INVOLVEMENT

Throughout the planning and investigative phases, the Army, USEPA, and MADEP have been directly involved by reviewing and commenting on all proposals, project reports, and reviews. Periodic meetings have been held to maintain open lines of communication and to keep all parties abreast of current activities.

Citizen input during this process has been predominantly through the Technical Review Committee (TRC) established by the Army. Quarterly meetings of the TRC held since June 15, 1991, have brought together local representatives from the towns of Sudbury, Stow, Maynard, and Hudson, and elected representatives from both the state and federal levels. Local citizens interests were presented by representatives from the 4-Town Families Organized to Clean Up Sites (FOCUS), the Lake Boon Association, and the Organization for the Assabet River. The TRC has also included representatives from the Fort Devens Environmental Management Office (EMO), USEPA, MADEP, the U.S. Fish and Wildlife Service, the U.S. Army Environmental Center (USAEC, formerly USATHAMA), and the U.S. Army Corps of Engineers (USACE). In addition, special Public Information Meetings followed by question-and-answer sessions were held to present information about such topics at the USEPA's Federal Facilities Superfund Remedial Program, the Army's Superfund program at the Sudbury Annex, the Massachusetts State Public Involvement Program (PIP), and the Master Environmental Plan. Site visits and tours were also conducted to familiarize any interested citizen or citizens and local, state, or federal representatives or agencies with the various sites and the proposed plans for investigations. Both citizen and regulatory agency input was solicited and considered during all phases of the project.

On June 1, 1995, the Army finalized the Proposed Plan. On June 7 and June 8, 1995, notices appeared in the Enterprise Sun, Maynard Beacon, Southborough Villager, the Beacon, the Middlesex News, and Sudbury Town Crier. The notices announced the date, time, and place of the public hearing for the Proposed Plan and provided a name and phone number for questions or requests for further information.

A public meeting was held on June 14, 1995, at 7:00 pm at the Stow Town Building on Great Road in the Town of Stow, Massachusetts. The remedial investigations and the preferred remedial alternatives for AOCs A7 and A9 were presented and discussed. Representatives at the meeting included: Tom Strunk of the Fort Devens EMO; Bob Lim, Remedial Project Manager, USEPA; Mark Casella and Anne Malewicz, MADEP; Debbie Acone, USACE; Susanne Simon, ATSDR; and Stephen McGinn, Project Manager, OHM. The informational meeting was followed immediately by a public hearing at which formal public comments were solicited for the record.

SUMMARY OF MAJOR QUESTIONS AND COMMENTS

The public comment period ended on July 5, 1995. No written comments or questions were received during the public comment period. The following is a summary of major points and comments at the public hearing and the Army's response. A transcript of the public hearing is also included in this appendix.

APPENDIX B
(CONTINUED)

Question:

What are the components of a RCRA Subtitle C cap, and how does the cap function after installation?

Response:

A large-scale color reproduction of Figure 4 was used as a display at the public meeting to show a cross-section through the proposed RCRA Subtitle C landfill cap. It was explained that a base layer of sand at least one foot thick would be placed above the waste to provide a secure surface to install the capping system on. Samples of the geosynthetic clay liner, 30-mil HDPE geomembrane, geonet drain layer, and 10-ounce geotextile supplied by a manufacturer were passed around for inspection to all interested parties, and the function of each cap component was explained. It was then pointed out that a minimum of 2 feet of soil cover would be placed above the capping system to protect it, and that grass would be planted on the soil cover to stabilize the surface.

Once the RCRA Subtitle C landfill cap is installed, access to the site will be restricted by a chain-link fence. Future use of the site will be controlled by deed restrictions. Cap integrity will be preserved through regular inspections and maintenance of the soil cover.

Question:

Who will maintain the Sudbury Training Annex after Fort Devens closes?

Response:

The U.S. Army will maintain the Sudbury Training Annex. At the present time, it appears likely that Fort Drum will be responsible for implementing the Army's plans to remediate and maintain AOC A7. Personnel from Fort Drum have already toured the site and are aware that there is an active citizens group concerned with progress at the site. Fort Drum wants to ensure a smooth transition and is preparing to assume responsibility for the Sudbury Training Annex.

Question:

Is the Army planning to bring in wastes from sites not on the Sudbury Training Annex, such as Fort Devens, for disposal in AOC A7?

Response:

No. Only contaminated soils and waste from sites on the Sudbury Training Annex will be placed beneath the landfill cap in AOC A7.

Question:

The proposed plan only deals with soil contamination. What plans are there to address the ground water issues and is there a schedule?

APPENDIX B
(CONTINUED)

Response:

Soil remediation was separated from ground water remediation when it was decided that additional off-site ground water investigation would be required to assess the extent of the chlorinated VOC and pesticide plume originating in AOC A7. This was done so that soil, or source control, remediation could be initiated without being delayed by the data gap in the ground water investigation. The U.S. Army Corps of Engineers real estate office has contacted the landowner downgradient of AOC A7 requesting permission to install and sample monitoring wells on his property. The Army is now awaiting permission.

There is no schedule at this time regarding the ground water investigation. The investigation is considered to be ongoing and additional off-site monitoring wells will be installed and sampled as soon as possible. Once analytical data is received regarding ground water quality downgradient of AOC A7, a proposed plan for ground water will be prepared if a remedial response is warranted.

Question:

How will the Sudbury Training Annex be affected by the Base Realignment and Closure (BRAC) process? Who will be responsible for deciding what parts of the Annex can be released, and what parts will be retained for further investigation and/or remediation?

Response:

The BRAC process will require "fence-to-fence" surveys before any decision can be made about what sections of the Annex can be released. Although some of the surveys, such as the historical and archaeological, have been completed, ordnance, radiological, and other surveys must be completed before any part of the Annex can be released.

It was also pointed out that the Army cannot and will not act unilaterally under the BRAC process. The USEPA, the MADEP, and citizens groups will all pay an active part in the process.

PUBLIC HEARING

Sudbury Training Annex

Proposed Plan

held at:

Stow Town Building
380 Great Road
Stow, Massachusetts
June 14, 1995
7:00 p.m.
(Robin Gross, Registered Professional Reporter)

1 P R O C E E D I N G S
2 COMMENT PERIOD
3 MR. DARGATY: What type of thicknesses are
4 you talking about as far as the layers of sand?
5 MR. McGINN: The base layer here is a foot
6 thick. That whole material right there, the whole
7 package together is less than half an inch.
8 MR. DARGATY: How about on top?
9 MR. McGINN: Two feet of soil on top, and
10 that will all be grassed over.
11 MR. DARGATY: How about preventing people
12 from inserting poles in there, pipes or anything
13 else?
14 MR. McGINN: Part of what goes on is the
15 whole thing will have a security fence around the
16 perimeter.
17 MR. DARGATY: For always?
18 MR. McGINN: Always. The access will be
19 limited to that site.
20 MR. STRUNK: It's there now, if you've been
21 to the site, a chain link fence about 8 feet high
22 and locked gate all around A7, and that will always
23 stay.
24 MR. DARGATY: So the town will never think

of putting anything on there.

MR. STRUNK: I think you could do a restriction on the property. Fort Devens actually will do a restriction that that will never be -- that will prevent access to that site.

MR. McGINN: And also the plan includes 30 years worth of maintenance and monitoring on the site, which includes regular inspections of all the security arrangements, the fences, you know, the soil cover and all that.

MR. RUZICH: What's the presumed life of a cap like that?

MR. McGINN: I don't know, to tell you the truth. At least 30 years. I honestly don't know. I've never been asked that question before.

MR. STRUNK: We're into the comment period, by the way. As soon as the questions started. I'll just make it formal.

MR. DARGATY: Then what happens after 25 or 30 years?

MS. RUZICH: That's matter transmitters. Star Trek.

MR. McGINN: There you go. That will be up to the regulators at the time.

1 MR. RUZICH: What does that stuff do with
2 tree roots?
3 MR. McGINN: You don't let trees grow on
4 it. That's part of the maintenance on the site.
5 But all you really want up here is grass, for the
6 most part.
7 MS. RUZICH: Who will physically be in
8 charge of the maintenance if Fort Devens closes?
9 Has it been assigned to anybody at this point?
10 MR. STRUNK: Well, the last ripple I've
11 heard in this continuous thing, Cindy, is it would
12 be Fort Drum that would take over the responsibility
13 for Sudbury and the Annex.
14 MS. RUZICH: Do they know where Stow,
15 Massachusetts, is?
16 MR. STRUNK: Yes, they've been here.
17 They've toured the site.
18 MS. RUZICH: Really? That's great.
19 MR. STRUNK: I've made them aware. Stow is
20 very aware of concerns. And I've made it clear we
21 have a very loud local voice. And Fort Devens is
22 the voice that people depend on for accurate
23 information about the Annex, and they were aware of
24 that issue. I said, probably unlike other sites

you've dealt with, the community is very much on top of what the Army is doing. And they wanted to make sure that everything, the transition was very smooth and they understood everything. So they did a tour of the Annex, particularly these spots right here.

MS. RUZICH: What, will they be one party to the agreement, or is it just that the Army does the signing and then the Army, someone in Washington, would assign this to Fort Drum?

MR. STRUNK: The major command, force command, would assign the responsibility for the Annex to Fort Drum. The rest of Fort Devens itself, the enclave that's going to remain would be the Army reserve unit in the center section, that will be controlled by Fort McCoy in Wisconsin and Fort Drum is upper New York state, the installation that sent the troops down to Haiti, 10th Mountain Group, I think. But that's the latest I've heard. That's subject to change, again, as these things go back and forth and different generals yell at different generals. I hope, it's Fort Drum, I think. They seem to be prepared to do it.

MS. RUZICH: You had mentioned when we were talking before about moving with the excavated soil

1 and that you would be bringing things into this area
2 that's being capped. Are we bringing in things from
3 off-site? Are we taking stuff, say, from Fort
4 Devens and bringing it here?
5 MR. STRUNK: No.
6 MS. RUZICH: Or is it just A7 and A9?
7 MR. STRUNK: As well as A7 and A9, Cindy,
8 what I've been discussing with Bob Lim at EPA is we
9 have other removals to do, local ones, 100 yards
10 here, 120 yards there.
11 MS. MALEWICZ: On site.
12 MR. STRUNK: We had planned to do that
13 off-site, but we found they are less contaminated
14 than other soils that exist there. So to save
15 money, and for expediency, we're going to work out
16 to save these small removals from other these other
17 sites under the cap also instead of going off-site.
18 The amount of money that's saved is incredible.
19 Because there was a soil treatment plan on one that
20 if we don't treat the soil at all the major cost of
21 the whole removal disappears. It's just so simple;
22 and to coordinate it in time so this is all done at
23 the same time and we don't get involved in spending
24 money sending stuff that doesn't need to be sent off

base. So it's only stuff from the Sudbury Annex.

