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RECORD OF DECISION
AREA OF CONTAMINATION 57
DEVENS RESERVE FORCES TRAINING AREA
DEVENS, MASSACHUSETTS

IN ACCORDANCE WITH U.S. ARMY REGULATION 200-2,
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NATIONAL ENVIRONMENTAL POLICY ACT OF 1969.

SEPTEMBER 2001

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TABLE OF CONTENTS

Section	Title	Page No.
	DECLARATION FOR THE RECORD OF DECISION	1
1.0	SITE NAME, LOCATION, AND DESCRIPTION	1
2.0	SITE HISTORY AND ENFORCEMENT ACTIVITIES	1
2.1	LAND USE AND RESPONSE HISTORY	1
2.2	ENFORCEMENT HISTORY	6
3.0	COMMUNITY PARTICIPATION	7
4.0	SCOPE AND ROLE OF THE RESPONSE ACTION	8
5.0	SUMMARY OF SITE CHARACTERISTICS	9
5.1	AOC 57 AREA 2 CONTAMINANT CHARACTERIZATION	9
5.1.1	Area 2 Soil Characterization	9
5.1.2	Area 2 Groundwater Characterization	10
5.1.3	Area 2 Sediment Characterization	12
5.1.4	Area 2 Surface Water Characterization	14
5.2	AOC 57 AREA 3 CONTAMINANT CHARACTERIZATION	15
5.2.1	Area 3 Soil Characterization	16
5.2.2	Area 3 Groundwater Characterization	17
5.2.3	Area 3 Sediment Characterization	18
5.2.4	Area 3 Surface Water Characterization	19
5.3	CONCEPTUAL SITE MODEL	20
6.0	CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES	21
7.0	SUMMARY OF RISK ASSESSMENT	21
7.1	HUMAN-HEALTH RISK ASSESSMENT	21
7.2	ECOLOGICAL RISK ASSESSMENT SUMMARY	24
8.0	PRINCIPAL THREAT WASTES	25
9.0	GENERAL STATUTORY REQUIREMENTS AND REMEDIAL ACTION OBJECTIVES	26
9.1	APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS	27
9.2	RESPONSE AND REMEDIAL ACTION OBJECTIVES	27
10.0	DESCRIPTION OF ALTERNATIVES	29
10.1	DESCRIPTION OF ALTERNATIVES FOR AOC 57 AREA 2	30
10.1.1	Alternative II-1: No Action	30
10.1.2	Alternative II-2: Limited Action	30
10.1.3	Alternative II-3: Excavation (For Possible Future Use) and Institutional Controls	32
10.1.4	Alternative II-4: Excavation (For Unrestricted Use) And Institutional Controls	34
10.2	DESCRIPTION OF ALTERNATIVES FOR AOC 57 AREA 3	36

RECORD OF DECISION
AREA OF CONTAMINATION 57
DEVENS, MASSACHUSETTS

TABLE OF CONTENTS

Section	Title	Page No.
10.2.1	Alternative III-1: No Action	36
10.2.2	Alternative III-2: Limited Action	36
10.2.3	Alternative III-3: Excavation (For Unrestricted Use) and Institutional Controls	38
10.2.4	Alternative III-2a: Excavation (to Accelerate Groundwater Cleanup) and Institutional Controls	39
11.0	SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES	41
11.1	SUMMARY COMPARISON OF AREA 2 ALTERNATIVES	43
11.1.1	Overall Protection of Human Health and the Environment	43
11.1.2	Compliance with Applicable or Relevant and Appropriate Requirements	43
11.1.3	Long-term Effectiveness and Permanence	44
11.1.4	Reduction of Toxicity, Mobility, or Volume Through Treatment	45
11.1.6	Implementability	46
11.1.7	Cost	46
11.1.8	State Acceptance	47
11.1.9	Community Acceptance	47
11.2	SUMMARY COMPARISON OF AREA 3 ALTERNATIVES	48
11.2.1	Overall Protection of Human Health and the Environment	48
11.2.2	Compliance with Applicable or Relevant and Appropriate Requirements	48
11.2.3	Long-term Effectiveness and Permanence	49
11.2.4	Reduction of Toxicity, Mobility, or Volume Through Treatment	50
11.2.5	Short-term Effectiveness	50
11.2.6	Implementability	51
11.2.7	Cost	51
11.2.8	State Acceptance	52
11.2.9	Community Acceptance	52
12.0	THE SELECTED REMEDY	52
12.1	DESCRIPTION OF REMEDY FOR AOC 57 AREA 2	52
12.1.1	Summary of the Rational for Selection of Alternative II-3	53
12.1.2	Description of Alternative II-3	53
12.1.3	Summary of Costs for Alternative II-3	55
12.1.4	Expected Outcome of Alternative II-3	57
12.2	DESCRIPTION OF REMEDY FOR AOC 57 AREA 3	58
12.2.1	Summary of the Rational for Selection of Alternative III-2a	58
12.2.2	Description of Alternative III-2a	58
12.2.3	Summary of Costs for Alternative III-2a	61
12.2.4	Expected Outcome of Alternative III-2a	62
13.0	STATUTORY DETERMINATIONS	63
13.1	STATUTORY DETERMINATIONS FOR ALTERNATIVE II-3	63
13.1.1	The Selected Remedy is Protective of Human Health and the Environment	63

RECORD OF DECISION
AREA OF CONTAMINATION 57
DEVENS, MASSACHUSETTS

TABLE OF CONTENTS

Section	Title	Page No.
13.1.2	The Selected Remedy Attains Applicable or Relevant and Appropriate Requirements	63
13.1.3	The Selected Remedial Action is Cost-Effective	64
13.1.4	The Selected Remedy Utilizes Permanent Solutions and Alternative Treatment or Resource Recovery Technologies to the Maximum Extent Practicable	64
13.1.5	The Selected Remedy Does Not Satisfy the Preference for Treatment as a Principal Element	64
13.1.6	Five-Year Review Requirements	65
13.2	STATUTORY DETERMINATIONS FOR ALTERNATIVE III-2A	65
13.2.1	The Selected Remedy is Protective of Human Health and the Environment	65
13.2.2.	The Selected Remedy Attains Applicable or Relevant and Appropriate Requirements	65
13.2.3	The Selected Remedial Action is Cost-Effective	66
13.2.4	The Selected Remedy Utilizes Permanent Solutions and Alternative Treatment or Resource Recovery Technologies to the Maximum Extent Practicable	66
13.2.5	The Selected Remedy Satisfies the Preference for Treatment as a Principal Element	67
13.2.6	Five-Year Review Requirements	67
14.0	DOCUMENTATION OF SIGNIFICANT CHANGES	67
15.0	STATE ROLE	68

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

REFERENCES

APPENDICES

APPENDIX A - FIGURES
APPENDIX B - TABLES
APPENDIX C - RESPONSIVENESS SUMMARY
APPENDIX D - ADMINISTRATIVE RECORD INDEX
APPENDIX E - DECLARATION OF STATE CONCURRENCE
APPENDIX F - GLOSSARY OF ACRONYMS AND ABBREVIATIONS

RECORD OF DECISION
AREA OF CONTAMINATION 57
DEVENS, MASSACHUSETTS

LIST OF FIGURES

Figures No.	Title
1	Location of AOC 57
2	Location of Areas 1, 2, and 3
3	Areas 1, 2, and 3 Site Map
4	Area 2 Monitoring Well Locations
5	Area 3 Monitoring Well Locations
6	Conceptual site Model
7	Area 2 Soil Areas Exceeding PRGs
8	Area 3 Soil Area Exceeding Unrestricted Use PRGs
9	Alternative III-2a Estimated Soil Excavation Area
10	Alternative II-3 Soil Excavation Area

RECORD OF DECISION
AREA OF CONTAMINATION 57
DEVENS, MASSACHUSETTS

LIST OF TABLES

Table No.	Title
1	Summary of AOC 57 Areas 2 and 3 Risk Assessment Scenarios
2	Quantitative Human-Health Risk Summary
3	Comparison of Area 2 Human-health Risk Estimates To USEPA Criteria
4	Comparison of Area 3 Human-health Risk Estimates To USEPA Criteria
5	Area 2 Primary Risk Contributors
6	Area 3 Primary Risk Contributors
7	AOC 57 Soil Preliminary Remediation Goals
8	AOC 57 Groundwater Preliminary Remediation Goals
9	Summary of ARARs for AOC 57 Area 2
10	Summary of ARARs for AOC 57 Area 3
11	Cost Summary for Alternative II-3: Excavation (For Possible Future Use) and Institutional Controls
12	AOC 57 Cleanup Levels for Contaminants of Concern
13	Cost Summary for Alternative III-2a: Excavation (to Accelerate Groundwater Cleanup) and Institutional Controls
14	Synopsis of Federal and State Location-specific ARARs for Alternative II-3
15	Synopsis of Federal and State Chemical-specific ARARs for Alternative II-3
16	Synopsis of Federal and State Action-specific ARARs for Alternative II-3
17	Synopsis of Federal and State Location-specific ARARs for Alternative III-2a
18	Synopsis of Federal and State Chemical-specific ARARs for Alternative III-2a
19	Synopsis of Federal and State Action-specific ARARs for Alternative III-2a

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Area of Contamination 57
Devens Reserve Forces Training Area
Devens, Massachusetts
CERCLIS ID MA7210025154

STATEMENT OF PURPOSE AND BASIS

This decision document presents the U.S. Army's selected remedial action for Area of Contamination (AOC) 57 at the Devens Reserve Forces Training Area (RFTA) (formerly Fort Devens), Devens, Massachusetts. It was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 USC §§ 9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) 40 CFR Part 300, et seq., as amended. The Devens Base Realignment and Closure (BRAC) Environmental Coordinator and the Director of the Office of Site Remediation and Restoration, U.S. Environmental Protection Agency (USEPA) Region 1, have been delegated the authority to approve this Record of Decision. AOC 57 comprises three subareas: Area 1, Area 2, and Area 3.

This decision is based on the Administrative Record that has been developed in accordance with Section 113(k) of CERCLA. The Administrative Record is available for public review at the Devens BRAC Environmental Office, Devens, Massachusetts, and at the Ayer Town Hall, Main Street, Ayer, Massachusetts. The Administrative Record Index (Appendix D of this Record of Decision) identifies each of the items considered during selection of the remedial action.

STATE CONCURRENCE

The Commonwealth of Massachusetts concurs with the selected remedies. Appendix E of this Record of Decision contains a copy of the Declaration of State Concurrence.

ASSESSMENT OF SITE

The response actions selected in this Record of Decision are necessary to protect public health or welfare or environment from actual or threatened releases of hazardous substances to the environment.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedies for AOC 57 are:

- Area 1 - No Further Action
- Area 2 - Alternative II-3: Excavation (For Possible Future Use) and Institutional Controls
- Area 3 - Alternative III-2a: Excavation (to Accelerate Groundwater Cleanup) and Institutional Controls

Area 1

Area 1 is a storm-drain outfall and drainage ditch that receives precipitation runoff from paved areas around Building 3713. The discharge to the storm drainage ditch eventually flows to Cold Spring Brook. An estimated 50 to 100-gallon spill of No. 4 fuel oil was discharged through the Area 1 outfall in 1977. Approximately 3,000 gallons of mixed oil and water were recovered through use of containment dikes and absorbent booms in 1977, and approximately 25 cubic yards (cy) of petroleum contaminated soil were removed in 1997. Review of available data indicates that contamination associated with the fuel oil spill has been removed, and a risk assessment indicates that there are no unacceptable risks for unrestricted use.

The selected remedy at Area 1 is No Further Action.

Area 2

At Area 2 the selected remedy is Alternative II-3: Excavation (For Possible Future Use) and Institutional Controls. This remedy is a comprehensive approach that addresses all current and potential future risks caused by soil and groundwater contamination. Area 2 is located adjacent to a former vehicle storage yard associated with motor repair shops at the former Fort Devens. Although the 1977 fuel oil spill at Building 3713 primarily affected Area 1, Area 2 was investigated because a portion of the spill was reported to have flowed to Area 2 via an eroded drainage ditch. Data gathered during the remedial investigation (RI) as well as preceding investigations suggests that Area 2 contamination is the result of the historical disposal of vehicle maintenance wastes along the break in slope between an upland and flood plain area. Removal of approximately 1,300 cy of contaminated soil from Area 2 in 1994 addressed what was considered a principal threat at Area 2. There are no principal threat wastes remaining at AOC 57 Area 2.

Subsequent investigations and risk assessment indicate human-health risks within or below the USEPA target cancer-risk range and noncancer threshold under current land use conditions, but indicate potential risks to construction workers exceeding the USEPA target risk threshold from exposure to soil under possible future use conditions. Further, under hypothetical unrestricted (i.e., residential) use conditions the risk assessment indicates potential risks to residents exceeding the USEPA target cancer-risk range and noncancer threshold for exposure to flood plain soil and groundwater.

The key components of the selected remedy at AOC 57 Area 2 consist of the following:

- Soil Excavation and treatment/disposal at an off-site treatment, storage, or disposal facility
- Wetlands Protection
- Institutional Controls

  - Existing zoning that prohibits residential use of Area 2 property and proposed deed restrictions that prohibit potable use of Area 2 groundwater and residential use of flood plain property
- Environmental Monitoring
  - Long-term groundwater monitoring
  - Long-term surface water monitoring
- Institutional Control Inspections
- Five-year Site Reviews

This remedy relies on excavation of soil exceeding cleanup levels to protect future use construction workers, and institutional controls in the form existing zoning and proposed deed restrictions to prevent potable use of groundwater. If future land use at AOC 57 is inconsistent with these institutional controls, then the site exposure scenarios for human health and the environment would be re-evaluated to assess whether this response action remains appropriate. To the extent practical, remedial activities will be performed with minimal alteration or disturbance of wetlands, and disturbed areas will be restored. Long-term environmental monitoring will be implemented to assess the success of restoration activities, maintenance of surface water quality, and to monitor for attainment of groundwater cleanup levels.

Area 3

At Area 3 the selected remedy is Alternative III-2a: Excavation (to Accelerate Groundwater Cleanup) and Institutional Controls. This remedy is a comprehensive approach that addresses all current and potential future risks caused by soil and groundwater contamination. Area 3 is located adjacent to a former vehicle storage yard associated with motor repair shops at the former Fort Devens. Data gathered during the RI, as well as preceding investigations, suggest that Area 3 contamination is the result of the historical disposal of vehicle maintenance wastes. Removal of approximately 1,800 cy of contaminated soil from Area 3 in 1999 addressed what was considered a principal threat at Area 3. There are no principal threat wastes remaining at AOC 57 Area 3.

Subsequent investigations and risk assessments indicate human-health risks within or below the USEPA target cancer risk range and noncancer threshold under current land use conditions, but indicate potential risks to commercial/industrial workers exceeding the USEPA target risk range from exposure to groundwater under possible future use conditions. Further, under hypothetical unrestricted (i.e., residential) use conditions, the risk assessment indicates potential risks to residents exceeding the USEPA target cancer risk range and noncancer threshold for exposure to soil and groundwater.

The key components of the selected remedy at AOC 57 Area 3 consist of the following:

- Soil Excavation and treatment/disposal at an off-site treatment, storage, or disposal facility
- Wetlands Protection
- Institutional Controls
  - Existing zoning that prohibits residential use of Area 3 property and proposed deed restrictions that prohibit potable use of Area 3 groundwater and residential use of flood plain property
- Environmental Monitoring
  - Long-term groundwater monitoring

  - Long-term surface water monitoring
- Institutional Control Inspections
- Five-year Site Reviews

This remedy relies on excavation of soil to accelerate restoration of aerobic (i.e., nonreducing) conditions to groundwater and reduce the release of naturally occurring arsenic from soil. Also included are institutional controls in the form of existing zoning and proposed deed restrictions to prohibit potable use of groundwater in both upland or flood plain areas. If future land use at AOC 57 is inconsistent with these institutional controls, then the site exposure scenarios for human health and the environment would be re-evaluated to assess whether this response action remains appropriate. Long-term environmental monitoring will be implemented to assess the success of restoration activities, maintenance of surface water quality, and to monitor for attainment of groundwater cleanup levels.

STATUTORY DETERMINATIONS

Area 1

The selected remedy for Area 1 is protective of human health and the environment, attains federal and state environmental and facility siting requirements that are applicable to the remedial action, is cost effective, and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

Because the No Action remedy at Area 1 will not result in hazardous substances, pollutants, or contaminants remaining on site above concentrations that allow for unrestricted exposure, a five-year review will not be required for this portion of the site.

Area 2

The selected remedy for Area 2 is protective of human health and the environment, attains federal and state environmental and facility siting requirements that are applicable to the remedial action, is cost effective, and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. To the extent that the treatment, storage, or disposal facility that receives the soil excavated from Area 2 provides treatment, the selected remedy will satisfy the statutory preference for treatment as a principal element. Removal/excavation of soil from Area 2 will reduce contaminant mobility in that environment and eliminate risk to future construction worker receptors.

Because the remedy for Area 2 will result in hazardous substances, pollutants, or contaminants remaining on site above concentrations that allow for unrestricted exposure and unlimited use, a statutory review will be performed within five years of initiation of remedial action to ensure that the remedy remains protective of human health and the environment. Subsequent five-year reviews will be performed as long as hazardous substances, pollutants, or contaminants remain on-site above concentrations that allow for unrestricted exposure and unlimited use.

Area 3

The selected remedy for Area 3 is protective of human health and the environment, attains federal and state environmental and facility siting requirements that are applicable to the remedial action, is cost effective, and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. To the extent that the treatment, storage, or disposal facility that receives the soil excavated from Area 3 provides treatment, the selected remedy will satisfy the statutory preference for treatment as a principal element. Previous removal actions have reduced the mobility of site contaminants.

Because the remedy for Area 3 will result in hazardous substances, pollutants, or contaminants remaining on site above concentrations that allow for unrestricted exposure and unlimited use, a statutory review will be performed within five years of initiation of remedial action to ensure that the remedy remains protective of human health and the environment. Subsequent five-year reviews will be performed as long as hazardous substances, pollutants, or contaminants remain on-site above concentrations that allow for unrestricted exposure and unlimited use.

DATA CERTIFICATION CHECKLIST

The following information is contained in the Decision Summary section of this Record of Decision. Additional information can be found in the Administrative Record file.

- Chemicals of concern and their respective concentrations
- Baseline risk represented by the chemicals of concern
- Cleanup levels established for chemicals of concern and the basis for those levels
- How source materials constituting principal threats are addressed
- Current and reasonably anticipated future land use assumptions and the current and potential future beneficial uses of groundwater used in the baseline risk assessment
- Potential land and groundwater use that will be available at the site as a result of the selected remedy
- Estimated capital, annual operation and maintenance, and total present worth costs; discount rate; and the number of years over which the remedy cost estimates are projected
- Key factors that led to selection of the remedy

AUTHORIZING SIGNATURES

The foregoing represents the selection of a remedial action by the U.S. Department of the Army and the U. S. Environmental Protection Agency, with the concurrence of the Commonwealth of Massachusetts Department of Environmental Protection.

Concur and recommend for immediate implementation:

U.S. DEPARTMENT OF THE ARMY

Benjamin F. Goff — 24 Sept 01
Date

Benjamin F. Goff
BRAC Environmental Coordinator
Devens Reserve Forces Training Area
Devens, Massachusetts

U.S. ENVIRONMENTAL PROTECTION AGENCY

Patricia L. Meaney — 9/28/01
Date

Patricia L. Meaney
Director,
Office of Site Remediation and Restoration
Region 1

DECISION SUMMARY

1.0 SITE NAME, LOCATION, AND DESCRIPTION

This Record of Decision addresses past releases to soil and groundwater at Area of Contamination (AOC) 57 at Devens Reserve Forces Training Area (RFTA), Devens Massachusetts. The Devens RFTA, formerly Fort Devens, is located in the Towns of Ayer and Shirley (Middlesex County) and Harvard and Lancaster (Worcester County), approximately 35 miles northwest of Boston, Massachusetts. A Federal Facilities Agreement between the U.S. Department of the Army and the U.S. Environmental Protection Agency (USEPA) establishes the Army as the lead agency for developing, implementing, and monitoring response actions at Devens RFTA in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Fort Devens is identified by the CERCLIS ID number MA7210025154.

AOC 57 is located between Barnum Road and Cold Spring Brook on the northeast side of what was formerly the Main Post of Fort Devens, in the town of Harvard, Massachusetts (Figure 1). It is in an area of the former Fort Devens that was used primarily for the storage and maintenance of military vehicles. AOC 57 was first investigated as Study Area (SA) 57 - Building 3713 Fuel Oil Spill.

2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

This section provides a brief description of the historical land use at Devens RFTA, investigative and response history at AOC 57, and enforcement history.

2.1 LAND USE AND RESPONSE HISTORY

Fort Devens was established in 1917 as Camp Devens, a temporary training camp for soldiers from the New England area. In 1931, the camp became a permanent installation and was renamed Fort Devens. Throughout its history, Fort Devens served as a training and induction center for military personnel, and as a unit mobilization and demobilization site. All or portions of this function occurred during World Wars I and II, the Korean and Vietnam conflicts, and operations Desert Shield and Desert Storm. During World War II, more than 614,000 inductees were processed, and Fort Devens reached a peak population of 65,000.

The primary mission of Fort Devens was to command, train, and provide logistical support for nondivisional troop units and to support and execute Base Realignment and Closure (BRAC) activities. The installation also supported the Army Readiness Region and National Guard units in the New England area. Fort Devens was identified for cessation of operations and closure under Public Law 101-510, the Defense Base Realignment and Closure Act of 1990, and was officially closed in September 1996. Portions of the property formerly occupied by Fort Devens were retained by the Army for reserve forces training and renamed the Devens RFTA. Areas not retained as part of the Devens RFTA were, or are in the process of being, transferred to new owners for reuse and redevelopment.

AOC 57 is located on the south side of Barnum Road in an area of the former Fort Devens that was used primarily for the storage and maintenance of military vehicles. In addition, areas north of Barnum Road have historically been, and continue to be, used as rail yards and for freight handling and storage. AOC 57 consists of three subareas (Area 1, Area 2, and Area 3) located south to southeast of Building 3713 and former buildings 3756, 3757 and 3758 (Figure 2). These subareas historically received stormwater runoff and wastes from vehicle maintenance at former vehicle storage yards associated with Building 3713 and former buildings 3757 and 3758. Former Building 3756 was a mess hall that was converted to a general storehouse. The vehicle storage yards were abandoned in 1998, and the pavement and fencing were removed. The former storage yards are now soil and grass-covered areas.

AOC 57 Areas 2 and 3 are located within Lease Parcel A6a that the Army plans to transfer to the Massachusetts Government Land Bank. This Record of Decision defines each area as an upland area (elevations greater than 228 feet (ft.) mean sea level [msl]) that slopes downward to a 100-year flood plain (elevations less than 228 ft. msl). This characterization more accurately describes AOC 57 than the Feasibility Study and Proposed Plan that used the term "wetland" to describe all areas at AOC 57 with an elevation less than 228 ft. msl. In fact, based on a 1993 wetland delineation, wetland conditions at Area 2 extend only up to approximately 222 ft. msl. This change in definition has not affected the selection of remedial actions at Areas 1, 2, or 3.

The upland area at AOC 57 is forested with trees and scrub brush. At Area 2 the flood plain boundary is located approximately 300 ft. from Cold Spring Brook, and at Area 3 the flood plain boundary is located approximately 400 ft. from Cold Spring Brook. The flood plain area is densely vegetated with brush and contains small areas of standing water. Based on a 1993 wetlands delineation, proposed remedial activities at Area 2 may extend into the Cold Spring Brook bordering vegetated wetland. The 1993 wetlands delineation did not include Area 3, but proposed remedial activities at Area 3 may also extend into the Cold Spring Brook bordering vegetated wetland. A portion of Area 1 is located outside of Lease Parcel A6a and outside of the 100-year flood plain (i.e., at an elevation greater than 228 ft. msl).

Lease Parcel A6a is located within 500 ft. of the Devens public water supply line that serves Barnum Road. The parcel is also located approximately 2,500 ft. southwest of the Devens Grove Pond well field and 3,000 ft. southwest of the Town of Ayer water supply wells on the south shore of Grove Pond. It is outside the Zone II for both the Devens Grove Pond Wellfield and the Ayer Grove Pond wells (see Figure 2). Groundwater elevation data indicate that the groundwater flow direction at AOC 57 is to the southeast and away from Grove Pond and the water supply wells.

According to Exhibit A of the Devens Zoning By-laws, Zoning District Parcel Maps (Vanasse Hangen Brustlin, 1994a), and the Devens Re-use Plan (Vanasse Hangen Brustlin, 1994b), land on the southeast side of Barnum Road is included either in Zoning District Parcel 17, which is zoned for Rail, Industrial, and Trade Related use, or in the Open Space and Recreation Zoning District. The narrative description accompanying the Zoning District Parcel Maps indicates that the boundary between these zones is the flood plain line. As shown on Figures 2 and 3, the 100-year flood plain crosses Lease Parcel A6a and bisects AOC 57 Areas 2 and 3. Therefore, Rail, Industrial, and Trade Related zoning applies to upland regions at AOC 57, while Open Space and Recreation zoning applies to flood plain regions.

Area 1. Area 1 consists of a stormwater outfall area and drainage ditch (Storm Drainage System 6 of the Storm Sewer System Evaluation [AREE 70] Report [ADL, 1994]) that receives precipitation collected from

paved areas around Building 3713 (see Figure 3). The discharge to the storm drainage ditch eventually flows to Cold Spring Brook. The following items summarize the history of Area 1 at AOC 57.

1977. On February 13, 1977, Fort Devens personnel at Building 3713 noticed No. 4 fuel oil flowing from an overfilled 30,000 gallon underground storage tank (UST) into a nearby storm drain (Biang et al., 1992; DFAE, 1977). The storm drain discharged the spilled No. 4 fuel oil to a drainage ditch at the Area 1 outfall. The released oil flowed down the ditch to Cold Spring Brook. There was no evidence on February 13 and 14 of more than 50 to 100 gallons of fuel oil in the potentially affected water courses. Nevertheless, containment dikes and absorbent booms were set up across Cold Spring Brook adjacent to Area 2, and approximately 3,000 gallons of mixed oil and water were recovered (DFAE, 1977).

1992. Area 1 at AOC 57, then SA 57, was investigated as part of the Site Investigation (SI) of Groups 2 and 7 Historic Gas Stations (ABB-ES, 1995a). Surface soil, surface water, and sediment samples were collected, and analysis identified polycyclic aromatic hydrocarbons (PAHs) and total petroleum hydrocarbons (TPH) in surface soil. A Preliminary Risk Evaluation (PRE) indicated no unacceptable risk for presumed commercial/industrial site reuse. The Army recommended further investigation of Area 1 as part of the installation-wide AREE 70 storm sewer study.

1994. The AREE 70 evaluation included AOC 57 Area 1 (Storm Drain System 6) (ADL, 1994). Analyses of surface water and sediment samples indicated elevated levels of arsenic, chromium, and lead in sediment and arsenic and lead in surface water. Semivolatile organic compounds (SVOCs) were also detected at a maximum total SVOC concentration of 59.8 micrograms per gram (µg/g). Results of the sampling were incorporated into the Lower Cold Spring Brook SI ecological PRE.

1994. The Lower Cold Spring Brook SI included sampling results from the AREE 70 report in its assessment of potential risks (ABB-ES, 1995b). The Lower Cold Spring Brook SI produced no evidence that surface water contaminants posed risks to aquatic receptors. Furthermore, no ecological risks were identified from exposure to contaminated media in several storm drain systems, including Storm Drain System 6 (AOC 57 Area 1). No further study was recommended for Area 1.

1997. Although there were no unacceptable risks, the Army performed a soil removal action at the Area 1 outfall area in response to newly promulgated Massachusetts Contingency Plan (MCP) standards to address soil contamination resulting from releases of petroleum (Weston, 1998). An approximate 22- by 22.5- ft. area was excavated to maximum depth of 3 ft. In all, approximately 25 cubic yards (cy) of contaminated soil were removed. Although some PAH contaminants at the limit of the excavation exceeded the MCP S-1/GW-1 standards, statistical review of the data indicated that remaining contamination was consistent with that expected from asphalt paved and traffic areas along Barnum Road. It was further concluded based on data review that fuel oil contamination had been successfully removed. The removal action report recommended no further action at Area 1 with the intent that the decision be formalized in the AOC 57 Record of Decision (Weston, 1998).

2000. An assessment of risks was performed as part of the AOC 57 Remedial Investigation (RI) to demonstrate Area 1 does not pose unacceptable risk for future unrestricted land use. The assessment indicates that there are no unacceptable risks for future unrestricted land use (Refer to Appendix N-1 of the RI report [HLA, 2000a]), and the RI report recommended no further action at AOC 57 Area 1.

Area 2. Area 2 is located approximately 700 ft. northeast of Area 1, and adjacent to a former vehicle storage yard associated with the motor repair shops located in former Buildings 3757 and 3758 (see Figure 3). The nearby former Building 3756 served as a mess hall and was later converted to a general storehouse. Area 2 was originally thought to have been contaminated by the Area 1 No. 4 fuel oil spill; however, area grading was such that overland flow to Area 2 would not have been possible. When initially investigated, this Area 2 consisted of an eroded drainage ditch created by periodic rainfall runoff from vehicle storage yards associated with Buildings 3757 and 3758. The area has since been regraded (following a soil removal action) and a permanent drainage swale has been installed. Runoff drains into the swale and discharges east to Cold Spring Brook. Portions of Area 2 are within the Cold Spring Brook 100-year flood plain (see Figures 2 and 3). Data gathered during the RI as well as preceding investigations suggests that Area 2 contamination is the result of the historical disposal of vehicle maintenance related wastes. Contaminant distributions indicate that the disposal occurred along the break in slope above the flood plain. The following items summarize the history of Area 2 at AOC 57.

1992. The drainage ditch at Area 2 was investigated as part of the SI for Groups 2 and 7 Historic Gas Stations (ABB-ES, 1995a). Naphthalene and TPH were detected in surface soil. Fingerprint analysis of soil from Area 2 indicated that contaminants in the soil were most likely derived from lubricating oil, possibly vehicle crankcase oil, and not the 1977 release of No. 4 fuel oil. Results of human-health and ecological PREs indicated that the chemical hazards at Area 2 were not significant.

1994. The Army performed a soil removal action at Area 2 in 1994 in response to newly promulgated MCP standards (OHM, 1996). Based on available data and a cleanup level for TPH of 500 milligrams per kilogram (mg/kg), it was estimated that 350 tons of soil would need excavation. The removal action

concluded that there was not a significant risk to ecological receptors. The RI report recommended that the Army perform a FS to evaluate alternatives to address risks to human health.

2000. The Army prepared a FS report to evaluate candidate remedial alternatives for control of risk from exposure to remaining contaminants at AOC 57 (Harding ESE, 2000).

2000. During December 2000, the Army collected additional soil samples at Area 2 from four locations at the southern end of the former excavation to further characterize the distribution of extractable petroleum hydrocarbons (EPH) (Harding ESE, 2001). Sampling locations were selected to correspond to historical locations with the highest EPH concentrations. EPH were detected in the December 2000 samples at concentrations that would not pose unacceptable risk to human health.

Area 3. Area 3 is located approximately 600 ft. to the northeast of Area 2, south of former vehicle maintenance motor pools. Portions of Area 3 are within the Cold Spring Brook 100-year flood plain (see Figure 3). The site is characterized by a historic garage and vehicle waste disposal area. The following items summarize the history of Area 3 at AOC 57.

1995. Four test-pits were excavated east of Area 2 where historical photos indicated soil staining. Sample analysis showed the presence of TPH and chlorinated VOCs. The area was designated AOC 57 Area 3.

1996 through 1998. RI field investigations were performed to better characterize the nature and extent of contamination (HLA, 2000a). RI activities included collection of 40 soil samples from eight test pits; 87 soil samples from 20 TerraProbe points, six soil borings, and one monitoring well boring; collecting five

shows that the MCP S-2/GW-3 cleanup goals were met in sidewall samples except at the southern end of the excavation where exceedance of the volatile petroleum hydrocarbon (VPH), EPH, Aroclor-1260, and dieldrin goals occurred. Comparison to the risk-based cleanup goals showed exceedance (4.3 µg/g vs. 2µg/g) of the Aroclor-1260 goal. In total, 1,860 cy of material, comprising the majority of Area 3 soil contamination, were removed (HLA, 2000a).

2000. The Army prepared a FS report to evaluate candidate remedial alternatives for control of risk from exposure to remaining contaminants at AOC 57 (Harding ESE, 2000).

2000. In response to regulatory agency concerns, the Army installed two small–diameter groundwater screening points at Area 3 to further characterize the presence of chlorinated compounds in groundwater (HLA, 2000b; Harding ESE, 2000). Each point consisted of nominal ½-inch inside diameter pipe with a five-ft. vertically slotted screen. The points were advanced and sampled at 10-ft. intervals beginning at the water table. Point 57N-00-01X was advanced to 58 ft. below ground surface (bgs) downgradient of the source area, and point 57N-00-02X was advanced to 79 ft. bgs upgradient of the source area. Groundwater samples were analyzed at an on-site laboratory for tetrachloroethene (PCE), trichloroethene (TCE), dichloroethene (DCE), 1,2-dichlorobenzene (1,2-DCB), and 1,4-dichlorobenzene (1,4-DCB). Massachusetts Department of Environmental Protection (MADEP) representatives collected split samples for off-site analysis of VOCs by USEPA Method 8260B.

Six samples were collected for on-site screening from the downgradient location 57N-00-01X. On-site analysis did not detect target compounds in any of these samples.

Seven samples were collected for on-site screening from 57N-00-02X located approximately 25 ft. upgradient of the previously excavated Area 3 source area. The only detection of PCE, 1 microgram per Liter (µg/L), was from the sample collected from 34 to 39 ft. bgs. TCE was detected at 12.4 µg/L in the sample collected at 54 to 59 ft. bgs. No other target compounds were detected. Based upon the depth of these detections and their upgradient location, these contaminants are not attributed to the Area 3 source area.

2001. On April 3, 2001, USEPA and MADEP collected groundwater samples from six Area 3 monitoring wells (57M-95-03X, 57M-96-09X, 57M-96-10X, 57M-96-11X, 57M-96-12X, and 57M-96-13X) to assess groundwater quality. The samples were analyzed for Target Analyte List VOCs and the inorganics arsenic, barium, cadmium, and zinc. The analytical results showed one exceedance of drinking water standards: arsenic at 80 to 91 µg/L in the sample from 57M-96-11X.

2.2 ENFORCEMENT HISTORY

On December 21, 1989, Fort Devens was placed on the National Priorities List (NPL) under CERCLA as amended by the Superfund Amendments and Reauthorization Act (SARA) to evaluate and implement response actions to cleanup past releases of hazardous substances, pollutants, and contaminants. A Federal Facilities Agreement to establish a procedural framework for ensuring that appropriate response actions are implemented at Fort Devens was developed and signed by the Army and the USEPA Region I on May 13, 1991, and finalized on November 15, 1991. AOC 57 is considered a sub-site to the entire installation.

In 1995, the Army initiated a RI for AOC 57. The RI report was issued in June 2000. The purpose of the RI was to determine the nature and extent of contamination at the AOC, assess human-health and ecological risks, and provide a basis for conducting a FS.

An FS that evaluates remedial action alternatives for cleanup of groundwater was issued in November 2000. The FS identifies and screens remedial alternatives and provides a detailed analysis of seven of these remedial alternatives to allow decision-makers to select a remedy for cleanup of AOC 57.

The proposed plan detailing the Army's preferred remedial alternatives for Areas 2 and 3 at AOC 57 was issued in February 2001 for public comment. Technical comments presented during the public comment period are included in the Administrative Record. Appendix C of this Record of Decision, the Responsiveness Summary, contains a summary of these comments and the Army's responses, and describes how these comments affected the remedy selection.

3.0 COMMUNITY PARTICIPATION

The Army has held regular and frequent informational meetings, issued fact sheets and press releases, and held public meetings to keep the community and other interested parties informed of activities at AOC 57. Community interest in AOC 57 was low throughout this process until issuance of the Proposed Plan. At that time, several community members and local groups expressed strong concerns about the Army's preferred alternatives and time frames to achieve groundwater cleanup goals.

In February 1992, the Army released, following public review, a community relations plan that outlined a program to address community concerns and keep citizens informed about and involved in remedial activities at Fort Devens. As part of this plan, the Army established a Technical Review Committee (TRC) in early 1992. The TRC, as required by SARA Section 211 and Army Regulation 200-1, included representatives from USEPA, U.S. Army Environmental Center, Devens RFTA, MADEP, local officials, and the community. Until January 1994, when it was replaced by the Restoration Advisory Board (RAB), the committee generally met quarterly to review and provide technical comments on schedules, work plans, work products, and proposed activities for the SAs and AOCs at Devens RFTA. The AREE, SI, RI, and FS reports, Proposed Plan, and other related support documents were all submitted to the TRC or RAB for their review and comment.

The Army, as part of its commitment to involve the affected communities, forms a RAB when an installation closure involves transfer of property to the community. The Fort Devens RAB was formed in February 1994 to add members of the Citizen's Advisory Committee (CAC) to the TRC. The CAC had been established previously to address Massachusetts Environmental Policy Act/Environmental Assessment issues concerning the reuse of property at Devens RFTA. The RAB consists of 28 members (15 original TRC members plus 13 new members) who are representatives from the Army, USEPA Region I, MADEP, local governments and citizens of the local communities. It meets monthly and provides advice to the installation and regulatory agencies on the Devens RFTA cleanup programs. Specific responsibilities include: addressing cleanup issues such as land use and cleanup goals, reviewing plans and documents, identifying proposed requirements and priorities, and conducting regular meetings that are open to the public.

On February 23, 2001, the Army issued the Proposed Plan, to provide the public with a brief explanation of the Army's proposal for remedial action at AOC 57. The Proposed Plan also described the opportunities for public participation and provided details on the upcoming public comment period and public meeting.

On February 23, 2001, the Army published a public notice announcing the Proposed Plan, the date for a public informational meeting, and the start and end dates of a 31-day public comment period in the Leominster Fitchburg Sentinel & Enterprise, Worcester Telegram, Harvard Post, and papers of the Nashoba Publishing Company (Groton Landmark, Harvard Hillside, Pepperell Free Press, The Public Spirit, Shirley Oracle, and Townsend Times). The Public Notice was published in the Lowell Sun on February 26, 2001. The public notices were republished by the Leominster Fitchburg Sentinel & Enterprise, Lowell Sun, Worcester Telegram and Harvard Post on March 5, 2001, and by Nashoba Publishing Company on March 7, 2001. Notice announcing a 30-day extension of the public comment was published in the Lowell Sun on March 28, 2001, Leominster Fitchburg Sentinel & Enterprise on March 28, 2001, Worcester Telegram on March 28, 2001, Harvard Post on March 30, 2001, and in the Groton Landmark, Harvard Hillside, Pepperell Free Press, The Public Spirit, Shirley Oracle, and Townsend Times on March 30, 2001. The Army also made the Proposed Plan available to the public at the public information repositories at the Ayer Public Library, the Hazen Memorial Library in Shirley, the Harvard Public Library, and the Lancaster Public Library, or by request from the Devens BRAC Environmental Office.

From February 23 through April 25, 2001, the Army held a 61-day public comment period to accept public comments on the Proposed Plan. On March 8, 2001, the Army held an informal public information meeting at Devens RFTA to present the Army's Proposed Plan to the public and to provide the opportunity for open discussion concerning the Proposed Plan. The Army also accepted formal verbal or written comments from the public during a public hearing held as part of the meeting. A transcript of this hearing, formal public comments, and the Army's response to comments are included in the attached Responsiveness Summary (see Appendix C).

All supporting documentation for the decision regarding AOC 57 is contained in the Administrative Record for review. The Administrative Record is a collection of all the documents considered by the Army in choosing the plan of action for AOC 57. On February 23, 2001, the Army made the Administrative Record available for public review at the Devens BRAC Environmental Office and at the Ayer Town Hall, Ayer, Massachusetts. An index to the Administrative Record is available at the USEPA Records Center, 90 Canal Street, Boston, Massachusetts and is provided as Appendix D of this Record of Decision.

4.0 SCOPE AND ROLE OF THE RESPONSE ACTION

This Record of Decision documents the selection of remedial actions proposed for control of site risks at Areas 2 and 3 of AOC 57. In addition, it formalizes the recommendations for No Further Action at Area 1 proposed in the Removal Action Report for *Study Area 57, Area 1, Storm Drain System No. 6 Outfall* (Weston, 1998) and in the final RI report (HLA, 2000a). There is no identified risk to human health or the environment at Area 1, and no further remedial action is required under CERCLA. Further, because the

limited nature of remaining contamination at Area 1 is typical of contamination at stormwater outfalls in Massachusetts, it is exempt from MCP requirements.

Implementation of Alternative II-3 (Excavation [For Possible Future Use] and Institutional Controls) at Area 2 will protect possible future use construction workers from the threat of exposure to contaminated flood plain soil by removal of soil exceeding cleanup criteria. The presence of flood plain and wetland conditions and existing zoning currently prevent residential use of the area and potential residential exposure to contaminated soil and groundwater. In addition, Alternative II-3 will protect potential future area residents from the threat of direct contact exposure to flood plain soil and exposure to contaminated groundwater by establishing institutional controls that prohibit residential use of flood plain property and potable use of groundwater.

Implementation of Alternative III-2a at Area 3 will protect possible future commercial workers and unrestricted use residents from exposure to groundwater and protect future unrestricted use residents from exposure to contaminated flood-plain soil by establishing institutional controls that prohibit potable use of Area 3 groundwater and residential use of flood plain property. In addition, groundwater cleanup will be accelerated by excavation of soil containing contaminants that cause reducing conditions which result in release of naturally occurring arsenic from soil to groundwater. The presence of flood plain and wetland conditions and existing zoning currently prevent residential use of the area and potential residential exposure to contaminated soil. To protect future unrestricted use residents from exposure to contaminated flood-plain soil and groundwater in the event of future property transfer, the Army would include deed covenants to prohibit residential use of flood plain property and potable use of groundwater in flood plain.

Implementation of the selected remedial actions at Areas 2 and 3 will address all remaining identified threats at AOC 57.

5.0 SUMMARY OF SITE CHARACTERISTICS

The following subsections summarize the nature and distribution of contamination presented in the AOC 57 RI report (HLA, 2000). The discussion of soil contamination represents conditions following soil removal actions performed at Areas 2 and 3 in 1994 and 1999, respectively.

5.1 AOC 57 AREA 2 CONTAMINANT CHARACTERIZATION

Contaminated media at AOC 57 Area 2 include surface and subsurface soil, groundwater, sediment, and surface water. The nature and extent of contamination is described in detail in the final RI report and is summarized in the FS report and in the following subsections.

5.1.1 Area 2 Soil Characterization

Soil contamination at Area 2 can be divided into two types: 1) petroleum hydrocarbons found in surface and subsurface soil in both upland and flood plain area, and 2) VOCs, SVOCs, PCBs, and pesticides found along the southern portion of the 1994 soil removal excavation and within the floodplain.

The most significant contamination encountered during the 1995 RI efforts was in five test pits (57E-95-07X, -12X, -15X, -16X, and -17X) located within the flood plain around the southern portion of the soil removal excavation from at depths ranging from the ground surface to the water table at 4 to 5 ft. bgs. Detected VOCs include toluene, ethylbenzene, and xylenes (TEX), 1,2-DCE (cis- and trans- isomers), TCE, and PCE. The highest off-site laboratory concentrations of VOCs were observed in 57E-95-07X in the 4-ft.-bgs sample with 0.344 mg/kg of total TEX, 0.0039 mg/kg of 1,2-DCE, 0.011 mg/kg of TCE, and 0.0059 mg/kg of PCE. The primary SVOCs encountered were naphthalene and methylnaphthalene. The 4-ft.-bgs sample from 57E-95-07X contained the highest concentration of total SVOCs at 12 mg/kg. Elevated concentrations of pesticides and PCBs were also observed. Detected pesticides included dieldrin at a maximum observed concentration of 0.032 mg/kg in the surficial sample from 57E-95-17X, 2,2-bis(para-chlorophenyl)-1,1-dichloroethene (DDE) at 0.00928 mg/kg in the same sample, and Endosulfan I at 0.081 mg/kg in the 2-ft.-bgs sample from 57E-95-16X. Maximum observed concentrations of PCBs were 3.2 mg/kg of Aroclor-1248 and 12 mg/kg of Aroclor-1260, both from the 2-ft.-bgs sample from 57E-95-16X. High concentrations of TPH were coincident with the VOC detections. Notable off-site laboratory detections included 31,800 mg/kg in the 4-ft.-bgs sample from 57E-95-07X, 5,110 mg/kg in the surficial sample from 57E-95-12X, 26,100 mg/kg in the 2-ft.-bgs sample from 57E-95-15X, 30,000 mg/kg in the 2-ft.-bgs sample from 57E-95-16X, and 2,390 mg/kg in the surficial sample from 57E-95-17X.

Additional soil sampling in 1998 aided in defining the extent of the petroleum hydrocarbon contamination south of the removal action excavation. TPH and/or EPH results from 57S-98-04X, 57S-98-08X, 57S-98-09X, and 57S-9810X all showed lower concentrations than upgradient explorations. Elevated EPH concentrations were observed in the area southwest of the removal action and at 57S-98-06X.

A comparison of 1998 EPH and TPH results showed that EPH results were much lower than TPH results from the same sample. This suggests that the TPH data may be artificially high because of interference by organic material in the soils or potential biogenic sources.

Elevated concentrations of arsenic were detected in surficial samples coincident with the petroleum hydrocarbon contamination. The arsenic concentration was highest, at 61.2 mg/kg, in the zero-ft.-bgs sample from 57S-98-07X.

Data gathered during the RI as well as previous investigations suggest that the soil contamination resulted from the historical disposal of vehicle maintenance related wastes. Contaminant distributions indicate that the disposal occurred along the break in slope above the flood plain. Contaminants in surficial soils then percolated/leached into subsurface soils and groundwater where they were transported hydrogeologically downgradient and resorbed to subsurface soils. Contaminants to the south and southeast of the removal action excavation do not appear to be migrating toward the wetland. Contaminant distributions do show that petroleum hydrocarbons and chlorinated VOCs appear to have migrated toward the wetland southwest of the excavation.

5.1.2 Area 2 Groundwater Characterization

During the RI field investigation the Army collected two rounds of groundwater samples from 11 monitoring wells at Area 2 (G3M-92-02X, G3M-92-07X, 57M-95-01X, 57M-95-02X, 57M-95-04A, 57M-95-04B, 57M-95-05X, 57M-95-06X, 57M-95-07X, 57M-95-08A, and 57M-96-08B). Figure 4 shows the location of

these monitoring wells. Groundwater samples were analyzed for VOCs, SVOCs, total and filtered inorganics, pesticides/PCBs, TPH, total dissolved solids (TDS), and water quality parameters.

Several inorganic analytes were detected above the calculated Devens background concentrations in groundwater. Arsenic, barium, calcium, copper, lead, manganese, potassium, sodium, and zinc were detected above background concentrations in the unfiltered samples, and barium, lead, manganese, potassium, and sodium were detected above background concentrations in filtered samples. The greatest number of background exceedances were observed in the Round 1 unfiltered samples from 57M-95-01X, located over 500 ft. west of the 1994 soil excavation area, and 57M-95-04A, located just south of the excavation area. The highest arsenic concentration, 24.5 µg/L, was reported in the Round 1 sample from 57M-95-01X. The Round 2 samples from these wells showed only one background exceedance: sodium in 57M-95-01X. The Round 2 unfiltered samples also showed a dramatic decrease in total suspended solids (TSS) from Round 1.

Several VOCs were detected in Round 1 and Round 2 groundwater samples. The Round 1 sample from 57M-95-01X contained 1,1,1-TCA at 0.5 µg/L, toluene at 0.63 µg/L, TCE at 0.56 µg/L, and TPH at 356 µg/L, while the Round 2 sample contained only toluene at 1.2 µg/L. The Round 2 sample from the other upgradient wells, 57M-95-02X and G3M-92-07X, contained 1.6 µg/L and 0.89 µg/L, respectively, of toluene.

Groundwater samples from the vicinity of the soil removal excavation contained lower concentrations of toluene than the upgradient samples. However, Round 1 and Round 2 samples from monitoring wells 57M-95-04A, 57M-95-07X, and 57M-95-08B contained chlorinated solvents. The highest concentrations were detected in 57M-95-04A: 1,2-DCE (3.6 µg/L, total cis- and trans-) in the Round 1 sample, TCE (1.9 µg/L) in the Round 2 sample, and PCE (16 µg/L) in the Round 2 sample. PCE was detected in Rounds 1 and 2 at 57M-95-07X, located approximately 140 ft. west of the excavation, at 4.0 and 3.0 µg/L, respectively. The maximum concentration in 57M-95-08B was 1.8 µg/L.

Diethylphthalate and bis(2-ethylhexyl)phthalate were the only SVOCs detected in the Round 1 and 2 groundwater samples from Area 2. The presence of both these compounds was attributed to laboratory contamination.

Endosulfan I was the only pesticide detected in Area 2 groundwater. The Round 1 sample from 57M-95-06X contained 0.0271 µg/L. No PCBs were detected in Area 2 groundwater. The only Area 2 TPH detection, 356 µg/L, occurred in the Round 1 sample from the upgradient well 57M-95-01X.

One groundwater sample was collected in 1998 from the piezometer 57P-98-02X, located approximately 50 ft. downgradient of the excavation area, and submitted for off-site analysis for VOCs, SVOCs, select inorganics, pesticides/PCBs, and EPH/VPH.

The inorganics, arsenic, lead, and manganese were detected at levels in excess of established Devens background concentrations in the 1998 sample. Arsenic was detected at 54.5 µg/g and lead at 16 µg/L in the unfiltered samples. The filtered sample contained 73 µg/L of arsenic and 4.4 µg/L of manganese.

Three VOCs were detected in the sample, 1,2-DCE at 13 µg/L (total cis- and trans-); TCE at 0.71 µg/L; and toluene at 0.54 µg/L. The only detected SVOC was bis(2-ethylhexyl)phthalate at 6.4 µg/L.

No pesticides, PCBs, or EPH/VPH carbon ranges were detected in the 1998 sample.

5.1.3 Area 2 Sediment Characterization

Background concentrations for inorganics in sediment have not been established for the Devens area; therefore, inorganic concentrations in 1995 sediment samples 57D-95-03X through 57D-95-10X were compared to established background concentrations for Devens soils. Exceedances of background concentrations were noted for arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, sodium, vanadium, and zinc. The surficial sediment samples had far more exceedances of background concentrations than the deeper sediment samples. There was no apparent correlation between sample locations and the number of background exceedances. However, the greatest number of maximum observed concentrations occurred at the upstream sample 57D-95-03X. Maximum concentrations and their respective sample locations are as follows: arsenic, 180 µg/g at 57D-95-03X; barium, 159 µg/g at 57D-95-07X; beryllium, 2.8 µg/g at 57D-95-04X (2 ft. bgs); cadmium, 2.33 µg/g at 57D-95-05X; calcium, 18,400 µg/g at 57D-95-07X; chromium, 98.8 µg/g at 57D-5-05X (2 ft. bgs); cobalt, 29.9 µg/g at 57D-95-03X; copper, 201 µg/g at 57D -95-04X (1 ft. bgs); iron, 31,500 µg/g at 57D-95-03X; lead, 410 µg/g at 57D-95-04X (1 ft. bgs); manganese, 3,940 µg/g at 57D-95-07X; mercury, 0.36 µg/g at 57D-95-06X; nickel, 46.8 µg/g at 57D-95-03X; selenium, 3.24 µg/g at 57D-95-03X; sodium, 3,610 µg/g at 57D-95-04X (1 ft. bgs); vanadium, 46.4 µg/g at 57D-95-03X; and zinc, 468 µg/g at 57D-95-09X.

Additional samples collected in 1998 contained three compounds that exceeded background concentrations. The sediment sample CSD-98-01X, located on the edge of the marsh on the upstream side of the containment dike, contained 14.3 µg/g of copper and 220 µg/g of arsenic. This was the highest concentration of arsenic detected in Cold Spring Brook sediments. The other background exceedance occurred in 57D-98-02X, located on the edge of the marsh on the downstream side of the containment dike. This sample contained lead at 88.9 µg/g. There were no background exceedances in the most downgradient sample, 57D-98-03X.

The 1995 and 1998 sediment data are consistent with the results of the Lower Cold Spring Brook SI (ABB-ES, 1995), which concludes that inorganic concentrations tend to be highest in the upstream sample CSD-98-13X and Area 2 marsh samples CSD-98-14X, CSD-94-20X, and CSD-94-35X. The downstream samples CSD-94-17X, SSD-93-92G, and CSD-94-19X generally contained lower inorganic concentrations than the upstream samples. The lowest concentrations were in CSD-94-19X, the most downstream of the Lower Cold Spring Brook SI samples collected for AOC 57.

The inorganic results show that elevated concentrations of arsenic are present at the edge of the Area 2 marsh on the upstream side of the containment dike. However, arsenic concentrations in sediment collected from the marsh between Area 2 and the stream channel (e.g., CSD-94-14X, CSD-94-20X, CSD-94-35X, 57D-95-04X, and 57D-95-05X) showed much lower arsenic concentrations, all below the MCP S-1/GW-1 standard. This indicates that arsenic contamination in sediment within the stream channel is the result of upstream sources or conditions, as evidenced in the upgradient samples G3D-92-01X and 57D-95-03X. Results of the Lower Cold Spring Brook SI and RI sampling showed arsenic concentrations in sediment decrease in the downstream direction. Historical photographs show that between 1920 and 1960 there were apple orchards adjacent to the south side of Cold Spring Brook southwest (upstream) of Area 2. The orchards and railroad tracks, which cross Barnum Road, are potential sources of the observed upstream arsenic contamination.

The common laboratory contaminants acetone, dichloromethane (methylene chloride), toluene, and trichlorofluoromethane (Freon) were detected in several of the 1995 sediment samples. Toluene was detected in six of the sediment samples and is consistent with soil and groundwater contamination at AOC 57 Area 2. One of the toluene detections occurred at an upstream sampling location, 0.0028 µg/g in the 2-ft.-bgs sample from 57D-95-03X. The maximum concentration of 0.02 µg/g was observed in sediments in the 1-ft.-bgs sample from 57D-95-04X, located in the marsh area upstream of the containment dike. PCE and chlorobenzene were detected in only one of the 1995 RI sediment samples. The 2-ft.-bgs sample from the upstream location 57D-95-03X contained 0.0046 µg/g of PCE and 0.0016 µg/g of chlorobenzene.

The 1998 sediment samples from Area 2 contained two VOCs, PCE and TCE. 57D-98-01X, located on the upstream side of the containment dike contained, 0.078 µg/g of PCE. 57D-98-02X, located on the downstream side of the containment dike contained, 0.01 µg/g of PCE and 0.027 µg/g of TCE. There were no VOC detections in 57D-98-03X. The 1995 and 1998 data show that AOC 57 Area 2 is contributing small amounts of chlorinated VOCs (PCE and TCE) to near-shore sediments. PCE and TCE were not detected in stream channel sediments. The data also suggest that Area 2 may be a source of toluene contamination in sediments, although toluene was detected in upstream sediments.

The SVOCs benzo(k)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene were detected in 1995 RI sediment samples. Chrysene was detected in only one of the samples, the 2-ft.-bgs sample from the downstream location 57D-95-07X at 0.46 µg/g, while the rest of the compounds were found in both upstream and downstream samples. The highest concentrations of total SVOCs were observed in the duplicate surficial sample from the upstream location 57D-95-03X and the surficial sample from 57D-95-07X, located downstream from the containment dike. Respective SVOC concentrations were 19 µg/g at 57D-95-03X and 18 µg/g in 57D-95-07X.

Benzo(k)flouranthene, chrysene, flouranthene, phenanthrene, and pyrene were detected in the 1998 sediment samples. The highest total concentration of SVOCs as well as the highest individual concentrations were found in 57D-98-02X, which contained a total of 6.65 µg/g of SVOCs. 57D-98-01X had 3.05 µg/g of SVOCs and 57D-98-03X contained 2.20 µg/g. These data suggest that Area 2 is contributing small amounts of SVOCs to the wetland. However, the 1995 RI sampling and the Lower Cold Spring Brook SI showed that much higher concentrations were detected in the upstream samples 57D-95-03X and CSD-94-13X, indicating an upstream source.

Ten of the 1995 RI sediment samples contained pesticides. The surficial sediment samples contained higher concentrations than the deeper sediment samples. The highest concentrations of total pesticides as well as the maximum observed concentrations of individual analytes were observed in the upstream samples. The upstream surficial samples from locations 57D-95-08X and 57D-95-03X both contained 2,2-bis(para-chlorophenyl)-1,1-dichloroethane (DDD), DDE, and 2,2-bis(para-chlorophenyl)-1,1,1-trichloroethane (DDT) at total concentrations of 0.79 µg/g and 1.165 µg/g, respectively. The deeper sample (2 ft. bgs) at 57D-95-03X contained DDD and DDE at a total concentration of 0.0719 µg/g. Surficial samples from the area immediately upstream of the containment dike had concentrations of total pesticides of 0.7081 (57D-95-05X) and 0.678 µg/g (57D-95-06X). The only detection of the pesticide dieldrin, at 0.0183 µg/g, was found in the surficial sample from 57D-95-05X. Sample locations downstream of the containment dike contained the lowest concentrations of total pesticides.

Pesticides were detected in two of the three 1998 sediment samples. 57D-98-02X contained 0.091 µg/g of DDD and 57D-98-03X contained 0.0418 µg/g of DDD and 0.046 µg/g of dieldrin. No pesticides were detected on the upstream side of the containment dike at 57D-98-01X. As with many of the previous analytes, the highest concentrations were found at the upstream locations and not adjacent to AOC 57 Area 2.

PCBs were found in only one 1995 RI sediment sample. The surficial sediment sample from 57D-95-05X contained 0.301 µg/g of Aroclor-1260.

None of the 1998 sediment samples contained PCBs.

TPH concentrations in 1995 RI sediment samples from Cold Spring Brook ranged between 106 µg/g in the deep sediment sample from 57D-95-07X and 3170 µg/g in the surficial sample from 57D-95-05X. The highest observed TPH concentrations were observed in the surficial samples located immediately upstream of the containment dike adjacent to AOC 57 Area 2. Petroleum fingerprinting of the sediment samples indicated that the upstream and downstream samples were comprised of both the diesel and gasoline patterns while the samples collected adjacent to Area 2 were predominately of the diesel pattern.

TPH concentrations in the samples collected in 1998 ranged between 103 µg/g in 57D-98-01X and 452 µg/g in 57D-98-02X. EPH/VPH carbon ranges for these samples were all below detection levels.

5.1.4 Area 2 Surface Water Characterization

During the 1995 RI field activities, nine surface water samples, including a duplicate sample, were collected at the eight sediment sample locations (57D-95-03X through 57D-95-10X) in Cold Spring Brook and its associated wetlands in the vicinity of AOC 57 Area 2. Filtered surface water samples were also collected at the toxicity testing locations 57D-95-04X, 57D-95-05X, 57D-95-06X, 57D-95-08X, and 57D-95-10X. Surface water samples were analyzed for select VOCs, SVOCs, inorganics, pesticides, PCBs, TPH, and water quality parameters.

Background concentrations for inorganics in surface water have not been established for the Devens area; therefore, inorganic concentrations in the 1995 surface water samples 57D-95-03X through 57D-95-10X were compared against established background concentrations for Devens groundwater. Calcium, iron, manganese, sodium, and zinc were shown to be in excess of background concentrations in the filtered surface water samples. The unfiltered surface water samples also showed exceedances of these compounds as well as aluminum, arsenic, barium, cadmium, chromium, copper, lead, magnesium, mercury, potassium, and vanadium. The bulk of the exceedances occurred in the unfiltered sample from 57D-95-04X. The filtered sample showed exceedances of only calcium and sodium. The large number of background exceedances are attributed to an elevated total suspended solids (TSS) concentration of 504,000 µg/g in the unfiltered sample. The greatest number of background exceedances in a filtered sample was observed at 57D-95-05X, located adjacent to Area 2. This sample contained calcium, iron, manganese, sodium and zinc all in excess of background concentrations.

Three additional surface water samples, 57W-98-01X through 57W-98-03X, were collected in 1998 to further characterize the impact of Area 2 on Cold Spring Brook and the associated wetlands. The samples were collected from the same locations as the 1998 sediment samples. The samples were submitted for off-site analysis for VOCs, SVOCs, select inorganics, select dissolved inorganics, pesticides, PCBs, EPH and

volatile petroleum hydrocarbons (VPH). Water quality parameters were also measured at the time of sample collection.

All three of the unfiltered samples contained arsenic, barium, copper, lead, and zinc in excess of background concentrations. The highest concentrations of all inorganic analytes were observed in 57W-98-02X. None of the filtered samples contained inorganic analytes in excess of background.

In contrast to the sediments, toluene was found in only one of the 1995 Area 2 surface water samples: the upstream sample 57D-95-08X at 0.58 µg/L. The common laboratory contaminant dichloromethane (methylene chloride) was found in five of the surface water samples. The only other VOCs detections in the 1995 RI surface water samples occurred at 57D-95-05X. This sample was shown to contain 1.8 µg/L of PCE, 3.5 µg/L of TCE, and 26 µg/L of DCE (cis- and trans- isomers). This sample location is located in the groundwater discharge area southwest of the Area 2 soil removal excavation.

Similar results were found during the 1998 surface water sampling. 57W-98-01X, collected from a flowing seep on the upstream side of the containment dike, contained 2.6 µg/L of PCE and 0.6 µg/L of TCE. These data along with 57D-95-05X indicate that Area 2 is contributing chlorinated organic compounds to surface water. Two VOCs, chloroform at 0.72 µg/L and carbon disulfide at 1.1 µg/L, were detected in 57W-98-02X. Toluene, at 1.1 µg/L, was the only VOC detected in 57W-98-03X.

SVOCs were detected in one of the 1995 RI surface water samples. 57D-95-04X, located upstream of AOC 57 Area 2 contained 0.52 µg/L of phenanthrene and 24 µg/L of bis(2ethylhexyl) phthalate. This was also the sample exhibiting the highest TSS.

No SVOCs were detected in the 1998 Area 2 surface water samples.

No pesticides or PCBs were detected in either the 1995 or 1998 surface water samples.

TPH were found in two of the 1995 RI surface water samples. 57D-95-04X contained 924 µg/L and 57D-95-05X contained 247 µg/L. The detection at 57D-95-04X may be partially attributed to the elevated TSS concentrations observed in the sample.

No VPH carbon fractions were detected in the 1998 Area 2 surface water samples.

The C19-C36 aliphatic and C11-C22 aromatic EPH ranges were detected in all of the 1998 surface water samples. The highest concentrations were found in 57W-98-02X which contained 1,700 µg/L of the C19-C36 aliphatic range and 1,400 µg/L of the C11-C22 aromatic range.

5.2 AOC 57 AREA 3 CONTAMINANT CHARACTERIZATION

Contaminated media at AOC 57 Area 3 include surface and subsurface soil, groundwater, sediment, and surface water. The nature and extent of contamination is described in detail in the final RI report and is summarized in the FS report and in the following subsections.

5.2.1 Area 3 Soil Characterization

Soil samples from test pits, TerraProbes™, and soil borings at Area 3 in 1995 and 1996 identified an elongated area encompassing test pit 57E-95-24X on the north, and the soil borings 57B-96-07X and 57B-96-12X on the south, characterized by high TPH and SVOC concentrations. A zero to 5-ft.-bgs zone defined by test pits 57E-95-24X and 57E-96-28X through 57E-96-31X was interpreted as an historic disposal site. Advective transport and sorption appear to have aided in the southerly migration of soil contamination.

The most significant observed soil contaminants included the SVOCs naphthalene, 1,2-DCB, and 1,4-DCB. Within soil borings, the 5-ft.-bgs sample from 57B-96-07X contained 31.3 mg/kg of total SVOCs including 8 mg/kg of 1,2-DCB, 2 mg/kg of 1,4-DCB, 9 mg/kg of 2-methylnaphthalene, and 9 mg/kg of naphthalene. Within the test pits, the bulk of the detections occurred in the 10-ft.-bgs sample from 57E-96-28X. Detected SVOC analytes consist of 1,2,4-trichlorobenzene at 0.5 mg/kg, 1,2-DCB at 6 mg/kg, 1,4-DCB at 4 mg/kg, 2-methylnaphthalene at 0.4 mg/kg, fluoranthene at 1 mg/kg, fluorene at 0.3 mg/kg, chrysene at 1 mg/kg, naphthalene at 2 mg/kg, phenanthrene at 0.4 mg/kg, and pyrene at 3 mg/kg.

Elevated concentrations of PCBs in soil were encountered in proximity to the source area. The highest observed concentrations of PCBs, 3.6 mg/kg of Aroclor-1248 and 10 mg/kg of Aroclor-1260, were found in 57E-95-24X at 4 ft. bgs.

Elevated concentrations of TPH were observed coincident with the SVOC contamination. TPH was detected in all of the Area 3 test pit soil samples at concentrations ranging between 64,900 mg/kg at 57E-95-24X and 262 mg/kg at 57E-96-29X. Petroleum fingerprinting performed on samples collected in 1996 showed that all samples were below detection limits for the gasoline, diesel, and aviation gas patterns. Five soil boring samples were shown to contain measurable concentrations of TPH. Three of these samples contained TPH concentrations in excess of 100 mg/kg; the surficial sample from 57B-96-07X contained 41,400 mg/kg, the 5-ft.-bgs sample from the same boring contained 31,600 mg/kg, and the 5-ft.-bgs sample from 57B-96-11X contained 4,250 mg/kg. Petroleum fingerprinting of the soil samples indicated that the TPH contamination was consistent with a motor oil pattern.

In May of 1998, two soil samples, one at the ground surface and one at the water table, were collected from each of six downgradient locations at Area 3 (57S-98-11X through 57S-98-16X) to better define downgradient soil contamination. Sample depths ranged between 0 and 3 ft. bgs. All 12 samples were screened at the on-site laboratory for TPHC.

TPH concentrations ranged between 2,900 µg/g at 0 ft. at 57S-98-14X to less than 260 µg/g at 2 ft. bgs at 57S-98-16X. The highest concentrations of TPH were found adjacent to monitoring well 57M-96-11X where 57S-98-14X at 0 ft. contained 2,900 µg/g. When compared to previous sample data, the 1998 data showed lower concentrations of petroleum hydrocarbons, VOCs, SVOCs, and arsenic.

The area identified by the above samples was the subject of the 1999 removal action that targeted soils with TPH and PCB concentrations exceeding MCP S-2/GW-3 soil standards. The majority of contamination described above was removed during the removal action, the exception being contamination at the south end of the excavation as defined by the 1998 samples.

5.2.2 Area 3 Groundwater Characterization

Area 3 groundwater contamination occurs primarily from the source area located immediately north of 57M-95-03X to the most downgradient monitoring well, 57M-96-11X, as depicted on Figure 5. Contaminants observed in this area include inorganics, VOCs, and SVOCs.

During 1995 sampling event, arsenic was detected at 74 µg/L, exceeding the federal drinking water Maximum Contaminant Level (MCL) of 50 µg/L, in 57M-95-03X, but decreased to 33.2 µg/L in the 1996 sample. Cadmium was detected at 8.67 µg/L in the 1996 sample, exceeding the MCL of 5 µg/L. Arsenic was detected at 170 µg/L in 1996 in the primary and duplicate samples from 57M-96-11X.

Additional groundwater sampling was performed at Area 3 in May of 1998. Filtered and unfiltered samples were collected from monitoring well 57M-96-11X as well as the piezometers 57P-98-03X and 57P-98-04X, located slightly downgradient. The inorganic analytes arsenic, barium, copper, lead, and manganese were detected in the unfiltered samples from 57M-96-11X at concentrations in excess of established Devens background concentrations. The highest concentration of arsenic detected in an unfiltered sample was 84.4 µg/L in the duplicate sample collected from 57M-96-11X. The filtered samples collected from 57M-96-11X contained higher concentrations of arsenic: 138 µg/L in the duplicate sample. The primary sample from 57M-96-11X contained comparable arsenic concentrations: 84.4 µg/L in the unfiltered sample and 133 µg/L in the filtered sample. TSS in the unfiltered sample were 2,120,000 µg/L. The reason for the increase in arsenic concentrations from the unfiltered to the filtered samples is not known. All other inorganic analyte concentrations decreased from the unfiltered to the filtered samples. Arsenic concentrations in the piezometers were significantly lower: 13.4 µg/L and 20.9 µg/L in the unfiltered and filtered samples collected from 57P-98-03X and 7.7 µg/L and 12.7 µg/L in the unfiltered and filtered samples collected from 57P-98-04X.

During 1996 sampling, VOCs were detected in 57M-95-03X, 57M-96-11X, 57M-96-12X, and 57M-96-13X. Toluene was found in all of these samples with a maximum concentration of 19 µg/L in 57M-95-03X. Toluene, at 1.1 µg/L, was the only VOC detected in 57M-96-12X. 57M-96-13X contained toluene at 2.9 µg/L, ethylbenzene at 2.8 µg/L, and the only detection of styrene, 8 µg/L. Chlorinated solvents comprised the majority of the detections in 57M-95-03X and 57M-96-11X. 57M-95-03X contained 4.5 µg/L of carbon tetrachloride, 10 µg/L of chloroform, 2.9 µg/L of dichloromethane, 0.59 µg/L of TCE, 2.6 µg/L of PCE, as well as 46 µg/L of ethylbenzene and 200 µg/L of xylenes. 57M-96-11X contained 0.89 µg/L of 1,2-DCE (total cis- and trans-), 1.1 µg/L of TCE, and 4.8 µg/L of PCE. This sample also contained 0.86 µg/L of toluene, 4.6 µg/L of ethylbenzene, and 6.8 µg/L of xylenes. The majority of VOC detections occurred in 57M-96-11X during the 1998 sampling event. PCE was detected at 5.5 µg/L, TCE at 3.8 µg/L, ethylbenzene at 20 µg/L, and xylenes at 5.8 µg/L. Two VOCs were detected in 57P-98-03X, ethylbenzene at 3.2 µg/L, and xylenes at 5.7 µg/L. Chlorobenzene at 0.88 µg/L was the only VOC detected in 57P-98-04X.

SVOCs detected during 1996 sampling consisted of 1,2-DCB, 1,4-DCB, and naphthalene. The majority of SVOC detections occurred at 57M-95-03X and 57M-96-11X. 57M-95-03X, located immediately downgradient of the identified source area contained 9.8 µg/L of 1,2-DCB, 5.6 µg/L of 1,4-DCB, 4.4 µg/L of 2-methylnaphthalene, 1.5 µg/L of 4-methylphenol, and 20 µg/L of naphthalene. The duplicate sample from 57M-96-11X, the most downgradient well contained 3.4 µg/L of 1,2-DCB, 3.3 µg/L of naphthalene, and 6.7 µg/L of bis(2-ethylhexyl)phthalate. Other SVOC detections include 5 µg/L of

methylphenol in 57M-96-13X and 12 µg/L of bis(2-ethylhexyl)phthalate in the sample from the upgradient well G3M-92-07X. Five SVOCs were detected in the 1998 Area 3 groundwater samples. The most detections occurred in 57P-98-03X which contained bis(2-ethylhexyl)phthalate at 52 µg/L, 1,2-DCB at 4.9 µg/L, 2-methylnaphthalene at 2 µg/L, and naphthalene at 13 µg/L. 57M-96-11X contained detectable concentrations of three SVOC compounds: 1,2-DCB at 6.4 µg/L, 1,4-DCB at 2.7 µg/L, and naphthalene at 6.2 µg/L.

No pesticides, PCBs, TPH, or EPH fractions were detected in Area 3 groundwater.

All three VPH carbon ranges were detected in the sample collected from 57M-96-11X during 1998 sampling. The C5-C8 aliphatic range was detected at 91 µg/L, the C9-C12 aliphatic range at 75 µg/L, and the C9-C10 aromatic range at 250 µg/L (duplicate sample). The highest concentration of aromatics, 310 µg/L, was detected in 57P-98-03X. This was the only VPH fraction detected in this sample

On April 3, 2001, USEPA and MADEP collected groundwater samples from 6 Area 3 monitoring wells (57M-95-03X, 57M-96-09X, 57M-96-10X, 57M-96-11X, 57M-96-12X, and 57M-96-13X) to assess groundwater quality. The samples were analyzed for Target Analyte List VOCs and the inorganics arsenic, barium, cadmium, and zinc. The analytical results showed one exceedance of drinking water standards: arsenic at 104 µg/L in the sample from 57M-96-11X.

5.2.3 Area 3 Sediment Characterization

Five sediment samples were collected in 1998 from the flood plain immediately south of AOC 57 Area 3, and approximately 350 ft. northwest of the Cold Spring Brook channel. Inorganics analysis of these samples showed that arsenic, barium, lead, manganese, and zinc were present at concentrations in excess of established Devens soil background concentrations. The greatest number of exceedances were found in 57D-98-05X, which contained arsenic at 37.1 µg/g, lead at 64.6 µg/g, and zinc at 90.8 µg/g. Barium at 59.8 µg/g, and copper at 459 µg/g, were above background concentrations in 57D-98-04X. Arsenic at 37 µg/g, was the only background exceedance in 57D-98-06X.

Several sediment samples were collected from the portion of Cold Spring Brook located hydrogeologically downgradient from Area 3 as part of the Lower Cold Spring Brook SI. These samples include CSD-94-16X and CSD-94-18X. CSD-94-26X represents conditions downstream of this area, and G3D-92-02X, CSD-94-19X, and the 1995 RI samples 57D-95-07X and 57D-95-10X, represent conditions upstream. A review of inorganic data from these locations indicates that Area 3 is not impacting sediment quality in Cold Spring Brook, located approximately 350 ft. to the southeast. The Lower Cold Spring Brook SI stated that inorganics concentrations were generally higher in upstream samples than in the downstream samples. Arsenic concentrations in this area follow a general trend of decreasing from the upstream locations (e.g., G3D-92-02X, CSD-94-19X, 57D-95-07X, and 57D-95-10X) to the downstream locations (CSD-94-26X and CSD-94-27X). One of the further downstream samples, G3D-92-03X, did exhibit an elevated arsenic concentration of 95.2 µg/g. This result is not corroborated by any sample results either immediately upstream or downstream.