MS. MALEWICZ: According to the state regulations they would not be permitted to take off-site waste.

MR. STRUNK: That's true.

MS. RUZICH: I just wanted to make sure it didn't become sort of a generic landfill for whatever.

MS. MALEWICZ: No, no.

MR. LIM: That wouldn't happen.

MR. DARGATY: What are we talking about, 50,000 square feet?

MR. STRUNK: Probably more, an acre and how much?

MR. McGINN: The whole cap area now is running just about two acres.

MR. STRUNK: That's, what, 43 feet, 46,000 square feet an acre, so it would be 86,000.

MS. RUZICH: Let's see, a couple of other things. One was more administrative. What are your requirements for posting this meeting and advertising the meeting; and did we do that? I couldn't find an ad in the Maynard Beacon, the last issue. I did find one in Stow, but have you done

everything about --

MR. STRUNK: I have the credit card for newspapers like we did, Cindy, a display ad, and we have the tear sheets back from the newspaper. They'll tear the ad out to prove they printed it and send it in before we pay them. So it was all done by credit card, it was done three weeks ago. So it's been out.

MS. RUZICH: Okay.

MR. STRUNK: I sent the TRC members -- all TRC members had a notice and everything. So I think we pretty well covered it.

MS. RUZICH: One thing I wanted to say was, you know, I appreciate that we're finally doing this. It's been five years since we started doing this. In fact, the first meeting that I attended was in July of 1990. I think the only people who were the same people who were here are the three of us from Focus. I think everybody else has gone through one or multiple revisions of individuals at this point, and I appreciate that we finally got here. This may be a record in terms of federal Superfund, only five years to get to talking about doing a cleanup.

1 Let's see, the other question I had was you
2 had mentioned that the area going downstream from
3 OHM, A7-51 well, that you would be looking
4 off-site. Why wasn't that, if you suspect that
5 something is migrating off-site, why did the
6 investigation stop at the boundary? Because if the
7 suspected contamination is coming from A7, shouldn't
8 the off-site area that's downstream be a part of
9 that same investigation and the same treatment?
10 MR. STRUNK: When it became clear that we
11 wouldn't be able to resolve the groundwater issue
12 until we had additional wells downgradient, I
13 requested from the Department of Army headquarters
14 permission to put off-site wells. They granted that
15 permission; the Corps of Engineers real estate
16 office has sent a letter requesting right of way to
17 the landowner. The landowner in this case has
18 agreed, but they haven't returned the letter yet.
19 So we don't have in it in our hands. But once
20 that's --
21 MS. RUZICH: Is that the Sand and Gravel --
22 MR. STRUNK: Apparently the person who owns
23 that owns quite a bit of land along there.
24 MS. RUZICH: Malone, Crow Island?

MR. DARGATY: Malone Sand and Gravel.

MR. STRUNK: And apparently the way that land is situated, it would never be considered buildable property or anything like that; and he didn't mind. So I haven't yet received the formal okay from the landowner for those wells, but as soon as that's aboard we plan to put in two or three wells between the perimeter of the Annex and the Assabet River. And that's information we really need in order to --

MS. RUZICH: So we're really only dealing with the soil contamination in this step. Does the document itself require that the groundwater issues be dealt with in a specific period of time?

MR. STRUNK: I would say that, let's see, our original schedule on the ROD called for a Record of Decision in the fall of 1996. That was the original AIG schedule. And we didn't want to delay the whole ROD until we had resolved the groundwater, so at EPA suggestion we kept on schedule and kept the source control moving by just breaking it out and dealing with the source control first; let's get that done, and then as we learn more we can get the wells in. Hopefully we can develop a plan for

1 dealing with the groundwater situation, if there is
2 one that really needs to be dealt with. And if
3 that's the situation I'd like to see that as fast as
4 I can and, hopefully, on schedule.
5 MS. RUZICH: I guess what I'm asking is,
6 we're doing this piece, and one of the biggest
7 concerns we have had over time is the piecing up of
8 the Annex, is this little spot is clean so we don't
9 have to worry about this and you're checking it off
10 bit by bit, and in the meantime the Army is shutting
11 down operations in Massachusetts. So I guess what
12 I'm asking is, is there a scheduled date at this
13 point for the groundwater treatment?
14 MR. STRUNK: No, we don't have one. And
15 that's a good point.
16 MS. ACONE: We couldn't get closure on this
17 site until we clean the groundwater. The site
18 wouldn't close.
19 MR. LIM: As far as the groundwater
20 contamination, as far as we're concerned, the
21 investigation is still continuing in the
22 groundwater. And that the FS, however, evaluated
23 the remedy for the groundwater, which is a
24 groundwater collection trench. However, we

1 recognize that there was a missing piece of data
2 between 51 and the Assabet River that we needed to
3 fill that data gap. The groundwater investigation
4 is still considered ongoing, and the Army will be
5 installing monitoring wells as soon as we can.
6 MS. RUZICH: I'm confused on "little site,
7 big site." We've got lots of little sites within
8 one big Superfund site. The entire Superfund site
9 will not be released until that groundwater patch is
10 dealt with and all the other issues in the site as
11 well?
12 MR. LIM: All the other sites, as you're
13 talking about, the other study areas.
14 MS. RUZICH: So as a whole group it doesn't
15 get released until every last one of them is
16 finished in terms of the EPA's --
17 MR. DARGATY: You don't know that for sure,
18 do you? They could possibly release some areas
19 where groundwater is not affected.
20 MR. LIM: As far as that would -- in the
21 base closure process, from what I understand, the
22 base gets divided into clean and dirty parcels, and
23 once Sudbury goes final on the base closure list we
24 would go through the process of I suppose parceling

the Annex as far as what's clean and what's dirty.

And, you know, there's other processes within the base closure process that I'm not entirely aware of; but under the current non-base closure situation that Sudbury is still in, the Annex wouldn't be released in any way until all cleanup at all sites are completed.

MS. RUZICH: Does the base closure happen in October of this year then? Is that the plan?

MR. STRUNK: No, I'm not certain, Cindy. It's July 1st Congress will accept the bases that are proposed on the list, which Sudbury Annex is, and after that I'm not sure. I haven't heard really what a clear outline is yet.

MS. RUZICH: So the Sudbury Annex isn't tied to Fort Devens?

MR. STRUNK: No, it's separate. Fort Devens was listed for base closure I think in 1991, and the Annex was just placed on it this winter, this January. So it's a separate entity. And they've nominated me to be the base closure environmental coordinator for it and they have sent all this early material down, but I have no schedules from the Army yet. And I know basically

1 what has to happen there, but it's going to take a
2 while to do that.
3 MR. LIM: But in September, for our
4 September TRC, I'm sure we'll know more
5 information. We'll be able to perhaps give a brief
6 outline of the process as far as the federal
7 screening process and all the other base closure
8 type processes that I'm sure you are concerned
9 about, about the property and parceling and stuff.
10 MS. RUZICH: The question, the thing I'm
11 trying to find out, is even though the base is
12 closed does EPA retain jurisdiction over the cleanup
13 issue?
14 MR. LIM: Yes, I will still be the project
15 manager.
16 MS. RUZICH: So you essentially are the
17 person who agrees whether to release the whole
18 site?
19 MR. LIM: Yes. EPA is involved in that.
20 MS. RUZICH: So the Army can't choose to
21 say, "Well, we declare this square clean so we're
22 taking that and we're going to sell it and build
23 things without your cooperation"?
24 MR. LIM: The Army cannot do anything

1 unilaterally. The EPA and DEP will still be
2 involved.
3 MS. MALEWICZ: I can add to that a little
4 bit. I'm involved in the Watertown Arsenal cleanup,
5 which is a base closing. And they prepare, the Army
6 will send out, once it's termed a BRAC site, if it
7 should become a BRAC site, base closing site, they
8 will prepare what they call a CRFA document which is
9 available for public comment as well. At that time
10 they will ask DEP and EPA on their recommendations
11 of what areas may be able to be released; in other
12 words, are deemed clean in the sense that
13 historically they weren't used for anything, there's
14 no evidence of contamination, maybe some areas that
15 there's no further action.
16 With those recommendations, they will put
17 together a package saying XYZ area may be able to be
18 released. Then their real estate division will say,
19 you know, can the town use it now or could it be
20 used, so they can get that piece back into the
21 community. Watertown was a -- is a 65 acre,
22 originally 65 acre parcel and it's now a 37.5 acre
23 parcel, and because of the spotted contamination
24 deemed it wasn't sufficient to have any parcels

1 parceled off for use right away.
2 So they do take the DEP and EPA's
3 recommendations to heart. And there's actually, if
4 it should go BRAC closing, we can provide you more
5 information, get you up to speed, and there's an
6 actual formal process that you would be a part of.
7 MR. STRUNK: Cindy, the things they are
8 funding for is doing a complete ordinance survey,
9 radiological survey, things that hadn't been under
10 the investigation, remediation fund, that's covered
11 in BRAC, so it's a lot more extensive fence-to-fence
12 survey that covers a lot of things.
13 MS. RUZICH: They were supposed to do that
14 as part of the original work plan, a lot of those.
15 I think some of that stuff actually did occur at
16 Sudbury.
17 MR. STRUNK: They have, actually, yes, in
18 the Sudbury Annex, a lot of things that would be
19 done under base closure have already been pretty
20 well completed, like the historical and
21 archeological survey. This is true.
22 Well, any further questions?
23 MR. CASELLA: I've got a question for
24 Steve. Will the groundwater data be in, Steve,

before we initiate the capping operation for the area? Is there enough time?

MR. McGINN: The additional groundwater data?

MR. CASELLA: Yes.

MR. McGINN: I don't know what the schedule is on that right now.

MR. STRUNK: I would imagine that it would be. Don't you think, Debbie?

MR. DARGATY: It's eventually going to be irrelevant, if you're going to remove all the contamination before you cap it.

MR. McGINN: Well, we're removing the primary source of the contamination.

MR. DARGATY: You may still have some in there.

MR. McGINN: You've still got, you know, a contaminated groundwater plume which is already covering this area right here, so removing the primary source is going to reduce the loading --

MR. DARGATY: How far down are you going to go, to the water level?

MR. McGINN: As far as the excavation in here? I'd say probably between 8 and 10 feet in

1 some places. It will be below the top of the
2 groundwater.
3 MR. DARGATY: You will be below the
4 groundwater?
5 MR. McGINN: Yes. From what we can tell
6 right now, based on what we've seen in the borings
7 and what we've seen in the test pits and what we
8 have for groundwater levels in here, it is below top
9 of the groundwater. Could be less than that in some
10 places, maybe a little more.
11 MR. DARGATY: If you were to remove all the
12 contamination, there still may be pockets that have
13 migrated down between the primary source and the
14 well you're going to dig, right?
15 MR. McGINN: Because we're already going to
16 see the contamination here in well No. 8 which is in
17 the source area and also downgradient of well No.
18 51. So, you know, you've already got contamination
19 from this area leaching out in this area, traveling
20 in the groundwater and is already in this area. And
21 where it extends out to over here is essentially --
22 MR. DARGATY: That's a slope, right?
23 MR. McGINN: As far as the top of the
24 groundwater there, yes.