The VOCs acetone, benzene, chlorobenzene, toluene, and xylene were detected in Area 3 sediment samples. Acetone was found in every sample at concentrations ranging between 0.21 and 0.057 µg/g. 57D-98-08X had the most detections: 0.037 µg/g of benzene, 0.0031 µg/g of chlorobenzene, 0.0048 µg/g of toluene, and 0.011

µg/g of xylenes. 57D-98-06X was found to contain 0.007 µg/g of benzene, 0.013 µg/g of chlorobenzene, and 0.0047 of toluene. 57D-98-05X contained low concentrations of chlorobenzene and toluene, 0.019 µg/g and 0.0018 µg/g respectively. There is no evidence that Area 3 VOCs are adversely impacting wetlands or Cold Spring Brook sediments.

The SVOCs 1,2-DCB, 1,4-DCB, benzo(b)flouranthene, benzo(k)flouranthene, chrysene, flouranthene, naphthalene, phenanthrene, and pyrene were detected in Area 3 sediment samples. The highest concentration of total SVOCs was found in 57D-98-05X, at 3.27 µg/g. The SVOCs detected in sediment are consistent with those detected in source area and downgradient soils and groundwater. The SVOC concentrations decrease farther into the wetland; 57D-98-07X contained 1.86 µg/g, and 57D-98-08X contained 0.415 µg/g.

The Lower Cold Spring Brook SI samples collected from the portion of the brook downgradient of Area 3 (Bowers Brook area) showed that SVOCs decreased from the upstream samples to the downstream samples. Pyrene at 1 µg/g was the only SVOC detected at CSD-94-18X, and no SVOCs were detected in the downstream sample CSD-94-26X.

One pesticide was detected in Area 3 sediments. DDD was detected in 57D-98-05X at 0.048 µg/g and in 57D-98-06X at 0.15 µg/g. Pesticides were not detected in any other 1998 Area 3 sediment samples.

Of the samples included in the Lower Cold Spring Brook SI, only CSD-94-18X was analyzed for pesticides. DDD was found in this sample at 0.0498 µg/g. This pesticide was also found in upstream samples near Area 2.

PCBs were detected in one of the Area 3 sediment samples. 57D-98-05X contained 0.84 µg/g of Aroclor 1260. PCBs were not detected in Lower Cold Spring Brook SI samples.

TPH concentrations ranged between 3,540 µg/g at 57D-98-05X and 109 µg/g at 57D-98-08X. Besides 57D-98-05X, all other samples contained less than 250 µg/g of TPH. VPH analysis of these samples showed that 57D-98-06X contained small concentrations of all carbon fractions; 3.3 µg/g of C5-C8 aliphatics, 5.6 µg/g of C9-C12 aliphatics, and 4.3 µg/g of C9-C10 aromatics. The only other VPH detection occurred in 57D-98-05X, which contained 4.2 µg/g of C9-C12 aliphatics. EPH fractions were detected in only one sample, 57D-98-05X. 57D-98-05X contained 630 µg/g of the C19-C36 aliphatics and 280 µg/g of the C11-C22 aromatics. The TPH and EPH detections at 57D-98-05X correspond with the observed distribution of soil contamination at Area 3.

5.2.4 Area 3 Surface Water Characterization

Five surface water samples were collected in 1998 from the wetland/flood-plain immediately south of Area 3. Samples were submitted for off-site analysis for EPH/VPH, VOCs, SVOCs, select inorganics, select dissolved inorganics, pesticides, and PCBs.

Arsenic, antimony, barium, copper, lead, and zinc were all found in excess of established Devens background groundwater concentrations. 57W-98-05X contained exceedances of all of the above analytes and 57W-98-07X had the fewest exceedances with only barium and lead in excess of background. The filtered samples from 57W-98-04X (24 µg/L), 57W-98-05X (53.4 µg/L), and 57W-98-08X (12.5 µg/L)

contained arsenic in excess of background concentrations. These were the only background exceedances in the filtered samples.

Two of the Area 3 surface water samples contained detectable concentrations of VOCs. 57W-98-05X contained 4.6 µg/L of chlorobenzene, 0.58 µg/L of carbon disulfide, and 1.6 µg/L of toluene. Toluene at 0.59 µg/L was the only VOC detected in 57W-98-08X.

Benzo[k]flouranthene at 0.94 µg/L in 57W-98-08X was the only SVOC detected in Area 3 surface water samples.

No pesticides or PCBs were detected in Area 3 surface water samples.

The C9-C10 aromatic range was the only VPH fraction detected at Area 3. The surface water sample 57W-98-05X contained 25 µg/L of the aromatic range.

The EPH C11-C22 aromatic ranges were detected in every surface water sample. The highest concentration was 650 µg/L in 57W-98-08X. The 57W-98-08X and 57W-98-04X samples also contained the C19-C36 aliphatic fraction at 1,100 µg/L and 1,000 µg/L, respectively.

5.3 CONCEPTUAL SITE MODEL

Figure 6 presents a simplified conceptual site model encompassing the essential features of AOC 57 Areas 2 and 3. The conceptual site model is a three-dimensional "picture" of site conditions that illustrates contaminant sources, release mechanisms, exposure pathways, migration routes, and potential human and ecological receptors. It documents current and potential future site conditions and shows what is known about human and environmental exposure through contaminant release and migration to potential receptors. The risk assessment and response action for Areas 2 and 3 is based on this conceptual site model

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Based on the results of the RI, the primary site-related contaminants at AOC 57 are solvent and fuel-related contaminants in soil and groundwater. The interpreted Area 2 contaminant source was contaminated surface and near surface soils located in the vicinity of the soil removal excavation. The soil contamination is believed to be due to disposal of vehicle maintenance wastes. The Area 3 contaminant source is the historic disposal site identified by test pitting at 57E-95-24X.

The primary release mechanism at both areas was infiltration into groundwater from source area contaminants above the water table. The potential secondary release mechanism is the contaminated soil downgradient of the source areas. The contaminated soil downgradient of the source areas is believed to be the result of sorption of dissolved phase contaminants.

The primary migration pathway/transport mechanism is groundwater flow of dissolved contaminants.

6.0 CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

Land at AOC 57 is currently idle. There are no active military operations or land-redevelopment activities near AOC 57. The vehicle storage yards associated with Buildings 3756, 3757, and 3758 were abandoned in 1998, and the pavement and fencing were removed. The majority of the AOC is forested and densely vegetated, and access is difficult. There is no specific reason to visit the AOC, and there are no nuisance or curiosity attractions. The wetland area is muddy; and standing surface water is not deep or aesthetically pleasing. Therefore, it is unlikely that any people would be present at AOC 57 under the existing land use conditions. Groundwater at and beneath AOC 57 is not used as a source of drinking or industrial water, and is not considered a groundwater resource by the Commonwealth of Massachusetts,

Upland portions of AOC 57 are located within an area zoned for Rail, Industrial, and Trade Related uses, while flood plain portions are zoned for Open Space and Recreation (Vanasse Hangen Brustlin, 1994a and 1994b). Because of poor soil and seasonal flooding, construction of buildings in the delineated flood-plain area or use of this area for anything other than open space is not realistic. However, the future use of the flood-plain area could include constructing designated trails for passive recreational use (e.g., bird watching).

Future residential use of land at AOC 57 is not likely; the Devens Reuse Plan does not include residential development of land in the vicinity of AOC 57, and construction of residential properties in the flood plain is not realistic because of poor soil and seasonal flooding.

7.0 SUMMARY OF RISK ASSESSMENT

The RI report contains baseline human-health and ecological risk assessments to evaluate the probability and magnitude of potential human-health and environmental effects associated with exposure to contaminated media remaining at AOC 57 following soil removal actions.

7.1 HUMAN-HEALTH RISK ASSESSMENT

The human-health risk assessment followed a four step process: 1) contaminant identification, which identified those hazardous substances that, given the specifics 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 noncarcinogenic risks. A detailed discussion of the human-health risk assessment approach and results is presented in Section 9.0 of the RI report and summarized in Subsection 2.5 of the FS report.

Potential human-health effects associated with exposure to the contaminants of concern were estimated quantitatively or qualitatively through the development of several hypothetical exposure pathways. These pathways were developed to reflect the potential for exposure to hazardous substances based on the current uses, possible (i.e., assumed) future uses, and unrestricted (i.e., residential) future use. Although

development/use of AOC 57 as residential property is considered unlikely, that possibility cannot be ruled out, especially if property ownership is transferred from the Army to a private entity. Therefore, to assess the need for land use restrictions and to maintain protectiveness if contamination remains on site above concentrations protective of unrestricted use, the Army included the residential scenario. Table 1 summarizes the human-health receptor and exposure scenarios evaluated at AOC 57 Areas 2 and 3.

For carcinogens, the excess lifetime cancer risks were calculated for each exposure pathway by multiplying the exposure concentration by the chemical-specific cancer slope factor. Cancer slope factors have been developed by USEPA from epidemiological or animal studies to reflect a conservative "upper bound" of the risk posed by potentially carcinogenic compounds. That is, the true risk is unlikely to be greater than the risk predicted. The resulting risk estimates are probabilities that are usually expressed in scientific notation (e.g., $1x10^{-6}$ for 1 in 1,000,000) and indicate (using this example) that an average individual is not likely to have greater that a one in a million chance of developing cancer over 70 years as a result of site-related exposure to the compound at the stated concentration. This is referred to as an "excess lifetime cancer risk" because it would be in addition to the risk individuals face from other causes such as smoking or exposure to too much sun. The chance of an individual's developing cancer from all other causes has been estimated to be as high as one in three. USEPA's generally acceptable risk range for site-related exposures is $1x10^{-4}$ to $1x10^{-6}$. USEPA practice considers carcinogenic risks to be additive when assessing exposure to a mixture of hazardous substances.

The potential for noncarcinogenic effects was also calculated for each pathway by dividing the exposure concentration by the reference dose (RfD) or other suitable benchmark for noncarcinogenic health effects for an individual compound. RfDs have been developed by USEPA to protect sensitive individuals over the course of a lifetime and they reflect a daily exposure level that is likely to be without an appreciable risk of an adverse health effect. RfDs are derived from epidemiological or animal studies and incorporate uncertainty factors to help ensure that adverse health effects will not occur. The ratio of exposure to the toxicity benchmark is called an hazard quotient. The hazard quotient is often expressed as a single value (e.g., 0.3) indicating the ratio of the stated exposure as defined to the RfD value (in this example, the exposure as characterized is approximately one third of an acceptable exposure level for the given compound). The sum of hazard quotients for different contaminants is referred to as the hazard index (HI). However, hazard quotients are only considered additive for compounds that have the same or similar toxic endpoint. For example: the hazard quotient for a compound known to produce liver damage should not be added to a second whose toxic endpoint is kidney damage.

The RI risk assessment evaluated post-removal action conditions for surface soil and subsurface soil Areas 2 and 3. Chemicals of potential concern (CPCs) identified in surface soil and subsurface soil included aluminum, arsenic, chromium, iron, lead, manganese, Aroclor 1248 and 1260, dieldrin, TPH, and EPH and VPH fractions. CPCs identified in groundwater, surface water, and sediment were similar to those identified in soil, but also included chlorinated VOCs and SVOCs which were detected at low concentrations in site groundwater. Petroleum compounds and PCBs are interpreted to be directly associated with the release of oils and vehicle maintenance wastes to soils at the site. Inorganic constituents selected as CPCs were interpreted to be indirectly associated with the petroleum release. The natural degradation of petroleum contaminants had caused reducing conditions in the aquifer, which in turn resulted in enhanced leaching of naturally-occurring inorganics from source area soils. Tables 9-4 through 9-19 of the RI report list site contaminants, frequency of contaminant detection, maximum and average concentrations, and whether the contaminant was selected as a CPC.

Table 2 summarizes numerical carcinogenic and noncarcinogenic risk estimates for current, possible future, and unrestricted land use scenarios. Tables 3 and 4 compare the numerical risk estimates to USEPA risk management criteria. Review of the tables shows that at Area 2 estimated excess cancer risks associated with current land use conditions at both upland and flood-plain areas are within the USEPA acceptable carcinogenic risk range of $1x10^{-4}$ to $1x10^{-6}$. Noncancer risks associated with current land use are below the noncarcinogenic target HI of 1. Estimated cancer risks associated with possible future land use at the Area 2 upland and flood-plain areas of the site are also within USEPA's acceptable risk range. However, noncancer risks to a possible future construction worker associated with excavation of Area 2 flood plain subsurface soil exceeded an HI of 1. These noncancer risks were primarily attributable to PCBs (Tables 5 and 6).

For unrestricted exposure to upland and flood-plain soil at Area 2, cancer risks do not exceed the USEPA cancer risk range; however, noncancer risks associated with unrestricted exposure to both upland and flood-plain soil exceed an HI of 1. These noncancer risks were primarily attributable to PCBs, chromium, petroleum hydrocarbons, and arsenic. Following USEPA risk assessment guidance, when an HI exceeds 1, it is appropriate to consider the toxicological endpoints upon which the noncarcinogenic hazards are based and the target organs for toxicological effects. Hazard indices for individual compounds should properly be added together only if the toxicological endpoints or mechanisms of action of the compounds are similar. In the case with the upland Area 2 unrestricted child resident exposure scenario, the target-organ specific HIs are less than or equal to the USEPA target threshold value of 1 for noncancer risks, as calculated in Appendix N-6, Table 5 of the final RI report (HLA, 2000). Therefore, noncancer risks from unrestricted child resident exposure to surface soil at Area 2 upland areas are considered unlikely. Unrestricted (residential) exposure to Area 2 flood plain groundwater poses risks that exceed the USEPA acceptable cancer risk range and target HI of 1, due primarily to arsenic.

At Area 3 estimated excess cancer risks associated with current land use conditions at both upland and flood-plain areas are within the USEPA acceptable carcinogenic risk range. Noncancer risks associated with current land use are below the noncarcinogenic target HI of 1. Potential risks associated with possible future construction and commercial/industrial worker exposure to surface and subsurface soil are within the USEPA target cancer risk range and below an HI of 1. However, estimated cancer risks associated with possible future commercial/industrial worker ingestion of Area 3 upland groundwater exceed USEPA's acceptable risk range, and noncancer risks associated with possible future commercial/industrial worker ingestion of groundwater exceed an HI of 1. Because, however, the target-organ specific HIs are less than or equal to the USEPA target threshold value of 1, noncancer risks from commercial/industrial worker ingestion of Area 2 upland groundwater are considered unlikely. Cancer risks associated with unrestricted exposures to upland and flood-plain soil at Area 3 do not exceed the USEPA acceptable cancer risk range; however, noncancer risks associated with unrestricted exposure to flood plain soil exceed an HI of 1. Unrestricted exposure to both upland and flood-plain groundwater at Area 3 poses risks that exceed the USEPA acceptable cancer risk range and target HI of 1. These cancer risks result primarily from arsenic, while the noncancer risks result primarily from hydrocarbons.

Because groundwater at AOC 57 is not currently used for potable water and the area bordering Barnum Road is serviced by a public water supply, future potable use exposure to AOC 57 groundwater is unlikely to occur. A more realistic potential use of AOC 57 groundwater is for industrial non-potable

process water. However, it is unlikely that non-potable industrial uses of groundwater would result in an exposure scenario which would result in levels of risk that exceed the USEPA risk range or target level.

Based on the preceding discussion, those areas and media that present cancer risk greater than $1x10^{-4}$ and noncancer risk with HI greater than 1 are listed below.

Area 2 – Upland Area

None

Area 2 Flood Plain Area

- Possible future construction worker exposure to subsurface soil (noncarcinogenic risk).
- Unrestricted use child residential exposure to flood plain surface soil (noncarcinogenic risk).
- Unrestricted use child residential exposure to flood plain subsurface soil (noncarcinogenic risk).
- Unrestricted use adult residential exposure to flood plain groundwater (carcinogenic and noncarcinogenic risks).

Area 3 Upland Area

- Possible future commercial/industrial worker exposure to upland groundwater (carcinogenic and noncarcinogenic risks).
- Unrestricted use adult residential exposure to flood plain groundwater (carcinogenic and noncarcinogenic risks).

Area 3 Flood Plain Area

- Unrestricted use child residential exposure to flood plain surface soil (noncarcinogenic risk).
- Unrestricted use adult residential exposure to flood plain groundwater (carcinogenic and noncarcinogenic risks).

7.2 ECOLOGICAL RISK ASSESSMENT SUMMARY

The Baseline Ecological Risk Assessment (BERA) evaluated potential risks for ecological receptors at AOC 57 for CPCs in surface soil, surface water, sediment, and groundwater using benchmarks from the literature and site-specific data (e.g., toxicity test results, bioaccumulation study results, and measurement of fish and crayfish tissue concentrations). The following exposure pathways were evaluated in the BERA:

- food chain risks to terrestrial and semi-aquatic mammals and birds that occur in the upland, forested flood plain, and open stream/marsh areas;

- direct contact risks to aquatic receptors (e.g., plants, invertebrates, amphibians, and fish) exposed to surface water and sediment; and

- direct contact risks to terrestrial plants and soil invertebrates exposed to surface soil.

Based on the results of the AOC 57 BERA, there do not appear to be significant adverse affects to ecological receptors. Based on a comparison of surface water data with upgradient groundwater data, Cold Spring Brook surface water in the vicinity of Area 2 may be affected by groundwater discharge. However, there does not appear to be a risk to aquatic receptors from the chemicals common to both these media. Groundwater from Area 3 does not appear to be affecting downgradient surface water in the flood plain of Cold Spring Brook, based on the difference in chemicals detected in these media. Details of the BERA are contained in the RI report (HLA, 2000) and summarized in the FS report (Harding ESE, 2000).

8.0 PRINCIPAL THREAT WASTES

The NCP establishes an expectation that treatment will be used to address the principal threats at a site wherever practical, whereas engineering controls, such as containment, may be used for wastes that pose a relatively low long-term threat or where treatment is impractical. The concept of principal threat and low-level threat wastes is applied on a site-specific basis when characterizing source material. Source material is defined as material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to groundwater, to surface water, to air, or acts as a source for direct exposure. Contaminated groundwater generally is not considered to be source material, although nonaqueous phase liquids (NAPLs) may be.

Principal threat wastes are those source materials considered to be highly toxic or highly mobile which cannot be reliably contained or that would present a significant risk to human health or the environment should exposure occur. The manner in which principal threats are addressed generally will determine whether the statutory preference for treatment as a principal element is satisfied. Although USEPA has not established a threshold level of toxicity/risk to identify a principal threat waste; toxicity and mobility must combine to pose a potential risk several orders of magnitude greater than is acceptable under current or reasonably expected future land use, given realistic exposure scenarios. Further, characterizing a waste as a principal threat does not necessarily mean that the waste poses the primary risk at a site. Examples of source materials that generally constitute principal threats include liquid wastes in drums, lagoons, or tanks; NAPLs floating on or under groundwater; soil, sediment, sludge, or debris containing high concentrations of mobile or potentially mobile contaminants; buried nonliquid wastes; and soil containing significant concentrations of highly toxic material.

Low-level threat wastes are those source materials that generally can be readily contained and that would present only a low risk in the event of a release or exposure. Examples of wastes generally considered to constitute low-level threats include soil containing contaminants that are relatively immobile in air or groundwater (i.e., nonliquid, low volatility, low leachability) in the specific environmental setting and soil

1containing contaminants not greatly above RfD levels or presenting an excess cancer risk near the acceptable risk range.

At AOC 57 Area 2, a 1994 removal action resulted in the excavation and approved disposal of approximately 1,300 cy of soil considered a principal threat to groundwater at the site. RI investigations completed after the removal action did not identify extensive remaining contamination at AOC 57 Area 2, and no waste drums, tanks, or impoundments, or areas of high toxicity/concentration/mobility soil contamination are known to exist. The post-removal-action risk assessment calculated potential risks under current and possible future land use scenarios which are within USEPA's acceptable cancer risk range. Noncancer risks were generally below a target HI of 1, although an HI of 4 was calculated for a future construction worker exposed to surface and subsurface flood plain soil (see Table 2). For the future unrestricted use resident scenario, cancer risks for exposure to soil remained with the acceptable range, while noncancer risks increased to an HI of 23 for child resident exposure to subsurface flood plain soil. However, future residential use of the flood plain at AOC 57 is considered unlikely. Based on this assessment, the Army concludes that there are currently no principal threat wastes remaining at AOC 57 Area 2.

At AOC 57 Area 3, a 1999 removal action in response to contamination identified during the RI field program, resulted in the excavation and approved disposal of approximately 1,860 cy of soil considered a threat to public health and welfare and a principal threat to groundwater at the site. No waste drums, tanks, or impoundments, or areas of high toxicity/concentration/mobility soil contamination are known to remain at AOC 57 Area 3. A post-removal action risk assessment presented in the FS report calculated potential soil exposure risks under current and possible future land use scenarios which are within USEPA's acceptable cancer risk range. Noncancer risks were below a target HI of 1 (see Table 2). For the future unrestricted use resident scenario, cancer risks for exposure to soil remained within the acceptable range, while noncancer risks increased to an HI of 4 for child resident exposure to subsurface flood plain soil. However, future residential use of the flood plain at AOC 57 is considered unlikely. Based on this assessment, the Army concludes that there are currently no principal threat wastes remaining at AOC 57 Area 3.

9.0 GENERAL STATUTORY REQUIREMENTS AND REMEDIAL ACTION 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 the following:

- a requirement that the remedial action, when complete, must attain all federal and more stringent state environmental requirements, standards, criteria, or limitations that are applicable or relevant and appropriate to the action, unless a waiver is invoked;
- a requirement that a remedial action be cost-effective and use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and
- a preference for remedies in which treatment permanently and significantly reduces the toxicity, mobility, or volume of hazardous substances as a principal element.

9.1 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

As stated, applicable or relevant and appropriate requirements (ARARs) are federal or more stringent state environmental laws that are applicable or relevant and appropriate to the hazardous substances or circumstances at a site. Inherent in the interpretation of ARARs is the assumption that protection of human health and the environment is ensured.

Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site.

Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not applicable to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site.

Requirements under federal or state law may be either applicable or relevant and appropriate to CERCLA cleanup actions, but not both. However, requirements must be both relevant and appropriate for compliance to be necessary. In the case where both a federal and a state ARAR are available, or where two potential ARARs address the same issue, the more stringent regulation must be selected. The final NCP states that a state standard must be legally enforceable and more stringent than a corresponding federal standard to be relevant and appropriate. However, CERCLA §121(d)(4) provides several ARAR waiver options that may be invoked, providing that the basic premise of protection of human health and the environment is not ignored. A waiver is available for state standards that have not been uniformly applied in similar circumstances across the state. In addition, CERCLA §121(d)(2)(C) forbids state standards that effectively prohibit land disposal of hazardous substances.

CERCLA on-site remedial response actions must only comply with the substantive requirements of a regulation and not the administrative requirements to obtain federal, state, or local permits [CERCLA §121(e)].

The MCP at 310 CMR 40.0000 is not considered an ARAR for CERCLA actions at Devens RFTA. The provisions of the MCP are mostly administrative in nature and, therefore, do not have to be complied with in connection with the response action selected for AOC 57. Further, the MCP contains a specific provision (310 CMR 40.0111) for deferring application of the MCP at CERCLA sites. 310 CMR 40.0111(1)(a) provides that response actions at CERCLA sites shall be deemed adequately regulated for purposes of compliance with the MCP, provided the MADEP concurs in the CERCLA Record or Decision.

9.2 RESPONSE AND REMEDIAL ACTION OBJECTIVES

Remedial response objectives are site-specific qualitative cleanup objectives used for defining remedial action objectives (RAOs) and for developing appropriate remedial alternatives. They are developed based

on the nature and distribution of contamination, the resources currently or potentially threatened, and the potential for human and environmental exposure. Although current-use exposure scenario cancer risks were within USEPA's target risk range and below a noncancer HI threshold value of 1, the human-health risk assessment did identify a number of possible future and unrestricted use exposure scenarios with risk levels that exceeded these values. At AOC 57, remedial response objectives were developed for each medium of concern (i.e., soil and groundwater) based on the human-health risk assessment results for land use scenarios where the risk assessment revealed potential cancer risks greater than the target risk range of $1x10^{-4}$ to $1x10^{-6}$ and a noncancer HI greater than 1. As detailed in the RI report (HLA, 2000) and summarized in the FS report, the BERA revealed that there were no significant adverse affects to ecological receptors, and no ecological response objectives were developed.

Preliminary remediation goals (PRGs) for AOC 57 were developed following the USEPA guidance documents entitled *Risk Assessment Guidance for Superfund: Volume 1 - Human Health Evaluation Manual (Part B, Development of Risk Based Preliminary Remediation Goals)*, Interim, December 1991 (RAGS Part E) (USEPA, 1991a) and OSWER Directive 9355.0-30, *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions* (USEPA, 1991b).

The first step in developing human-health PRGs was to identify those environmental media that, in the baseline human-health risk assessment, present either a cumulative current or future cancer risk greater than $1x10^{-4}$ or a noncarcinogenic target-organ based HI greater than 1, based on reasonable maximum exposure (RME) assumptions. The RI report discusses specific assumptions used in deriving the RME for each exposure scenario (HLA, 2000). The next step was to identify chemicals of concern (COCs) within the media that present cancer risks greater than $1x10^{-6}$ or a hazard quotient greater than 1. After identification of media of concern and COCs, PRGs were developed for each COC according to the following hierarchy:

1) Comparison to ARARs.
2) If no chemical-specific ARAR was available (i.e., such as for soils), risk-based concentrations were back-calculated to a target cancer risk of $1x10^{-6}$ and a target hazard quotient of 1 for each COC using the exposure assumptions employed in the RI report (HLA, 2000).

There are no federal chemical-specific ARARs for lead in soil; although, OSWER Directive 9355.4-12 (USEPA, 1994) specifies 400 mg/kg for a residential soil lead screening level. For this reason, the PRG for lead was based upon the MCP Method 1 Risk Characterization S-2/GW-1 Soil Standard of 600 mg/kg (MCP Sections 310 CMR 40.0940 and 40.0974-0975). The S-2 standard is applicable to the construction worker scenario where there is potentially accessible soil, the possibility of child receptors exists, and there is low frequency and high intensity for exposure for a construction worker. Additional detail on the development of PRGs is contained in Section 3.0 of the FS report.

RAOs are site-specific, quantitative goals defining the extent of cleanup required to achieve response objectives. RAOs specify contaminants of concern, exposure routes, receptors, and PRGs. RAOs are used as the framework for developing remedial alternatives. The RAOs are formulated to achieve the overall USEPA goal of protecting human health and the environment. RAOs for AOC 57 are listed below.

Area 2 Flood Plain

- Protect possible future construction workers that might work within Area 2 flood plain (recreational) areas from ingesting soils containing Aroclor-1260 and lead at concentrations in excess of PRGs considered protective of human health, as presented in Table 7.

- Prevent unrestricted use residential receptors from coming in dermal contact with and ingesting Area 2 flood plain soils containing Aroclor-1260, arsenic, chromium, lead, and the EPH C11-C22 aromatic carbon range at concentrations in excess of PRGs considered protective of human health, as presented in Table 7.

- Prevent unrestricted potable use of Area 2 flood plain groundwater containing arsenic and PCE at concentrations that exceed MCLs and Massachusetts Maximum Contaminant Levels (MMCLs) for drinking water (Table 8).

Area 3 Upland

- Protect possible future commercial/industrial workers from ingesting Area 3 upland groundwater that contains arsenic, cadmium, and 1,4-DCB at concentrations that exceed MCLs and MMCLs for drinking water (see Table 8).

- Prevent unrestricted residential potable use of Area 3 upland groundwater containing arsenic, cadmium, and 1,4-DCB at concentrations that exceed MCLs and MMCLs for drinking water (see Table 8).

Area 3 Flood Plain

- Prevent unrestricted use residential receptors from coming in dermal contact with and ingesting surface soils containing the EPH C11-C22 aromatic carbon range at concentrations in excess of PRGs considered protective of human health, as presented in Table 7.

- Prevent unrestricted residential potable use of Area 3 flood plain groundwater containing arsenic and PCE at concentrations that exceed MCLs and MMCLs drinking water (see Table 8).

10.0 DESCRIPTION OF ALTERNATIVES

CERCLA and the NCP set forth the process by which remedial actions are evaluated and selected. In accordance with these requirements, the Army developed a range of candidate alternatives for AOC 57 Areas 2 and 3. Section 4.0 of the FS identified and screened a number of soil and groundwater treatment technologies and process options based on probable effectiveness and implementability. The technologies and process options remaining after screening were then combined into the candidate alternatives listed below.

Area 2
Alternative II-1: No Action

Alternative II-2: Limited Action
Alternative II-3: Excavation (For Possible Future Use) and Institutional Controls
Alternative II-4: Excavation (For Unrestricted Use) and Institutional Controls

Area 3
Alternative III-1: No Action
Alternative III-2: Limited Action
Alternative III-3: Excavation (For Unrestricted Use) and Institutional Controls

In Section 5.0 of the FS, the technologies retained following screening were assembled into alternatives and then screened with respect to effectiveness, implementability, and cost to eliminate impractical alternatives or alternatives with significantly higher costs (i.e., order of magnitude differences).

Of the 7 alternatives identified in the FS, all were retained during the FS screening step and evaluated in detail in Section 6.0 of the FS report.

In addition, the Army developed Alternative III-2a: Excavation (to Accelerate Groundwater Cleanup) and Institutional Controls for Area 3 following the Public Comment period on the Proposed Plan. This alternative addresses public concern about the length of time required to cleanup groundwater at Area 3. A narrative summary of each of the alternatives is provided in the following paragraphs.

10.1 DESCRIPTION OF ALTERNATIVES FOR AOC 57 AREA 2

This section provides a summary description of the remedial alternatives evaluated for AOC 57 Area 2.

10.1.1 Alternative II-1: No Action

The No Action alternative for Area 2 does not contain any remedial action components to reduce or control potential risks. No monitoring, further investigation, or site reviews would be performed, and no institutional controls implemented. The No Action alternative was developed, as required by the NCP, to provide a baseline with which to compare other alternatives.

Estimated Time for Design and Construction:	Not applicable
Estimated Time for Cleanup:	Not applicable
Estimated Capital Cost:	$0
Estimated Operation and Maintenance Cost :	$0
Estimated Total Cost	$0

10.1.2 Alternative II-2: Limited Action

Alternative II-2 contains components to reduce potential human-health risks associated with contaminated soil and groundwater at the Area 2 flood plain. Key components of Alternative II-2 consist of following:

- Institutional Controls
  - Institutional controls that protect possible future use construction workers by controlling excavation activities at the Area 2 flood plain
  - Existing zoning that prohibits residential use of Area 2 property and proposed deed restrictions that prohibit potable use of Area 2 groundwater and residential use of flood plain property
- Environmental Monitoring
  - Long-term groundwater monitoring
  - Long-term surface water monitoring
- Institutional Control Inspections
- Five-year Site Reviews

Institutional Controls. Alternative II-2 contains institutional controls to protect possible future-use construction workers from exposure to contaminated flood plain soil and future unrestricted use residents from exposure to contaminated flood plain soil and groundwater. The presence of flood plain and wetland conditions and existing zoning currently prevents residential use of the area and potential residential exposure to contaminated soil and groundwater. Upland portions of AOC 57 are located within an area zoned for Rail, Industrial, and Trade Related uses, while flood plain portions of AOC 57 are zoned for Open Space and Recreation (Vanasse Hangen Brustlin, 1994a and 1994b). Residential construction would not be permitted under those designations.

To protect possible future-use construction workers from exposure to contaminated soil, this alternative would require establishment of land use restrictions within the flood-plain area where soil contaminants exceed concentrations considered protective of human health under the possible future land use exposure scenario (Figure 7). As part of the land use restrictions, the contaminated soil area would be surveyed, marked with permanent survey markers, and identified as an Excavated Soils Management Area (ESMA). Contractors performing work within the ESMA would be required to prepare and follow an Excavated Soils Management Plan that would define precautionary measures to be taken to minimize risk to human health and the environment.

To protect future unrestricted use residents from exposure to contaminated flood-plain soil and groundwater in the event of future property transfer, the Army would include deed covenants to prohibit residential use of flood plain property and potable use of groundwater in flood plain. Groundwater beneath upland areas at Area 2 already meets groundwater cleanup levels; however, because the zone of influence of an upland well could draw contaminated groundwater from nearby wetland/flood-plain areas, use of upland groundwater as potable water prior to attaining cleanup levels in wetland/flood-plain areas would require careful evaluation. Because of the potential for Area 2 upland wells to be influenced by flood plain groundwater, potable use of Area 2 upland groundwater would also be prohibited.

All institutional controls would be stated in full or by reference within deeds, easements, mortgages, leases, or other instruments of property transfer. These controls would be drafted, implemented and enforced in cooperation with federal, state, and local governments. These controls would be maintained as long as soil and groundwater contaminants remained at concentrations above protective cleanup levels.

Environmental Monitoring. Environmental monitoring would consist of performing long-term groundwater and surface water sampling. Long-term groundwater sampling would be performed to assess

for groundwater COCs (arsenic and PCE) migration and to monitor for the decrease of the groundwater COCs to concentrations that are protective of unrestricted use residential receptors.

Surface water sampling would also be a component of environmental sampling to assess for off-site migration of human-health COCs in excess of PRGs via the groundwater to surface water pathway. The purpose of the surface water sampling would not be to collect additional ecological risk assessment data.

Sampling frequency, location, analytes, sampling procedures, and action levels for environmental monitoring would be detailed in a long-term monitoring plan (LTMP) and submitted to USEPA and MADEP for review and concurrence prior to implementing the environmental monitoring component of this alternative. Following attainment of groundwater cleanup levels, monitoring would be discontinued in accordance with the time frame specified in the LTMP.

Institutional Control Inspections. The Army would prepare and submit an Institutional Control Monitoring Plan for regulatory agency review and concurrence as part of the site LTMP to detail the institutional controls to be incorporated/referenced within instruments of property transfer and ensure that the institutional control requirements are met. The plan would include a checklist of elements to be assessed during regularly scheduled on-site inspections and interviews with the site property owner, manager, or designee. If future land use at AOC 57 is inconsistent with these institutional controls, then the site exposure scenarios for human health and the environment would be re-evaluated to assess whether this response action remains appropriate.

Five-Year Site Reviews. Section 121c of CERCLA and NCP§300.430(f)(4)(ii) require that if a remedial action results in contaminants remaining on-site above concentrations that allow unrestricted and unlimited use, the lead agency must review the action at least every five years. During five-year site reviews, an assessment is made of whether the implemented remedy continues to be protective of human health and the environment or whether the implementation of additional remedial action is appropriate. Because Alternative II-2 would result in contaminants remaining on site above concentrations allowing unrestricted use, five-year reviews would be required. Subsequent five-year reviews will be performed as long as hazardous substances, pollutants, or contaminants remain on-site above concentrations that allow for unrestricted exposure and unlimited use.

Estimated Time for Design and Construction:	6 months
Estimated Time for Groundwater Cleanup:	2 years
Estimated Capital Cost:	$16,250
Estimated Operation and Maintenance Cost (Present Worth*):	$178,914
Contingency	$48,791
Estimated Total Cost	$243,955

*Present worth based on 7 percent discount rate and environmental monitoring, institutional controls inspections, and five-year reviews for 30 years.

10.1.3 Alternative II-3: Excavation (For Possible Future Use) and Institutional Controls

Alternative II-3 adds soil excavation and wetland protection components to the components of Alternative II-2 to reduce potential human-health risks associated with contaminated soil and groundwater at the Area 2 flood plain. Key components of Alternative II-2 consist of following:

- Soil Excavation and treatment/disposal at an off-site treatment, storage, or disposal facility
- Wetlands Protection
- Institutional Controls
  - Existing zoning that prohibits residential use of Area 2 property and proposed deed restrictions that prohibit potable use of Area 2 groundwater and residential use of flood plain property
- Environmental Monitoring
  - Long-term groundwater monitoring
  - Long-term surface water monitoring
- Institutional Control Inspections
- Five-year Site Reviews

Soil Excavation and Treatment/disposal at an Off-site Treatment, Storage, or Disposal Facility. Alternative II-3 includes excavation of flood plain soils with Aroclor-1260 and lead concentrations in excess of PRGs that are considered protective of possible future-use construction workers. The estimated areal extent of soil contamination to be excavated is shown in Figure 7, based on observed PRG exceedances. Based upon the depth of an organic soil layer observed during the RI, the estimated average depth of contaminated soil is 4 ft. bgs. The in-place volume of soil to be excavated is estimated to be approximately 640 cy. The actual extent of excavation and volume of soil removed would depend on the extent of PRG exceedances identified by field screening during excavation. The excavated soil will be treated/disposed at an approved off-site treatment, storage, or disposal facility.

An excavation work plan would be prepared to guide the excavation process; however, the FS assumption of excavation using conventional construction equipment such as tracked excavators, front-end loaders, and dump trucks would likely hold true. It is also assumed that the extent of excavation would be guided using on-site field-screening methods and final cleanup confirmed using off-site analytical methods. The excavation plan would detail how large pieces of debris or rocks would be separated from soil, cleaned of soil, and reused or disposed. It would also address groundwater management issues associated with excavation activities. Assumptions used in preparation of the FS report are described in Subsection 6.1.3.7 of that document.

Wetlands Protection. Soil excavation for Alternative II-3 would be within the 100-year flood plain (228 ft. msl) and possibly would be within the delineated bordering vegetated wetland based on a 1993 wetlands delineation (see Figure 7). Therefore, wetland protection would likely be required as a result of potential excavation activities. Protection would be provided in accordance with the Massachusetts Wetland Protection Act and Regulations at 310 CMR 10.55.

Prior to any excavation activities, a new wetlands delineation would be performed at Area 2. If the proposed construction area is confirmed to be within delineated vegetated wetlands, a pre-construction mitigation study would be performed to determine the impact to the affected area and the compensatory mitigation required as a result of the excavation activities. Once the extent of anticipated impacts is known, a mitigation/restoration plan would be prepared for regulatory agency review and concurrence.

The primary goal of wetland restoration activities would be to restore fresh-water wetlands within the excavation area which are disturbed during remedial activities. The surface area of the restored wetland

would be equal to or greater than that of the altered wetland. Depending on federal and state regulatory guidance, as well as financial and temporal considerations, a number of diverse approaches exist to restore self-sustaining wetlands. At a minimum, wetland restoration would include backfilling with suitable material to achieve desired grade and controlling erosion and siltation. During construction, erosion control measures such as soil berms, silt fencing, and hay bales would be used to protect against erosion and siltation within the flood-plain area. Compensatory mitigation and monitoring would be implemented according to the mitigation plan. A wetland scientist would monitor wetland restoration for a period of five years, beginning the year after the wetlands creation.

Institutional Controls. Similar to Alternative II-2, this alternative would require establishment of institutional controls to prohibit potable use of Area 2 groundwater and residential use of flood plain property. Also similar to Alternative II-2, these restrictions would be stated in full or by reference within deeds, easements, mortgages, leases, or other instruments of property transfer. Unlike Alternative II-2, deed restrictions pertaining to invasive construction activities and identification of an ESMA at the Area 2 flood plain would not be required for Alternative II-3 because the soil excavation component would remove COCs that exceed possible-future-use PRGs for protection of construction workers.

Environmental Monitoring. Environmental monitoring would consist of performing long-term groundwater and surface water sampling as described for Alternative II-2.

Institutional Control Inspections. Institutional control inspections would be performed as described for Alternative II-2.

Five-Year Site Reviews. Five-year site reviews would be performed as described for Alternative II-2.

Estimated Time for Design and Construction:	6 months
Estimated Time for Groundwater Cleanup:	2 years
Estimated Capital Cost:	$348,645
Estimated Operation and Maintenance Cost (Present Worth*):	$185,064
Contingency	$133,427
Estimated Total Cost	$667,137

*Present worth based on 7 percent discount rate and environmental monitoring, institutional controls inspections, and five-year reviews for 30 years.

10.1.4 Alternative II-4: Excavation (For Unrestricted Use) And Institutional Controls

Alternative II-4 contains components similar to those of Alternative II-3 to reduce potential human-health risks associated with contaminated soil and groundwater at the Area 2 flood plain. However, the scope of the components differs. Key components of Alternative II-4 consist of following:

- Soil Excavation and treatment/disposal at an off-site treatment, storage, or disposal facility
- Wetlands Protection
- Institutional Controls
  - Existing zoning that prohibits residential use of Area 2 property and proposed deed restrictions that prohibit potable use of Area 2 groundwater

- Environmental Monitoring
  - o Long-term groundwater monitoring
  - o Long-term surface water monitoring
- Institutional Control Inspections
- Five-year Site Reviews

Soil Excavation and Treatment/disposal at an Off-site Treatment, Storage, or Disposal Facility. The major difference between this alternative and Alternative II-3 is the extent of proposed excavation. This alternative includes excavating flood plain soils that exceed unrestricted-use PRGs for protection of residential receptors (see Figure 7). Based upon the depth of an organic soil layer observed during the RI, the estimated average depth of contaminated soil is 4 ft. bgs. The in-place volume of soil to be excavated is estimated to be approximately 1,800 cy. The actual extent of excavation and volume of soil removed would depend on the extent of PRG exceedances identified by field screening during excavation. The excavated soil will be treated/disposed at an approved off-site treatment, storage, or disposal facility, or other approved facility, as appropriate.

Wetlands Protection. Wetlands protection activities would be similar to those described for Alternative II-3, although somewhat more extensive because of the greater anticipated extent of excavation.

Institutional Controls. Similar to Alternatives II-2 and II-3, this alternative would require establishment of institutional controls to prohibit potable use of Area 2 groundwater. Also similar to Alternative II-2, these restrictions would be stated in full or by reference within deeds, easements, mortgages, leases, or other instruments of property transfer. Unlike Alternatives II-2 and II-3, deed restrictions pertaining to invasive construction activities and residential use at the Area 2 flood plain would not be required, because the soil excavation component of Alternative II-4 would remove COCs that exceed PRGs for protection of possible future use construction workers and unrestricted use residents.

Environmental Monitoring. Environmental monitoring would consist of performing long-term groundwater and surface water sampling as described for Alternative II-2.

Institutional Control Inspections. Institutional control inspections would be performed as described for Alternative II-2.

Five-Year Site Reviews. Five-year site reviews would be performed as described for Alternative II-2.

Estimated Time for Design and Construction:	6 months
Estimated Time for Groundwater Cleanup:	2 years
Estimated Capital Cost:	$871,882
Estimated Operation and Maintenance Cost (Present Worth*):	$185,064
	$264,237
Estimated Total Cost	$1,321,183

*Present worth based on 7 percent discount rate and environmental monitoring, institutional controls inspections, and five-year reviews for 30 years.

10.2 DESCRIPTION OF ALTERNATIVES FOR AOC 57 AREA 3

This section provides a summary description of the remedial alternatives evaluated for AOC 57 Area 3.

10.2.1 Alternative III-1: No Action

The No Action alternative for Area 3 does not contain any remedial action components to reduce or control potential risks. No monitoring, further investigation, or site reviews would be performed, and no institutional controls implemented. The No Action alternative was developed, as required by the NCP, to provide a baseline with which to compare other alternatives.

Estimated Time for Design and Construction:	Not applicable
Estimated Time for Cleanup:	Not applicable
Estimated Capital Cost:	$0
Estimated Operation and Maintenance Cost:	$0
Estimated Total Cost	$0

10.2.2 Alternative III-2: Limited Action

Alternative III-2 contains components to reduce potential human-health risks associated with contaminated soil (flood plain) and groundwater (upland and flood plain) at the Area 3. Key components of Alternative II-2 consist of following:

- Institutional Controls
  - Existing zoning that prohibits residential use of Area 3 property and proposed deed restrictions that prohibit potable use of Area 3 groundwater and residential use of flood plain property
- Environmental Monitoring
  - Long-term groundwater monitoring
  - Long-term surface water monitoring
- Institutional Control Inspections
- Five-year Site Reviews

Institutional Controls. Alternative III-2 would protect possible future-use commercial workers and future unrestricted use residents by requiring establishment of land use restrictions for both upland and flood plain portions of AOC 57 Area 3. The presence of flood plain and wetland conditions and existing zoning currently prevents residential use of the area and potential residential exposure to contaminated soil and groundwater. Upland portions of AOC 57 are located within an area zoned for Rail, Industrial, and Trade Related uses, while flood plain portions are zoned for Open Space and Recreation (Vanasse Hangen Brustlin, 1994a and 1994b). Residential construction would not be permitted under those designations.

To protect possible future commercial workers and unrestricted use residents from exposure to groundwater and future unrestricted use residents from exposure to contaminated flood-plain soil in the event of future property transfer, the Army would include deed covenants to prohibit potable use of Area 3 groundwater and residential use of flood plain property. All institutional controls would be stated in full or by reference within deeds, easements, mortgages, leases, or other instruments of property transfer.

These controls would be drafted, implemented and enforced in cooperation with federal, state, and local governments. These covenants would be maintained as long as soil and/or groundwater contaminants remained at concentrations above protective cleanup levels.

Environmental Monitoring. Environmental monitoring would consist of performing long-term groundwater and surface water sampling. Long-term groundwater sampling would be performed to assess for decreases in arsenic, PCE, cadmium, and 1,4-DCB concentrations (upland and flood plain COCs), and for the need for continued groundwater institutional controls to protect human receptors.

Surface water sampling would also be a component of environmental sampling to assess for off-site migration of human-health COCs in excess of PRGs via the groundwater to surface water pathway. The purpose of the surface water sampling would not be to collect additional ecological risk assessment data.

Sampling frequency, location, analytes, sampling procedures, and action levels for environmental monitoring would be detailed in a LTMP and submitted to USEPA and MADEP for review and concurrence prior to implementing the environmental monitoring component of this alternative. Following attainment of groundwater cleanup levels, monitoring would be discontinued in accordance with the time frame specified in the LTMP.

Institutional Control Inspections. The Army would prepare and submit an Institutional Control Monitoring Plan for regulatory agency review and concurrence as part of the site LTMP to detail the institutional controls to be incorporated/referenced within instruments of property transfer and ensure that the institutional control requirements are met. The plan would include a checklist of elements to be assessed during regularly scheduled on-site inspections and interviews with the site property owner, manager, or designee. If future land use at AOC 57 is inconsistent with these institutional controls, then the site exposure scenarios for human health and the environment would be re-evaluated to assess whether this response action is appropriate.

Five-Year Site Reviews. Section 121c of CERCLA and NCP§300.430(f)(4)(ii) require that if a remedial action results in contaminants remaining on-site above concentrations that allow unrestricted and unlimited use, the lead agency must review the action at least every five years. During five-year site reviews, an assessment is made of whether the implemented remedy continues to be protective of human health and the environment or whether the implementation of additional remedial action is appropriate. Because Alternative III-2 would result in contaminants remaining on site above concentrations allowing unrestricted use, five-year reviews would be required. Subsequent five-year reviews will be performed as long as hazardous substances, pollutants, or contaminants remain on-site above concentrations that allow for unrestricted exposure and unlimited use.

Estimated Time for Design and Construction:	6 months
Estimated Time for Groundwater Cleanup:	8 years
Estimated Capital Cost:	$15,750
Estimated Operation and Maintenance Cost (Present Worth*):	$222,972
Contingency	$59,681
Estimated Total Cost	$298,403

*Present worth based on 7 percent discount rate and environmental monitoring, institutional controls inspections, and five-year reviews for 30 years.

10.2.3 Alternative III-3: Excavation (For Unrestricted Use) and Institutional Controls

Alternative III-3 adds soil excavation and wetland protection components to the components of Alternative III-2 to reduce potential human-health risks Area 3. Key components of Alternative III-3 consist of following:

- Soil Excavation and treatment/disposal at an off-site treatment, storage, or disposal facility
- Wetlands Protection
- Institutional Controls
  - Existing zoning that prohibits residential use of Area 3 property and proposed deed restrictions that prohibit potable use of Area 3 groundwater
- Environmental Monitoring
  - Long-term groundwater monitoring
  - Long-term surface water monitoring
- Institutional Control Inspections
- Five-year Site Reviews

Soil Excavation and Treatment/disposal at an Off-site Treatment, Storage, or Disposal Facility. Alternative III-3 includes excavation of flood plain soils with EPH C11-C22 aromatic range concentrations in excess of PRGs that are considered protective of future unrestricted use residents. The estimated areal extent of soil contamination to be excavated is shown in Figure 8 based on observed unrestricted use PRG exceedances. Based upon the depth of an organic soil layer observed during the RI, the estimated average depth of contaminated soil is 3 ft. bgs. The estimated in-place volume of soil to be excavated is 120 cy. The actual extent of excavation and volume of soil removed would depend on the extent of PRG exceedances identified by field screening during excavation. The excavated soil will be treated/disposed at an approved off-site treatment, storage, or disposal facility.

An excavation work plan would be prepared to guide the excavation process; however, the FS assumption of excavation using conventional construction equipment such as tracked excavators, front-end loaders, and dump trucks would likely hold true. It is also assumed that the extent of excavation would be guided using on-site field-screening methods and final cleanup confirmed using off-site analytical methods. The excavation plan would detail how large pieces of debris or rocks would be separated from soil, cleaned of soil, and reused or disposed. It would also address groundwater management issues associated with excavation activities. Assumptions used in preparation of the FS report are described in Subsection 6.1.3.7 of that document.

Wetlands Protection. Soil excavation for Alternative III-3 would be within the 100-year flood plain (228 ft. msl) and possibly would be within the delineated bordering vegetated wetland. Therefore, wetland protection would likely be required as a result of potential excavation activities. Protection would be provided in accordance with the Massachusetts Wetland Protection Act and Regulations at 310 CMR 10.55.

Prior to any excavation activities, a wetlands delineation would be performed at Area 3. If the proposed construction area is confirmed to be within delineated vegetated wetlands, a pre-construction mitigation study would be performed to determine the impact to the affected area and the compensatory mitigation

required as a result of the excavation activities. Once the extent of anticipated impacts is known, a mitigation/restoration plan would be prepared for regulatory agency review and concurrence.

The primary goal of wetland restoration activities would be to restore affected fresh-water wetlands within the excavation area and disturbed during remedial activities. The surface area of the restored wetland would be equal to or greater than that of the altered wetland. Depending on federal and state regulatory guidance, as well as financial and temporal considerations, a number of diverse approaches exist to restore self-sustaining wetlands. At a minimum, wetland restoration would include backfilling with suitable material to achieve desired grade and controlling erosion and siltation. During construction, erosion control measures such as soil berms, silt fencing, and hay bales would be used to protect against erosion and siltation within the flood-plain area. Compensatory mitigation and monitoring would be implemented according to the mitigation plan. A wetland scientist would monitor wetland restoration for a period of five years, beginning the year after the wetlands creation.

Institutional Controls. Similar to Alternative III-2, this alternative would require establishment of institutional controls to prohibit potable use of Area 3 groundwater. Also similar to Alternative III-2, these restrictions would be stated in full or by reference within deeds, easements, mortgages, leases, or other instruments of property transfer and would be maintained as long as groundwater contaminants remained at concentrations above cleanup levels.

Environmental Monitoring. Environmental monitoring would consist of performing long-term groundwater and surface water sampling as described for Alternative III-2.

Institutional Control Inspections. Institutional control inspections would be performed as described for Alternative III-2.

Five-Year Site Reviews. Five-year site reviews would be performed as described for Alternative III-2.

Estimated Time for Design and Construction:	6 months
Estimated Time for Cleanup:	8 years
Estimated Capital Cost:	$80,699
Estimated Operation and Maintenance Cost (Present Worth*):	$229,122
Contingency	$77,455
Estimated Total Cost	$387,276

*Present worth based on 7 percent discount rate and environmental monitoring, institutional controls inspections, and five-year reviews for 30 years.

10.2.4 Alternative III-2a: Excavation (to Accelerate Groundwater Cleanup) and Institutional Controls

Alternative III-2a combines elements of Alternatives III-2 and III-3. It contains all the elements of Alternative III-2, plus soil removal to accelerate groundwater cleanup. Key components of Alternative III-2a consist of the following:

- Soil Excavation and treatment/disposal at an off-site treatment, storage, or disposal facility

- Wetlands Protection
- Institutional Controls
  - Existing zoning that prohibits residential use of Area 3 property and proposed deed restrictions that prohibit potable use of Area 3 groundwater and residential use of flood plain property
- Environmental Monitoring
  - Long-term groundwater monitoring
  - Long-term surface water monitoring
- Institutional Control Inspections
- Five-year Site Reviews

Soil Excavation and Treatment/disposal at an Off-site Treatment, Storage, or Disposal Facility. Alternative III-2a includes excavation of flood plain soil with elevated concentrations of organics that are believed to contribute to reducing (i.e., anaerobic) conditions and the release of naturally occurring arsenic to groundwater. In lieu of other site-specific data that relate concentrations of soil organics to arsenic in groundwater, this Record of Decision assumes that EPH C11-C22 aromatic range concentrations will be used as an indicator of organic concentrations. Because this alternative relies on institutional controls to achieve protection of human health under anticipated future land use scenarios, this Record of Decision does not identify PRGs or cleanup criteria for the soil removal. These criteria will be developed during the design phase of the remedy. It is anticipated that the excavation will occur in the floodplain around the southern edge of the 1999 soil excavation where concentrations of organics are believed to be greatest. Based on observations of an organic soil layer during the RI, excavation depths could average 3 ft. and cover an area similar to the area shown in Figure 9. This corresponds to an estimated in-place soil volume of 120 cy. The actual extent of excavation and volume of soil removed would depend on the criteria developed during remedy design. The excavated soil will be treated/disposed at an approved off-site treatment, storage, or disposal facility, or other approved facility, as appropriate.

An excavation work plan would be prepared to guide the excavation process; however, it is assumed that excavation would proceed with conventional construction equipment such as tracked excavators, front-end loaders, and dump trucks. It is also assumed that the extent of excavation would be guided using on-site field-screening methods and final cleanup confirmed using off-site analytical methods. The excavation plan would detail how large pieces of debris or rocks would be separated from soil, cleaned of soil, and reused or disposed. It would also address groundwater management issues associated with excavation activities.

Wetlands Protection. Wetlands protection activities would be performed as described for Alternative III-3.

Institutional Controls. Institutional controls would be implemented as described for Alternative III-2.

Environmental Monitoring. Environmental monitoring would consist of performing long-term groundwater and surface water sampling as described for Alternative III-2.

Institutional Control Inspections. Institutional control inspections would be performed as described for Alternative III-2.

Five-Year Site Reviews. Five-year site reviews would be performed as described for Alternative III-2.

Estimated Time for Design and Construction:	6 months
Estimated Time for Cleanup:	8 years
Estimated Capital Cost:	$80,699
Estimated Operation and Maintenance Cost (Present Worth*):	$229,122
Contingency	$77,455
Estimated Total Cost	$387,276

*Present worth based on 7 percent discount rate and environmental monitoring, institutional controls inspections, and five-year reviews for 30 years.

11.0 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 remedial action alternatives. Building upon these specific statutory mandates, the NCP articulates nine evaluation criteria to be used in assessing the individual remedial alternatives. The nine criteria are used to select a remedy that meets the goals of protecting human health and the environment, maintaining protection over time, and minimizing untreated waste.

Section 6.0 of the FS report provides a detailed analysis of the alternatives using the first seven of the nine evaluation criteria. Definitions of the nine criteria are provided below:

Threshold Criteria

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

- Overall Protection of Human Health and the Environment This criterion assesses whether a remedy will protect human health and the environment. This includes an assessment of how human-health and environmental risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

- Compliance with Applicable or Relevant and Appropriate Requirements This criterion assesses whether a remedy complies with all federal and state environmental and facility-siting laws and requirements that apply or are relevant and appropriate to the conditions and cleanup options at a specific site. If an alternative can not meet an ARAR, the analysis of the alternative must provide the rationale for invoking a statutory waiver.

Primary Balancing Criteria

The following five criteria are used to compare and evaluate the elements of alternatives that meet the threshold criteria.

- Long-Term Effectiveness and Permanence This criterion assesses the effectiveness of the alternative in protecting human health and the environment after response objectives have been

met. In addition, it includes consideration of the magnitude of residual risks and the adequacy and reliability of controls.

- Reduction of Toxicity, Mobility, or Volume Through Treatment This criterion evaluates the effectiveness of treatment processes used to reduce toxicity, mobility, or volume of hazardous substances. It also considers the degree to which treatment is irreversible, and the type and quantity of residuals remaining after treatment. SARA emphasizes that, whenever possible, a remedy should be selected that uses treatment to permanently reduce the toxicity of contaminants at the site, the spread of contaminants away from the source of contamination, and the volume or amount of contamination at the site.

- Short-Term Effectiveness This criterion evaluates the effectiveness of the alternative in protecting human health and the environment during the construction and implementation of a remedy until response objectives have been met. It considers the protection of the community, workers, and the environment during implementation of remedial actions.

- Implementability This criterion assesses the technical and administrative feasibility of an alternative and availability of required goods and services. Technical feasibility considers the ability to construct and operate a technology and its reliability, the ease of undertaking additional remedial actions, and the ability to monitor the effectiveness of a remedy. Administrative feasibility considers the ability to obtain approvals from other parties or agencies and extent of required coordination with other parties or agencies.

- Cost This criterion evaluates the capital and operation and maintenance costs of each alternative.

Modifying Criteria

The modifying criteria are used in the final evaluation of remedial alternatives, generally after the Army has received public comments on the FS and Proposed Plan.

- State Acceptance This criterion considers the state's preferences among or concerns about the alternatives, including comments on ARARs or the proposed use of waivers.

- Community Acceptance This criterion considers the community's preferences among or concerns about the alternatives.

Following the detailed analysis of each individual alternative, the Army performed a comparative analysis, focusing on the relative performance of each alternative with respect to the nine evaluation criteria. The purpose of the comparative analysis was to identify the advantages and disadvantages of the alternatives relative to one another and to aid in the eventual selection of a remedial alternative for soil at each AOC. Subsection 7.1 of the FS report presents the approach of the comparative analysis, and Subsections 7.2 and 7.3 of the FS report present the comparison of the alternatives for Areas 2 and 3, respectively.

11.1 SUMMARY COMPARISON OF AREA 2 ALTERNATIVES

The following subsections provide a summary of the comparative analysis of alternatives for AOC 57 Area 2.

11.1.1 Overall Protection of Human Health and the Environment

This criterion addresses how an alternative as a whole will protect human health and the environment. According to CERCLA, this criterion must be met for a remedial alternative to be chosen as a final site remedy.

The risk assessment of the RI did not identify any current human-health risk at AOC 57 Area 2, therefore Alternative II-1 is protective of human health under current conditions. However, Alternative II-1 does not provide any action to reduce or control possible future exposure to site-related COCs and therefore is not protective of human health. No ecological risks were identified, so Alternative II-1 is protective of the environment.

Alternatives II-2, II-3, and II-4 are all protective of human health and the environment. Alternative II-2 would establish institutional controls to limit possible future construction-worker exposure to flood plain soils, prohibit residential use of flood plain property, and limit future unrestricted resident exposure to groundwater. Alternative II-3 would protect possible future construction workers by removing/excavating flood plain soils with contaminants exceeding protective concentrations. Similar to Alternative II-2, Alternative II-3 would protect future unrestricted use residents from exposure to soil and groundwater by establishing institutional controls. Alternative II-4 would protect possible future construction worker and unrestricted residents from exposure to flood plain soil by removing/excavating soils with contaminants exceeding protective concentrations. Similar to Alternatives II-2 and II-3, Alternative II-4 would protect future unrestricted use residents from exposure to groundwater by establishing institutional controls. Because no ecological risks were identified, Alternatives II-2, II-3, and II-4 are all protective of the environment.

11.1.2 Compliance with Applicable or Relevant and Appropriate Requirements

CERCLA also requires that the selected alternative meet the criterion of compliance with ARARs, or obtain a waiver if the criterion can not be met, for a remedial alternative to be chosen as a final site remedy. Table 9 provides a comparison of ARARs among the alternatives evaluated for AOC 57 Area 2.

Location-Specific ARARs. Portions of AOC 57 Area 2 are located within flood-plain and wetland areas, therefore federal and state regulations pertaining to the protection of wetland and flood-plain areas are potential ARARs. Alternative II-1, because it provides no action, will not trigger any location-specific ARARs. Similarly, Alternative II-2, which entails only implementing institutional controls and monitoring, would not trigger location-specific ARARs. The soil removal activities that are part of Alternatives II-3 and II-4 would need to meet federal and state ARARs pertaining to the protection of wetlands and flood plains. Protection of endangered species may also need to be considered during the design and implementation of both these alternatives.

Chemical-Specific ARARs. Chemical-specific ARARs for AOC 57 Area 2 include MCLs, MMCLs, and the Massachusetts Groundwater Quality Criteria for arsenic and PCE. Chemical-specific ARARs would not be met by any of the alternatives in the short-term, but would be met by natural processes in the long-term. All the alternatives rely on the benefits of the former soil removal action that removed groundwater contaminant sources and groundwater diffusion and dispersion to meet chemical-specific ARARs within the two monitoring wells where ARARs have been marginally or sporadically exceeded. Alternative II-1 would not implement environmental monitoring to measure changes in contaminant concentrations; therefore, attainment of ARARs would not be confirmed. Alternatives II-2, II-3, and II-4 would use environmental monitoring to evaluate long-term effectiveness and the potential for COC migration off-site.

No chemical-specific ARARs were identified for soil.

Action-Specific ARARs. Alternative II-1, No Action, and Alternative II-2, which entails only implementing institutional controls and monitoring, would not trigger action-specific ARARs. Alternatives II-3 and II-4 would need to meet action-specific ARARs because of the soil excavation component. Federal and state regulations pertaining to the handling, transportation, and disposal of solid and hazardous wastes would be triggered because of the soil removal activities performed as a component of Alternative II-3. Construction activities would also be controlled to meet federal and state regulations pertaining to the control of surface water runoff, and protection of surface water and air quality.

11.1.3 Long-term Effectiveness and Permanence

This criterion assesses the effectiveness of the alternative in protecting human health and the environment after response objectives have been met. Also considered are the magnitude of residual risk and the reliability of controls. Alternative II-1 does not provide any long-term or permanent measures for protecting possible future construction worker from exposure to flood plain soil or unrestricted use residents from exposure to flood plain soil and groundwater at AOC 57 Area 2. Alternative II-2 relies on institutional controls to prevent human receptor exposure to soils and groundwater containing COCs that exceed PRGs. The long-term effectiveness of these controls depends on how well future property owners adhere to the controls and how well federal, state, and local governments enforce the controls. It is anticipated that these controls would be relatively easy to maintain to ensure long-term effectiveness given that the property is adjacent to and within a wetland area and is zoned for open space and recreational use.

Alternatives II-3 would effectively and permanently minimize risk to the possible future construction workers by excavating flood plain soil with contaminants exceeding concentrations protective of the workers. However, because COCs that exceed unrestricted-use PRGs would remain on-site, Alternative II-3 relies on existing institutional controls to prevent unrestricted residential exposure to flood plain soil. These controls would be relatively easy to maintain to ensure long-term effectiveness given that the property is adjacent to and within a wetland area and is zoned for open space and recreational use. The excavation component of Alternative II-4 would remove COCs that exceed both future construction worker and unrestricted resident use PRGs and would effectively and permanently minimize risk to the construction worker and residential receptors from exposure to contaminated soils, without reliance on institutional controls.

Groundwater quality is expected to continue to improve at the site as a result of the former soil removal action at the source area, and as a result of additional soil removal as part of Alternatives II-3 and II-4. PRGs (currently exceeded in only two groundwater monitoring wells) will eventually be achieved through diffusion and dispersion processes (arsenic and PCE) and to a limited extent by volatilization and biodegradation processes (PCE). None of the alternatives for Area 2 provide active controls to reduce concentrations of COCs in groundwater. However, Alternative II-2, II-3, and II-4 provide institutional controls to prohibit potable use of groundwater and to perform long-term environmental monitoring to assess the effectiveness and permanence of groundwater cleanup. Alternative II-1 does not provide institutional controls to prohibit potable use of groundwater, or to perform monitoring to assess the effectiveness and permanence of groundwater cleanup. As is the case for the soil institutional controls, the long-term effectiveness of groundwater institutional controls depends on how well future property owners adhere to the controls and how well federal, state, and local governments enforce the controls. It is anticipated that these controls would be relatively easy to maintain to ensure long-term effectiveness given that the property is adjacent to and within a wetland area and is zoned for open space and recreational use.

Overall, the degree of effectiveness and permanence increases for each alternative (i.e., Alternative II-1<Alternative II-2<Alternative II-3<Alternative II-4) because of the decreasing need to depend on institutional control enforcement.

11.1.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

This criterion evaluates how well the alternatives meet the statutory preference under CERCLA for treatment that reduces the toxicity, mobility, or volume of contaminants. It also considers the type and quantity of treatment residuals.

Alternatives II-1 and II-2 do not employ active removal or treatment processes to address soil contamination, and therefore would not satisfy CERCLA's statutory preference for treatment as a principal component for soil remedial action. Alternatives II-3 and II-4 both employ active removal processes and treatment/disposal at an off-site treatment, storage, or disposal facility to address soil contamination and therefore satisfy CERCLA's statutory preference for treatment. Because the volume of soil to be excavated and treated as part of Alternative II-4 is greater than in Alternative II-3, would, Alternative II-4 provides the greatest degree of reduction of toxicity, mobility, and volume through treatment.

All the alternatives rely, to equal extents, on the completed upland soil removal action and natural groundwater processes of diffusion, dispersion, volatilization, and biodegradation to restore groundwater quality to upgradient conditions. Regaining upgradient groundwater quality will decrease the solubility of naturally occurring arsenic, the major risk contributor in groundwater at the site.

11.1.5 Short-term Effectiveness

CERCLA requires that potential adverse short-term effects to cleanup workers, the surrounding community, and the environment be considered during selection of a remedial action. Alternative II-2 provides the least adverse short-term effects of all the alternatives. Alternative II-2 includes applying institutional controls to minimize human exposure to site soils. Because this alternative does not provide

active or intrusive remedial actions, this alternative would not pose a significant risk to the community, site workers, or the environment during implementation. Alternative II-1 does not provide any remedial actions; therefore, short-term risks to the community or environment would not result from implementation. However, soil exposure would not be restricted, and therefore, this alternative would not provide any short-term protection should construction work or residential development be permitted in the Area 2 flood plain.

Alternatives II-3 and II-4 both include excavation of site soils as a component, which increases the potential risks to cleanup workers. Personal protective equipment and engineering controls (dust control) would be required to minimize risk to workers and exposure to downwind receptors. Soils would be transported to the treatment, storage, or disposal facility following federal and state regulations. Both Alternative II-3 and Alternative II-4 would have adverse short-term impacts on wetlands; however, these adverse effects would be greater for Alternative II-4 because of the larger area that would be excavated.

All alternatives, except Alternative II-1, include performing long-term environmental monitoring and implementing deed restrictions to prohibit residential use of flood plain property and potable use of groundwater. If properly implemented and enforced, these actions will protect site workers and the community until PRGs in groundwater are achieved. Qualitatively, it is possible that groundwater PRGs may be achieved the earliest with Alternative II-4, given that this alternative includes removal of the greatest volume of soil.

11.1.6 Implementability

This criterion evaluates each alternative's ease of construction and operation, and availability of services, equipment, and materials to construct and operate the alternative. Also evaluated is the ease of undertaking additional remedial actions and administrative feasibility.

Although the engineering/implementation complexity increases for each alternative (i.e., Alternative II-1 < Alternative II-2 < Alternative II-3 < Alternative II-4), engineering and construction services, equipment, and materials are readily available to implement any of the alternatives. Alternative II-1 requires no remedial action. Alternative II-2 requires only the implementation of institutional controls. Alternatives II-3 and II-4 are each incrementally greater in complexity and wetland disruption because of additional soil excavation.

None of the alternatives would limit or interfere with the ability to perform future remedial actions.

11.1.7 Cost

Cost includes the capital (up-front) cost of implementing an alternative and the long-term cost of operating and maintaining the alternative. To facilitate the comparison of costs among alternatives, both operation and maintenance cost and total cost are typically expressed as net present worth (i.e., the amount of money that would need to be invested at a specific interest or discount rate now to pay future costs).

A comparison of the estimated total present worth costs (based on a 7 percent discount rate over 30 years) for each alternative evaluated in detail is presented in the following table. Capital, operation and

maintenance, and present worth costs for each alternative were calculated with an estimated accuracy of -30 percent to +50 percent.

Alternative	Capital Cost	O&M Cost (net present worth)	Contingency	Total Cost (net present worth)
Alternative II-1	$0	$0	$0	$0
Alternative II-2	$16,250	$178,914	$48,791	$243,955
Alternative II-3	$348,645	$185,064	$133,427	$667,137
Alternative II-4	$871,882	$185,064	$264,237	$1,321,183

There are no costs associated with Alternative II-1. O&M costs for Alternatives II-2 through II-4 are approximately equal; however, capital costs increase significantly as excavation and treatment volumes increase. Total estimated costs for Alternative II-4 at $1,321,183 are approximately five times greater than costs for Alternative II-2 ($243,955) and two times greater than costs for Alternative II-3 ($667,137).

Further comparison of the total costs shows that the benefit of achieving possible future-use PRGs in soil (difference between Alternatives II-2 and II-3), costs approximately $423,000 while the benefit of achieving unrestricted use PRGs in soil (difference between Alternatives II-2 and Alternative II-4) costs approximately $1,077,000.

11.1.8 State Acceptance

This criterion addresses whether, based on its review of the RI, FS, and proposed plan, the state concurs with, opposes, or has no comment on the alternative the Army is proposing as the remedy for AOC 57 Area 2. The Commonwealth of Massachusetts has reviewed the RI, FS, proposed plan, and this Record of Decision and concurs with the selected remedy.

11.1.9 Community Acceptance

The Army received verbal comments from five people during the public hearing on March 8, 2001, and written comments from 14 people during the public comment period (see Appendix C). A common thread of the comments was the desire to achieve groundwater cleanup goals in as short a time as possible. The Army believes that the Feasibility Study Report estimate of 1 to 2 years for Alternative II-3 to attain the arsenic drinking water standard at Area 2 following proposed soil removal is consistent with the goal of achieving cleanup goals in as short a time as possible.

A second common thread was the desire to cleanup AOC 57 such that it would be suitable for unrestricted (i.e., residential) use. Residential use is not planned or anticipated for Area 2 at AOC 57. Furthermore, wetland conditions and existing zoning both serve to prevent residential use. The Army believes that implementation of institutional controls (e.g., restrictive deed covenants prohibiting potable use of groundwater) in Alternative II-3, combined with existing zoning, will protect human health and the environment under both current and reasonable future land use conditions.

11.2 Summary Comparison of Area 3 Alternatives

The following subsections provide a summary of the comparative analysis of alternatives for AOC 57 Area 3.

11.2.1 Overall Protection of Human Health and the Environment

This criterion addresses how an alternative as a whole will protect human health and the environment. According to CERCLA, this criterion must be met for a remedial alternative to be chosen as a final site remedy.

The risk assessment of the RI did not identify any current human-health risk at AOC 57 Area 3; therefore, Alternative III-1 is protective of human health under current conditions. However, Alternative III-1 does not provide any action to reduce or control possible future exposure to site-related COCs in soil and groundwater and therefore is not protective of human health. No ecological risks were identified, so Alternative III-1 is protective of the environment.

Alternatives III-2, III-3, and III-2a are protective of human health and the environment. Alternative III-2 would establish institutional controls to prevent future commercial-worker exposure to upland groundwater, unrestricted residential exposure to upland and flood plain groundwater, and residential exposure to flood plain soil. Alternative III-3 would protect future unrestricted use residents from exposure to flood plain soil by removing/excavating soils with contaminants exceeding protective concentrations. The excavation proposed in Alternative III-2a would accelerate groundwater cleanup and rely on institutional controls to protect future unrestricted use residents from direct contact soil exposure. Similar to Alternative III-2, Alternatives III-3 and III-2a would protect possible future commercial workers and unrestricted use residents from exposure to groundwater by establishing institutional controls. Because no ecological risks were identified, Alternatives III-2 and III-3 are both protective of the environment.

11.2.2 Compliance with Applicable or Relevant and Appropriate Requirements

CERCLA also requires that the selected alternative meet the criterion of compliance with ARARs, or obtain a waiver if the criterion can not be met, for a remedial alternative to be chosen as a final site remedy. Table 10 provides a comparison of ARARs among the alternatives evaluated for AOC 57 Area 3.

Location-Specific ARARs. Portions of AOC 57 Area 3 are located within flood-plain and wetland areas, therefore federal and state regulations pertaining to the protection of wetland and flood-plain areas are potential ARARs. Alternative III-1, because it provides no action, will not trigger any location-specific ARARs. Similarly, Alternative III-2, which entails only implementing institutional controls and monitoring, would not trigger location-specific ARARs. The soil removal activities that are part of Alternatives III-3 and III-2a would need to meet federal and state ARARs pertaining to the protection of wetlands and flood plains. Protection of endangered species may also need to be considered during the design and implementation of this alternative.

Chemical-Specific ARARs. Chemical-specific ARARs for AOC 57 Area 3 include MCLs, MMCLs, and the Massachusetts Groundwater Quality Criteria for 1,4-DCB and PCE. Chemical-specific ARARs

would not be met by any of the alternatives in the short-term, but would be met by natural processes in the long-term. All the alternatives rely on the benefits of the former soil removal action that removed groundwater contaminant sources and groundwater diffusion and dispersion to meet chemical-specific ARARs. Alternative III-1 would not implement environmental monitoring to measure changes in contaminant concentrations; therefore, attainment of ARARs would not be confirmed. Alternatives III-2, III-3, and III-2a would use environmental monitoring to evaluate long-term effectiveness and the potential for COC migration off-site.

No chemical-specific ARARs were identified for soil.