1 MR. DARGATY: From the primary source to
2 where you're going to put the well, that's like a
3 big slope, if I remember correctly.
4 MR. McGINN: It's kind of flat in this area
5 and slopes off pretty fast heading this way and then
6 shallows off, but this is a gradual easy slope all
7 the way down to the river.
8 MR. DARGATY: Does the water flow downhill
9 at that point, do you know?
10 MR. McGINN: Yes, it does. Essentially
11 from the site it's flowing straight across the site
12 this way (indicating).
13 MR. DARGATY: I know it's flowing down, but
14 is it flowing at an angle?
15 MR. McGINN: Oh, sure.
16 MR. DARGATY: Do you know that for sure?
17 MR. McGINN: You can see that the gradient
18 elevations from the downgradient of the groundwater
19 -- there's a slope on top of the groundwater. The
20 slope on top of the groundwater is nowhere near as
21 steep as the slope you're seeing out here.
22 MR. DARGATY: Will that tell you something
23 as to what the depth of migrating contamination is
24 between the primary source and where you're going to

1 dig your well?
2 MR. McGINN: Sure.
3 MR. DARGATY: If what you say is true, that
4 wouldn't be any deeper than what it is at the
5 primary source?
6 MR. McGINN: Below the top of ground
7 surface, no.
8 MR. DARGATY: You wouldn't expect to find
9 contamination 20, 30 feet below, except for the
10 water?
11 MR. McGINN: Well, the answer to that is
12 sort of yes and no. In this particular case the
13 answer would be no. Based on the geology and the
14 hydrology out here, I would say the answer would be
15 no.
16 MS. MALEWICZ: Steve, can you clarify for
17 the audience why you're leaving certain materials
18 behind, like TCLP and why you're removing others? I
19 think that clarifies why the cap is appropriate and
20 why it is appropriate to leave some things behind.
21 MR. McGINN: Sure. This area in here,
22 we've had all the test pit results from this area.
23 Along with the test pits, you can see the squares,
24 we've got -- right through here we've got a variety

of them in here located on top of geophysical anomalies. We came through in this area and did the geophysical surveys, located the test pits over the anomalies, essentially dug down to see what we could find, what was buried out there. We dug down to a depth of 6 feet in all these pits, took samples at 2, 4, and 6 feet below ground surface, and what we're seeing is a definite difference between what we're seeing in this area here and what we're seeing over in this area right here.

Primarily this is essentially solid waste as opposed to liquid chemical waste over here. Along with the chemical waste we've got in here there's also, by test pit R, which is this one, we've got buried drums and other lab waste here. We do know we have had material leaching out of those things, broken drums, broken glass containers; and the type of chemical contamination you see here is actually different than what you see going on here.

We do see low levels of pesticides and some metals in this area right through here, but at much lower concentrations than you're seeing over in this area. Also, from what we can tell right now from the test pits, the borings and all the other

1 information we've got, this material here, while
2 less hazardous than this material, also is at a
3 higher level relative to the top of groundwater. So
4 that the balance of the buried material out here is
5 not in the top of groundwater; also, there's not a
6 lot of material leaching out of it, or at this point
7 there's not a lot of material leaching out of it
8 getting down into the groundwater and then being
9 transported out.
10 We're fairly confident about saying that
11 the balance of the well control we've got out in
12 front of this area right here, these five wells
13 we've got which are downgradient of this whole area
14 right here, show a lot, essentially a lot cleaner
15 groundwater out in front of this area than we're
16 seeing out in this area right here.
17 So this material, we're seeing some
18 contaminated groundwater here with the same
19 contamination that we're seeing in the soils and
20 groundwater up in the source area.
21 This area over here, we're seeing lower
22 levels of contaminants and different types of
23 contaminants in the soils. And also we're not
24 seeing a lot of those contaminants out in the

1 groundwater right now. Which is why I feel
2 confident that you could go ahead and cap this stuff
3 and leave it right here and you know you're not
4 going to be creating a problem for yourself down the
5 road; and why we think you can take this material
6 here and place it out here. Because essentially
7 this material out here is of the same nature and
8 character as what we see right here.
9 Then what appears to be hazardous materials
10 are all slated to be dug up and taken completely off
11 the site altogether, because the type of cap and the
12 situation here is not appropriate for containing
13 this kind of material.
14 MR. DARGATY: Well, Tom, if there's no
15 other questions, let's bang it up and go home.
16 MR. STRUNK: Okay, George. Like I said,
17 until July 5th if you want to write up any comments,
18 send them to me, I'll pass it on and we'll include
19 that in the formal record. You're welcome to do
20 that; I appreciate it if you did. Anything that
21 came to your mind. And thank you very much for
22 coming out this evening.
23 (Whereupon, the proceedings were
24 concluded at 8:00 p.m.)

1 C E R T I F I C A T E
2 I, Robin Gross, Registered Professional
3 Reporter, do hereby certify that the foregoing
4 transcript, Volume I, is a true and accurate
5 transcription of my stenographic notes taken on June
6 14, 1995.
7
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9 _____
10 Robin Gross
11 Registered Professional Reporter
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APPENDIX C

ARARs

APPENDIX C

ARARs

The ARARs tables contained in this appendix are reproductions of those contained in the Final Feasibility Study Report for the Fort Devens Sudbury Training Annex, Middlesex County, Massachusetts submitted by OHM in May, 1995. The original table numbers have been retained for ease of comparison.

TABLE 3-2

FORT DEVENS SUDBURY TRAINING ANNEX - AOC A7
ARARs FOR EXCAVATION AND OFF-SITE TREATMENT AND DISPOSAL OF LABORATORY WASTE AND CONTAINMENT BY RCRA SUBTITLE C LANDFILL CAP

Requirement	*Status*	*Requirement Synopsis*	*Action To Be Taken To Attain ARAR*
		ACTION-SPECIFIC	
Laboratory Waste - Federal			
RCRA - Identification and Listing of Hazardous Waste (40 CFR 261)	Relevant and Appropriate	Establishes definitions for solid and hazardous wastes. Sets forth criteria used to identify hazardous waste and to list particular wastes. Identifies characteristics of a hazardous waste and contains a particular list of hazardous wastes.	Laboratory waste includes soil and debris contaminated by liquid containers. The waste is assumed to be classified as F002 spent solvents.
RCRA - Land Disposal Restrictions (40 CFR 268)	Relevant and Appropriate	Identifies hazardous wastes that are restricted from land disposal and defines exemptions. Subpart D contains treatment standards for RCRA-listed wastes.	Removal of laboratory waste and associated contaminated soils triggers LDRs. Since the wastes have been classified as F002 spent halogenated solvents, the wastes will be transported off site for treatment and disposal in accordance with the requirements of the LDRs.
Off-Site Rule (40 CFR §300.440)	Applicable	Requires that hazardous substances, pollutants, or contaminants transferred off site for treatment, storage, or disposal during a CERCLA response action be transferred to a facility operating in compliance with §3004 and §3005 of RCRA and other federal laws and all applicable state requirements.	Laboratory waste material will be transported to a TSDF that is in compliance.
Laboratory Waste - State			
HWR - Requirements for Generators (310 CMR 30.4000-30.416)	Relevant and Appropriate	Requirements for generators, including accumulation of waste prior to off-site disposal.	Generator requirements will be complied with during excavation and removal of laboratory waste materials.
HWR - Use and Management of Containers (310 CMR 30.680)	Relevant and Appropriate	Requirements for use and management of containers.	Packing of laboratory waste materials will adhere to these requirements.
Soil - Federal			
RCRA Subtitle C, Subpart B - General Facility Standards (40 CFR 264.10 - 264.18)	Relevant and Appropriate	General requirements regarding waste analysis, security, training, inspections, and location for any facility that treats, stores, or disposes of hazardous wastes (a TSDF).	Requirements regarding security, training, and inspections will be met

TABLE 3-2
(CONTINUED)

Requirement	*Status*	*Requirement Synopsis*	*Action To Be Taken To Attain ARAR*
RCRA Subtitle C, Subpart B - Construction Quality Assurance Program (40 CFR 264.19)	Relevant and Appropriate	For all surface impoundments, waste piles, and landfill units, this regulation requires that a construction quality assurance (CQA) program be developed and implemented. A written CQA plan must identify the steps that will be used to monitor and document the quality of materials and their installation.	A CQA program will be developed and implemented for the construction of the landfill cap at Area A7.
RCRA Subtitle C, Subpart C - Preparedness and Preparation (40 CFR 264.30 - 264.37)	Relevant and Appropriate	Requirements applicable to the design, operation, equipment, and communications associated with a TSDF, and to arrangements with local response departments.	Since these regulations are primarily intended for facilities with indoor operations and a landfill cap is being constructed at Area A7, only requirements regarding communications equipment will apply during construction activities.
RCRA Subtitle C, Subpart D - Contingency Plan and Emergency Procedures (40 CFR 264.50 - 264.56)	Relevant and Appropriate	Outlines general requirements for contingency and emergency planning procedures for TSDF operations.	During all remedial action, a contingency plan with emergency procedures will be developed.
RCRA - Subpart N, Landfill Closure and Post-Closure Care (40 CFR 264.310)	Relevant and Appropriate	Final cover at a landfill requires the cover to be designed and constructed to meet certain performance standards. Cover to provide long-term minimization of infiltration. Settling and subsidence must be accommodated. Post-closure use of property must be restricted as necessary to prevent damage to cover. Runoff and runon must be prevented. Protect and maintain surveyed benchmarks. References §264.117 - 264.120 for maintenance and monitoring requirements.	Cap design will meet performance standards. Runoff and runon prevention measures will be taken. Surveyed benchmarks will be protected.
RCRA Subtitle C, Subpart G - Closure and Post-closure (40 CFR 264.117 - 264.120)	Relevant and Appropriate	Details general requirements for closure and post-closure of hazardous waste facilities, including installation of a ground water monitoring program and beginning a period of 30 years of post closure care. §264.119 requires the placement of deed restrictions.	Because Area A7 is being closed as a landfill, parts of this requirement concerning long-term monitoring and maintenance of the site are relevant and appropriate. Sets a minimum of 30-year post-closure care period. Deed restrictions will be placed restricting the future uses of the site. A post-closure plan will be prepared. The plan will identify monitoring and maintenance activities, and their frequency.
RCRA Subtitle C, Subpart F - Releases from Solid Waste Management Units (40 CFR 264.90 - 264.101)	Relevant and Appropriate	Specifies compliance points and ground water monitoring requirements for TSDFs during active-care and closure-care periods. Corrective action program must be developed if monitoring shows exceedences in limits.	Ground water monitoring will be conducted following the construction of the cap. Corrective action may be taken if monitoring warrants action.
RCRA Proposed Amendments for Landfill Closure (52 FR 8712)	To Be Considered	Provides an option for the application of alternative closure and post-closure requirements based on a consideration of site-specific conditions, including exposure pathways of concern.	Cap and post-closure monitoring will be designed taking into account exposure pathways of concern.

TABLE 3-2
(CONTINUED)

Requirement	*Status*	*Requirement Synopsis*	*Action To Be Taken To Attain ARAR*
RCRA - Land Disposal Restrictions (LDRs) (40 CFR 268)	Applicable	Land disposal of a RCRA hazardous waste is restricted without specified treatment. It must be determined that the waste meets the definition of one of the specified restricted wastes and the remedial action must constitute "placement" for the land disposal restrictions to be considered applicable. For each hazardous waste, the LDRs specify that the waste must be treated either by a treatment technology or to a concentration level prior to disposal in a RCRA Subtitle C-permitted facility.	If soil at Areas A7 and A9 fail TCLP testing, soil must be treated before the final disposal. Soils that fail TCLP testing could not be consolidated under the landfill cap at Area A7.
USEPA Guidance: Design and Construction of RCRA/CERCLA Final Covers (EPA/625/4-91/025)	To Be Considered	USEPA guidance that provides technical guidance on the design and construction of RCRA/CERCLA final covers.	Guidance will be considered in the design and construction of the landfill cap at Area A7.
USEPA Guidance: Quality Assurance and Quality Control for Waste Containment Facilities (EPA/600/R-93/182)	To Be Considered	USEPA guidance that provides technical guidance on quality assurance and quality control measures for containment facilities.	A construction quality assurance program will be developed for the remedial action at Area A7 based on this guidance document.
Clean Water Act: Final NPDES General Permits for Storm Water Discharges From Construction Sites; Notice (57 FR 44412-44435)	Relevant and Appropriate	Addresses NPDES permits for construction sites. For construction sites greater than 5 acres, develop and implement storm water pollution prevention plans. Storm water controls include stabilization practices, such as seeding and geotextiles, and structural practices, such as silt fences, swales, sediment traps, basins, etc. Identify maintenance procedures.	During construction, storm water management practices will be implemented.
Soil - State			
HWR - General Management Standards for All Facilities (310 CMR 30.510)	Relevant and Appropriate	Establishes requirements for operation of facilities including security, inspection, and personnel training.	Requirements regarding security, inspection, and training will be met during and after construction of the landfill cap.
HWR - Contingency Plan, Emergency Procedures, Preparedness, and Prevention (310 CMR 30.520)	Relevant and Appropriate	Requirements for notification, safety equipment, and spill control for hazardous waste facilities. A facility's contingency plan shall include: procedures to be used following emergency situations and to prevent hazards to public health, safety, or welfare and the environment. Copies of the plan shall be submitted to the local police and fire departments, hospitals, and emergency response teams.	During the remedial construction, safety and communication equipment will be kept at the site, and local authorities will be familiarized with site operations. Plans will be developed and implemented during site work. Copies of plans will be kept on site.

TABLE 3-2
(CONTINUED)

Requirement	*Status*	*Requirement Synopsis*	*Action To Be Taken To Attain ARAR*
HWR - Landfill Closure and Post-Closure Care (310 CMR 30.633(1) & (2B))	**Relevant and Appropriate**	Sets forth performance requirements for the closure of a landfill. For closure, the final cover must be designed and constructed to: provide long-term minimization of migration of liquids through the closed landfill; function with minimum maintenance; promote drainage and minimize erosion or abrasion of the cover; and accommodate settling. Post-closure, long-term maintenance, and monitoring requirements from 310 CMR 30.592 apply. Establishes a 30-year post-closure care period (310 CMR 30.590) and ground water monitoring (310 CMR 30.660).	Landfill cap at Area A7 will be designed to meet performance standards for this requirement. Following construction, long-term monitoring and maintenance requirements for the landfill will also apply.
HWR - Post-Closure (310 CMR 30.591(b) & 30.592(b))	Relevant and Appropriate	Requirement that establishes 30-year period of operations and maintenance for owners and operators of all facilities at which hazardous waste will remain on site after closure.	Requires a minimum of 30 years for post-closure care at Area A7, and at any other site where hazardous waste will remain in place.
HWR - Land Disposal Restrictions (310 CMR 30.750)	Relevant and Appropriate	Identifies and describes those hazardous wastes which are restricted from land disposal. These regulations also define the limited circumstances where prohibited land disposal is permissible.	If soils from Areas A7 and A9 fail TCLP test, then this requirement, which requires treatment prior to disposal, is applicable. Soil that fails TCLP testing could not be consolidated under the landfill cap as part of the necessary subgrade.
Massachusetts Surface Water Quality Standards (310 CMR 4.00) (see also 57 FR 44426-44427)	Relevant and Appropriate	Massachusetts 401 certification for the Clean Water Act requires additional measures for surface water discharges during construction. Set backs and best management practices (BMPs) are identified and are dependent upon the classification of the receiving water.	During construction, any new discharge outfill pipes will be designed to be set back from the Assabet River. Receiving swales, infiltration trenches or basins, filter media dikes or other BMPs will be prepared with the goal to minimize erosion yet maximize infiltration or otherwise improve water quality prior to discharge.
Massachusetts Ambient Air Quality Standards (310 CMR 6.00)	Applicable	Establishes the standards and requirements for ambient air quality standards in the Commonwealth. Specifically, Section 6.04(1) provides ambient air quality criteria such as particulate matter standards. The primary ambient air quality standards for particulate matter are: 50 $\mu g/m^3$ annual ambient air quality standard, attained when the expected annual mean arithmetic concentration is less than or equal to 50 $\mu g/m^3$; and 150 $\mu g/m^3$ - maximum 24-hour concentration, attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is less than or equal to one.	The emissions limits for particulate matter will be managed through engineering controls during construction activities at Area A7.

TABLE 3-3

FORT DEVENS SUDBURY TRAINING ANNEX - AOC A9
ARARs FOR CONTAMINATED SOIL EXCAVATION
AND CONSOLIDATION AT AOC A7

Requirement	*Status*	*Requirement Synopsis*	*Action To Be Taken To Attain ARAR*
		CHEMICAL-SPECIFIC	
Federal			
Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals)(OSWER 9285.7-01B)	To Be Considered	USEPA guidance used to develop preliminary remediation goals for carcinogenic and non-carcinogenic contaminants in various media.	Using the guidance, risk-based cleanup levels were developed for arsenic and thallium. Arsenic and thallium contaminated soils at AOC A9 will be excavated to 30 and 20 parts per million, respectively. Confirmatory samples will be taken to ensure that all contaminated soils above the cleanup level are removed.
		LOCATION SPECIFIC - None.	
		ACTION-SPECIFIC	
Federal			
RCRA - Identification and Listing of Hazardous Waste (40 CFR 261)	Applicable	Establishes definitions for solid and hazardous waste. Sets forth criteria used to identify hazardous waste and to list particular wastes. Identifies the characteristics of a hazardous waste and contains a list of particular hazardous wastes.	Soils at Area A9 will be TCLP tested to determine if it is hazardous.
Preparation of Soil Sampling Protocols: Sampling Techniques and Strategies (EPA/600/R-92/128, July 1992)	To Be Considered	USEPA guidance document for use in the development of soil sampling protocols. A particulate sampling theory is the basis for proper soil sampling. Other soil sampling scenarios are discussed including sampling from stockpiled material.	During remedial design, a soil sampling plan will be developed for implementation during excavation of soil. The goal of the sampling will be to determine whether soil can be consolidated as part of the subgrade of the landfill cap or must be shipped off-site for treatment/disposal.
State			
HWR - Identification and Listing of Hazardous Waste (310 CMR 30.100)	Applicable	Establishes provisions for classifying waste as regulated hazardous waste. Two methods are employed to identify wastes as hazardous, characteristics and listing.	Soil will be TCLP tested for arsenic to determine if it is hazardous by characteristics.
Massachusetts Air Pollution Control Regulations (310 CMR 6.00)	Applicable	Establishes the standards and requirements for ambient air quality standards in the Commonwealth. Specifically, Section 6.04(1) provides ambient air quality criteria such as particulate matter standards. The primary ambient air quality standards for particulate matter are: $50\mu g/m^3$ annual ambient air quality standard, attained when the expected annual mean arithmetic concentration is less than or equal to $50\mu g/m^3$; and $150\mu g/m^3$ - maximum 24-hour concentration, attained when the expected number of days per calendar year with a 24-hour average concentration above $150\mu g/m^3$ is less than or equal to one.	If necessary, emissions limits for particulate matter will be managed through engineering controls during excavation activities at all sites.

APPENDIX D

ADMINISTRATIVE RECORD INDEX

Fort Devens - Sudbury Annex

Administrative Record File

Index

for Source Control

Record of Decision for AOC A7 and A9

Prepared for

New England Division
Corps of Engineers

With Assistance from
ABB Environmental Services, Inc
Corporate Place 128, 107 Audubon Road, Wakefield, MA 01880 . (617) 245-6606

Introduction

This document is the Index to the Administrative Record File for the Source Control Record of Decision for AOCs A7 and A9 at the Fort Devens-Sudbury Annex. Section I of the Index cites site-specific documents and Section II cites guidance documents used by U.S. Army in selecting a responses action at the site. Some documents in this Administrative Record File Index have been cited but not physically included in the Administrative Record for this Source Control ROD. If a document has been cross-referenced to another Administrative Record File Index, the available corresponding comments and responses have been cross-referenced as well. Efforts were made to include all appropriate comments and responses individually. In come cases, however, comments were only included as part of the response package.

The Administrative Record File is available for public review at EPA Region I's Records Center in Boston, Massachusetts (index only), at the Fort Devens Environmental Management Office, Fort Devens, Massachusetts, and at the Sudbury Town Hall, Sudbury, Massachusetts. Supplemental/Addendum volumes may be added to this Administrative Record File. Questions concerning the Administrative Record should be addressed to the Fort Devens Environmental Management Office.

The Administrative Record is required by the Comprehensive Environmental Responses, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendment and Reauthorization Act (SARA).

ADMINISTRATIVE RECORD INDEX FILE

for

Source Control

for Record of Decision for AOC A7 and A9

Fort Devens - Sudbury Annex Sites

Complied: September 8, 1995

All of the below entries are filed in the Master Fort Devens - Sudbury Annex Administrative Record File and are therefore cross referenced in this Index.

1.0 Pre-Remedial

1.2 Preliminary Assessment

Reports

The record cited below as entry number 1 is oversized and may be reviewed, by appointment only, at the Fort Devens Environmental Management Office.