Action-Specific ARARs. Alternative III-1, No Action, and Alternative III-2, which entails only implementing institutional controls and monitoring, would not trigger action-specific ARARs. Alternatives III-3 and III-2a would need to meet action-specific ARARs because of the soil excavation component. Federal and state regulations pertaining to the handling, transportation, and disposal of solid and hazardous wastes would be triggered because of the soil removal activities performed as a component of Alternatives III-3 and III-2a. Construction activities would also be controlled to meet federal and state regulations pertaining to the control of surface water runoff, and protection of surface water and air quality.

11.2.3 Long-term Effectiveness and Permanence

This criterion assesses the effectiveness of the alternative in protecting human health and the environment after response objectives have been met. Also considered are the magnitude of residual risk and the reliability of controls. Alternative III-1 does not provide any long-term or permanent measures for protecting possible future commercial workers or unrestricted use residents from exposure to upland groundwater or for protecting unrestricted use residents from exposure to flood plain soil and groundwater at AOC 57 Area 3. Alternative III-2 relies on institutional controls for protecting possible future commercial workers and unrestricted use residents from exposure to upland groundwater and for protecting unrestricted use residents from exposure to flood plain soil and groundwater at AOC 57 Area 3. The long-term effectiveness of these controls depends on how well future property owners adhere to the controls and how well federal, state, and local governments enforce the controls.

Alternatives III-3 and III-2a would effectively and permanently minimize risk to the unrestricted use residents by excavating flood plain soil with contaminants exceeding protective concentrations. However, Alternatives III-3 and III-2a rely on the same institutional controls as Alternative III-2 to protect possible future commercial workers and unrestricted use residents from exposure to upland groundwater and for protecting unrestricted use residents from exposure to flood plain groundwater at AOC 57 Area 3.

Groundwater quality is expected to continue to improve at the site as a result of the former soil removal action at the source area, and as a result of additional soil removal proposed as part of Alternatives III-3 and III-2a. None of the alternatives for Area 3 provide active controls to reduce concentrations of COCs in groundwater. However, Alternatives III-2, III-3, and III-2a provide institutional controls to prohibit potable use of groundwater and to perform long-term environmental monitoring to assess the effectiveness and permanence of groundwater cleanup.

Overall, the effectiveness and permanence for Alternatives III-3 and III-2a are considered equal, but greater than that of Alternative III-2, which are greater than for Alternative III-1.

11.2.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

This criterion evaluates how well the alternatives meet the statutory preference under CERCLA for treatment that reduces the toxicity, mobility, or volume of contaminants. It also considers the type and quantity of treatment residuals.

Alternatives III-1 and III-2 do not employ active removal or treatment processes to address soil contamination and therefore would not satisfy CERCLA's statutory preference for treatment as a principal component for soil remedial action. Alternatives III-3 and III-2a would use active removal processes and treatment/disposal at an off-site treatment, storage, or disposal facility to address soil contamination and therefore would satisfy CERCLA's statutory preference for treatment.

All the alternatives rely, to equal extents, on the completed upland soil removal action and natural groundwater processes of diffusion, dispersion, volatilization, and biodegradation to restore groundwater water quality to upgradient conditions. Regaining upgradient groundwater quality will decrease the solubility of naturally occurring arsenic, the major risk contributor in groundwater at the site.

11.2.5 Short-term Effectiveness

CERCLA requires that potential adverse short-term effects to cleanup workers, the surrounding community, and the environment be considered during selection of a remedial action. Alternative III-2 provides the least adverse short-term effects of all the alternatives. Alternative III-2 includes applying institutional controls to minimize human exposure to site soils. Because this alternative does not provide active or intrusive remedial actions, this alternative would not pose a significant risk to the community, site workers, or the environment during implementation. Alternative III-1 does not provide any remedial actions; therefore, short-term risks to the community or environment would not result from implementation. However, soil exposure would not be restricted, and, therefore, this alternative would not provide any short-term protection should construction work or residential development be permitted in the Area 3 flood plain.

Alternatives III-3 and III-2a include excavation of site soils as a component, which increases the potential risks to cleanup workers. Personal protective equipment and engineering controls (dust control) would be required to minimize risk to workers and exposure to downwind receptors. Soils would be transported to the treatment, storage, or disposal facility following federal and state regulations. Alternatives III-3 and III-2a have potential adverse short-term impacts on wetlands, while Alternatives III-1 and III-2 do not.

Alternatives III-2, III-3, and III-2a include performing long-term environmental monitoring and implementing deed restrictions to prohibit residential use of flood plain property and potable use of groundwater. If properly implemented and enforced these actions will protect site workers and the community until PRGs in groundwater are achieved.

11.2.6 Implementability

This criterion evaluates each alternative's ease of construction and operation, and availability of services, equipment, and materials to construct and operate the alternative. Also evaluated is the ease of undertaking additional remedial actions and administrative feasibility.

Although the engineering/implementation complexity increases for each alternative, (i.e., Alternative III-2a = Alternative III-3 > Alternative III-2 > Alternative III-1), engineering and construction services, equipment, and materials are readily available to implement any of the alternatives. Alternative III-1 requires no remedial action. Alternative III-2 requires only the implementation of institutional controls. Alternatives III-3 and III-2a have the greatest complexity and wetland disruption because of soil excavation.

None of the alternatives would limit or interfere with the ability to perform future remedial actions.

11.2.7 Cost

Cost includes the capital (up-front) cost of implementing an alternative and the long-term cost of operating and maintaining the alternative. To facilitate the comparison of costs among alternatives, both operation and maintenance cost and total cost are typically expressed as net present worth (i.e., the amount of money that would need to be invested at a specific interest or discount rate now to pay future costs).

A comparison of the estimated total present worth costs (based on a 7 percent discount rate over 30 years) for each alternative evaluated in detail is presented in the following table. Capital, operation and maintenance, and present worth costs for each alternative were calculated with an estimated accuracy of -30 percent to +50 percent.

Alternative	Capital Cost	O&M Cost (net present worth)	Contingency	Total Cost (net present worth)
Alternative III-1	$0	$0	$0	$0
Alternative III-2	$15,750	$222,972	$59,681	$298,403
Alternative III-3	$80,699	$229,122	$77,455	$387,276
Alternative III-2a	$80,699	$229,122	$77,455	$387,276

There are no costs associated with Alternative III-1. O&M costs for Alternatives III-2, III-3, and III-2a are approximately equal. However, capital costs increase significantly in Alternatives III-3 and III-2a because of soil excavation and treatment. Total estimated costs for Alternatives III-3 and III-2a are about 1.3 times greater than costs for Alternative III-2.

Further comparison of the total costs shows that the benefit of achieving unrestricted residential use PRGs in soil (difference between Alternatives III-2 and III-3) costs approximately $89,000.

11.2.8 State Acceptance

This criterion addresses whether, based on its review of the RI, FS, and proposed plan, the state concurs with, opposes, or has no comment on the alternative the Army is proposing as the remedy for AOC 57 Area 3. The Commonwealth of Massachusetts has reviewed the RI, FS, proposed plan, and this Record of Decision and concurs with the selected remedy.

11.2.9 Community Acceptance

The Army received verbal comments from five people during the public hearing on March 8, 2001, and written comments from 14 people during the public comment period (see Appendix C). A common thread of the comments was the desire to achieve groundwater cleanup goals in as short a time as possible. The Feasibility Study Report estimated a range of 1 to 8 years for Alternative III-2 to attain the arsenic drinking water standard at Area 3. A second common thread was the desire to cleanup AOC 57 such that it would be suitable for unrestricted (i.e., residential) use.

Following review of the comments, the Army has decided it is appropriate to remove additional contaminated soil at Area 3 to accelerate the groundwater cleanup process. As discussed in this section and in Section 12.2, a new alternative, Alternative III-2a, which adds soil removal to Alternative III-2, has been developed and selected for AOC 57 Area 3.

Residential use is not planned or anticipated for AOC 57 Area 3. Furthermore, wetland conditions and existing zoning both serve to prevent residential use. The Army believes that implementation of institutional controls (e.g., restrictive deed covenants to prohibit residential use of property and potable use of groundwater) as proposed in Alternatives III-2 and III-2a, combined with existing zoning, will protect human health and the environment under both current and reasonable future land use conditions.

12.0 THE SELECTED REMEDY

The selected remedy for AOC 57 Area 2 is Alternative II-3: Excavation (For Possible Future Use) and Institutional Controls, and the selected remedy for AOC 57 Area 3 is Alternative III-2a: Excavation (to Accelerate Groundwater Cleanup) and Institutional Controls. The following sections summarize the selection rational and a description of remedial components, cost, and expected outcome for each alternative. Changes in the selected remedies may occur a result of new information and data collected during the design of the alternative. Major changes will be documented in the form of a memorandum in the Administrative Record, an Explanation of Significant Changes, or an amendment to this Record of Decision, as appropriate.

12.1 DESCRIPTION OF REMEDY FOR AOC 57 AREA 2

This subsection provides a summary of the rationale for selecting Alternative II-3, describes the alternative and its costs, and describes the outcomes expected as a result of implementing the alternative.

12.1.1 Summary of the Rational for Selection of Alternative II-3

The Army believes Alternative II-3 provides the best balance among the candidate alternatives for Area 2. Alternatives II-3 is protective of human health under current and anticipated future land use scenarios. Existing and proposed institutional controls will prevent unrestricted use. It is also protective of the environment and attains ARARs. Alternative II-3 offers improved long-term effectiveness when compared to Alternative II-2, and has fewer short-term impacts and risks than Alternative II-4. The alternative is readily implementable at a reasonable cost.

12.1.2 Description of Alternative II-3

Alternative II-3 contains components to reduce potential human-health risks associated with contaminated soil and groundwater at the Area 2 flood plain. Key components of Alternative II-2 consist of following:

- Soil Excavation and treatment/disposal at an off-site treatment, storage, or disposal facility
- Wetlands Protection
- Institutional Controls
  - Existing zoning that prohibits residential use of Area 2 property and proposed deed restrictions that prohibit potable use of Area 2 groundwater and residential use of flood plain property
- Environmental Monitoring
  - Long-term groundwater monitoring
  - Long-term surface water monitoring
- Institutional Control Inspections
- Five-year Site Reviews

Soil Excavation and Treatment/disposal at an Off-site Treatment, Storage, or Disposal Facility. Alternative II-3 includes excavation of flood plain soils with Aroclor-1260 and lead concentrations in excess of PRGs that are considered protective of possible future-use construction workers. The estimated areal extent of soil contamination to be excavated is shown in Figure 10 based on observed PRG exceedances. Based upon the depth of an organic soil layer observed during the RI, the estimated average depth of contaminated soil is 4 ft. bgs. The in-place volume of soil to be excavated is estimated to be approximately 640 cy. The actual extent of excavation and volume of soil removed will depend on the extent of PRG exceedances identified by field screening during excavation. The excavated soil will be treated/disposed at an approved off-site treatment, storage, or disposal facility, or other approved facility as appropriate.

An excavation work plan will be prepared to guide the excavation process; however, the FS assumption of excavation using conventional construction equipment such as tracked excavators, front-end loaders, and dump trucks will likely hold true. It is also assumed that the extent of excavation will be guided using on-site field-screening methods and final cleanup confirmed using off-site analytical methods. The excavation plan will detail how large pieces of debris or rocks will be separated from soil, cleaned of soil, and reused or disposed. It will also address groundwater management issues associated with excavation activities. Assumptions used in preparation of the FS report are described in Subsection 6.1.3.7 of that document.

Wetlands Protection. Soil excavation for Alternative II-3 will be within the 100-year flood plain (228 ft. msl) and possibly will be within the delineated bordering vegetated wetland based on a 1993 wetlands delineation (see Figure 10). Therefore, wetland protection will likely be required as a result of potential excavation activities. Protection will be provided in accordance with the Massachusetts Wetland Protection Act and Regulations at 310 CMR 10.55.

Prior to any excavation activities, a new wetlands delineation will be performed at Area 2. If the proposed construction area is confirmed to be within delineated vegetated wetlands, a pre-construction mitigation study will be performed to determine the impact to the affected area and the compensatory mitigation required as a result of the excavation activities. Once the extent of anticipated impacts is known, a mitigation/restoration plan will be prepared for regulatory agency review and concurrence.

The primary goal of wetland restoration activities will be to restore fresh-water wetlands within the excavation area which are disturbed during remedial actions. The surface area of the restored wetland will be equal to or greater than that of the altered wetland. Depending on federal and state regulatory guidance, as well as financial and temporal considerations, a number of diverse approaches exist to restore self-sustaining wetlands. At a minimum, wetland restoration will include backfilling with suitable material to achieve desired grade and controlling erosion and siltation. During construction, erosion control measures such as soil berms, silt fencing, and hay bales will be used to protect against erosion and siltation within the flood-plain area. Compensatory mitigation and monitoring will be implemented according to the mitigation plan. A wetland scientist will monitor wetland restoration for a period of five years, beginning the year after the wetland creation.

Institutional Controls. The presence of flood plain and wetland conditions and existing zoning currently prevents residential use of the area and potential residential exposure to contaminated soil and groundwater. Upland portions of AOC 57 are zoned for zoned for Rail, Industrial, and Trade Related use while flood plain portions of AOC 57 are zoned for Open Space and Recreation (Vanasse Hangen Brustlin, 1994a and 1994b). Residential construction is not permitted under those designations.

Groundwater beneath upland areas at Area 2 already meets groundwater cleanup levels; however, because the zone of influence of an upland well could draw contaminated groundwater from nearby wetland/flood-plain areas, use of upland groundwater as potable water prior to attaining cleanup levels in wetland/flood-plain areas would require careful evaluation. Because of the potential for Area 2 upland wells to be influenced by flood plain groundwater, potable use of Area 2 upland groundwater would also be prohibited.

In the event of future property transfer, the Army will include deed covenants to prohibit potable use of Area 2 groundwater and unrestricted use of flood plain property. All institutional controls will be stated in full or by reference within deeds, easements, mortgages, leases, or other instruments of property transfer. These controls will be drafted, implemented and enforced in cooperation with federal, state, and local governments. These covenants will be maintained as long as soil and groundwater contaminants remained at concentrations above cleanup levels. If future land use at AOC 57 is inconsistent with these institutional controls, then the site exposure scenarios for human health and the environment would be re-evaluated to assess whether this response action remains appropriate.

Environmental Monitoring. Environmental monitoring will consist of performing long-term groundwater and surface water sampling. Long-term groundwater sampling will be performed to assess for groundwater COC (arsenic and PCE) migration and to monitor for the decrease of the groundwater COCs to concentrations that are protective of residential receptors.

Surface water sampling will be a component of environmental sampling to assess for off-site migration of human-health COCs in excess of PRGs via the groundwater to surface water pathway. The purpose of the surface water sampling will not be to collect additional ecological risk assessment data.

Sampling frequency, location, analytes, sampling procedures, and action levels for environmental monitoring will be detailed in a LTMP and submitted to USEPA and MADEP for review and concurrence prior to implementing the environmental monitoring component of this alternative. Following attainment of groundwater cleanup levels, monitoring will be discontinued in accordance with the time frame specified in the LTMP.

Institutional Control Inspections. The Army will prepare and submit an Institutional Control Monitoring Plan for regulatory agency review and concurrence as part of the site LTMP to detail the institutional controls to be incorporated/referenced within instruments of property transfer and ensure that the institutional control requirements are met. The plan will include a checklist of elements to be assessed during regularly scheduled on-site inspections and interviews with the site property owner, manager, or designee. If future land use at AOC 57 is inconsistent with these institutional controls, then the site exposure scenarios for human health and the environment will be re-evaluated to assess whether this response action is appropriate.

Five-Year Site Reviews. Section 121c of CERCLA and NCP§300.430(f)(4)(ii) require that if a remedial action results in contaminants remaining on-site above concentrations that allow unrestricted and unlimited use, the lead agency must review the action at least every five years. During five-year site reviews, an assessment is made of whether the implemented remedy continues to be protective of human health and the environment or whether the implementation of additional remedial action is appropriate. Because Alternative II-3 will result in contaminants remaining on site above concentrations allowing unrestricted use and to the extent required by law, the Army will review the site at least once every five years to ensure that the remedial action remains protective of human health and the environment. Five-year reviews will be performed as long as hazardous substances, pollutants, or contaminants remain on-site above concentrations that allow for unrestricted exposure and unlimited use.

12.1.3 Summary of Costs for Alternative II-3

Table 11 contains a summary of estimated costs for implementing Alternative II-3. The estimate is based on the best available information regarding the anticipated scope of the remedial alternative; however, changes in cost elements may occur as a result of new information and data collected during design of the alternative. This is an engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost. Additional detail on the cost estimate is provided in the FS.

Cost Estimate Assumptions. The following assumptions were used in estimating the baseline cost:

- Predesign sampling within the former excavation area will consist of collecting approximately 36 soil samples with a Geoprobe and analyzing the samples for the COCs.
- Excavating approximately 640 cy (1,152) tons of soil. The soil volume estimated to be excavated at Area 2 is based on the assumption that the COCs detected within the former excavation area will be below the PRGs.
- Disposing of approximately ¼ of the excavated soil as a hazardous waste and disposing ¾ of the excavated soil as MA99 waste under a MADEP Bill of Lading.
- The lined stockpile/dewatering area will be approximately 50 by 100 ft.
- Water in the excavation and leachate from the stockpiles will be collected and treated off-site.
- Using on-site field-screening methods to guide the extent of excavation, specifically USEPA Method 4020 immuno-assay testing for PCBs and x-ray fluorescence for lead.
- Collecting approximately 27 confirmation samples (one sample per 900 sq. ft. of floor area and one sample per 30 ft. of wall length) for off-site analysis.
- Off-site analytical costs are based on 3-day turn-around-time for USEPA Methods 6010 and 8082 for lead and PCBs, respectively.
- There will be minimal difficulty in implementing deed restrictions.
- Performing institutional control inspections once per year.
- Performing environmental sampling twice per year for the first three years and once per year thereafter. Environmental sampling will be terminated upon obtaining groundwater PRG concentrations for three consecutive sampling events.
- Collecting groundwater samples at five existing monitoring wells using low-flow sampling techniques.
- Collecting surface water samples from four locations in Cold Spring Brook.
- Analyzing groundwater and surface water samples for arsenic and PCE (VOCs by USEPA Method 8260). Both filtered and unfiltered samples will be collected for arsenic.
- Collecting QC samples at a frequency of one per ten regular samples (ten percent).

Cost-sensitivity Analysis. The greatest uncertainty in the cost estimate pertains to the duration that long-term environmental monitoring and groundwater-use deed restrictions will need to be maintained. To assess the effect of this uncertainty, costs for this alternative were evaluated for a 3-year and a 30-year environmental monitoring duration. A second significant uncertainty pertains to the volume of soil that will require excavation to achieve possible future-use PRGs, specifically in regard to excavation depth. If the average depth of excavation of the area varies by +/- 1 ft., the total volume excavated will change by +/- 25 percent, thereby affecting soil excavation, transportation, and disposal costs.

Decreasing the environmental sampling duration from 30 to 3 years decreases the total O&M present worth cost by approximately 44 percent, while varying the quantity of soil excavated by +/- 25 percent, changes the total capital cost by approximately 12 percent. The low range costs (25 percent less soil excavated and 3 years of environmental monitoring) and high range costs (25 percent greater soil excavated and 30-year cleanup duration) are presented in Table 11. Low-range and high-range costs ($515,000 and $719,000, respectively) varied from the baseline present worth cost by approximately 23 percent and 8 percent, respectively.

Additional discussion of cost uncertainty is contained in Section 6.0 of the FS report.

12.1.4 Expected Outcome of Alternative II-3

This section presents the expected outcome of Alternative II-3 in terms of land and groundwater use and risk reduction as result of the response action. Five general categories of outcome are discussed:

- Final cleanup levels and basis
- Available uses of land upon achieving soil cleanup levels
- Available uses of groundwater upon achieving cleanup levels
- Anticipated socio-economic and community revitalization effects
- Anticipated environmental and ecological benefits

Final cleanup levels and basis. The purpose of this response action is to control risks posed by direct contact with soil and groundwater. The results of the baseline risk assessment indicate that existing contaminant concentrations in soil pose noncancer risks exceeding an HI of 1 to possible future use construction workers and unrestricted use residents. Contaminants in groundwater pose excess lifetime cancer risks exceeding the target risk range of $1x10^{-4}$ to $1x10^{-6}$ and an HI of 1 to future unrestricted use residents (see Tables 2 and 5).

Table 12 identifies cleanup levels by media for COCs at AOC 57 Area 2.

Available Uses of Land Upon Achieving Soil Cleanup Levels. Upon achieving soil cleanup levels, upland areas at Area 2 (i.e., areas with elevation greater than 228 ft. msl) will be suitable for commercial/industrial development or, in the absence of existing zoning, unrestricted use. Wetland/flood-plain areas (i.e., areas with elevation less than 228 ft. msl) at Area 2 will be suitable for construction of designated trails for passive recreational use (e.g., bird watching). Wetland/flood-plain soils will remain unsuitable for unrestricted (residential) use. The length of time to achieve soil cleanup goal is estimated to be 6 months.

Available Uses of Groundwater Upon Achieving Cleanup Levels. Groundwater beneath upland areas at Area 2 already meets groundwater cleanup levels; however, because the zone of influence of an upland well could draw contaminated groundwater from nearby wetland/flood-plain areas, use of upland groundwater as potable water prior to attaining cleanup levels in wetland/flood-plain areas would require careful evaluation. The Feasibility Study estimated that 1 to 2 years beyond the completion of excavation may be required for groundwater beneath wetland/flood-plain areas to attain cleanup levels. Upon achieving cleanup levels, groundwater will be suitable for potable water use.

Anticipated Socio-economic and Community Revitalization Effects. Implementation of Alternative II-3 will allow use of AOC 57 Area 2 in a manner that is consistent with current long-term plans for commercial/industrial use of the upland and open-space/recreational use of the wetland/flood-plain.

Anticipated Environmental and Ecological Benefits. Adverse environmental and ecological effects are not anticipated if Alternative II-3 is not implemented. Beneficial environmental and ecological effects are not anticipated if Alternative II-3 is implemented.

12.2 DESCRIPTION OF REMEDY FOR AOC 57 AREA 3

This subsection provides a summary of the rationale for selecting Alternative III-2a: Excavation (to Accelerate Groundwater Cleanup) and Institutional Controls, describes the alternative and its costs, and describes the outcomes expected as a result of implementing the alternative.

12.2.1 Summary of the Rational for Selection of Alternative III-2a

The Army believes Alternative III-2a provides the best balance among the candidate alternatives for Area 3. Alternatives III-2a is protective of human health under current and anticipated future land use scenarios. Existing and proposed institutional controls will prevent unrestricted use. It is also protective of the environment and attains ARARs. Alternative III-2a offers improved long-term effectiveness when compared to Alternatives III-1 and III-2. It has short-term impacts and risks greater than Alternatives III-1 and III-2, and similar to those of Alternative III-3. The alternative is readily implementable at a reasonable cost.

12.2.2 Description of Alternative III-2a

Alternative III-2a: Excavation (to Accelerate Groundwater Cleanup) and Institutional Controls contains components to reduce potential human-health risks associated with exposure to contaminated soil (flood plain) and groundwater (upland and flood plain) at the Area 3. It contains all the elements of Alternative III-2, plus soil removal to accelerate groundwater cleanup. Key components of Alternative III-2a consist of following:

- Soil Excavation and treatment/disposal at an off-site treatment, storage, or disposal facility
- Wetlands Protection
- Institutional Controls
  - Existing zoning that prohibits residential use of Area 3 property and proposed deed restrictions that prohibit potable use of Area 3 groundwater and residential use of flood plain property
- Environmental Monitoring
  - Long-term groundwater monitoring
  - Long-term surface water monitoring
- Institutional Control Inspections
- Five-year Site Reviews

Soil Excavation and Treatment/disposal at an Off-site Treatment, Storage, or Disposal Facility. Alternative III-2a includes excavation of flood plain soil with elevated concentrations of organics that are believed to contribute to reducing (i.e., anaerobic) conditions and the release of naturally occurring arsenic to groundwater. In lieu of other site-specific data that relate concentrations of soil organics to arsenic in groundwater, this Record of Decision assumes that EPH C11-C22 aromatic range concentrations will be used as an indicator of organic concentrations. Because this alternative relies on institutional controls to achieve protection of human health under anticipated future land use scenarios, this Record of Decision does not identify PRGs or cleanup criteria for the soil removal. These criteria will be developed during the design phase of the remedy. It is anticipated that the excavation will occur in the

floodplain around the southern edge of the 1999 soil excavation where concentrations of organics are believed to be greatest. Based on observations of an organic soil layer during the RI, excavation depths could average 3 ft. and cover an area similar to the area shown in Figure 9. This corresponds to an estimated in-place soil volume of 120 cy. The actual extent of excavation and volume of soil removed would depend on the criteria developed during remedy design. The excavated soil will be treated/disposed at an approved off-site treatment, storage, or disposal facility, or other approved facility as appropriate.

An excavation work plan would be prepared to guide the excavation process; however, it is assumed that excavation would proceed with conventional construction equipment such as tracked excavators, front-end loaders, and dump trucks. It is also assumed that the extent of excavation would be guided using on-site field-screening methods and final cleanup confirmed using off-site analytical methods. The excavation plan would detail how large pieces of debris or rocks would be separated from soil, cleaned of soil, and reused or disposed. It would also address groundwater management issues associated with excavation activities.

Wetlands Protection. Soil excavation for Alternative III-2a will be within the 100-year flood plain (228 ft. msl) and possibly will be within the delineated bordering vegetated wetland. Therefore, wetland protection will likely be required as a result of potential excavation activities. Protection will be provided in accordance with the Massachusetts Wetland Protection Act and Regulations at 310 CMR 10.55.

Prior to any excavation activities, a wetlands delineation will be performed at Area 3. If the proposed construction area is confirmed to be within delineated vegetated wetlands, a pre-construction mitigation study will be performed to determine the impact to the affected area and the compensatory mitigation required as a result of the excavation activities. Once the extent of anticipated impacts is known, a mitigation/restoration plan will be prepared for regulatory agency review and concurrence.

The primary goal of wetland restoration activities will be to restore affected fresh-water wetlands within the excavation area and disturbed during remedial activities. The surface area of the restored wetland will be equal to or greater than that of the altered wetland. Depending on federal and state regulatory guidance, as well as financial and temporal considerations, a number of diverse approaches exist to restore self-sustaining wetlands. At a minimum, wetland restoration will include backfilling with suitable material to achieve desired grade and controlling erosion and siltation. During construction, erosion control measures such as soil berms, silt fencing, and hay bales will be used to protect against erosion and siltation within the flood-plain area. Compensatory mitigation and monitoring will be implemented according to the mitigation plan. A wetland scientist will monitor wetland restoration for a period of five years, beginning the year after the wetlands creation.

Institutional Controls. Alternative III-2a would protect possible future-use commercial workers and future unrestricted use residents by requiring establishment of land use restrictions for both upland and flood plain portions of AOC 57 Area 3. The presence of flood plain and wetland conditions and existing zoning currently prevents residential use of the area and potential residential exposure to contaminated soil and groundwater. Upland portions of AOC 57 are located within an area zoned for Rail, Industrial, and Trade Related uses, while flood plain portions are zoned for Open Space and Recreation (Vanasse Hangen Brustlin, 1994a and 1994b). Residential construction would not be permitted under those designations.

To protect possible future commercial workers and unrestricted use residents from exposure to groundwater and future unrestricted use residents from exposure to contaminated flood-plain soil in the event of future property transfer, the Army would include deed covenants to prohibit potable use of Area 3 groundwater and residential use of flood plain property. All institutional controls would be stated in full or by reference within deeds, easements, mortgages, leases, or other instruments of property transfer. These controls would be drafted, implemented and enforced in cooperation with federal, state, and local governments. These covenants would be maintained as long as soil and/or groundwater contaminants remained at concentrations above protective cleanup levels.

Environmental Monitoring. Environmental monitoring will consist of performing long-term groundwater and surface water sampling. Long-term groundwater sampling will be performed to assess for decreases in arsenic; maintenance of PCE, cadmium, and 1,4-DCB concentrations (upland and flood-plain COCs) at or below cleanup levels; and for the need for continued groundwater institutional controls to protect human receptors.

Surface water sampling will also be a component of environmental sampling to assess for off-site migration of human-health COCs in excess of PRGs via the groundwater to surface water pathway. The purpose of the surface water sampling will not be to collect additional ecological risk assessment data.

Sampling frequency, location, analytes, sampling procedures, and action levels for environmental monitoring will be detailed in a LTMP and submitted to USEPA and MADEP for review and concurrence prior to implementing the environmental monitoring component of this alternative. Following attainment of groundwater cleanup levels, monitoring will be discontinued in accordance with the time frame specified in the LTMP.

Institutional Control Inspections. The Army will prepare and submit an Institutional Control Monitoring Plan for regulatory agency review and concurrence as part of the site LTMP to detail the institutional controls to be incorporated/referenced within instruments of property transfer and ensure that the institutional control requirements are met. The plan will include a checklist of elements to be assessed during regularly scheduled on-site inspections and interviews with the site property owner, manager, or designee. If future land use at AOC 57 is inconsistent with these institutional controls, then the site exposure scenarios for human health and the environment will be re-evaluated to assess whether this response action is appropriate.

Five-Year Site Reviews. Section 121c of CERCLA and NCP§300.430(f)(4)(ii) require that if a remedial action results in contaminants remaining on-site above concentrations that allow unrestricted and unlimited use, the lead agency must review the action at least every five years. During five-year site reviews, an assessment is made of whether the implemented remedy continues to be protective of human health and the environment or whether the implementation of additional remedial action is appropriate. Because Alternative III-2a will result in contaminants remaining on site above concentrations allowing unrestricted use and to the extent required by law, the Army will review the site at least once every five years to ensure that the remedial action remains protective of human health and the environment. Five-year reviews will be performed as long as hazardous substances, pollutants, or contaminants remain on-site above concentrations that allow for unrestricted exposure and unlimited use.

12.2.3 Summary of Costs for Alternative III-2a

Table 13 contains a summary of estimated costs for implementing Alternative III-2a. The estimate is based on the best available information regarding the anticipated scope of the remedial alternative; however, changes in cost elements may occur as a result of new information and data collected during design of the alternative. This is an engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost. Additional detail on the cost estimate is provided in the FS.

Cost Estimate Assumptions. The following assumptions were used in estimating the baseline cost:

- Excavating approximately 120 cy (216 tons) of soil
- Disposing of all soil as MA99 waste under a MADEP BOL (i.e., no hazardous waste).
- The lined stockpile/dewatering area will be approximately 50 feet by 50 feet.
- Water in the excavation and leachate from the stockpiles will be collected and treated off-site.
- The extent of excavation will be guided by field screening methods.
- Collecting approximately 10 confirmation samples (one sample per 900 sq. ft. of floor area and one sample per 30 feet of wall length) for off-site analyses.
- Off-site soil analytical costs are based on 3-day turn-around-time (analysis by the MADEP EPH Method was assumed).
- There will be minimal difficulty in implementing deed restrictions.
- Institutional control inspections will be performed once per year.
- Environmental sampling will be performed twice per year for the first three years and once per year thereafter. Environmental sampling will be terminated upon obtaining groundwater PRG concentrations for three consecutive sampling events.
- Groundwater samples will be collected at five existing monitoring wells using low-flow sampling techniques.
- Surface water samples will be collected from four locations in Cold Spring Brook.
- Groundwater and surface water samples will be analyzed for arsenic and cadmium, 1,4-DCB, and PCE (assumed USEPA Methods 6010, 8270, and 8260, respectively). Both filtered and unfiltered samples would be collected for arsenic and cadmium.
- QC samples will be collected at a frequency of one per ten regular samples (ten percent).

Cost-sensitivity Analysis. The greatest uncertainty in the cost estimate pertains to the duration that long-term environmental monitoring, groundwater-use deed restrictions, and five-year reviews would need to be maintained. To assess the effect of this uncertainty, costs for this alternative were evaluated for 7-year and 30-year environmental monitoring durations. A second significant uncertainty pertains to the volume of soil that will require excavation, specifically in regard to excavation depth. If the average depth of excavation of the area varies by +/-1 ft., the total volume excavated will change by +/- 33 percent, thereby affecting soil excavation, transportation, and disposal costs.

Decreasing the environmental sampling duration from 30 to 7 years decreases the total O&M present worth cost by approximately 45 percent, while varying the quantity of soil excavated by +/- 33 percent, changes the total capital cost by approximately 8 percent. The low range costs (33 percent less soil excavated and 7 years of environmental monitoring) and high range costs (33 percent greater soil excavated and 30-years of environmental monitoring, institutional controls, and five-year site reviews) are

presented in Table 13. Low-range and high-range costs ($252,103 and $395,077) varied from the baseline present worth cost by approximately 35 percent and 2 percent, respectively.

12.2.4 Expected Outcome of Alternative III-2a

This section presents the expected outcome of Alternative III-2a in terms of land and groundwater use and risk reduction as result of the response action. Five general categories of outcome are discussed:

- Final cleanup levels and basis
- Available uses of land upon achieving soil cleanup levels
- Available uses of groundwater upon achieving cleanup levels
- Anticipated socio-economic and community revitalization effects
- Anticipated environmental and ecological benefits

Final cleanup levels and basis. The purpose of this response action is to control risks posed by direct contact with soil and ingestion of groundwater. The results of the baseline risk assessment indicate that existing contaminant concentrations in soil pose noncancer risks exceeding an HI of 1 to possible future unrestricted use residents. Contaminants in groundwater pose excess lifetime cancer risks exceeding the target risk range of $1x10^{-4}$ to $1x10^{-6}$ and an HI of 1 to possible future use commercial workers and future unrestricted use residents (Tables 2 and 6).

Table 12 identifies cleanup levels by media for COCs at AOC 57 Area 3.

Available Uses of Land Upon Achieving Soil Cleanup Levels. Alternative III-2a provides excavation to accelerate groundwater cleanup. Upland areas at Area 3 (i.e., areas with elevation greater than 228 ft. msl) are presently suitable for commercial/industrial development, or, in the absence of existing zoning, unrestricted use. Wetland/flood-plain areas (i.e., areas with elevation less than 228 ft. msl) at Area 3 do not pose unacceptable risks to recreational child visitors or construction workers; however, institutional controls will be used to control potential risks to unrestricted use residential receptors from exposure to wetland/flood-plain soil. The length of time to complete soil excavation is estimated to be 6 months.

Available Uses of Groundwater Upon Achieving Cleanup Levels. The Feasibility Study estimated that 1 to 8 years beyond the completion of the 1999 excavation may be required for groundwater beneath wetland/flood-plain areas at Area 3 to attain cleanup levels. Upon achieving cleanup levels, groundwater would be suitable for potable water use.

Anticipated Socio-economic and Community Revitalization Effects. Implementation of Alternative III-2a will allow use of AOC 57 Area 3 in a manner that is consistent with current long-term plans for commercial/industrial use of the upland and open-space/recreational use of the wetland/flood-plain.

Anticipated Environmental and Ecological Benefits. Adverse environmental and ecological effects are not anticipated if Alternative III-2a is not implemented. Beneficial environmental and ecological effects are not anticipated if Alternative III-2a is implemented.

13.0 STATUTORY DETERMINATIONS

Under CERCLA and the NCP, the Army must select remedies that are protective of human health and the environment, attain ARARs (unless a statutory waiver is justified), are cost effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of wastes as a principal element and a bias against off-site disposal of untreated wastes. The following subsections discuss how the selected remedies meet these statutory requirements.

13.1 STATUTORY DETERMINATIONS FOR ALTERNATIVE II-3

The selected remedy for AOC 57 Area 2 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 utilizes alternative treatment technologies and resource recovery technologies to the maximum extent practicable for this site. However, the selected remedy does not satisfy the statutory preference for treatment that permanently and significantly reduces the toxicity, mobility, or volume of hazardous substances as a principal element.

13.1.1 The Selected Remedy is Protective of Human Health and the Environment

The selected remedy for AOC 57 Area 2, Alternative II-3, will protect human health and the environment by eliminating, reducing, or controlling exposures to human and environmental receptors through engineering and institutional controls. More specifically, human exposure to soil and groundwater will be limited through excavation of wetland/flood-plain soils with soil treatment/disposal at an approved facility and through establishment of institutional controls to limit exposure to groundwater.

The selected remedy will reduce potential human-health risk levels for soil exposure such that they do not exceed EPA's acceptable risk range of 10^{-4} to 10^{-6} for incremental carcinogenic risk and such that the non-carcinogenic hazard is below a HI of 1. It will reduce potential human-health risk levels for groundwater exposure to protective ARARs levels (i.e., the remedy will attain ARARs).

Adverse ecological effects from exposure to site-related contaminants and media were not identified.

Implementation of the selected remedy will not pose any unacceptable short-term risks or cause any cross-media impacts.

13.1.2 The Selected Remedy Attains Applicable or Relevant and Appropriate Requirements

The selected remedy for AOC 57 Area 2 will attain all applicable or relevant and appropriate federal and state requirements. No waivers are required. ARARs for AOC 57 Area 2 were identified and discussed in the FS (Sections 3.0 and 6.0). Tables 14, 15, and 16 in Appendix B of this Record of Decision summarizes the ARARs for the selected remedy, including the regulatory citation, a brief summary of the requirement, and how it will be attained.