1. "Installation Assessment NARADCOM Research and Development Laboratory, Massachusetts," EPA Environmental Monitoring Systems Laboratory (March 1982).
2. "Burn Pit Remediation - Study Area A9," U.S. Army (November 21, 1986).

1.3 Site Inspection

Reports

1. "Final Report - Site Investigation - Natick Lab Annex Property," GZA Associates (March 4, 1991).
2. Phase II Site Investigations Report (Draft), Vol I-III, Fort Devens Sudbury Training Annex, Massachusetts," Ecology and Environment, Inc. (March 1994).
3. "Phase II Site Investigations Report (Draft Final), Volume I-III, Fort Devens Sudbury Training Annex, Massachusetts," Ecology & Environment, Inc. (July

1994).

4. "Replacement pages for the July 1994 Draft Final Phase II Site Investigations Report, Fort Devens Sudbury Training Annex, Massachusetts," Ecology & Environment, Inc. (September 1994).
5. "Draft Supplemental Site Investigation Task Order Work Plan, Fort Devens, Sudbury Annex," ABB Environmental Services, Inc. (October 1994).
6. "Draft Final Supplemental Site Investigation Task Order Work Plan, Sudbury Annex," ABB Environmental Services, Inc. (January 1995).
7. "Final Supplemental Site Investigations Task Order Work Plan, Sudbury Annex," ABB Environmental Services, Inc. (April 1995).
8. "Revised Figures, Final Supplemental Site Investigation Task Order Work Plan, Sudbury Annex," ABB Environmental Services, Inc. (May 1995).

Comments

9. Comments Dated April 29, 1994 from Lorna Bozeman, Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, Atlanta, Georgia on the "Draft Phase II site Investigation," (Ecology and Environment, Inc.).
10. Comments Dated Ma 16, 1994 from Robert Lim, USEPA, on the "Draft Phase II Site Investigations Report, Volumes 1-3," Ecology and Environment, Inc. (March 1994).
11. Comments Dated June 14, 1994 from Jay Naparstek, Commonwealth of Massachusetts Department of Environmental Protection on the March 1994 "Phase II Site Investigations Report Vol 1-3, Sudbury Training Annex, Massachusetts," Ecology and Environment, Inc.
12. Comments Dated June 27, 1994 from Robert Lim, USEPA, on the Draft Groundwater Model Report (as included in the Final Phase II Site Investigation Report.
13. Comments Dated August 22, 1994 from Jay Naparstek, Commonwealth of Massachusetts Department of Environmental Protection on the July 1994 "Phase II Site Investigations Report Vols 1-3, Fort Devens Sudbury Training Annex, Massachusetts," Ecology and Environment, Inc.
14. Comments Dated August 23, 1994 from Robert Lim, USEPA, on the July 1994 "Draft Final Phase II Site Investigations Report, Vol 1-3, Fort Devens Sudbury Training Annex," Ecology and Environment, Inc.
15. Comments Dated November 22, 1994 from Robert Lim, USEPA, on the October 1994 "Draft Task Order Work Plan, Supplemental Site Investigation," ABB Environmental Services, Inc.
16. Comments Dated December 5, 1994 from Jay Naparstek, Commonwealth of Massachusetts Department of Environmental Protection on the "Supplemental Site Investigations, Fort Devens Sudbury Training Annex Sudbury, Massachusetts," ABB Environmental Services, Inc.
17. Comments Dated February 22, 1995 from Robert Lim, USEPA, on the January

1995 Draft Final Supplemental Site Investigation Task Order Work Plan (ABB Environmental Services, Inc.).

Responses to Comments

18. Responses Dated June 1994 from U.S. Army Environmental Center on the Draft Phase II Site Investigations Report, Fort Devens Sudbury Training Annex, Fort Devens, Massachusetts (Ecology and Environment, Inc.).
19. Responses Dated September 1994 from U.S. Army Environmental Center on the Draft Phase II Site Investigation Report, Fort Devens Sudbury Training Annex (Ecology and Environment, Inc.).
20. Responses Dated January 20, 1995 from U. S. Army Environmental Center on the Draft Supplemental Site Investigation Task Order Work Plan, ABB Environmental Services, Inc. (October 1994).
21. Responses Dated February 22, 1995 from U.S. Army Environmental Center on the Draft Final Supplemental Site Investigation Task Order Work Plan, ABB Environmental Services, Inc. (January 1995).

Responses to Responses to Comments

22. Comments Dated November 23, 1994 from Jay Naparstek, Commonwealth of Massachusetts Department of Environmental Protection on the Response to Comments on the MADEPs Comments on the Draft Phase II Site Investigation Response Letter.

1.7 Correspondence Related to Proposal of a Site to the NPL

1. Letter from Daniel J. Hannon, Commonwealth of Massachusetts, Department of Environmental Protection to Fort Devens Installation Commander (May 24, 1991), concerning notification that Fort Devens in considered a priority disposal site.

2.0 Removal Response

2.1 Correspondence

1. Memorandum from Timothy Prior, U. S. Army for the Record (August 12, 1991) concerning contaminated soil disposal.
2. Memorandum from Joseph Pierce, U. S. Army to Fort Devens Installation Commander (August 19, 1991) concerning Air Force noncompliance issues at the Sudbury Annex.
3. "Record of Environmental Consideration," (November 9, 1992).
4. "3 Bills of Lading," (May 6, 1993).

2.2 Removal Response Reports

1. "Removal of Underground Storage Tanks," Environmental Application, Inc. (May 1989).
2. "Post Removal Reports - UST No. 0094-SA P12 Burning Ground-Underground Storage Tank Closure," ATEC Environmental Consultants (June 1992).
3. "Post Removal Report - Underground Storage Tank Closure - UST No. 0095 - Building 405," ATEC Environmental Consultants (November 4, 1992).
4. "Post Removal Report - Underground Storage Tank Closure - UST No. 0096 - Building 106," ATEC Environmental Consultants (November 9, 1992).

3.0 Remedial Investigation (RI)

3.4 Interim Deliverables

The document cited below as entry number 1 may be reviewed by appointment only at the Fort Devens Environmental Management Office.

1. "Installation Action Plan," (July 14, 1993).
2. "Initial Screening of Remedial Technologies and Process Options Fort Devens Sudbury Training Annex, Middlesex County, Massachusetts," OHM Remediation Services Corp., (September 23, 1993).
3. "Development and Screening of Remedial Alternatives Fort Devens Sudbury Training Annex, Middlesex County, Massachusetts," OHM Remediation Services Corp., (October 28, 1993).

Comments

4. Comments Date October 25, 1993 from D. Lynne Welsh, Commonwealth of Massachusetts Department of Environmental Protection on the Initial Screening of Remedial Technologies and Process Options, Fort Devens Sudbury Training Annex, Middlesex County, Massachusetts, OHM Remediation Corp. (September 23, 1993).
5. Comments Dated October 26, 1993 from Robert Lim, USEPA, on the Initial Screening of Remedial Technologies and Process Options, OHM Remediation Corp. (September 23, 1993).
6. Comments Dated October 27, 1993 from Cindy Svec Ruzich, Four Town Focus on the "Draft Initial Screening of Remedial Technologies and Process Options.
7. Comments Dated December 10, 1993 from Robert Lim, USEPA, on the October 1993 "Draft Development and Screening of Remedial action Alternatives, Fort Devens Sudbury Training Annex," OHM Remediation Services Corp.
17. Comments Dated December 22, 1993 from Jay Naparstek, Commonwealth of

Massachusetts Department of Environmental Protection on the October 1993 "Development and Screening of Remedial Alternatives: Fort Devens Sudbury Training Annex, Sudbury Massachusetts," OHM Remediation Services Corp.

3.6 Remedial Investigation (RI) Reports

The records cited below as entries number 1 and 2 may be reviewed, by appointment only, at the Fort Devens Environmental Management Office.

1. "Final Remedial Investigations of the Sudbury Annex," Dames & Moore (November 1986).
2. "Draft Site/Remedial Investigation Report - Volumes I-IV," OHM Remediation Services Corp. (February 1993).
3. "Draft/Final Site/Remedial Investigation Report - Vol I-V," OHM Remediation Services Corp. (July 1993).
4. "Final Site/Remedial Investigation Report Fort Devens Sudbury Training Annex Middlesex County, Massachusetts," OHM Remediation Services Corp.,(December 31, 1993).
5. "Final Report Site/Remedial Investigation, Fort Devens Sudbury Training Annex, Middlesex County, Massachusetts, Vol I-VI," OHM Remediation Services Corp. (January 1994).
6. "Draft Addendum Report Site/Remedial Investigation, Fort Devens Sudbury Training Annex Middlesex County, Massachusetts," OHM Remediation Services Corp. (August 1994).
7. "Draft Final Addendum Report, Site/Remedial Investigation, Fort Devens Sudbury Training Annex. Middlesex County, Massachusetts," OHM Remediation Services Corp. (April 1995).

Comments

8. Comments Dated April 12, 1993 from Cindy Svec Ruzich, Four Town FOCUS on the February 1993 "Draft Site/Remedial Investigation - Volumes I-IV," OHM Remediation Services Corp with the attached Comments Dated March 19, 1993 from Cambridge Environmental, Inc. on the February 1993 "Draft Site/Remedial Investigation - Volumes I-IV," OHM Remediation Services Corp.
9. Comments Dated April 12, 1993 from James P. Byrne, EPA Region I on the February 1993 "Draft Site/Remedial Investigation - Volume I-IV," OHM Remediation Services Corp.
10. Comments Dated April 13, 1993 from Molly J. Elder for D. Lynne Chappell, Commonwealth of Massachusetts Department of Environmental Protection on the February 1993 "Draft Site/Remedial Investigation - Volume I-IV,' OHM Remediation Services Corp.
11. Comments Dated May 18, 1993 from Kenneth C. Carr for Gordon E. Beckett,

U.S. Department of the Interior Fish and Wildlife Services on the February 1993 "Draft Site/Remedial Investigation - Volume I-IV," OHM Remediation Services Corp.

12. Comments Dated August 6, 1993 from Cindy Svec Ruzich, Four Town Focus, on the Comment Time Extension on the "Draft Final RI/SI Report" and Army Response to FOCUS Comments on 'Draft RI/SI Investigation Report".
13. Comments Dated August 20, 1993 from James P. Byrne, USEPA, on the "Draft Final Site/Remedial Investigation Report," OHM Remediation Services Corp.
14. Comments Dated September 2, 1993 from D. Lynne Welsh, Commonwealth of Massachusetts Department of Environmental Protection on the July 1993 "Draft Final Site/Remedial Investigation Report," OHM Remediation Services Corp.
15. Update of Comments Dated September 12, 1993 from Cindy Svec Ruzich of Four Town Focus on the Draft SI/RI Investigation Report.
16. Comments Dated September 14, 1993 from Robert Lim, USEPA on the Comment Time Extension on "Draft Final SI/RI Investigation Report and Army Response to Comments on "Draft SI/RI Investigation Report".
17. Comments Dated October 3, 1994 from Jay Naparstek, Commonwealth of Massachusetts Department of Environmental Protection on the August 1994 "Draft Addendum Final Site/Remedial Investigation Report, Fort Devens Sudbury Training Annex," OHM Remediation Services Corp.
18. Comments Dated October 5, 1994 from Robert Lim, USEPA, on the Draft SI/Ri Addendum Report, Fort Devens Sudbury Training Annex.
19. Comments Dated October 13, 1993 from Cindy Svec Ruzich of Four Town Focus on the Draft Final RI/SI Phase I Investigation Report, Volume I.
20. Comments Dated October 17, 1994 from Robert Lim, USEPA, on the August 1994 Draft SI/Ri Addendum Report, Fort Devens Sudbury Training Annex (OHM Remediation Services Corp.).
21. Comments Dated November 1, 1994 from Jay Naparstek, Commonwealth of Massachusetts Department of Environmental Protection on the August 1994 Draft Addendum Report, Fort Devens Sudbury Training Annex.
22. Letter Dated November 7, 1994 from Robert Lim, USEPA, to the Ecological Risk Assessment Issues in the Remedial Investigation of Areas of Contamination A4, A7, and A9.
23. Follow-up Letter Dated November 21, 1994 from Robert Lim, USEPA, to the Ecological Risk Assessment Issues in the Remedial Investigation of Areas of Contamination A4, A7, and A9.
24. Comments Dated May 19, 1995 from Robert Lim, USEPA, on the Draft Final Site/Remedial Investigation Addendum Report, Fort Devens Sudbury Training Annex (OHM Remediation).
25. Comments Dated May 19, 1995 from Robert Lim, USEPA, on the Area of Contamination A9, Risk Based Soil Cleanup Level for Thallium.

Response to Comments

26. Responses Dated July 16, 1993, July 19, 1993 and July 28, 1993 from OHM Remediation Services Corp to the April 12, 1993 Four Town FOCUS, the April 12, 1993 EPA Region I, the April 13, 1993 Commonwealth of Massachusetts Department of Environmental Protection and the May 18, 1993 U.S. Department of Interior Fish and Wildlife Service Comments on the February 1993 "Draft Site/Remedial Investigation - Volumes I-IV," OHM Remediation Services Corp.
27. Responses Dated October 14, 1993 from U.S. Army Environmental Center on the Draft Site/Remedial Investigation Report, Fort Devens Sudbury Training Annex (OHM Remediation Services Corp.).
28. Responses Dated October 28, 1993 from U.S. Army Environmental Center on the Draft Final Site/Remedial Investigation Report, Fort Devens Sudbury Training Annex (OHM Remediation Services Corp.).
29. Responses Dated November 4, 1994 from OHM Remediation Services Corp. on the USEPA Comments on the "Draft SI/RI Addendum Report.

30. Responses Dated June 21, 1995 from U.S. Army Environmental Center on the Draft Final Addendum to the Final Site/Remedial Investigation Report, Fort Devens Sudbury Training Annex.

Responses to Responses to Comments

31. Rebuttals Dated November 15, 1994 from Robert Lim, USEPA, on the Responses to the Army's Responses to Comments on the Draft SI/RI Addendum Report.
32. Correction Letter Dated November 22, 1994 from Robert Lim, USEPA, on November 15, 1994 letter.

3.7 Work Plans and Progress Reports

Reports

The records cited below as entries number 1 and 2 may be reviewed, by appointment only, at the Fort Devens Environmental Management Office.

1. "Draft Work Plan, Draft Field Sampling Plan, Draft Health and Safety Plan, Draft Quality Assurance Plan," OHM Remediation Services Corp (June/July 1991).
2. "Draft Final Work Plan, Draft Final Field Sampling Plan, Draft Final Health and Safety Plan, Draft Final Quality Assurance Plan," OHM Remediation Services Corp. (December 1991).
3. "Final Work Plan," OHM Remediation Services Corp. (April 1992).
4. "Final Field Sampling Plan," OHM Remediation Services Corp. (April 1992).
5. "Final Health and Safety Plan," OHM Remediation Services Corp (April 1992).
6. "Final Quality Assurance Project Plan - Volume I-II," OHM Remediation Services Corp. (April 1992).

7. "Draft Master Quality Assurance Project Plan," Ecology and Environment, Inc. (June 1993).
8. "Draft Technical Plan Addenda, Phase II Site Inspections, Remedial Investigations," Ecology and Environment, Inc. (June 1993).
9. "Final Technical Plan Addenda, Phase II Site Inspections, Remedial Investigations, Fort Devens Sudbury Training Annex, Massachusetts," Ecology & Environment, Inc. (January 1994).

Comments

10. Comments Dated August 21, 1991 from Anne D. Flood, Town of Maynard on the June/July 1991 "Draft Work Plan, Draft Field Sampling Plan, Draft Health and Safety Plan, Draft Quality Assurance Plan," OHM Remediation Services Corp.
11. Comments Dated August 22, 1991 from Gregory M. Ciardi, Maynard Public Schools on the June/July 1991 "Draft Work Plan, Draft Filed Sampling Plan, Draft Health and Safety Plan, Draft Quality Assurance Plan," OHM Remediation Services Corp.
12. Comments Dated February 12, 1992 from Todd S. Alving, Organization for the Assabet River on the December 1991 "Draft Final Work Plan, Draft Final Field Sampling Plan, Draft Final Health and Safety Plan, Draft Final Quality Assurance Plan," OHM Remediation Services Corp.
13. Comments Dated May 13, 1992 from James P. Byrne, EPA Region I on the April 1992 "Final Work Plan, Final Field Sampling Plan, Final Health and Safety Plan, Final Quality Assurance Project Plan," OHM Remediation Services Corp. and the April 1992 "Final Community Relations Plan," Dames & Moore.
14. Comments Dated May 18, 1992 from Ken Raina, Lake Boon Association on the April 1992 "Final Work Plan, Final Field Sampling Plan, Final Health and Safety Plan, Final Quality Assurance Project Plan," OHM Remediation Services Corp.
15. Comments Dated May 19, 1992 from Deborah Schumann and Cindy Svec Ruzich, Four Town FOCUS on the April 192 " Final Work Plan, Final Field Sampling Plan, Final Health and Safety Plan, Final Quality Assurance Project Plan," OHM Remediation Services Corp.
16. Comments dated July 7, 1993 from Jack McKenna, Metcalf & Eddy on the June 1993 "Draft Technical Plan Addenda, Phase II Site Inspections, Remedial Investigations," Ecology and Environment, Inc. and the June 1993 "Draft Final Addendum to the Final Technical Plans - Phase II Feasibility Study," OHM Remediation Services Corp.
17. Comments Dated July 23, 1993 from Molly J. Elder for D. Lynne Chappell, Commonwealth of Massachusetts Department of Environmental Protection on the June 1993 " Draft Master Quality Assurance Project Plans," Ecology and Environment, Inc.
18. Preliminary Comments Dated July 25, 1993 from Cindy Svec Ruzich of Four Town Focus on the "Technical Plan Addenda, Phase II Site Inspections, Remedial

Investigations," Ecology and Environment, Inc.

19. Comments Dated August 5, 1993 from Lynne Chappell, Commonwealth of Massachusetts Department of Environmental Protection on the June 1993 "Technical Plans Addenda Phase II Site Inspections, Remedial Investigations, Fort Devens Sudbury Training Annex, Massachusetts," Ecology and Environment, Inc.
20. Comments Dated August 6, 1993 from James P. Byrne, USEPA, on the "Draft Work Plan, Field Sampling Plan, Quality Assurance Project Plan, and Health and Safety Addenda for the Phase II Site Investigations and Remedial Investigations," Ecology and Environment, Inc.

Responses to Comments

21. Response Dated October 1991 from OHM Remediation Services Corp. to Regulatory Agency Comments on the June/July 1991 "Draft Work Plan, Draft Field Sampling Plan, Draft Health and Safety Plan, Draft Quality Assurance Project Plan," OHM Remediation Services Corp.
22. Response Dated November 19, 1991 from Joseph Pierce, U.S. Army to the August 21, 1991 Comments from Todd S. Alving, Organization for the Assabet River on the June/July 1991 "Draft Work Plan, Draft Field Sampling Plan, Draft Health and Safety Plan, Draft Quality Assurance Project Plan," OHM Remediation Services Corp.
23. Response Dated November 20, 1991 from Dennis R. Dowdy, U.S. Army to the August 22, 1991 Comments from Gregory M. Ciardi, Maynard Public Schools on the June/July 1991 "Draft Work Plan, Draft Field Sampling Plan, Draft Health and Safety Plan, Draft Quality Assurance Project Plan," OHM Remediation Services Corp.
24. Response Dated November 25, 1991 from Ronald J. Ostrowski, U. S. Army to the August 21, 1991 Comments from Anne D. Flood, Town of Maynard on the June/July 1991 "Draft Work Plan, Draft Field Sampling Plan, Draft Health and Safety Plan, Draft Quality Assurance Plan," OHM Remediation Services Corp.
25. Response Dated November 1991 from OHM Remediation Services Corp. to the Four Town FOCUS Comments on the June/July 1991 "Draft Work Plan, Draft Field Sampling Plan, Draft Health and Safety Plan, Draft Quality Assurance Plan," OHM Remediation Services Corp.
26. Responses from OHM Remediation Services Corp. to EPA Region I, Four Town FOCUS, and the U.S. Department of the Interior Fish and Wildlife Service Comments on the December 1991 "Draft Final Work Plan, Draft Final Field Sampling Plan, Draft Final Health and Safety Plan, Draft Final Quality Assurance Plan," OHM Remediation Services Corp.
27. Draft Responses to Four Town FOCUS Comments on the April 1992 "Final Work Plan," OHM Remediation Services Corp.
28. Responses Dated September 1993 from U.S. Army Environmental Center on the Technical Plan Addenda Phase II Site Investigation/Remedial Investigations, Fort Devens Sudbury Training Annex, Massachusetts (Ecology and Environment,

Inc.).