As indicted in Table 16, excavated materials from AOC 57 Area 2 will be evaluated to determine whether the materials are subject to RCRA Land Disposal Restrictions. If so, the materials will be treated in accordance with the Land Disposal Restrictions prior to disposal at an off-post facility.

13.1.3 The Selected Remedial Action is Cost-Effective

In the Army's judgment, the selected remedy is cost-effective because the remedy's costs are proportional to its overall effectiveness (see 40 CFR 300.430(f)(1)(ii)(D)). This determination was made by evaluating the overall effectiveness of those alternatives that satisfied the threshold criteria (i.e., that are protective of human health and the environment and attain all federal and any more stringent state ARARs, or as appropriate, waive ARARs). Overall effectiveness was evaluated by assessing three of the five balancing criteria: long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness, in combination. The overall effectiveness of each alternative then was compared to the alternative's costs to determine cost-effectiveness. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs and hence represents a reasonable value for the money to be spent.

The estimated costs of this remedial alternative are:

Estimated Capital Cost:	$348,645
Estimated Operation and Maintenance Cost (Present Worth*):	$185,064
Contingency:	$133,427
Estimated Total Cost:	$667,137

*Present worth based on 7 percent discount rate, for 30 years.

13.1.4 The Selected Remedy Utilizes Permanent Solutions and Alternative Treatment or Resource Recovery Technologies to the Maximum Extent Practicable

After the Army identified those alternatives that attain or, as appropriate, waive ARARs and that are protective of human health and the environment, the Army determined which alternative made use of 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 tradeoffs 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 offsite land disposal of untreated waste, and community and state acceptance. The Army believes the selected remedy provides the best balance of tradeoffs among the alternatives that are protective and attain ARARs.

13.1.5 The Selected Remedy Does Not Satisfy the Preference for Treatment as a Principal Element

The principal element of the selected remedy is excavation of contaminated soil. This element, in conjunction with previous removals, will complete addressing the primary threat at Area 2 which was contaminated soil that was contributing to groundwater contamination. More complex remedies utilizing treatment were not considered practical for Area 2.

13.1.6 Five-Year Review Requirements

Because Alternative II-3 will result in contaminants remaining on-site above concentrations that allow for unrestricted use and unrestricted exposure, a statutory review will be performed within five years after initiation of remedial action to assess whether the remedy remains or will remain protective of human health and the environment. Subsequent five-year reviews will be performed as long as hazardous substances, pollutants, or contaminants remain on-site above concentrations that allow for unrestricted exposure and unlimited use.

The five-year reviews may be discontinued when no hazardous substances, pollutants, or contaminants remain at AOC 57 Area 2 above concentrations that allow for unrestricted use and unrestricted exposure. This determination will be made after a five-year review documents that contaminants are at acceptable levels.

13.2 STATUTORY DETERMINATIONS FOR ALTERNATIVE III-2A

The selected remedy for AOC 57 Area 3 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 utilizes alternative treatment technologies and resource recovery technologies to the maximum extent practicable for this site. However, the selected remedy does not satisfy the statutory preference for treatment that permanently and significantly reduces the toxicity, mobility, or volume of hazardous substances as a principal element.

13.2.1 The Selected Remedy is Protective of Human Health and the Environment

The selected remedy for AOC 57 Area 3, Alternative III-2a will protect human health and the environment by eliminating, reducing, or controlling exposures to human and environmental receptors through engineering and institutional controls. More specifically, human exposure to contaminated groundwater will be limited through excavation of wetland/flood-plain soils that contribute to groundwater contamination, with soil treatment/disposal at an off-site treatment, storage, or disposal facility, and through establishment of institutional controls to limit exposure to groundwater.

The selected remedy will reduce potential human-health risk levels for groundwater exposure to protective ARARs levels (i.e., the remedy will attain ARARs).

Adverse ecological effects from exposure to site-related contaminants and media were not identified.

Implementation of the selected remedy will not pose any unacceptable short-term risks or cause any cross-media impacts.

13.2.2. The Selected Remedy Attains Applicable or Relevant and Appropriate Requirements

The selected remedy for AOC 57 Area 3 will attain all applicable or relevant and appropriate federal and state requirements. No waivers are required. ARARs for AOC 57 Area 3 were identified and discussed in

the FS (Sections 3.0 and 6.0). Tables 17, 18, and 19 in Appendix B of this Record of Decision summarizes the ARARs for the selected remedy, including the regulatory citation, a brief summary of the requirement, and how it will be attained.

As indicted in Table 19, excavated materials from AOC 57 Area 3 will be evaluated to determine whether the materials are subject to RCRA Land Disposal Restrictions. If so, the materials will be treated in accordance with the Land Disposal Restrictions prior to disposal at an off-post facility.

13.2.3 The Selected Remedial Action is Cost-Effective

In the Army's judgment, the selected remedy is cost-effective because the remedy's costs are proportional to its overall effectiveness (see 40 CFR 300.430(f)(1)(ii)(D)). This determination was made by evaluating the overall effectiveness of those alternatives that satisfied the threshold criteria (i.e., that are protective of human health and the environment and attain all federal and any more stringent state ARARs, or as appropriate, waive ARARs). Overall effectiveness was evaluated by assessing three of the five balancing criteria: long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness, in combination. The overall effectiveness of each alternative then was compared to the alternative's costs to determine cost-effectiveness. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs and hence represents a reasonable value for the money to be spent.

The estimated costs of this remedial alternative are:

Estimated Capital Cost:	$80,669
Estimated Operation and Maintenance Cost (Present Worth*):	$222,972
Contingency:	$77,455
Estimated Total Cost:	$387,276

*Present worth based on 7 percent discount rate, for 30 years.

13.2.4 The Selected Remedy Utilizes Permanent Solutions and Alternative Treatment or Resource Recovery Technologies to the Maximum Extent Practicable

After the Army identified those alternatives that attain or, as appropriate, waive ARARs and that are protective of human health and the environment, the Army determined which alternative made use of 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 tradeoffs 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 Army believes the selected remedy provides the best balance of tradeoffs among the alternatives that are protective and attain ARARs.

13.2.5 The Selected Remedy Satisfies the Preference for Treatment as a Principal Element

The principal element of the selected remedy is excavation of contaminated soil. This element, in conjunction with previous removals, will complete addressing the primary threat at Area 3 which was contaminated soil that was contributing to groundwater contamination. More complex remedies utilizing treatment were not considered practical for Area 3.

13.2.6 Five-Year Review Requirements

Because Alternative III-2a will result in contaminants remaining on-site above concentrations that allow for unrestricted use and unrestricted exposure, a statutory review will be performed within five years after initiation of remedial action to assess whether the remedy remains or will remain protective of human health and the environment. Subsequent five-year reviews will be performed as long as hazardous substances, pollutants, or contaminants remain on-site above concentrations that allow for unrestricted exposure and unlimited use.

The five-year reviews may be discontinued when no hazardous substances, pollutants, or contaminants remain at AOC 57 Area 3 above concentrations that allow for unrestricted use and unrestricted exposure. This determination will be made after a five-year review documents that contaminants are at acceptable levels.

14.0 DOCUMENTATION OF SIGNIFICANT CHANGES

The Army released a Proposed Plan for remedial action at AOC 57 Areas 2 and 3 in February 2001. The Proposed Plan identified Alternative II-3: Excavation (for Possible Future Use) and Institutional Controls as the Preferred Alternative for Area 2, and Alternative III-2: Limited Action as the Preferred Alternative for Area 3. The Proposed Plan also identified an excavation alternative for Area 3 (Alternative III-3: Excavation [For Unrestricted Use] and Institutional Controls). During the public comment period, the Army received numerous comments requesting that a more aggressive approach than limited action be implemented at Area 3 to speed up groundwater cleanup. In response to these comments, the Army developed, and has decided to implement, Alternative III-2a: Excavation (to Accelerate Groundwater Cleanup) and Institutional Controls at Area 3.

Alternative III-2a combines the institutional controls contained in Alternative III-2: Limited Action with excavation activities similar to those contained in Alternative III-3. This new alternative was named Alternative III-2a: Excavation (to Accelerate Groundwater Cleanup) and Institutional Controls because it was developed to speed groundwater cleanup, not to enable unrestricted/residential use.

There have been no significant changes made to Alternative II-3, the preferred alternative for AOC 57 Area 2, presented in the Proposed Plan.

15.0 STATE ROLE

The Commonwealth of Massachusetts Department of Environmental Protection has reviewed the various alternatives and has indicted its support for the selected remedies. The Commonwealth has reviewed the RI and FS reports to determine if the selected remedies are in compliance with applicable or relevant and appropriate Commonwealth environmental and facility siting laws and regulations. A copy of the letter of concurrence from the Commonwealth of Massachusetts is attached as Appendix E of this Record of Decision.

ABB-ES	ABB Environmental Services, Inc.
ADL	Arthur D. Little, Inc.
AOC	Area of Contamination
AREE	area requiring environmental evaluation
ARAR	applicable or relevant and appropriate requirement
BERA	Baseline Ecological Risk Assessment
bgs	below ground surface
BRAC	Base Realignment and Closure
CAC	Citizens Advisory Committee
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CMR	Code of Massachusetts Regulations
COC	chemical of concern
CPC	chemical of potential concern
cy	cubic yard(s)
1,2-DCB	1,2-dichlorobenzene
1,4-DCB	1,4-dichlorobenzene
DCE	dichloroethene
DDD	2,2-bis(para-chlorophenyl)-1,1-dichloroethane
DDE	2,2-bis(para-chlorophenyl)-1,1-dichloroethene
DDT	2,2-bis(para-chlorophenyl)-1,1,1-trichloroethane
EPH	extractable petroleum hydrocarbons
ESMA	Excavated Soils Management Area
ft.	feet or foot
FS	Feasibility Study
HI	hazard index
HLA	Harding Lawson Associates
LTMP	Long-term Monitoring Plan
MADEP	Massachusetts Department of Environmental Protection
MCL	Maximum Contaminant Level
MCP	Massachusetts Contingency Plan
mg/kg	milligrams per kilogram
MMCL	Massachusetts Maximum Contaminant Level
msl	mean sea level
NAPL	nonaqueous phase liquid
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
OHM	OHM Remediation Services Corp.

PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PID	photoionization detector
PRE	preliminary risk evaluation
PRG	preliminary remediation goals
RAB	Restoration Advisory Board
RAO	remedial action objectives
RfD	reference dose
RFTA	Reserve Forces Training Area
RI	Remedial Investigation
RME	reasonable maximum exposure
SA	Study Area
SARA	Superfund Amendments and Reauthorization Act
SI	Site Investigation
SVOC	semivolatile organic compound
TCE	trichloroethene
TEX	toluene, ethylbenzene, and xylenes
TPH	total petroleum hydrocarbons
TRC	Technical Review Committee
TSS	total suspended solids
µg/g	micrograms per gram
µg/L	micrograms per liter
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VPH	volatile petroleum hydrocarbons
VOC	volatile organic compound

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Arthur D. Little, Inc. (ADL), 1994. Final Storm Sewer System Evaluation (AREE 70) Report. Base Realignment and Closure Environmental Evaluation. Fort Devens, Massachusetts. prepared for the U.S. Army Environmental Center (AEC); prepared by Arthur D. Little, Inc., Cambridge, Massachusetts; June.

Biang, C.A., R.W. Peters, R.H. Pearl, and S.Y. Tsai, 1992. "Master Environmental Plan for Fort Devens, Massachusetts"; prepared for U.S. Army Toxic and Hazardous Materials Agency; prepared by Argonne National Laboratory, Environmental Assessment and Information Sciences Division; Argonne, Illinois; April.

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Harding ESE, 2000. "Final Focused Feasibility Study Report, Area of Contamination 57 Devens, Massachusetts"; prepared for U.S. Army Corps of Engineers, New England District, Concord, Massachusetts; Portland, Maine; November.

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Vanasse Hangen Brustlin, Inc., 1994b. "Devens Reuse Plan." Prepared for the Boards of Selectmen of the Towns of Ayer, Harvard, Lancaster, and Shirley and the Massachusetts Government Land Bank; November.

Weston, Roy F., Inc., 1998. "Contaminated Soil Removal – Phase II, Study Area 57, Area 1, Storm Drain System No. 6 Outfall, Removal Action Report"; July.

APPENDIX A - FIGURES

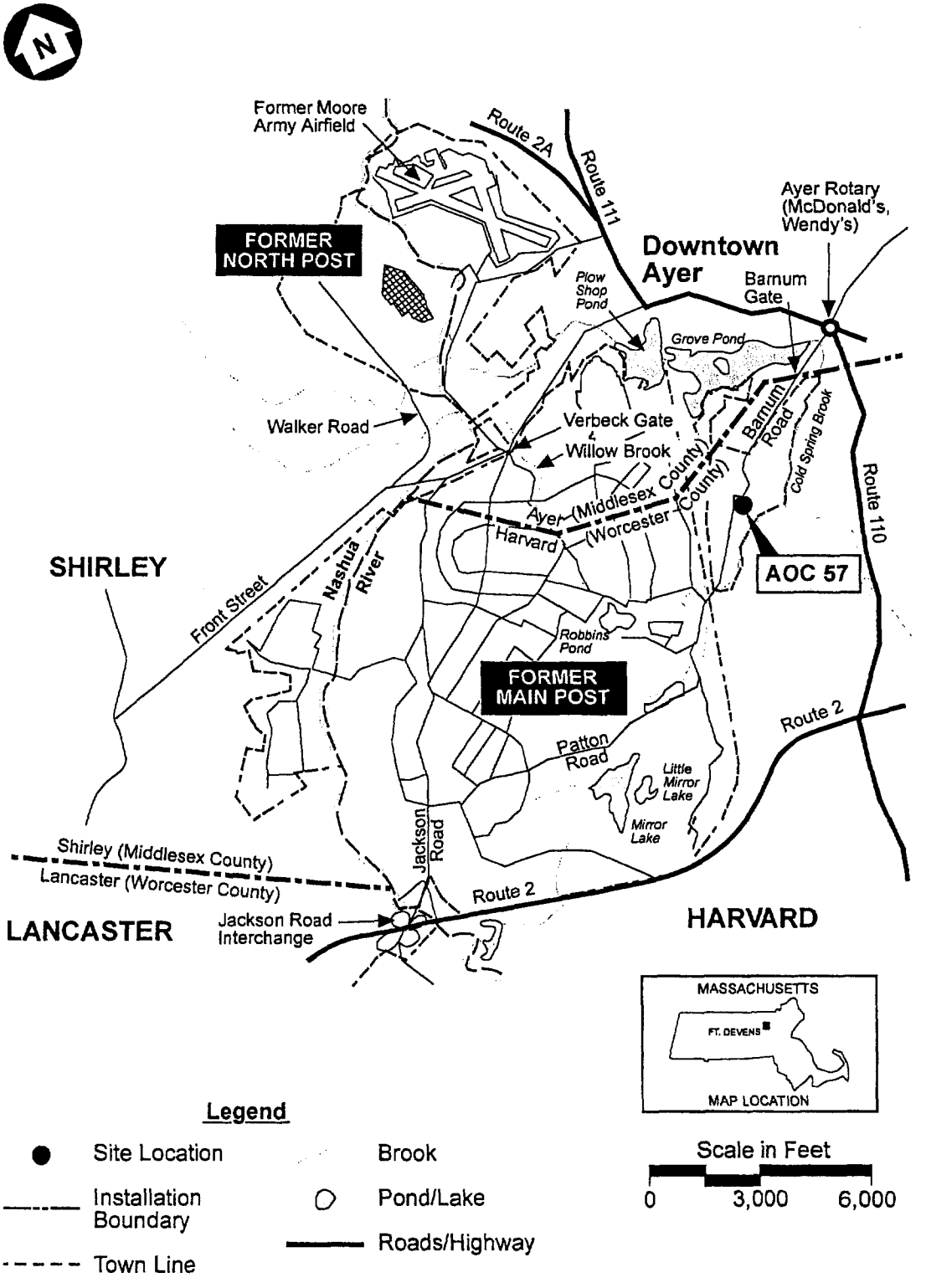


FIGURE 1
LOCATION OF AOC 57
AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

Harding ESE

W2001021(a)

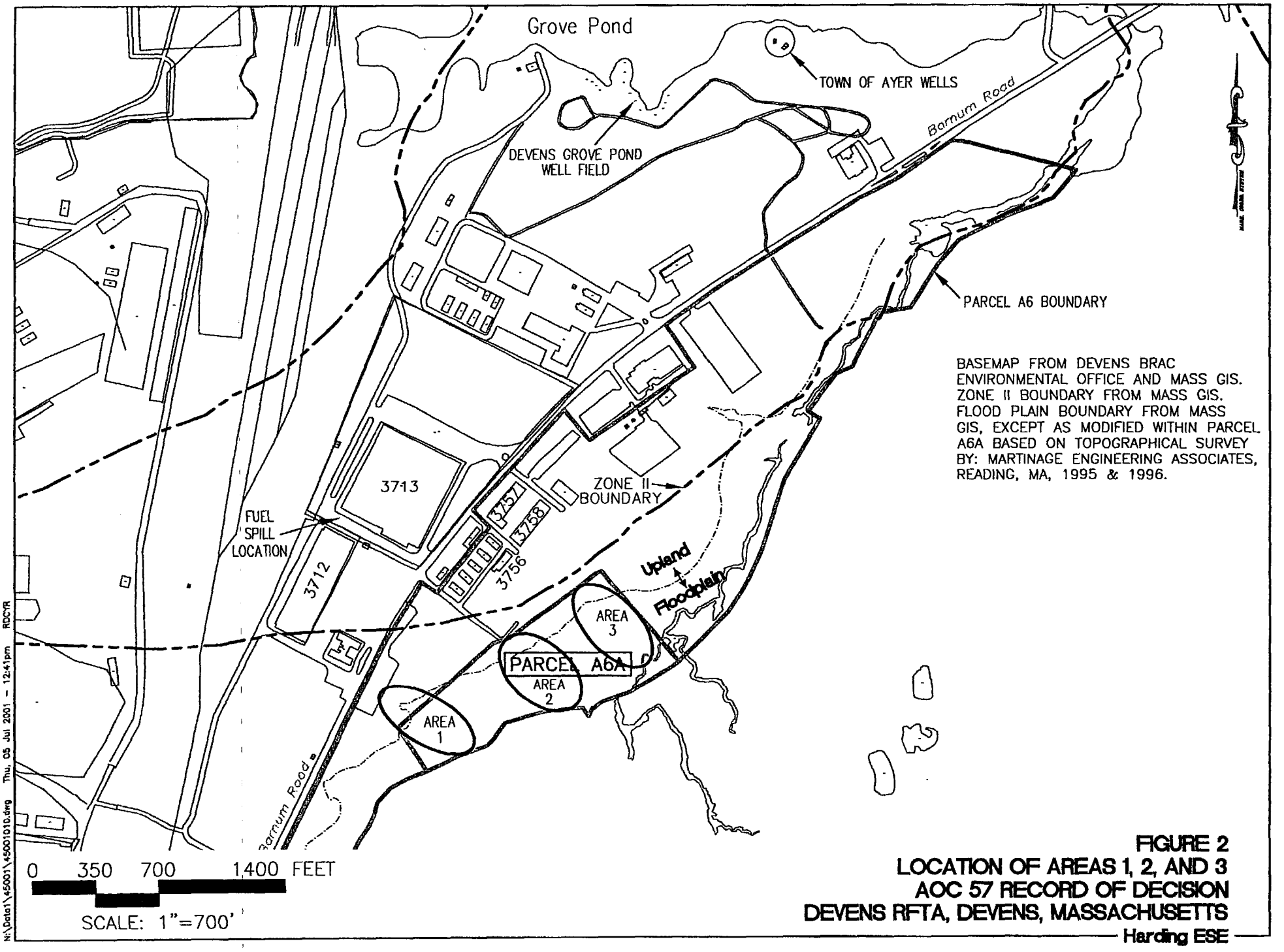
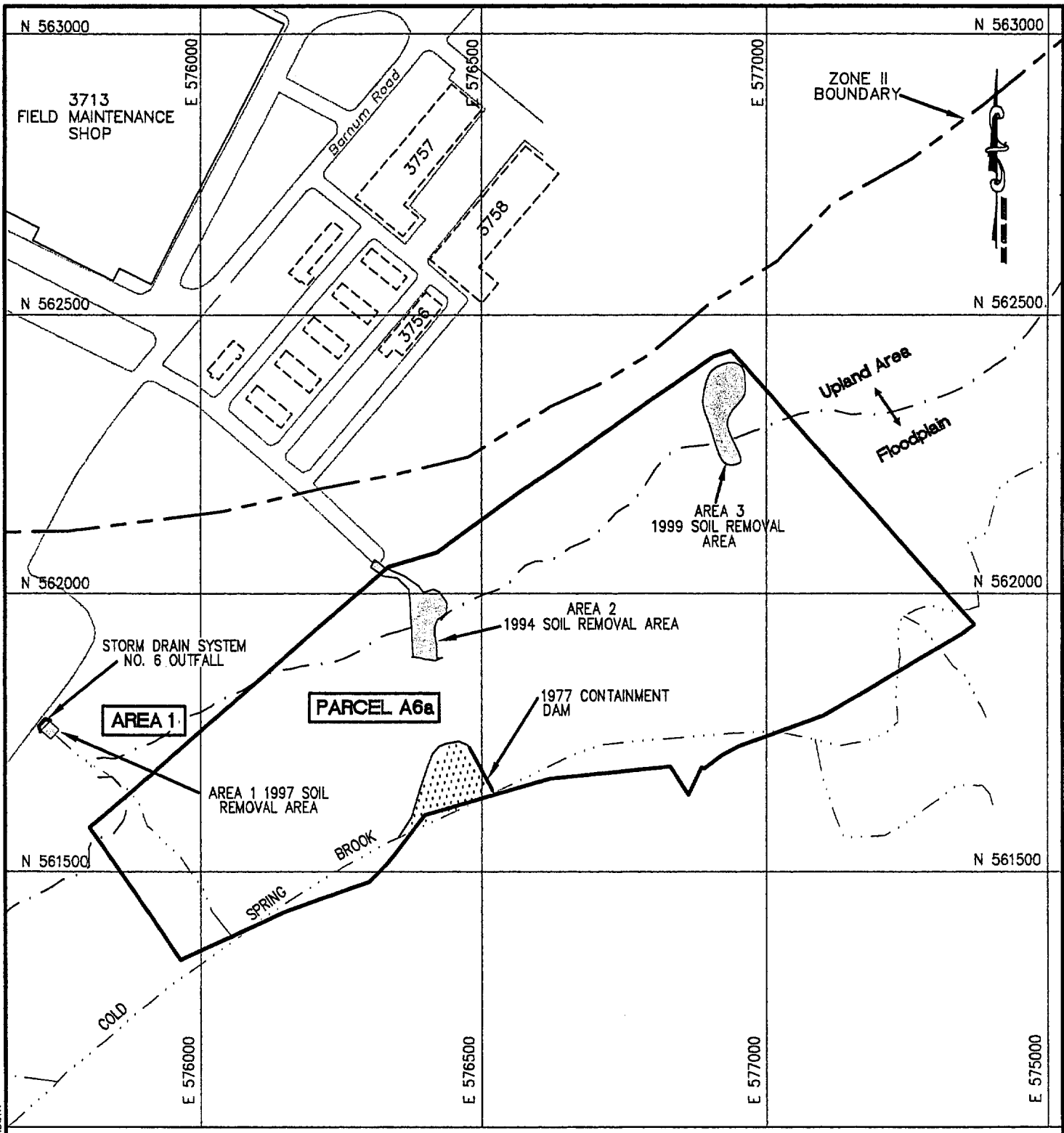


FIGURE 2
LOCATION OF AREAS 1, 2, AND 3
AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS
Harding ESE



BASEMAP FROM DEVENS BRAC ENVIRONMENTAL OFFICE AND MASS GIS. ZONE II BOUNDARY FROM MASS GIS. FLOOD PLAIN BOUNDARY FROM MASS GIS, EXCEPT AS MODIFIED WITHIN PARCEL A6A BASED ON TOPOGRAPHICAL SURVEY BY: MARTINAGE ENGINEERING ASSOCIATES, READING, MA, 1995 & 1996. DEPICTED DATUM IS NAD 27.

0 125 250 500 FEET

SCALE: 1"=250'

FIGURE 3
AREA 1, 2, AND 3 SITE MAP
AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

Harding ESE

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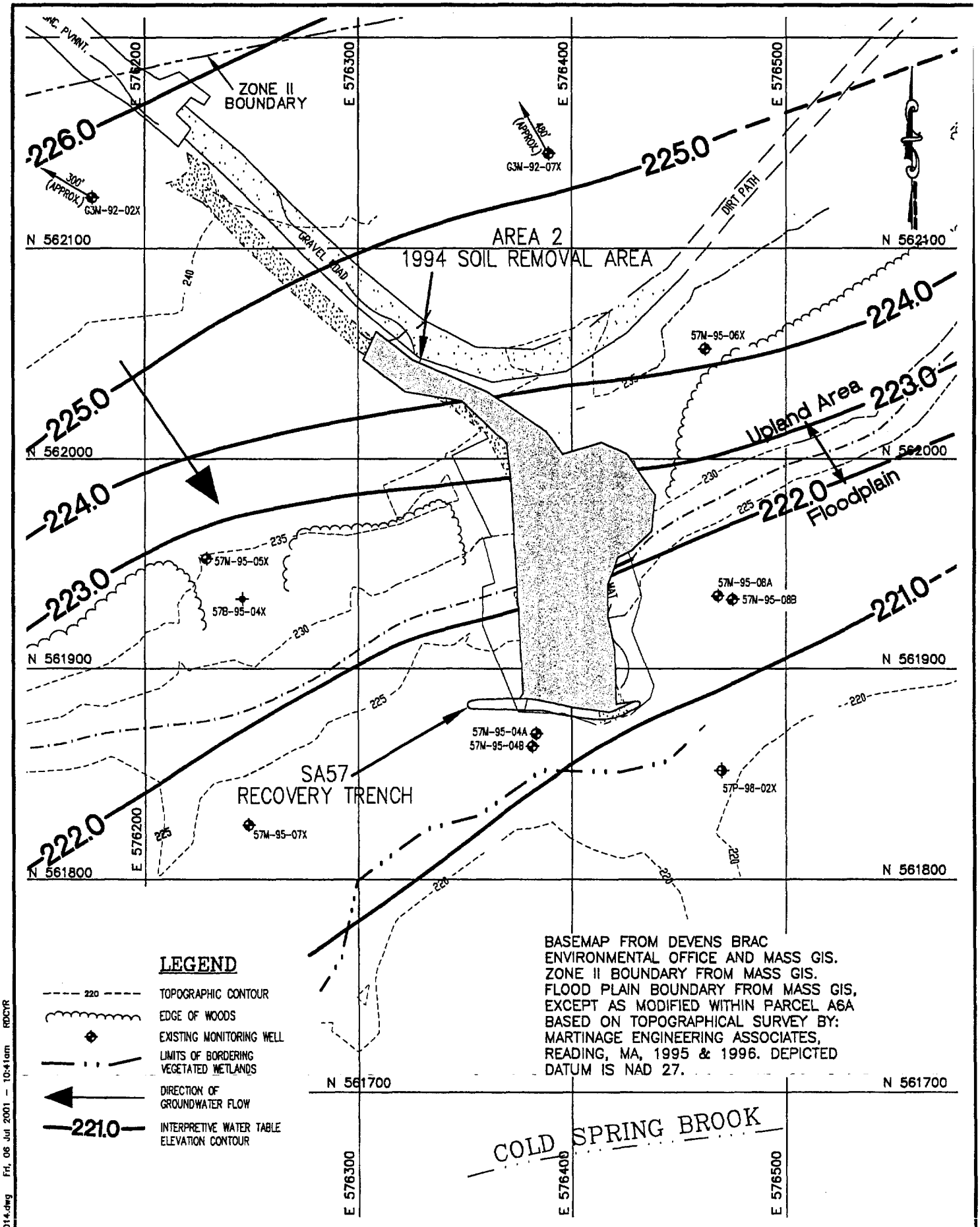

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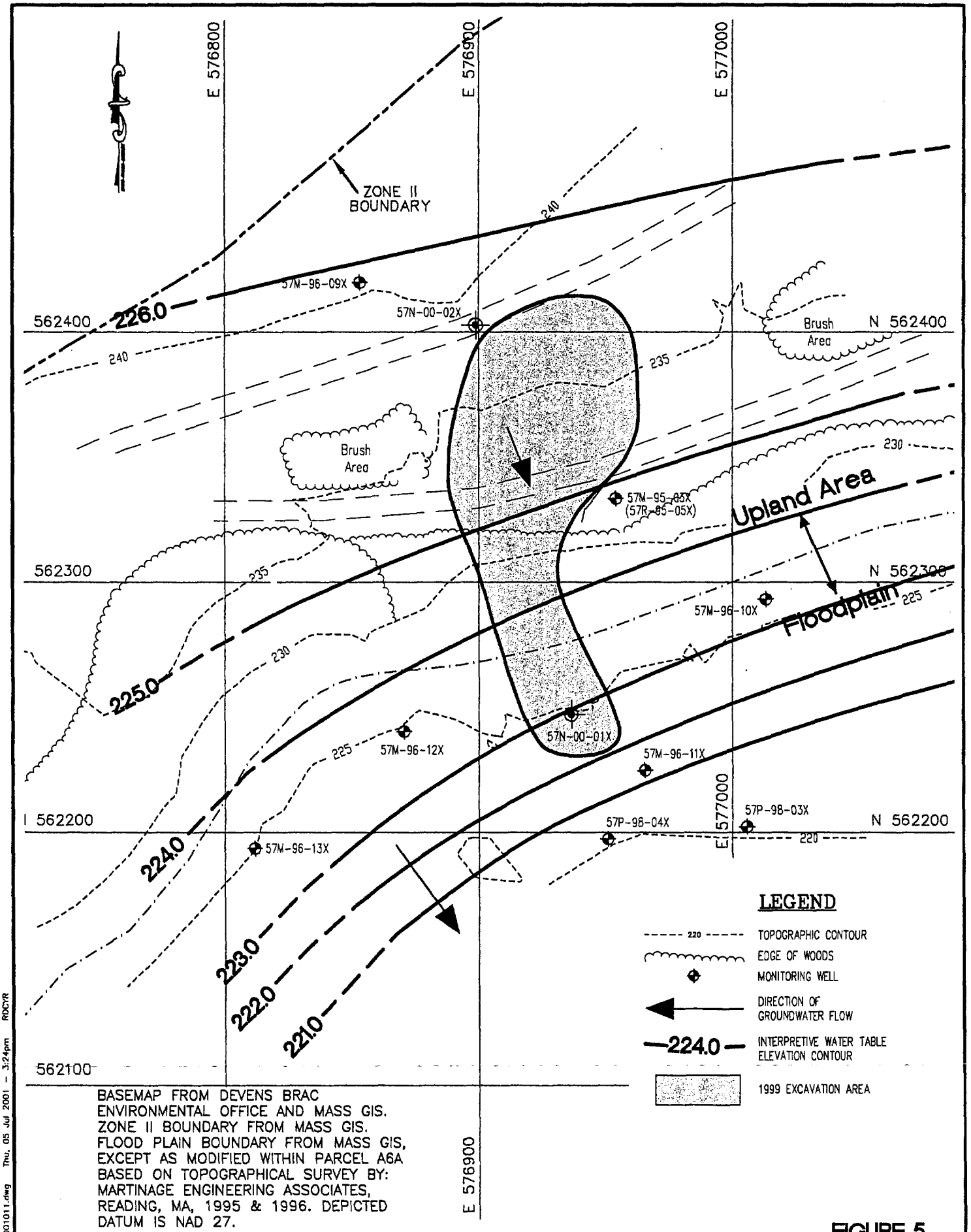
FIGURE 4
AREA 2 MONITORING WELL LOCATIONS
AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

Harding ESE



BASEMAP FROM DEVENS BRAC ENVIRONMENTAL OFFICE AND MASS GIS. ZONE II BOUNDARY FROM MASS GIS. FLOOD PLAIN BOUNDARY FROM MASS GIS, EXCEPT AS MODIFIED WITHIN PARCEL A6A BASED ON TOPOGRAPHICAL SURVEY BY: MARTINAGE ENGINEERING ASSOCIATES, READING, MA, 1995 & 1996. DEPICTED DATUM IS NAD 27.