Responses to Responses to Comments

29. Response Dated October 21, 1991 from D. Lynne Chappell, Commonwealth of Massachusetts Department of Environmental Protection to the Response Dated October 1991 from OHM Remediation Services Corp. to Regulatory Agency Comments on the June/July 1991 "Draft Work Plan, Draft Field Sampling Plan, Draft Health and Safety Plan, Draft Quality Assurance Plan," OHM Remediation Services Corp.
30. Response Dated October 22, 1991 from James P. Byrne, EPA Region I to the Response Dated October 1991 from OHM Remediation Services Corp. to Regulatory Agency Comments on the June/July 1991 "Draft Work Plan, Draft Field Sampling Plan, Draft Health and Safety Plan, Draft Quality Assurance Pan," OHM Remediation Services Corp.
31. Response Dated October 22, 1991 from Steven E. Mierzykowski, U.S. Department of the Interior Fish and Wildlife Service to the Response Dated October 22, 1991 from OHM Remediation Services Corp. to Regulatory Agency Comments on the June/July 1991 "Draft Work Plan, Draft Field Sampling Plan, Draft Health and Safety Plan, Draft Quality Assurance Plan," OHM Remediation Services Corp.
32. Response Dated January 2, 1992 from Four Town FOCUS to the Response Dated November 1991 from OHM Remediation Services Corp. to the FOCUS Comments on the June/July 1991 "Draft Work Plan, Draft Field Sampling Plan, Draft Quality Assurance Plan," OHM Remediation Services Corp.
33. Rebuttals Dated November 2, 1993 from D. Lynne Welsh, Commonwealth of Massachusetts Department of Environmental Protection on the June 1993 "Draft Technical Plan Addenda, Phase II Site Investigation/Remedial Investigation, Sudbury Training Annex," Ecology and Environment, Inc.

3.9 Health Assessments

1. "Health Consultation," U.S. Department of Health and Human Services Agency for Toxic Substances and Disease Registry (November 23, 1992).
2. "Final Site-Specific Risk Assessment for the Sudbury Training Annex Facility, Sudbury, Massachusetts," OHM Remediation Services Corp. (January 1994).

4.0 Feasibility Study (FS)

4.4 Interim Deliverables

1. "Preliminary Draft Screening of Alternatives," OHM Remediation Services Corp. (May 25, 1993).

4.6 Feasibility Study (FS) Reports

1. "Draft Final Report Feasibility Study, Fort Devens Sudbury Training Annex Middlesex County, Massachusetts," OHM Remediation Services Corp. (May 1994).
2. "Draft Final Feasibility Study Report, Fort Devens Sudbury Training Annex, Middlesex County, Massachusetts," OHM Remediation Services Corp. (May 1994).
3. "Draft Final Report, Feasibility Study at Fort Devens Sudbury Training Annex Areas A7 and A9," OHM Remediation Services Corp. (January 1995).
4. "Draft Final Feasibility Study at Fort Devens Sudbury Training Annex Areas A7 and A9," OHM Remediation Services Corp. (March 1995).
5. "Final Feasibility Study at Fort Devens Sudbury Training Annex Areas A7 and A9," OHM Remediation Services Corp. (May 1995).

Comments

6. Letter Dated January 30, 1995 from Robert Lim, USEPA, on the Source Control Record of Decision Proposal for Fort Devens Sudbury Annex Areas of Contamination A7 and A9.
7. Comments Dated March 2, 1995 from Robert Lim, USEPA, on the Draft Final Feasibility Study Report at Fort Devens Sudbury Training Annex Area A7 and A9," (OHM Remediation Services Corp.).
8. Comments Dated April 3, 1995 from Robert Lim, USEPA, on the Fort Devens Sudbury Training Annex Feasibility Study for Area A7, 100-Floodplan Location-Specific ARAR," (OHM Remediation Services Corp.).
9. Cross Reference: Comment Dated May 19, 1995 from Robert Lim, USEPA, on the Area of Contamination A9, Risk Based Soil Cleanup Level for Thallium [Filed and Cited as entry number 29 in minor break 3.6 Remedial Investigation Reports of this Administrative Record File Index.]

Response to Comments

10. Responses Dated September 20, 1994 from U.S. Army Environmental Center on the Draft Final Feasibility Study (OHM Remediation Services Corp.).
11. Responses Dated May 2, 1995 from U.S. Army Environmental Center on the Draft Final Feasibility Study Report, Sudbury Training Annex (OHM Remediation Services Corp.).

Responses to Responses to Comments

12. Rebuttals Dated October 4, 1994 from Robert Lim, USEPA, on the Army's Response to Comments on the Feasibility Study.

4.7 Work Plans and Progress Reports

Reports

1. "Draft Final Addendum to the Final Technical Plans - Phase II Feasibility Study," OHM Remediation Services Corp. (June 1993).
2. "Final Addendum to the Final Technical Plans for the Phase II Feasibility Study at the Fort Devens Sudbury Training Annex, Middlesex County, Massachusetts," OHM Remediation Services Corp. (November 10, 1993).

Comments

3. Cross Reference: Preliminary Comments Dated July 7, 1993 from Jack McKenna, Metcalf & Eddy on the June 1993 "Draft Technical Plan Addenda, Phase II Site Inspections, Remedial Investigations," Ecology & Environment, Inc on the June 1993 "Draft Final Addendum to the Final Technical Plans - Phase II Feasibility Study," OHM Remediation Services Corp. Filed and cited as entry number *** in 3.7 Work Plans and Progress Reports in this Administrative Record Index.
4. Comments Dated July 22, 1993 from D. Lynne Chappell, Commonwealth of Massachusetts Department of Environmental Protection on the June 1993 "Draft Final Addendum to the Final Technical Plans - Phase II Feasibility Study," OHM Remediation Services. Corp.
5. Comments Dated July 23, 1993 from D. Lynne Welsh, Commonwealth of Massachusetts Department of Environmental Protection on the "Addendum to the Final Technical Plans Phase II Feasibility Study, Fort Devens Sudbury Training Annex, Sudbury, Massachusetts," OHM Remediation Services Corp.
6. Comments Dated August 6, 1993 from James P. Byrne, USEPA, on the June 1993 "Addendum to the Final Technical Plans, Phase II Feasibility Study, Fort Devens Sudbury Training Annex, " OHM Remediation Services Corp.
7. Comments Dated August 6, 1993 from Cindy Svec Ruzich of Four Town Focus on the "Draft Addendum to the Final Technical Plans Phase II Feasibility," OHM Remediation Services Corp.

Responses to Comments

8. Responses Dated September 7, 1993 from OHM Remediation Services Corp. on USEPA Comments on the "Addendum to the Final Technical Plans, Phase II Feasibility Study, Fort Devens Sudbury Training Annex.

Responses to Responses to Comments

9. Rebuttal Dated October 1, 1993 from D. Lynne Welsh, Commonwealth of Massachusetts Department of Environmental Protection on the June 1993 Army Responses to MADEPs Comments on the Draft Final Addendum to the Final

Technical Plans Phase I Feasibility Study, Fort Devens Sudbury Training Annex, Sudbury, Massachusetts (OHM Remediation Corp).

4.9 Proposed Plan for Selected Remedial Action

Reports

1. "Draft Proposed Plan, Area 7, the Old Gravel Pit Landfill, Area A9, the POL Burn Area, Fort Devens Sudbury Training Annex, Sudbury, Massachusetts," OHM Remediation Services Corp. (March 1995).
2. "Draft Final Proposed Plan, Area 7, the Old Gravel Pit Landfill, Area A9, the POL Burn Area, Fort Devens Sudbury Training Annex, Sudbury, Massachusetts," OHM Remediation Services Corp., (April 1995).
3. "Proposed Plan AOC A7, the Old Gravel Pit Landfill, AOC A9, the POL Burn Area, Fort Devens Sudbury Training Annex, Middlesex County, Massachusetts," OHM Remediation Services Corp. (June 1995).

Comments

4. Comments Dated April 12, 1995 from Robert Lim, USEPA, on the March 1995 Draft Proposed Plan, Sudbury Training Annex (OHM Remediation Services Corp.).
5. Comments Dated May 18, 1995 from Robert Lim, USEPA on the April 1995 Draft Final Proposed Plan, Fort Devens Sudbury Training Annex (OHM Remediation Services Corp.).

5.0 Record of Decision (ROD)

5.2 Applicable or Relevant and Appropriate Requirements (ARARs)

1. Letter from D. Lynne Chappell, Commonwealth of Massachusetts Department of Environmental Protection to Jeff Waugh, U.S. Army (January 6, 1993). Concerning transmittal of the attached potential ARARs.
2. "Draft Preliminary Applicable or Relevant and Appropriate Requirements for the Fort Devens Sudbury Training Annex," OHM Remediation Services Corp. (January 21, 1993).

5.4 Record of Decision

Reports

1. "Record of Decision, Source Control Operable Unit, AOC A7, the Old Gravel Pit Landfill, AOC A9, the POL Burn Area, Fort Devens Sudbury Training

Annex, Middlesex County, Massachusetts," OHM Remediation Services Corp. (June 1995).

2. "Draft Final Record of Decision, Source Control Operable Unit, AOC A7, the Old Gravel Pit Landfill, AOC A9, the POL Burn Area, Fort Devens Sudbury Training Annex Middlesex County, Massachusetts," OHM Remediation Services Corp. (August 1995).
3. "Final Record of Decision, Source Control Operable Unit, AOC A7, the Old Gravel Pit Landfill, AOC A9, the POL Burn Area, Fort Devens Sudbury Training Annex Middlesex County, Massachusetts," OHM Remediation Services Corp. (September 1995).

Comments

4. Comments Dated July 21, 1995 from Robert Lim, USEPA, on the June 1995 Draft Record of Decision, Source Control Operable Unit AOC A7, the Old Gravel Pit Landfill, AOC 9, the POL Burn Area, Fort Devens Sudbury Training Annex, Middlesex County, Massachusetts (OHM Remediation Services Corp.).
5. Comments Dated August 25, 1995 from Robert Lim, USEPA, on the August 1995 Draft Final Record of Decision, Source Control Operable Unit AOC A7, the Old Gravel Pit Landfill, AOC 9, the POL Burn Area, Fort Devens Sudbury Training Annex, Middlesex County, Massachusetts (OHM Remediation Services Corp.).

10.0 Enforcement

10.16 Federal Facility Agreements

Reports

The document cited below as entry number 1 may be reviewed, by appointment only, at the Fort Devens Environmental Management Office.

1. "Draft Federal Facility Agreement Under CERCLA Section 120," EPA Region I and U.S. Department of the Army (March 1991).
2. "Final Federal Facility Agreement Under CERCLA Section 120," EPA Region I and U.S. Department of the Army (November 15, 1991).

Comments

3. Comments Dated July 12, 1991 from Edmond G. Benoit, Commonwealth of Massachusetts Department of Environmental Protection on the March 1991 "Draft Federal Facility Agreement Under CERCLA Section 120," EPA Region I and U.S. Department of the Army.

Responses to Comments

4. Response Dated September 5, 1991 from James P. Byrne, EPA Region I to the Comments Dated July 12, 1991 from Edmond G. Benoit, Commonwealth of Massachusetts Department of Environmental Protection on the March 1991 "Draft Federal Facility Agreement Under CERCLA Section 120," EPA Region I and U.S. Department of the Army.

13.0 Community Relations

13.2 Community Relations Plans

Reports

The document cited below as entries 1 and 2 may be reviewed, by appointment only, at the Fort Devens Environmental Management Office.