0 25 50 100 FEET

SCALE: 1"=50'

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FIGURE 5
AREA 3 MONITORING WELL LOCATIONS
AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

Harding ESE

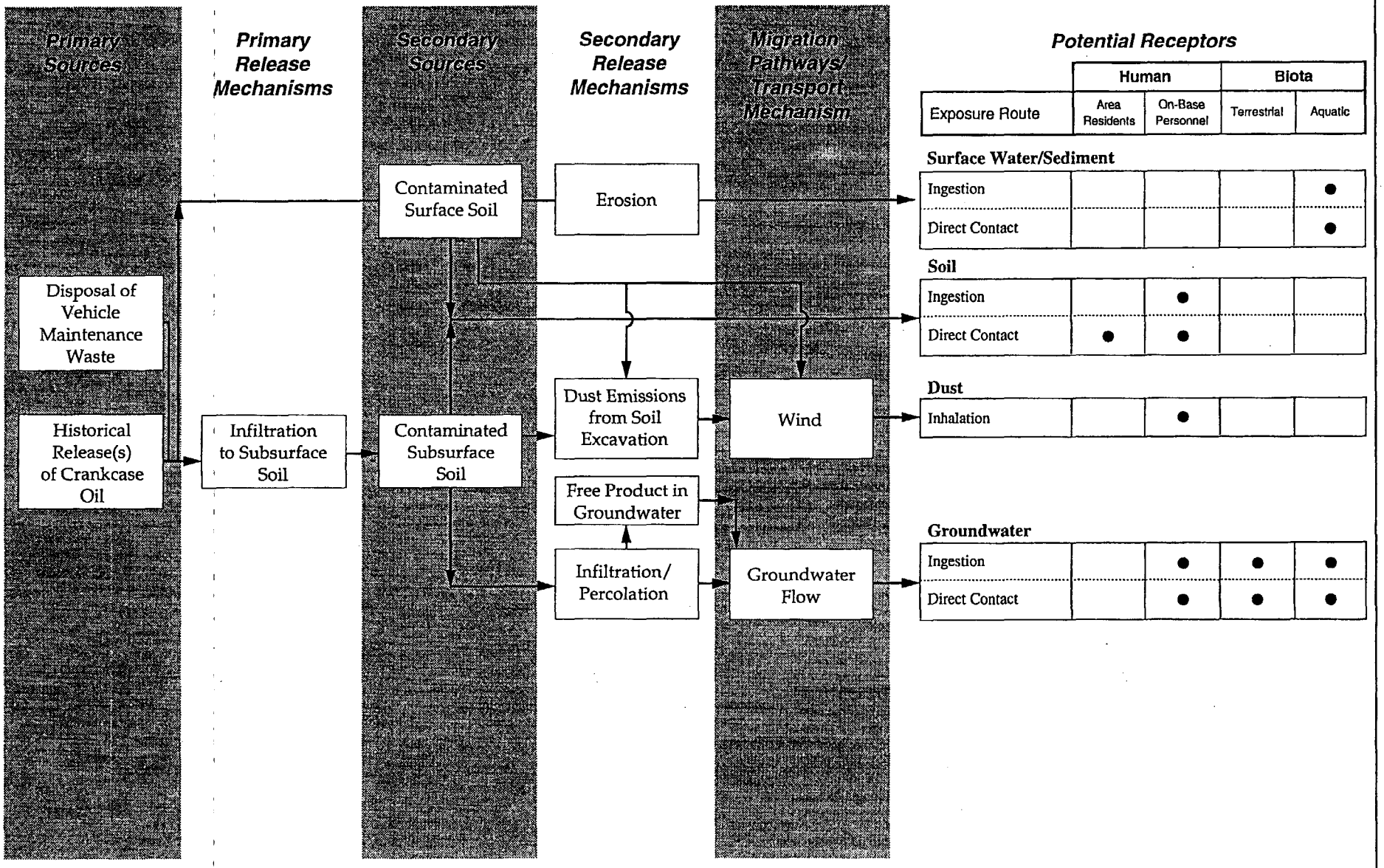

FIGURE 6
CONCEPTUAL SITE MODEL
AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MA

Harding ESE

2001021(c)

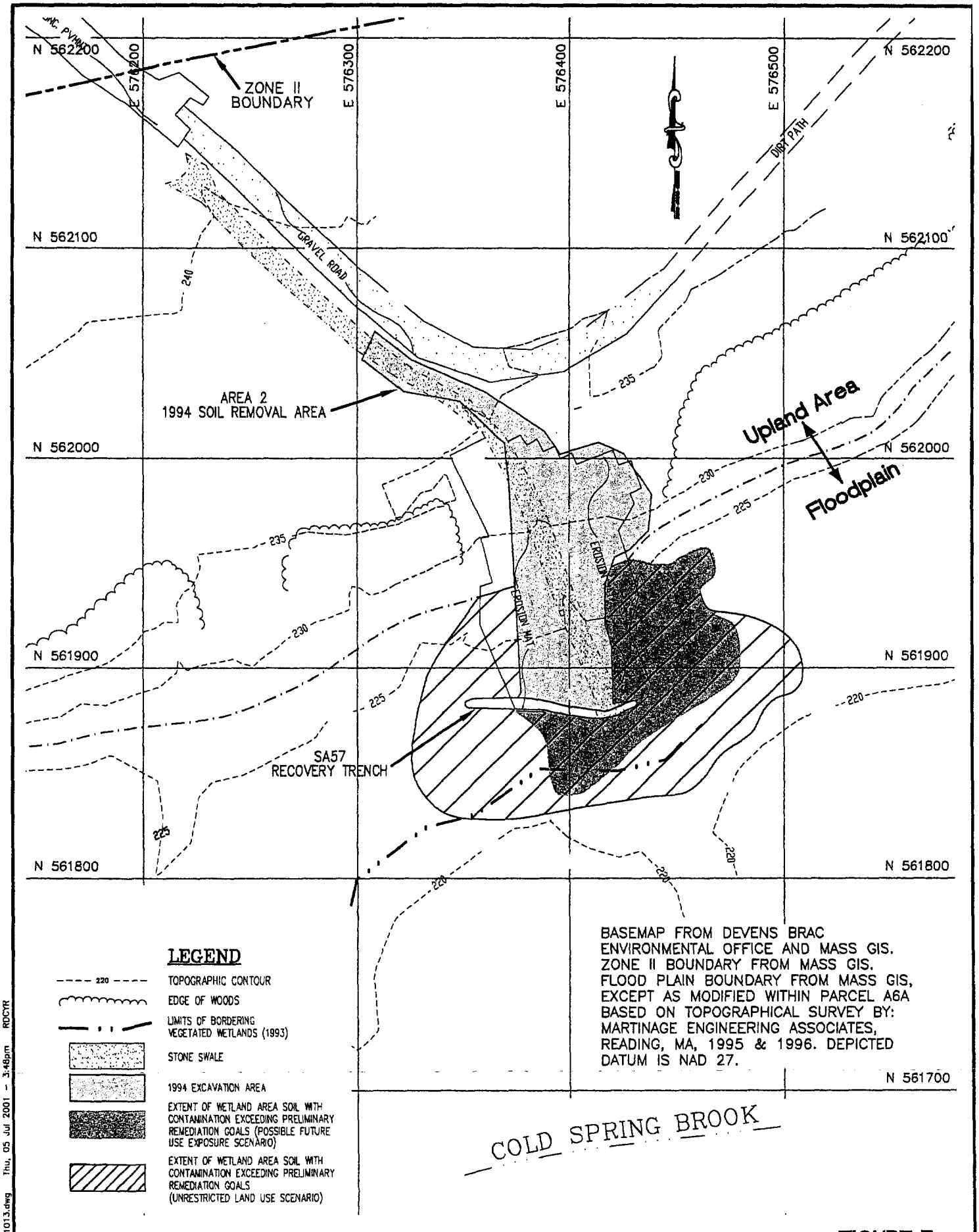

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FIGURE 7
AREA 2 SOIL AREAS EXCEEDING PRGs
AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS
Harding ESE

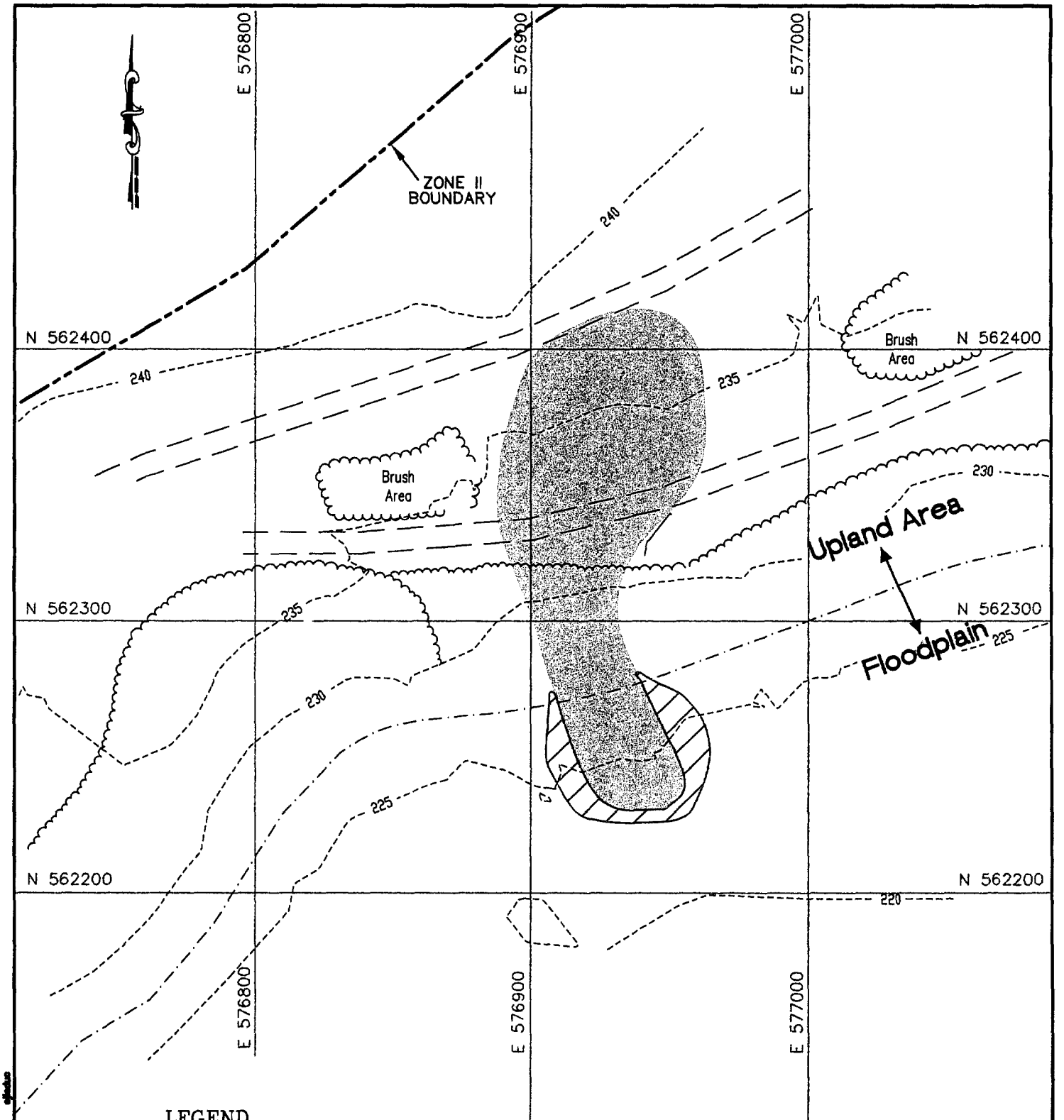

FIGURE 8
AREA 3 SOIL AREA EXCEEDING UNRESTRICTED USE PRGs
AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

Harding ESE

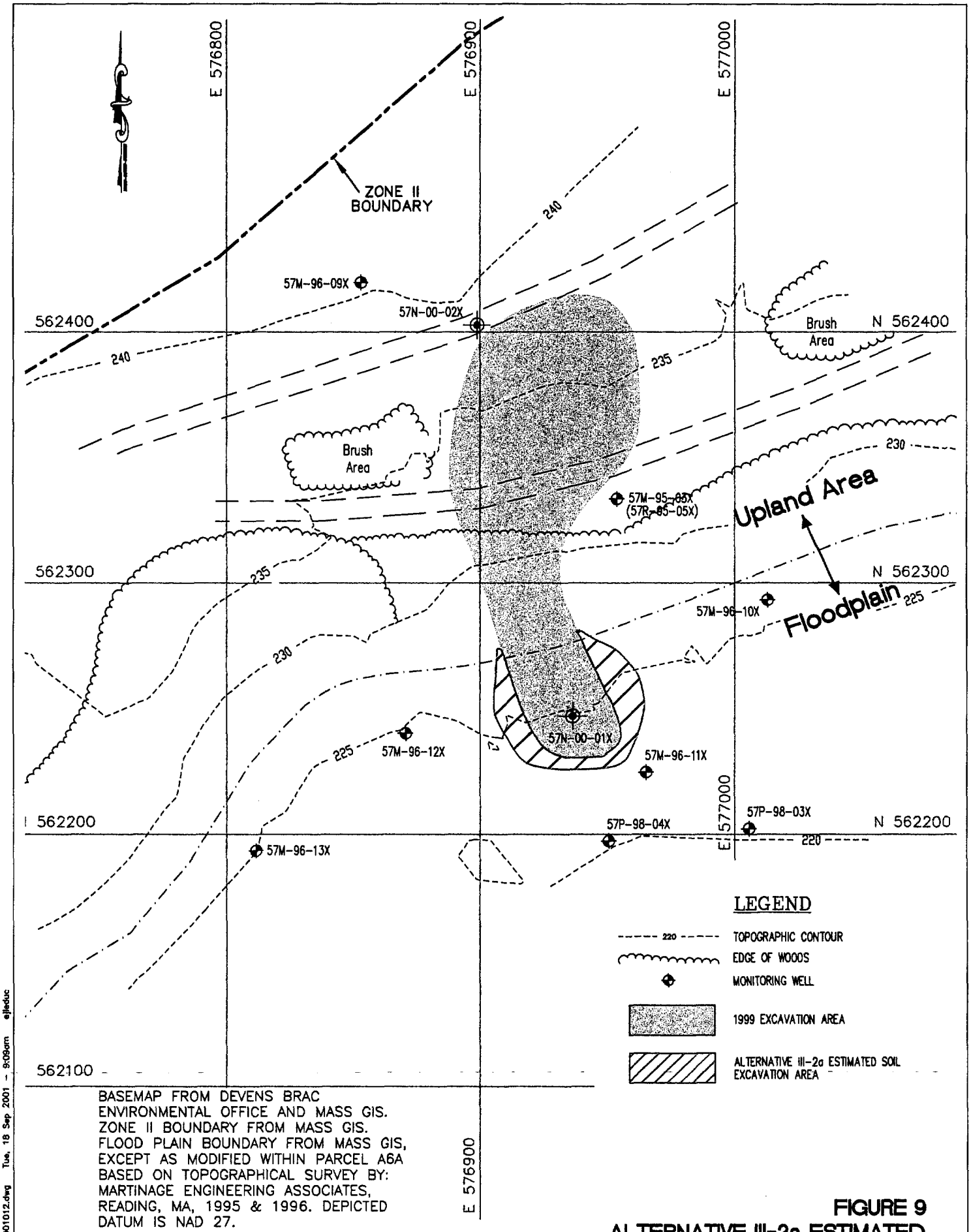

FIGURE 9
ALTERNATIVE III-2a ESTIMATED SOIL EXCAVATION AREA
AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

Harding ESE

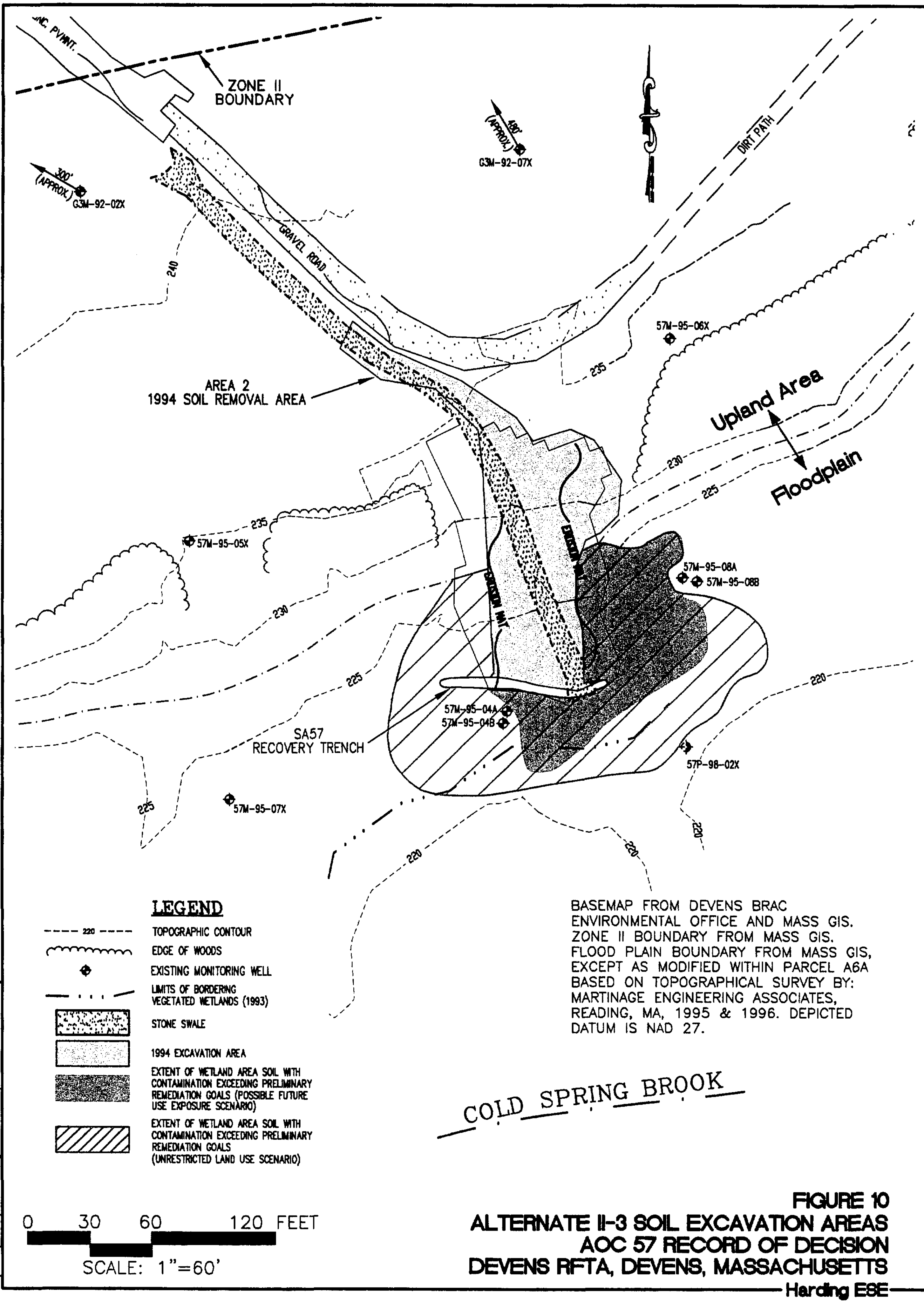

FIGURE 10
ALTERNATE II-3 SOIL EXCAVATION AREAS
AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

Harding ESE

APPENDIX B - TABLES

TABLE 1
SUMMARY OF AOC 57 AREAS 2 AND 3 RISK ASSESSMENT SCENARIOS

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

Subarea And Receptor	Evaluation Scenario: Incidental Ingestion of Surface Soil	Dermal Contact with Surface Soil	Inhalation of Particulates from Surface soil	Incidental Ingestion of Subsurface Soil	Dermal Contact with Subsurface Soil	Inhalation of Particulates from Subsurface Soil	Incidental Ingestion of Sediment and Surface ~~Water~~	Dermal Contact with Sediment and Surface ~~Water~~	Ingestion of Groundwater
Upland (Industrial) Area									
Current/Future Land Use									
Maintenance Worker	X	X	X						
Possible Furture Land Use									
Construction Worker	X	X	X	X	X	X			
Commercial Worker	X	X	X						X
Unrestricted Future Land Use									
Adult Resident	X	X	X	X	X	X			X
Child Resident	X	X	X	X	X	X			
Flood Plain (Recreational) Area									
Current/Future Land Use									
Recreational Child	X	X					X	X	
Possible Furture Land Use									
Construction Worker	X	X	X	X	X	X			
Unrestricted Future Land Use									
Adult Resident	X	X	X	X	X	X			X
Child Resident	X	X	X	X	X	X			

TABLE 2
QUANTITATIVE HUMAN-HEALTH RISK SUMMARY

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

	CENTRAL TENDENCY		RME	
	Total Cancer Risk	Total Hazard Index	Total Cancer Risk	Total Hazard Index
AREA 2 UPLAND (INDUSTRIAL) AREA)				
CURRENT LAND USE				
Maintenance Worker - Surface Soil				
Incidental Ingestion of Surface Soil: Maintenance Worker	2E-07	0.007	2E-06	0.03
Dermal Contact with Surface Soil: Maintenance Worker	8E-09	0.001	6E-08	0.002
Inhalation of Particulates from Surface Soil: Maintenance Worker	3E-10	0.0002	2E-09	0.0007
Receptor Total: Maintenance Worker	**2E-07**	**0.008**	**2E-06**	**0.03**
POSSIBLE FUTURE LAND USE				
Commercial/Industrial Worker - Surface Soil				
Incidental Ingestion of Surface Soil: Commercial/Industrial Worker	9E-07	0.04	7E-06	0.08
Dermal Contact with Surface Soil: Commercial/Industrial Worker	5E-08	0.01	2E-07	0.01
Inhalation of Particulates from Surface Soil: Commercial/Industrial Work	2E-09	0.002	6E-09	0.002
Total	**1E-06**	**0.05**	**7E-06**	**0.09**
Commercial/Industrial Worker - Groundwater				
Ingestion of Groundwater: Commercial/Industrial Worker	NE	0.07	NE	0.07
Total	**NE**	**0.07**	**NE**	**0.07**
Receptor Total: Commercial/Industrial Worker	**1E-06**	**0.1**	**7E-06**	**0.2**
Construction Worker - Surface Soil				
Incidental Ingestion of Surface Soil: Construction Worker	5E-07	0.4	1E-06	0.4
Dermal Contact with Surface Soil: Construction Worker	5E-08	0.05	1E-07	0.05
Inhalation of Particulates from Surface Soil: Construction Worker	2E-10	0.007	4E-10	0.007
Total	**6E-07**	**0.5**	**1E-06**	**0.5**
Construction Worker - Subsurface Soil				
Incidental Ingestion of Subsurface Soil: Construction Worker	2E-07	0.2	5E-07	0.2
Dermal Contact with Subsurface Soil: Construction Worker	2E-08	0.01	5E-08	0.01
Inhalation of Particulates from Subsurface Soil: Construction Worker	1E-10	0.003	2E-10	0.003
Total	**2E-07**	**0.2**	**6E-07**	**0.2**
Receptor Total: Construction Worker	**8.E-07**	**0.6**	**2.E-06**	**0.7**
UNRESTRICTED LAND USE				
Adult Resident - Surface Soil				
Incidental Ingestion of Surface Soil: Adult Resident			6E-06	0.09
Dermal Contact with Surface Soil: Adult Resident			9E-07	0.04
Inhalation of Particulates from Surface Soil: Adult Resident			2E-09	0.001
Total	**Not Evaluated***		**7E-06**	**0.1**
Adult Resident - Subsurface Soil				
Incidental Ingestion of Subsurface Soil: Adult Resident			3E-06	0.02
Dermal Contact with Subsurface Soil: Adult Resident			4E-07	0.003
Inhalation of Particulates from Subsurface Soil: Adult Resident			1E-09	0.0004
Total	**Not Evaluated***		**3E-06**	**0.02**
Adult Resident Total: Soil			**1.E-05**	**0.2**
Child Resident - Surface Soil				
Incidental Ingestion of Surface Soil: Child Resident			1E-05	0.8
Dermal Contact with Surface Soil: Child Resident			5E-06	0.8
Inhalation of Particulates from Surface Soil: Child Resident			6E-09	0.002
Total	**Not Evaluated***		**2E-05**	**2** [b
Child Resident - Subsurface Soil				
Incidental Ingestion of Subsurface Soil: Child Resident			7E-06	0.2
Dermal Contact with Subsurface Soil: Child Resident			2E-06	0.1
Inhalation of Particulates from Subsurface Soil: Child Resident			7E-10	0.001
Total	**Not Evaluated***		**9E-06**	**0.3**
Child Resident Total: Soil			**2.E-05**	**2**
Adult Resident - Groundwater				
Ingestion of Groundwater: Adult Resident			NE	0.2
Total	**Not Evaluated***		**NE**	**0.2**
Receptor Total: Resident [a]			**3.E-05**	**0.4**

TABLE 2
QUANTITATIVE HUMAN-HEALTH RISK SUMMARY

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

	CENTRAL TENDENCY		RME	
	Total Cancer Risk	Total Hazard Index	Total Cancer Risk	Total Hazard Index
AREA 2 - FLOOD PLAIN (RECREATIONAL) AREA				
CURRENT LAND USE				
Recreational Child - Surface Soil				
Incidental Ingestion of Surface Soil: Recreational Child	1E-06	0.04	5E-06	0.1
Dermal Contact with Surface Soil: Recreational Child	4E-06	0.3	8E-06	0.6
Total	**5E-06**	**0.3**	**1E-05**	**0.7**
Recreational Child - Sediment				
Incidental Ingestion of Sediment: Recreational Child	2E-06	0.04	5E-06	0.1
Dermal Contact with Sediment: Recreational Child	1E-05	0.3	2E-05	0.6
Total	**1E-05**	**0.3**	**3E-05**	**0.7**
Recreational Child - Surface Water				
Incidental Ingestion of Surface Water: Recreational Child	2E-06	0.04	5E-06	0.09
Dermal Contact with Surface Water: Recreational Child	5E-07	0.03	9E-07	0.06
Total	**3E-06**	**0.07**	**6E-06**	**0.1**
Receptor Total: Recreational Child	**2E-05**	**0.7**	**5E-05**	**1**
POSSIBLE FUTURE LAND USE				
Construction Worker - Surface Soil				
Incidental Ingestion of Surface Soil: Construction Worker	1E-06	1	3E-06	1
Dermal Contact with Surface Soil: Construction Worker	2E-07	0.3	4E-07	0.3
Inhalation of Particulates from Surface Soil: Construction Worker	5E-10	0.004	1E-09	0.004
Total	**1E-06**	**1**	**3E-06**	**1**
Construction Worker - Subsurface Soil				
Incidental Ingestion of Subsurface Soil: Construction Worker	1E-06	2	2E-06	2
Dermal Contact with Subsurface Soil: Construction Worker	1E-07	0.3	1E-07	0.7
Inhalation of Particulates from Subsurface Soil: Construction Worker	7E-08	0.02	1E-07	0.02
Total	**1E-06**	**3**	**2E-06**	**3**
Receptor Total: Construction Worker	**2.E-06**	**4**	**6.E-06**	**4**
UNRESTRICTED LAND USE				
Adult Resident - Surface Soil				
Incidental Ingestion of Surface Soil: Adult Resident			2E-05	0.2
Dermal Contact with Surface Soil: Adult Resident			3E-06	0.1
Inhalation of Particulates from Surface Soil: Adult Resident			6E-09	0.0004
Total	**Not Evaluated***		**2E-05**	**0.3**
Adult Resident - Subsurface Soil				
Incidental Ingestion of Subsurface Soil: Adult Resident			1E-05	1
Dermal Contact with Subsurface Soil: Adult Resident			5E-06	0.4
Inhalation of Particulates from Subsurface Soil: Adult Resident			8E-07	0.002
Total	**Not Evaluated***		**2E-05**	**1**
Adult Resident Total: Soil			**4.E-05**	**2**
Child Resident - Surface Soil				
Incidental Ingestion of Surface Soil: Child Resident			4E-05	2
Dermal Contact with Surface Soil: Child Resident			2E-05	2
Inhalation of Particulates from Surface Soil: Child Resident			3E-09	0.001
Total	**Not Evaluated***		**6E-05**	**4**
Child Resident - Subsurface Soil				
Incidental Ingestion of Subsurface Soil: Child Resident			3E-05	10
Dermal Contact with Subsurface Soil: Child Resident			3E-05	9
Inhalation of Particulates from Subsurface Soil: Child Resident			4E-07	0.005
Total	**Not Evaluated***		**6E-05**	**19**
Child Resident Total: Soil			**1.E-04**	**23**
Adult Resident - Groundwater				
Ingestion of Groundwater: Adult Resident			1.E-03	7
Total	**Not Evaluated***		**1E-03**	**7**
Receptor Total: Resident [a]			**1.E-03**	**9**

TABLE 2
QUANTITATIVE HUMAN-HEALTH RISK SUMMARY

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

	CENTRAL TENDENCY		RME	
	Total Cancer Risk	Total Hazard Index	Total Cancer Risk	Total Hazard Index
AREA 3 - UPLAND (INDUSTRIAL) AREA				
CURRENT LAND USE				
Maintenance Worker - Surface Soil				
Incidental Ingestion of Surface Soil: Maintenance Worker	3E-07	0.007	4E-06	0.03
Dermal Contact with Surface Soil: Maintenance Worker	2E-08	0.001	1E-07	0.001
Inhalation of Particulates from Surface Soil: Maintenance Worker	6E-10	0.0004	4E-09	0.0008
Receptor Total: Maintenance Worker	**3E-07**	**0.008**	**4E-06**	**0.03**
POSSIBLE FUTURE LAND USE				
Commercial/Industrial Worker - Surface Soil				
Incidental Ingestion of Surface Soil: Commercial/Industrial Worker	2E-06	0.04	1E-05	0.09
Dermal Contact with Surface Soil: Commercial/Industrial Worker	9E-08	0.002	3E-07	0.002
Inhalation of Particulates from Surface Soil: Commercial/Industrial Work	3E-09	0.002	1E-08	0.002
Total	**2E-06**	**0.04**	**1E-05**	**0.09**
Commercial/Industrial Worker - Groundwater				
Ingestion of Groundwater: Commercial/Industrial Worker	5E-05	2	2E-04	2
Total	**5E-05**	**2**	**2E-04**	**2**
Receptor Total: Commercial/Industrial Worker	**5E-05**	**2**	**2E-04**	**2**
Construction Worker - Surface Soil				
Incidental Ingestion of Surface Soil: Construction Worker	1E-06	0.7	2E-06	0.7
Dermal Contact with Surface Soil: Construction Worker	1E-07	0.06	2E-07	0.06
Inhalation of Particulates from Surface Soil: Construction Worker	4E-10	0.008	9E-10	0.008
Total	**1E-06**	**0.8**	**2E-06**	**0.8**
Construction Worker - Subsurface Soil				
Incidental Ingestion of Subsurface Soil: Construction Worker	2E-07	0.2	5E-07	0.2
Dermal Contact with Subsurface Soil: Construction Worker	2E-08	0.02	5E-08	0.02
Inhalation of Particulates from Subsurface Soil: Construction Worker	1E-10	0.0000001	2E-10	0.0000001
Total	**3E-07**	**0.2**	**6E-07**	**0.2**
Receptor Total: Construction Worker	**1.E-06**	**1**	**3.E-06**	**1**
UNRESTRICTED LAND USE				
Adult Resident - Surface Soil				
Incidental Ingestion of Surface Soil: Adult Resident			1E-05	0.09
Dermal Contact with Surface Soil: Adult Resident			2E-06	0.01
Inhalation of Particulates from Surface Soil: Adult Resident			5E-09	0.001
Total	**Not Evaluated***		**1E-05**	**0.1**
Adult Resident - Subsurface Soil				
Incidental Ingestion of Subsurface Soil: Adult Resident			3E-06	0.02
Dermal Contact with Subsurface Soil: Adult Resident			4E-07	0.005
Inhalation of Particulates from Subsurface Soil: Adult Resident			1E-09	1E-07
Total	**Not Evaluated***		**3E-06**	**0.03**
Adult Resident Total: Soil			**2.E-05**	**0.1**
Child Resident - Surface Soil				
Incidental Ingestion of Surface Soil: Child Resident			3E-05	0.8
Dermal Contact with Surface Soil: Child Resident			9E-06	0.2
Inhalation of Particulates from Surface Soil: Child Resident			3E-09	0.002
Total	**Not Evaluated***		**4E-05**	**1**
Child Resident - Subsurface Soil				
Incidental Ingestion of Subsurface Soil: Child Resident			7E-06	0.2
Dermal Contact with Subsurface Soil: Child Resident			2E-06	0.1
Inhalation of Particulates from Subsurface Soil: Child Resident			6E-10	3E-07
Total	**Not Evaluated***		**9E-06**	**0.3**
Child Resident Total: Soil			**5.E-05**	**1**
Adult Resident - Groundwater				
Ingestion of Groundwater: Adult Resident			6.E-04	5
Total	**Not Evaluated***		**6E-04**	**5**
Receptor Total: Resident [a]			**7.E-04**	**5**

TABLE 2
QUANTITATIVE HUMAN-HEALTH RISK SUMMARY

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

	CENTRAL TENDENCY		RME	
	Total Cancer Risk	Total Hazard Index	Total Cancer Risk	Total Hazard Index
AREA 3 - FLOOD PLAIN (RECREATIONAL) AREA				
CURRENT LAND USE				
Recreational Child - Surface Soil				
Incidental Ingestion of Surface Soil: Recreational Child	6E-07	0.02	3E-06	0.09
Dermal Contact with Surface Soil: Recreational Child	2E-06	0.2	3E-06	0.4
Total	**3E-06**	**0.2**	**6E-06**	**0.5**
Recreational Child - Sediment				
Incidental Ingestion of Sediment: Recreational Child	4E-07	0.003	8E-07	0.01
Dermal Contact with Sediment: Recreational Child	2E-06	0.07	5E-06	0.1
Total	**2E-06**	**0.07**	**6E-06**	**0.1**
Recreational Child - Surface Water				
Incidental Ingestion of Surface Water: Recreational Child	2E-06	0.05	4E-06	0.1
Dermal Contact with Surface Water: Recreational Child	5E-07	0.01	1E-06	0.01
Total	**3E-06**	**0.06**	**5E-06**	**0.1**
Receptor Total: Recreational Child	**9E-06**	**0.3**	**2E-05**	**0.7**
POSSIBLE FUTURE LAND USE				
Construction Worker - Surface Soil				
Incidental Ingestion of Surface Soil: Construction Worker	4E-06	0.5	9E-06	0.5
Dermal Contact with Surface Soil: Construction Worker	7E-08	0.08	1E-07	0.08
Inhalation of Particulates from Surface Soil: Construction Worker	3E-10	0.002	6E-10	0.002
Total	**4E-06**	**0.6**	**9E-06**	**0.6**
Construction Worker - Subsurface Soil				
Incidental Ingestion of Subsurface Soil: Construction Worker	7E-07	0.4	1E-06	0.4
Dermal Contact with Subsurface Soil: Construction Worker	7E-08	0.04	1E-07	0.04
Inhalation of Particulates from Subsurface Soil: Construction Worker	3E-10	--	6E-10	--
Total	**8E-07**	**0.4**	**1E-06**	**0.4**
Receptor Total: Construction Worker	**5.E-06**	**1**	**1.E-05**	**1**
UNRESTRICTED LAND USE				
Adult Resident - Surface Soil				
Incidental Ingestion of Surface Soil: Adult Resident			9E-06	0.1
Dermal Contact with Surface Soil: Adult Resident			1E-06	0.08
Inhalation of Particulates from Surface Soil: Adult Resident			3E-09	0.0003
Total	**Not Evaluated***		**1E-05**	**0.2**
Adult Resident - Subsurface Soil				
Incidental Ingestion of Subsurface Soil: Adult Resident			9E-06	0.1
Dermal Contact with Subsurface Soil: Adult Resident			1E-06	0.01
Inhalation of Particulates from Subsurface Soil: Adult Resident			3E-09	--
Total	**Not Evaluated***		**1E-05**	**0.1**
Adult Resident Total: Soil			**2.E-05**	**0.3**
Child Resident - Surface Soil				
Incidental Ingestion of Surface Soil: Child Resident			2E-05	1
Dermal Contact with Surface Soil: Child Resident			7E-06	2
Inhalation of Particulates from Surface Soil: Child Resident			2E-09	0.0006
Total	**Not Evaluated***		**3E-05**	**3**
Child Resident - Subsurface Soil				
Incidental Ingestion of Subsurface Soil: Child Resident			2E-05	0.5
Dermal Contact with Subsurface Soil: Child Resident			7E-06	0.2
Inhalation of Particulates from Subsurface Soil: Child Resident			2E-09	--
Total	**Not Evaluated***		**3E-05**	**0.7**
Child Resident Total: Soil			**5.E-05**	**4**
Adult Resident - Groundwater				
Ingestion of Groundwater: Adult Resident			1.E-03	8
Total	**Not Evaluated***		**1E-03**	**8**
Receptor Total: Resident [a]			**1.E-03**	**8**

TABLE 2
QUANTITATIVE HUMAN-HEALTH RISK SUMMARY

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

	CENTRAL TENDENCY		RME	
	Total Cancer Risk	Total Hazard Index	Total Cancer Risk	Total Hazard Index

NOTES:

[a] Cancer risk is the cumulative receptor cancer risk for child and adult contact with soil and adult ingestion of drinking water. Non-cancer risk is the cumulative adult non-cancer risk for contact with soil and ingestion of drinking water.

[b] Although the total screening HI for the Areas 2, Industrial, Child Resident exposure scenario to surface soil equals 2, target-organ specific HIs are less than or equal to the USEPA target threshold value of 1 for noncancer risks, as documented in the AOC 57 Final RI (see Appendix N-6):

Total Skin HI: 0.7
Total GI HI: 0.05
Total Nervous System HI: 0.07
Total Liver HI: 0.02
Total Kidney HI: 1

RME = Reasonable Maximum Exposure

NE = Not evaluated because there were no carcinogenic CPCs.

NA = Not additive

Totals may not appear accurate due to rounding; but, in fact, are based on addition of individual cancer risks and hazard indices prior to rounding.

* Central tendency not evaluated because only RME risks are assessed for residential exposures.

-- Hazard Index not calculated because there was no inhalation RfD available for the CPCs.

TABLE 3
COMPARISON OF AREA 2 HUMAN-HEALTH RISK ESTIMATES TO USEPA RISK ASSESSMENT THRESHOLDS

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

	Exposure Medium				
Subarea and Receptor	**Surface Soil**	**Subsurface Soil**	**Surface Water and Sediment**	**Ground-water**	**Receptor Total**
Upland (Industrial) Area					
Current/Future Land Use					
Maintenance Worker	○, □	--	--	--	○, □
Possible Future Land Use					
Construction Worker	○, □	○, □	--	--	○, □
Commercial Worker	○, □	--	--	--, □	○, □
Unrestricted Future Land Use					
Adult Resident	○, □	○, □	--	--, □	○, □
Child Resident	○, □ *	○, □	--	--	○, □ *
Total Resident	--	--	--	--	○, --
F. Plain (Recreational) Area					
Current/Future Land Use					
Recreational Child	○, □	--	○, □	--	○, □
Possible Future Land Use					
Construction Worker	○, □	○, ■	--	--	○, ■
Unrestricted Future Land Use					
Adult Resident	○, □	○, □	--	●, ■	●, ■
Child Resident	○, ■	○, ■	--	--	○, ■
Total Resident	--	--	--	--	●, --

NOTES:
Risk estimates based on reasonable maximum exposure (RME) contaminant concentrations.
Total resident cancer risk equals the sum of surface soil and subsurface soil cancer risks for child and adult residents, plus adult cancer risk.
○ = cancer risk estimate is within USEPA acceptable range of $1x10^{-4}$ to $1x10^{-6}$
● = cancer risk estimate exceeds USEPA acceptable range of $1x10^{-4}$ to $1x10^{-6}$
□ = noncancer risk estimate is equal or less than HI of 1
■ = noncancer risk estimate exceeds an HI of 1
-- = not evaluated
* = Although the total screening hazard index exceeds 1, target-organ specific HIs are less than or equal to 1.

TABLE 4
COMPARISON OF AREA 3 HUMAN-HEALTH RISK ESTIMATES TO USEPA RISK ASSESSMENT THRESHOLDS

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

	Exposure Medium				
Subarea and Receptor	**Surface Soil**	**Subsurface Soil**	**Surface Water and Sediment**	**Ground-water**	**Receptor Total**
Upland (Industrial) Area					
Current/Future Land Use					
Maintenance Worker	○, □	--	--	--	○, □
Possible Future Land Use					
Construction Worker	○, □	○, □	--	--	○, □
Commercial Worker	○, □	--	--	●, □ *	●, □ *
Unrestricted Future Land Use					
Adult Resident	○, □	○, □	--	●, ■	●, ■
Child Resident	○, □	○, □	--	--	○, □
Total Resident	--	--	--	--	●, --
F. Plain (Recreational) Area					
Current/Future Land Use					
Recreational Child	○, □	--	○, □	--	○, □
Possible Future Land Use					
Construction Worker	○, □	○, □	--	--	○, □
Unrestricted Future Land Use					
Adult Resident	○, □	○, □	--	●, ■	●, ■
Child Resident	○, ■	○, □	--	--	○, ■
Total Resident	--	--	--	--	●, --

NOTES:
Risk estimates based on reasonable maximum exposure (RME) contaminant concentrations.
Total resident cancer risk equals the sum of surface soil and subsurface soil cancer risks for child and adult residents, plus adult cancer risk.
○ = cancer risk estimate is within USEPA acceptable range of $1x10^{-4}$ to $1x10^{-6}$
● = cancer risk estimate exceeds USEPA acceptable range of $1x10^{-4}$ to $1x10^{-6}$
□ = noncancer risk estimate is equal or less than HI of 1
■ = noncancer risk estimate exceeds an HI of 1
-- = not evaluated
* = Although the total screening hazard index exceeds 1, target-organ specific HIs are less than or equal to 1.