1. "Draft Community Relations Plan," Dames & Moore (August 1991).
2. "Draft Final Community Relations Plan," Dames & Moore (December 1991).
3. "Final Community Relations Plan," Dames & Moore (April 1992).

Comments

4. Comments Dated September 30, 1991 from Cindy Svec Ruzich and Deborah Schumann, Four Town FOCUS on the August 1991 "Draft Community Relations Plan," Dames & Moore.
5. Comments Dated February 14, 1992 from Cindy Svec Ruzich and Deborah Schumann, Four Town FOCUS on the December 1991 "Draft Final Community Relations Plan," Dames & Moore.
6. Comments Dated March 17, 1992 from D. Lynne Chappell, Commonwealth of Massachusetts Department of Environmental Protection on the December 1991 "Draft Final Community Relations Plan," Dames & Moore.
7. Comments from James P. Byrne, EPA Region I on the December 1991 "Draft Final Community Relations Plan," Dames & Moore.
8. Cross Reference: Comments Dated May 13, 1992 from James P. Byrne, EPA Region I on the April 1992 "Final Work Plan, Final Field Sampling Plan, Final Heath and Safety Plan, Final Quality Assurance Project Plan," OHM Remediation Corp. and the April 1992 "Final Community Relations Plan," Dames & Moore. Filed and cited as entry number 15 in 3.7 Work Plans and Progress Reports in this Administrative Record Index.

Response to Comments

9. Response to the EPA Comments on the August 1991 "Draft Community Relations

Plan," Dames & Moore.

10. Response to the Commonwealth of Massachusetts Department of Environmental Protection Comments on the August 1991 "Draft Community Relations Plan," Dames & Moore.

13.11 Technical Review Committee Documents

1. Technical Review Committee Meeting Summary, List of Attendees, and Handouts (May 14, 1991).
2. Technical Review Committee Meeting Summary and List of Attendees (July 31, 1991).
3. Technical Review Committee Meeting Summary and List of Attendees (October 23, 1991).
4. Technical Review Committee Meeting Summary and List of Attendees (October 23, 1991).
5. Technical Review Committee Meeting Summary, Agenda, Handouts, Overheads, and List of Attendees (April 28, 1992).
6. Technical Review Committee Meeting Summary, Agenda, Handouts, Overheads, and List of Attendees (July 14, 1992).
7. Technical Review Committee Meeting Summary, Agenda, Handouts, Overheads, and List of Attendees (October 27, 1992).
8. Agenda and Attendance List for Sudbury Annex Working Meeting (November 23, 1992).
9. Technical Review Committee Meeting Summary, List of Attendees, and Handouts (February 2, 1993).
10. Letter from Richard D. Dotchin, U.S. Army to James P. Byrne, EPA Region I (March 3, 1993). Concerning followup to the February 2, 1993 Technical Review Committee Meeting.
11. Technical Review Committee Meeting Summary, List of Attendees, and Handouts (June 9, 1993).

17.0 Site Management Records

17.6 Site Management Plans

The document cited below as entries number 1 and 2 may be reviewed, by appointment only, at the Fort Devens Environmental Management Office.

Reports

1. "Draft Master Environmental Plan," OHM Remediation Services Corp. (May 1991).
2. "Draft Final Master Environmental Plan," OHM Remediation Services Corp. (October 1991).

3. "Final Master Environmental Plan," OHM Remediation Services Corp. (January 1992).
4. "Draft Master Environmental Plan, Fort Devens Sudbury Training Annex, Massachusetts," Ecology & Environment, Inc. (May 1994).
5. "Draft Project Operations Plan, Fort Devens Sudbury Training Annex, Sudbury, Massachusetts, Volume I & II," ABB Environmental Services, Inc. (October 1994).
6. "Final Project Operations Plan, Fort Devens Sudbury Training Annex, Sudbury, Massachusetts, Volume I & II," ABB Environmental Services, Inc. (April 1995).

Comments

7. Comments Dated July 11, 1991 from James P. Byrne, EPA Region I on the May 1991 "Draft Master Environmental Plan," OHM Remediation Services Corp.
8. Comments Dated July 15, 1991 from D. Lynne Chappell, Commonwealth of Massachusetts Department of Environmental Protection on the May 1991 "Draft Master Environmental Plan," OHM Remediation Services Corp.
9. Comments from James P. Byrne, EPA Region I on the January 1992 "Final Master Environmental Plan," OHM Remediation Services Corp.
10. Comments Dated June 27, 1994 from Robert Lim, USEPA, on the May 1994 "Master Environmental Plan, Update, Fort Devens Sudbury Training Annex, Massachusetts," Ecology and Environment, Inc.

Responses to Comments

11. Response Dated August 28, 1991 from OHM Remediation Services Corp. to the Comments Dated July 11, 1991 from James P. Byrne, EPA Region I on the May 1991 "Draft Master Environmental Plan," OHM Remediation Services Corp.
12. Response Dated August 28, 1991 from OHM Remediation Services Corp. to the Comments Dated July 15, 1991 from D. Lynne Chappell, Commonwealth of Massachusetts Department of Environmental Protection on the May 1991 "Draft Master Environmental Plan," OHM Remediation Services Corp.

Responses to Responses to Comments

13. Response Dated September 12, 1991 from James P. Byrne, EPA Region I to the Response Dated August 28, 1991 from OHM Remediation Services Corp.

17.8 Federal and Local Technical and Historical Records

The document cited below as entry number 1 may be reviewed, by appointment only, at the Fort Devens Environmental Management Office.

1. "An Intensive Archeological Survey of the Sudbury Training Annex," The Public Archaeology Laboratory, Inc. (April 1985).

GUIDANCE DOCUMENTS

The following guidance documents were relied upon during the Fort Devens - Sudbury Annex cleanup. These documents may be reviewed, by appointment only, at the Environmental Management Office at Fort Devens, Massachusetts.

1. Occupational Safety and Health Administration (OSHA). Hazardous Waste Operation and Emergency Response (Final Rule, 29 CRF Part 1910, Federal Register. Volume 54, Number 42) March 6, 1989.
2. USATHAMA. Geotechnical Requirements for Drilling Monitoring Well, Data Acquisition, and Reports, March 198.
3. USATHAMA. IRDMIS User's Manual, Version 4.2, April 1991.
4. USATHAMA. USATHAMA Quality Assurance Program: PAM-41, January 1990.
5. USATHAMA. Draft Underground Storage Tank Removal Protocol - Fort Devens, Massachusetts, December 4, 1992.
6. U.S. Environmental Protection Agency. Guidance for Preparation of Combined Work/Quality Assurance Project Plans for Environmental Monitoring: OWRS QA-1, May 1984.
7. U.S. Environmental Protection Agency. Office of Research and Development. Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans: QAMS-005/80, 1983.
8. U.S. Environmental Protection Agency. Test Methods for Evaluating Solid Waste: EPA SW-846 Third Edition, September 1986.
9. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation manual (Part A), EPA/1-89/002), 1989,.
10. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation manual (Part A), EPA/1-89/002), 1989.
11. U.S. Environmental Protection Agency. Hazardous Waste Management System: Identification and Listing of Hazardous Waste: Toxicity Characteristic Revisions, (Final Rule, 40 CFR Part 261 et al, Federal Register Part V), June 29, 1990.
12. U.S. Army. Environmental Quality - Environmental Protection and Enhancement, (Army Regulation 200-1), April 23, 1990.
13. U.S. Environmental Protection Agency, 1991. Design and Construction of RCRA/CERCLA Final Covers; Office of Research and Development; Washington, DC; EPA/625/4-91/025; May.
14. U.S. Environmental Protection Agency, 1991. Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals) Interim; Office of Emergency and Remedial Response, Washington, DC; Publication 9285.7-01B; October.

APPENDIX E

STATE LETTER OF CONCURRENCE

Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Department of Environmental Protection

William F. Weld
Governor
Argeo Paul Cellucci
Lt. Governor

Trudy Coxe
Secretary
David B. Struhs
Commissioner

September 26, 1995

John P. DeVillars
Regional Administrator
U.S. Environmental Protection Agency
Region I, JFK Building
Boston MA., 02203-2211

RE: Fort Devens Sudbury Training Annex
AOC A7, the Old Gravel Pit Landfill
AOC A9, the POL Burn Area
Sudbury, MA

Dear Mr. DeVillars:

The Massachusetts Department of Environmental Protection (MA DEP) has reviewed the August, 1995 Draft Final Record of Decision (ROD) regarding sites AOC A7 and AOC A9 for the Fort Devens Sudbury Training Annex Superfund Site located in Sudbury, Massachusetts.

Based upon that draft final report, MA DEP concurs with the selected remedial action. This action addresses the problems associated with AOC A7 and AOC A9 by preventing further endangerment to health, welfare, and the environment by implementation of this record of decision.

The preferred remedial alternative for AOC's A7 and A9 involves excavating laboratory waste with removal to an approved treatment facility. Additional contaminated soil and solid waste below hazardous levels will be consolidated in the central landfill area of AOC 7.

The landfill area will be capped with a RCRA Subtitle C multi-layer cap. Fencing, monitoring, and maintenance provisions with inspection over the life of the facility will be required.

Specifically, the major components for the selected alternative are as follows:

- Site Preparation and Grading
- Excavation and Off-Site Treatment/Disposal of Laboratory Waste at AOC 7
- Excavation of Contaminated Soil from AOC A9 and Consolidation

at AOC A7

- Construction of RCRA Subtitle C Landfill Cap at AOC A7
- Environmental Monitoring and O&M at AOC A7
- Institutional Controls at AOC A7
- Five Year Reviews at AOC A7

The remedial action selected for the AOC A7 and AOC A9 is consistent with the Massachusetts Contingency Plan. This remedy is protective of human health, welfare and the environment, attains ARAR's and is cost effective.

This concurrence is based upon the State's understanding that:

1). The MADEP will continue in the review and approval of operational designs and maintenance plans.

2). Ground water monitoring wells will be established on the northerly side of the proposed landfill.

3). Site conditions shall be reviewed within five (5) years from the conclusion of the remedial action to ensure that public health and the environment are not impacted.

If you require any additional information regarding this matter, please contact the Bureau of Waste Site Cleanup at any time.

Very truly yours,

Edward Kunce

Edward Kunce, Deputy
Assistant Commissioner

cc: Ms. Linda Murphy, Director, U.S. EPA
Mr. Jerry Collins, Maynard BOH
Mr. George Dargaty, Town of Stow
Mr. Robert Leupold, Sudbury BOH
Mr. Robert Steere, Hudson Board of Selectmen
Mr. Thomas Strunk, Fort Devens, EMO
Ms. Cindy Ruzich, Four Town FOCUS
Mr. Robert Lim, U.S. EPA
Mr. Richard Chalpin, MADEP, NERO
Mr. Steven Johnson, MA DEP, NERO
Mr. Ed Benoit, MADEP,CERO
Ms. Lynne Welsh,CERO