TABLE 5
AREA 2 PRIMARY RISK CONTRIBUTORS [a]

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

Subarea	Land Use	Medium	Cumulative Risk - Central Tendency	Cumulative Risk - RME [b]	Major Risk Contributor [c]	Risk Contribution [d] (By Chemical)
Area 2 Upland Cancer Risks		Estimated risks do not exceed 1×10^{-4}				
Area 2 Upland Noncancer Risks		Estimated risks do not exceed an HI of 1.				
Area 2 Flood Plain Cancer Risks	Unrestricted (Residential)	Groundwater	NA(e)	1.0E-03	Arsenic	9.6E-04 (92.2 %)
					Bis(2-ethylhexyl)phthalate	6.6E-05 (6.3%)
					Tetrachloroethylene	9.8E-06 (0.9 %)
					Aroclor -1260	5.2E-06 (0.5 %)
Area 2 Flood Plain Noncancer Risks	Possible Future (Construction Worker)	Subsurface Soil	3	3	Aroclor-1260	1.7 (immune system)
	Unrestricted (Residential)	Surface Soil	NA(e)	5	Arsenic	1.2 (skin)
					Aroclor-1260	2.8 (immune system)
		Subsurface Soil	NA(e)	19	Chromium	4.4 (NOAEL [GI])[f]
					Aroclor-1260	9.2 (immune system)
					C11-C22	3.8 (kidney)
		Groundwater	NA(e)	7	Arsenic	5 (skin)

Note:

(a) Risk exposure scenarios presented in this table are those that present a cumulative cancer risk greater than 1×10^{-4} based on RME assumptions.

(b) RME = Reasonable maximum exposure

(c) Chemicals that present a cancer risk greater than 1×10^{-6}.

(d) Cancer risks for individual chemicals at RME. Percent contribution to the total risk is shown in parentheses.

(e) NA = Not applicable - Only RME risks are assessed for residential exposures

(f) Reference dose (RfD) is based on no observed adverse effects level (NOAEL) dose. However, higher doses in study used to develop RfD were associated with effects on the GI system. Therefore, the HQ for this chemical was included in the segregated HI for effects to the GI system to provide a conservative estimate of the HI.

TABLE 6
AREA 3 PRIMARY RISK CONTRIBUTORS [a]

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

Subarea	Land Use	Medium	Cumulative Risk: Central Tendency	Cumulative Risk: RME[b]	Major Risk Contributor[c]	Risk Contribution[d] (By Chemical)
Area 3 Upland Cancer Risk	Possible Future (Commercial/Industrial)	Groundwater	4.7E-05	1.7E-04	Arsenic	1.7E-04 (98.2%)
					Carbon tetrachloride	2.0E-06 (1.2%)
	Unrestricted (Residential)	Groundwater	NA(e)	5.9E-04	Arsenic	5.8E-04 (98.2 %)
					Carbon tetrachloride	6.9E-06 (1.2%)
					1,4-dichlorobenzene	1.6E-06 (0.3%)
					Tetrachloroethylene	1.6E-06 (0.3%)
Area 3 Upland Noncancer Risk	Possible Future (Commercial/Industrial)	Groundwater	2	2	Arsenic	1.1 (skin)
	Unrestricted (Residential)	Groundwater	NA(e)	5	Arsenic	3.0 (skin)
Area 3 Flood Plain Cancer Risk	Unrestricted (Residential)	Groundwater	NA(e)	1.5E-03	Arsenic	1.5E-03 (99 %)
					Bis(2-ethylhexyl)phthalate	8.5E-06 (0.6%)
					Tetrachloroethylene	3.4E-06 (0.2%)
Area 3 Flood Plain Noncancer Risk	Unrestricted (Residential)	Groundwater	NA(e)	8	Arsenic	7.7 (skin)
		Surface Soil	NA(e)	3	C11-C22	1.7 (kidney)

Note:

(a) Risk exposure scenarios presented in this table are those that present a cumulative cancer risk greater than 1×10^{-4} based on RME assumptions.

(b) RME = Reasonable maximum exposure

(c) Chemicals that present a cancer risk greater than 1×10^{-6}.

(d) Cancer risks for individual chemicals at RME. Percent contribution to the total risk is shown in parentheses.

(e) NA = Not applicable - Only RME risks are assessed for residential exposures

TABLE 7
AOC 57 SOIL PRELIMINARY REMEDIATION GOALS

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

Land Use Scenario	Media	Chemical of Concern (a)	Maximum Detection (mg/kg)	Background (b) (mg/kg)	Human Health RBC (c) (mg/kg)	MCP(d) Method 1 S-1/GW-1 (mg/kg)	MCP(d) Method 1 S-2/GW-1 (mg/kg)	PRG (mg/kg)
Area 2								
Possible Future Land Use	Flood Plain							
	Subsurface Soil	Aroclor-1260	12	ND	3.5	(f)	(f)	3.5
		Lead	5060	48	400 (e)	300	600	600 (g)
Unrestricted Use	Flood Plain							
	Surface Soil	Aroclor-1260	4.2	ND	0.5	(f)	(f)	0.5
		Arsenic	61.2	19	21	(f)	(f)	21
	Subsurface Soil	Chromium	2410	33	550	(f)	(f)	550
		Lead	5060	48	400 (e)	(f)	(f)	400
		Aroclor-1260	12	ND	0.5	(f)	(f)	0.5
		C11-C22	990 (h)	ND	930	(f)	(f)	930
Area 3								
Unrestricted Use	Flood Plain							
	Surface Soil	C11-C22	3100	ND	930	(f)	(f)	930

Notes:

(a) CPCs that present cancer risks above 1E-06 or target-organ specific HI above 1.0 based on the baseline risk assessment.

(b) Background concentrations for inorganic analytes based upon chemical data gathered from 20 soils samples collected as part of Group 1A and 1B investigations. (See Appendix L of the RI Report (HLA, 1999a)

(c) PRGs are based on receptor risks to soil. Achieving the PRGs listed in this table should enable the residual receptor risks to be at or below a target-organ specific HI of 1 for soil and a cummulative receptor cancer risk at or below 1E-04 for soil.

(d) Massachusetts Contingency Plan Method 1 Risk Characterization S-1/GW-1 and S-2/GW-1 Soil Standards (MADEP, 1997)

(e) USEPA residential soil lead screening level per OSWER Directive 9355.4-12 (USEPA, 1994)

(f) Risk characterization performed following USEPA guidance. Method 1 MCP methods are not applied.

(g) No USEPA commercial/industrial soil lead screening level currently exists. PRG is based upon MCP Method 1 S-2/GW-1 standards (potentially accessible soil, children present, low frequency, and high intensity for construction worker).

(h) Maximum C11-C22 aromatic concentration was 990 mg/kg. Maximum TPHC concentration was 31,800 mg/kg or an estimated 7,050 mg/kg C11-C22 by converting TPHC concentrations to EPH/VPH concentrations. The computed site-specific average composition of petroleum detected at this site is presented in Appendix N of the RI Report (HLA, 1999a).

(i) Exceedance above 930 mg/kg C11-C12 or the equivalent calculated value 4,195 mg/kg TPHC for Area 2.

ACRONYMS

COC - Contaminant of Concern
CPCs- Contaminants of Potential Concern
MCP - Massachusetts Contingency Plan
ND - Not determined
PRG - Preliminary Remediation Goal
RBC - Risk-Based Concentration

TABLE 8

AOC 57 GROUNDWATER PRELIMINARY REMEDIATION GOALS

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS MASSACHUSETTS

Land Use Scenario	Subarea	Chemical of Concern (a)	Maximum Detection (b) (µg/L)	Background (c) (µg/L)	Human Health RBC (d) (µg/L)	ARARs MCL (e) (µg/L)	ARARs MMCL (f) (µg/L)	PRG (µg/L)
Area 2								
Unrestricted Use	Flood Plain	Arsenic	54.4	10.5	ND	50	50	50
		BEHP	400	ND	ND	6	6	--(h)
		Tetrachloroethylene	16	ND	ND	5	5	5
		Aroclor -1260	0.22	ND	ND	0.5	0.5	--(g)
Area 3								
Possible Future Land Use	Upland	Arsenic	74	10.5	ND	50	50	50
		Carbon Tetrachloride	4.5	ND	ND	5	5	--(g)
		Cadmium	8.67	4.01	ND	5	5	5
		1,4-dichlorobenzene	5.6	ND	ND	75	5	5
Unrestricted Use	Upland	Arsenic	74	10.5	ND	50	50	50
		Carbon tetrachloride	4.5	ND	ND	5	5	--(g)
		Cadmium	8.67	4.01	ND	5	5	5
		1,4-dichlorobenzene	5.6	ND	ND	75	5	5
		Tetrachloroethylene	2.6	ND	ND	5	5	--(g)
Unrestricted Use	Flood Plain	Arsenic	84.4	10.5	ND	50	50	50
		BEHP	52	ND	ND	6	6	--(h)
		Tetrachloroethylene	5.5	ND	ND	5	5	5

Note:

(a) CPCs that present cancer risks above 1E-06 or HQs above 1.0 as identified by the baseline risk assessment in the RI Report (HLA, 1999a) or exceedance of an ARAR.

(b) All reported maximum concentrations are for unfiltered samples. Concentrations are for 1995, 1996 and 1998 analytical data.

(c) Background concentrations for inorganic analytes based upon chemical data gathered as part of Group 1A and 1B investigations. (See Appendix L of the RI Report (HLA, 1999a).

(d) RBCs are based on receptor risks to soil. These values were not computed unless no ARAR was available for the COC.

(e) MCL - Maximum Contaminant Levels - USEPA Drinking Water Regulations and Health Advisories (USEPA, 1996)

(f) MMCL - Massachusetts Maximum Contaminant Level - Massachusetts Drinking Water Standards and Guidelines for Chemicals in Massachusetts Drinking Waters. (MADEP/ORS, 1999)

(g) No PRG because maximum detected concentration in the area did not exceed MCLs/MMCLs.

(h) No PRG because BEHP identified as a lab/sampling contaminant.

ACRONYMS:

BEHP - Bis(2-ethylhexyl)phthalate
COC - Contaminant of Concern
CPCs- Contaminants of Potential Concern
ND - Not determined
PRG - Preliminary Remediation Goal
RBC - Risk-Based Concentration

TABLE 9
SUMMARY OF ARARS FOR AOC 57 AREA 2

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

ARAR	ROLE OF ARAR			
	ALTERNATIVE II-1	ALTERNATIVE II-2	ALTERNATIVE II-3	ALTERNATIVE II-4
Federal Location-specific				
Floodplain Management Executive Order 11988 [40 CFR Part 6, Appendix A]	Not triggered.	Not triggered.	Requires that adverse effects to floodplains be minimized and that beneficial values be restored to disturbed areas.	Requires that adverse effects to floodplains be minimized and that beneficial values be restored to disturbed areas.
Protection of Wetlands Executive Order 11990 [40 CFR Part 6, Appendix A]	Not triggered.	Not triggered.	Requires that adverse effects to wetlands be minimized and that beneficial values be restored to disturbed areas.	Requires that adverse effects to wetlands be minimized and that beneficial values be restored to disturbed areas.
Clean Water Act, Dredge or Fill Requirements Section 404 [40 CFR Part 230]	Not triggered.	Not triggered.	Prohibits the filling of wetland areas.	Prohibits the filling of wetland areas.
Fish and Wildlife Coordination Act [16 USC 661 et seq.]	Not triggered.	Not triggered.	Requires action to prevent, mitigate, or compensate for project related impacts to wetlands.	Requires action to prevent, mitigate, or compensate for project related impacts to wetlands.
Endangered Species Act [50 CFR Parts 17.11-17.12]	Not triggered.	Not triggered.	Requires action to avoid adverse impacts to endangered or threatened species and their habitat.	Requires action to avoid adverse impacts to endangered or threatened species and their habitat.
Migratory Bird Treaty Act [16 USC 703 et seq.]	Not triggered.	Not triggered.	Requires protection of migratory birds, their nests, eggs, and young.	Requires protection of migratory birds, their nests, eggs, and young.

TABLE 9 (continued)
SUMMARY OF ARARS FOR AOC 57 AREA 2

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

ARAR	ROLE OF ARAR			
	ALTERNATIVE II-1	ALTERNATIVE II-2	ALTERNATIVE II-3	ALTERNATIVE II-4
State Location-specific				
Massachusetts Wetland Protection Regulations [310 CMR 10.00]	Not triggered.	Not triggered.	Sets limits on what activities may occur within 100-year floodplain and 100-ft buffer zone.	Sets limits on what activities may occur within 100-year floodplain and 100-ft buffer zone.
Massachusetts Endangered Species Regulations [321 CMR 8.00]	Not triggered.	Not triggered.	Requires action to minimize impacts to Massachusetts rare, threatened, or endangered species.	Requires action to minimize impacts to Massachusetts rare, threatened, or endangered species.
Federal Chemical-specific				
Safe Drinking Water Act, National Primary Drinking Water Regulations, MCLs and MCLGs [40 CFR Parts 141.60 - 141.63 and 141.50 - 141.52]	Used to establish groundwater cleanup levels.	Used to establish groundwater cleanup levels.	Used to establish groundwater cleanup levels.	Used to establish groundwater cleanup levels.
State Chemical-specific				
Massachusetts Groundwater Quality Standards [314 CMR 6.00]	Used to establish groundwater cleanup levels.	Used to establish groundwater cleanup levels.	Used to establish groundwater cleanup levels.	Used to establish groundwater cleanup levels.
Massachusetts Drinking Water Regulations [310 CMR 22.00]	Used to establish groundwater cleanup levels.	Used to establish groundwater cleanup levels.	Used to establish groundwater cleanup levels.	Used to establish groundwater cleanup levels.

TABLE 9 (continued)
SUMMARY OF ARARS FOR AOC 57 AREA 2

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

ARAR	ROLE OF ARAR			
	ALTERNATIVE II-1	ALTERNATIVE II-2	ALTERNATIVE II-3	ALTERNATIVE II-4
Federal Action-specific				
CWA, General Pretreatment Program (40 CFR Part 403)	Not triggered.	Not triggered.	Any wastewater discharge to Devens WWTP must comply with pretreatment standards.	Any wastewater discharge to Devens WWTP must comply with pretreatment standards.
Clean Water Act NPDES Permit Program [40 CFR 122,125]	Not triggered.	Not triggered.	Construction activities will be managed to comply with surface water discharge requires of these regulations.	Construction activities will be managed to comply with surface water discharge requires of these regulations.
Toxicity Characteristics (40 CFR 261.24)	Not triggered.	Not triggered.	Will be used to determine if soil/sediment is to be handled as hazardous waste.	Will be used to determine if soil/sediment is to be handled as hazardous waste.
RCRA, Land Disposal Restrictions (40 CFR 268)	Not triggered.	Not triggered.	Prohibits land disposal of RCRA hazardous waste without specified treatment.	Prohibits land disposal of RCRA hazardous waste without specified treatment.
TSCA (40 CFR Part 761 Subpart D) Storage and Disposal	Not triggered.	Not triggered.	Establishes requirements for the cleanup, storage, and disposal of PCBs.	Establishes requirements for the cleanup, storage, and disposal of PCBs.
TSCA (40 CFR Part 761 Subpart G) PCB Spill Cleanup Policy	Not triggered.	Not triggered.	Affects management of media containing 50 ppm or greater of PCBs.	Affects management of media containing 50 ppm or greater of PCBs.
USEPA OSWER Publication 9345.3-03FS, January 1992	Not triggered.	Affects management of sampling wastes.	Affects management of sampling wastes.	Affects management of sampling wastes.
Hazardous Waste Management Systems; (RCRA 40 CFR 260)	Not triggered.	Not triggered.	Establishes procedures for managing hazardous waste.	Establishes procedures for managing hazardous waste.
Standards for Owners and	Not triggered.	Not triggered.	Defines requirements for the	Defines requirements for the

TABLE 9 (continued)
SUMMARY OF ARARS FOR AOC 57 AREA 2

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

ARAR	ROLE OF ARAR			
	ALTERNATIVE II-1	ALTERNATIVE II-2	ALTERNATIVE II-3	ALTERNATIVE II-4
Operators of Hazardous Waste Treatment, Storage and Disposal Facilities (RCRA 40 CFR 264)			safe management of hazardous wastes.	safe management of hazardous wastes.
RCRA 40 CFR Part 262, Standards Applicable to Generators of Hazardous Waste	Not triggered.	Not triggered.	Establishes management standards for the treatment, storage, and disposal of hazardous wastes.	Establishes management standards for the treatment, storage, and disposal of hazardous wastes.
State Action-specific				
Massachusetts Hazardous Waste Management Rules; 310 CMR 30.000	Not triggered.	Not triggered.	Supplements RCRA rules used to determine if soil/sediment is to be handled as hazardous waste.	Supplements RCRA rules used to determine if soil/sediment is to be handled as hazardous waste.
Massachusetts Water Quality Certification and Certification for Dredging [314 CMR 9.00]	Not triggered.	Not triggered.	Wetland excavation must meet the substantive criteria and standards of these regulations.	Wetland excavation must meet the substantive criteria and standards of these regulations.
Massachusetts Air Pollution Control Regulations [310 CMR 7.00]	Not triggered.	Not triggered.	Remedial actions will be performed to prevent emissions in excess of these standards.	Remedial actions will be performed to prevent emissions in excess of these standards.

TABLE 9 (continued)
SUMMARY OF ARARS FOR AOC 57 AREA 2

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

Notes:

AOC	= Area of contamination
ARAR	= Area or Relevant and Appropriate Requirements
CFR	= Code of Federal Regulations
CMR	= Code of Massachusetts Regulations
CWA	= Clean Water Act
IDW	= Investigation derived waste
LDR	= Land Disposal Restrictions
MCL	= Maximum Contaminant Level
MCLG	= Maximum Contaminant Level Goal
NCP	= National Contingency Plan
NPDES	= National Pollutant Discharge Elimination System
PCB	= Polychlorinated biphenyls
ppm	= parts per million
PRGs	= Preliminary remediation goals
RCRA	= Resource Conservation and Recovery Act
TSCA	= Toxic Substances Control Act
USEPA	= U.S. Environmental Protection Agency
USC	= United States Code
WWTP	= Wastewater treatment plant

TABLE 10
SUMMARY OF ARARS FOR AOC 57 AREA 3

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

ARAR	ROLE OF ARAR		
	ALTERNATIVE III-1	ALTERNATIVE III-2	ALTERNATIVE III-3
Federal Location-specific			
Floodplain Management Executive Order 11988 [40 CFR Part 6, Appendix A]	Not triggered.	Not triggered.	Requires that adverse effects to floodplains be minimized and that beneficial values be restored to disturbed areas.
Protection of Wetlands Executive Order 11990 [40 CFR Part 6, Appendix A]	Not triggered.	Not triggered.	Requires that adverse effects to wetlands be minimized and that beneficial values be restored to disturbed areas.
Clean Water Act, Dredge or Fill Requirements Section 404 [40 CFR Part 230]	Not triggered.	Not triggered.	Prohibits the filling of wetland areas.
Fish and Wildlife Coordination Act [16 USC 661 et seq.]	Not triggered.	Not triggered.	Requires action to prevent, mitigate, or compensate for project related impacts to wetlands.
Endangered Species Act [50 CFR Parts 17.11-17.12]	Not triggered.	Not triggered.	Requires action to avoid adverse impacts to endangered or threatened species and their habitat.
Migratory Bird Treaty Act [16 USC 703 et seq.]	Not triggered.	Not triggered.	Requires protection of migratory birds, their nests, eggs, and young.

TABLE 10 (continued)
SUMMARY OF ARARS FOR AOC 57 AREA 3

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

ARAR	ROLE OF ARAR		
	ALTERNATIVE III-1	ALTERNATIVE III-2	ALTERNATIVE III-3
State Location-specific			
Massachusetts Wetland Protection Regulations [310 CMR 10.00]	Not triggered.	Not triggered.	Sets limits on what activities may occur within 100-year floodplain and 100-ft buffer zone.
Massachusetts Endangered Species Regulations [321 CMR 8.00]	Not triggered.	Not triggered.	Requires action to minimize impacts to Massachusetts rare, threatened, or endangered species.
Federal Chemical-specific			
Safe Drinking Water Act, National Primary Drinking Water Regulations, MCLs and MCLGs [40 CFR Parts 141.60 - 141.63 and 141.50 - 141.52]	Used to establish groundwater cleanup levels.	Used to establish groundwater cleanup levels.	Used to establish groundwater cleanup levels.
State Chemical-specific			
Massachusetts Groundwater Quality Standards [314 CMR 6.00]	Used to establish groundwater cleanup levels.	Used to establish groundwater cleanup levels.	Used to establish groundwater cleanup levels.
Massachusetts Drinking Water Regulations [310 CMR 22.00]	Used to establish groundwater cleanup levels.	Used to establish groundwater cleanup levels.	Used to establish groundwater cleanup levels.

TABLE 10 (continued)
SUMMARY OF ARARS FOR AOC 57 AREA 3

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

ARAR	ROLE OF ARAR		
	ALTERNATIVE III-1	ALTERNATIVE III-2	ALTERNATIVE III-3
Federal Action-specific			
CWA, General Pretreatment Program (40 CFR Part 403)	Not triggered.	Not triggered.	Any wastewater discharge to Devens WWTP must comply with pretreatment standards.
Clean Water Act NPDES Permit Program [40 CFR 122,125]	Not triggered.	Not triggered.	Construction activities will be managed to comply with surface water discharge requires of these regulations.
Toxicity Characteristics (40 CFR 261.24)	Not triggered.	Not triggered.	Will be used to determine if soil/sediment is to be handled as hazardous waste.
RCRA, Land Disposal Restrictions (40 CFR 268)	Not triggered.	Not triggered.	Prohibits land disposal of RCRA hazardous waste without specified treatment.
USEPA OSWER Publication 9345.3-03FS, January 1992	Not triggered.	Affects management of sampling wastes.	Affects management of sampling wastes.
Hazardous Waste Management Systems; (RCRA 40 CFR 260)	Not triggered.	Not triggered.	Establishes procedures for managing hazardous waste.
Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities (RCRA 40 CFR 264)	Not triggered.	Not triggered.	Defines requirements for the safe management of hazardous wastes.
RCRA 40 CFR Part 262, Standards Applicable to Generators of Hazardous Waste	Not triggered.	Not triggered.	Establishes management standards for the treatment, storage, and disposal of

TABLE 10 (continued)
SUMMARY OF ARARS FOR AOC 57 AREA 3

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

ARAR	ROLE OF ARAR		
	ALTERNATIVE III-1	ALTERNATIVE III-2	ALTERNATIVE III-3
			hazardous wastes.
State Action-specific			
Massachusetts Hazardous Waste Management Rules; 310 CMR 30.000	Not triggered.	Not triggered.	Supplements RCRA rules used to determine if soil/sediment is to be handled as hazardous waste.
Massachusetts Water Quality Certification and Certification for Dredging [314 CMR 9.00]	Not triggered.	Not triggered.	Wetland excavation must meet the substantive criteria and standards of these regulations.
Massachusetts Air Pollution Control Regulations [310 CMR 7.00]	Not triggered.	Not triggered.	Remedial actions will be performed to prevent emissions in excess of these standards.

Notes:

AOC = Area of contamination
ARAR = Applicable or Relevant and Appropriate Requirements
CFR = Code of Federal Regulations
CMR = Code of Massachusetts Regulations
CWA = Clean Water Act
IDW = Investigation derived waste
LDR = Land Disposal Restrictions
MCL = Maximum Contaminant Level
USEPA = U.S. Environmental Protection Agency
USC = United States Code
WWTP = Wastewater treatment plant
MCLG = Maximum Contaminant Level Goal
NCP = National Contingency Plan
NPDES = National Pollutant Discharge Elimination System
PCB = Polychlorinated biphenyls
ppm = parts per million
PRGs = Preliminary remediation goals
RCRA = Resource Conservation and Recovery Act

TABLE 11
COST SUMMARY FOR ALTERNATIVE II-3: EXCAVATION (FOR POSSIBLE FUTURE USE) AND INSTITUTIONAL CONTROLS

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

ITEM	COST
DIRECT COSTS	
Pre-Design Investigation	$5,670
Setup, Excavation, Dewatering, Transport, Disposal, Restoration	$211,475
Confirmatory Sampling, Summary Data Report	$12,879
Waste Characterization	$19,280
Wetland Delineation, Boundary Survey, Institutional Controls	$16,000
Direct Subtotal	$265,304
INDIRECT COSTS	
Design/Permitting (@10% of direct cost)	$26,530
Wetland Restoration Plan, Health&Safety	$14,765
Pre-Construction Mtg, Construction Oversight (@5% of direct cost)	$28,780
Legal/Administrative Fees (@5% of direct cost)	$13,265
Indirect Subtotal	$83,341
TOTAL CAPITAL COSTS	$348,645
OPERATION AND MAINTENANCE COSTS	
Present Worth of GW/SW Sampling 2X/yr for 3 yrs @7%	$43,412
Present Worth of GW/SW Sampling 1X/yr for yrs 4 thru 30 @7%	$80,931
Present Worth of Wetland Restoration Monitoring for 5 yrs @ 7%	$6,150
Present Worth of Institutional Control Inspections for 30 years @ 7%	$13,402
Present Worth of Institut. Control Reviews (every 5 yrs for 30 years @ 7%	$41,169
TOTAL O&M COSTS	$185,064
TOTAL CAPITAL AND O&M COSTS	$533,709
UNSPECIFIED DESIGN DETAILS (@25 PERCENT)	$133,427
TOTAL PRESENT WORTH OF ALTERNATIVE II-3	$667,136
COST SENSITIVITY ANALYSIS - MINIMUM ESTIMATE Also assume that the soil requiring excavation is reduced by 25% (160 CY, 288 tons, or 1 foot). Assume groundwater will attain MCLs after one year. Add two extra years validation for a total of 3 years monitoring. Assume wetland monitoring will remain at 5 years and IC/site reviews will remain at 30 years.	
MINIMUM COST OF POSSIBLE FUTURE USE ALTERNATIVE - AREA 2	$514,521
COST SENSITIVITY ANALYSIS - MAXIMUM ESTIMATE Assume that the soil requiring excavation is increased by 25% (160 CY, 288 tons, or 1 foot).	
MAXIMUM COST OF POSSIBLE FUTURE USE ALTERNATIVE - AREA 2	$718,585

Note: Detailed cost estimate is provided in Appendix B of FS report.

TABLE 12
AOC 57 CLEANUP LEVELS FOR CONTAMINANTS OF CONCERN

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

Subarea/Medium	Chemical of Concern	Cleanup Level	Basis for Cleanup Level	Risk at Cleanup Level
F. Plain/Subsurface Soil	Aroclor-1260	3.5 mg/kg*	Risk-based	HQ=0.5 †
	Lead	600 mg/kg*	MCP Method 1 S-2/GW-1	Not calc.
Groundwater	Arsenic	50 µg/L **	MCL	Not calc.
	Cadmium	5 µg/L **	MCL	Not calc.
	1,4-Dichlorobenzene	5 µg/L **	MMCL	Not calc.
	Tetrachloroethene	5 µg/L **	MCL/MMCL	Not calc.

Notes:
* Cleanup levels for soil are protective of possible future use construction/commercial workers.
** Cleanup levels for groundwater are protective of possible future use construction/commercial workers and unrestricted use residents.
† = Residual risk back calculated so that noncancer risk endpoint does not exceed an HI of 1.
mg/kg = milligrams per kilogram
µg/L = micrograms per kilogram
MCL = Maximum Contaminant Level
MMCL = Massachusetts Maximum Contaminant Level

TABLE 13
COST SUMMARY FOR ALTERNATIVE III-2a:
EXCAVATION (TO ACCELERATE GROUNDWATER CLEANUP) AND INSTITUTIONAL CONTROLS

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

ITEM	COST
DIRECT COSTS	
Setup, Excavation, Dewatering, Transport, Disposal, Restoration	$33,015
Confirmatory Sampling, Summary Data Report	$7,472
Waste Characterization	$4,820
Wetland Delineation, Boundary Survey, Institutional Controls	$14,750
Direct Subtotal	$60,057
INDIRECT COSTS	
Design/Permitting (@10% of direct cost)	$6,006
Wetland Restoration Plan, Health&Safety (@5% of direct cost)	$3,753
Pre-Construction Mtg, Construction Oversight (@5% of direct cost)	$7,881
Legal/Administrative Fees (@5% of direct cost)	$3,003
Indirect Subtotal	$20,642
TOTAL CAPITAL COSTS	$80,699
OPERATION AND MAINTENANCE COSTS	
Present Worth of GW/SW Sampling 2X/yr for 3 yrs @7%	$58,794
Present Worth of GW/SW Sampling 1X/yr for yrs 4 thru 30 @7%	$109,607
Present Worth of Wetland Restoration Monitoring for 5 yrs @ 7%	$6,150
Present Worth of Institutional Control Inspections for 30 years @ 7%	$13,402
Present Worth of Institut. Control Reviews (every 5 yrs for 30 years @ 7%	$41,169
TOTAL O&M COSTS	$229,122
TOTAL CAPITAL AND O&M COSTS	$309,821
UNSPECIFIED DESIGN DETAILS (@25 PERCENT)	$77,455
TOTAL PRESENT WORTH OF ALTERNATIVE III-3a	$387,277
COST SENSITIVITY ANALYSIS - MINIMUM ESTIMATE	
Assume that the soil requiring excavation is reduced by 33% (40 CY, 72 tons, or 1 foot).	
Assume groundwater will attain MCLs after 5 years. Add two extra years validation for a total of 7 years monitoring.	
Assume wetlands monitoring will remain at 5 years and institutional controls will cease after 7 years.	
MINIMUM COST OF UNRESTRICTED USED ALTERNATIVE - AREA 3	$252,103
COST SENSITIVITY ANALYSIS - MAXIMUM ESTIMATE	
Assume that the soil requiring excavation is increased by 33% (40 CY, 72 tons, or 1 foot).	
MAXIMUM COST OF UNRESTRICTED USED ALTERNATIVE - AREA 3	$395,077

Note: Detailed cost estimate is provided in Appendix B of FS report.

TABLE 14
SYNOPSIS OF FEDERAL AND STATE LOCATION-SPECIFIC ARARS FOR ALTERNATIVE II-3

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

REGULATORY AUTHORITY	LOCATION CHARACTERISTIC	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
Federal	Floodplains	Floodplain Management Executive Order 11988 [40 CFR Part 6, Appendix A]	Applicable	Requires federal agencies to evaluate the potential adverse effects associated with direct and indirect development of a floodplain. Alternatives that involve modification/construction within a floodplain may not be selected unless a determination is made that no practicable alternative exists. If no practicable alternative exists, potential harm must be minimized and action taken to restore and preserve the natural and beneficial values of the floodplain.	Contaminated soil removal will be designed to minimize alteration/destruction of the floodplain area. If this alternative is chosen, floodplains affected by Remedial Investigation will be restored to original elevations.
	Wetlands	Protection of Wetlands Executive Order 11990 [40 CFR Part 6, Appendix A]	Applicable	Under this Order, federal agencies are required to minimize the destruction, loss, or degradation of wetlands, and preserve and enhance natural and beneficial values of wetlands. If remediation is required within wetland areas, and no practical alternative exists, potential harm must be minimized and action taken to restore natural and beneficial values.	Contaminated soil removal will be designed to minimize alteration/destruction of the wetlands. If this alternative is chosen, the wetlands will be restored.
	Wetlands, Aquatic Ecosystem	Clean Water Act, Dredge or Fill Requirements Section 404 [40 CFR Part 230]	Relevant and Appropriate	Section 404 of the CWA regulates the discharge of dredged or fill materials to U.S. waters, including wetlands. Filling wetlands would be considered a	The removal of soil will be designed for eventual restoration. A Massachusetts PGP (granted by USACE) is typically required prior to excavating/restoring

TABLE 14 (continued)
SYNOPSIS OF FEDERAL AND STATE LOCATION-SPECIFIC ARARS FOR ALTERNATIVE II-3

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

REGULATORY AUTHORITY	LOCATION CHARACTERISTIC	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
				discharge of fill materials. Guidelines for Specification of Disposal Sites for Dredged or Fill material at 40 CFR Part 230, promulgated under CWA Section 404(b)(1), maintain that no discharge of dredged or fill material will be permitted if there is a practical alternative that would have less effect on the aquatic ecosystem. If adverse impacts are unavoidable, action must be taken to restore, or create alternative wetlands.	any sediment. The substantive portions of the permit would potentially be required.
	Surface Waters, Endangered Species, Migratory Species	Fish and Wildlife Coordination Act [16 USC 661 et seq.]	Relevant and Appropriate	Actions that affect species/habitat require consultation with USDOI, USFWS, NMFS, and/or state agencies, as appropriate, to ensure that proposed actions do not jeopardize the continued existence of the species or adversely modify or destroy critical habitat. The effects of water-related projects on fish and wildlife resources must be considered. Action must be taken to prevent, mitigate, or compensate for project-related damages or losses to fish and wildlife resources. Consultation with the responsible agency is also strongly recommended for on-site actions. Under 40 CFR Part 300.38, these	To the extent necessary, actions will be taken to develop measures to prevent, mitigate, or compensate for project related impacts to habitat and wildlife. The USFWS, acting as a review agency for the USEPA, will be kept informed of proposed Remedial Investigations.

TABLE 14 (continued)
SYNOPSIS OF FEDERAL AND STATE LOCATION-SPECIFIC ARARS FOR ALTERNATIVE II-3

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

REGULATORY AUTHORITY	LOCATION CHARACTERISTIC	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
				requirements apply to all response activities under the NCP.	
	Endangered Species	Endangered Species Act [50 CFR Parts 17.11-17.12]	Relevant and Appropriate	This act requires action to avoid jeopardizing the continued existence of listed endangered or threatened species or modification of their habitat.	According to the RI report, no endangered federally-listed species have been identified within one mile of the AOC 57. However, protection of endangered species and their habitat will be considered as part of the design and excavation activities.
	Atlantic Flyway, Wetlands, Surface Waters	Migratory Bird Treaty Act [16 USC 703 et seq.]	Relevant and Appropriate	The Migratory Bird Treaty Act protects migratory birds, their nests, and eggs. A depredation permit is required to take, possess, or transport migratory birds or disturb their nests, eggs, or young.	Remedial Investigations will be performed to protect migratory birds, their nests, and eggs.
State	Floodplains, Wetlands, Surface Waters	Massachusetts Wetland Protection Regulations [310 CMR 10.00]	Applicable	These regulations include standards on dredging, filling, altering, or polluting inland wetlands and protected areas (defined as areas within the 100-year floodplain). A NOI must be filed with the municipal conservation commission and a Final Order of Conditions obtained before proceeding with the activity. A Determination of Applicability or NOI must be filed for activities such as excavation within a 100 foot buffer zone. The regulations specifically prohibit loss of over 5,000	All work to be performed within wetlands and the 100 foot buffer zone will be in accordance with the substantive requirements of these regulations.

TABLE 14 (continued)
SYNOPSIS OF FEDERAL AND STATE LOCATION-SPECIFIC ARARS FOR ALTERNATIVE II-3

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

REGULATORY AUTHORITY	LOCATION CHARACTERISTIC	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
				square feet of bordering vegetated wetland. Loss may be permitted with replication of any lost area within two growing seasons.	
	Endangered Species	Massachusetts Endangered Species Regulations [321 CMR 8.00]	Applicable	Actions must be conducted in a manner that minimizes the impact to Massachusetts-listed rare, threatened, or endangered species, and species listed by the Massachusetts Natural Heritage Program.	The RI report identified several state-listed rare, threatened, or endangered species occurring within one mile of AOC 57. The protection of state listed endangered species will be considered during the design and implementation of this alternative.

Notes:

AOC = Area of contamination
ARAR = Area of Contamination
CFR = Code of Federal Regulations
CMR = Code of Massachusetts Regulations
CWA = Clean Water Act
USDOI = U.S. Department of the Interior
USFWS = U.S. Fish and Wildlife Service
NCP = National Contingency Plan
NMFS = National Maine Fisheries Service
NOI = Notice of Intent
PGP = Programatic General Permit
RI = Remedial Investigation
USACE = U.S. Army Corps of Engineers
USEPA = U.S. Environmental Protection Agency
USC = United States Code

TABLE 15
SYNOPSIS OF FEDERAL AND STATE CHEMICAL-SPECIFIC ARARS FOR ALTERNATIVE II-3

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

REGULATORY AUTHORITY	CHEMICAL MEDIUM	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
Federal	Groundwater	Safe Drinking Water Act, National Primary Drinking Water Regulations, MCLs and MCLGs [40 CFR Parts 141.60 - 141.63 and 141.50 - 141.52]	Relevant and Appropriate	The National Primary Drinking Water Regulations establish MCLs and MCLGs for several common organic and inorganic contaminants. MCLs specify the maximum permissible concentrations of contaminants in public drinking water supplies. MCLs are federally enforceable standards based in part on the availability and cost of treatment techniques. MCLGs specify the maximum concentration at which no known or anticipated adverse effect on humans will occur. MCLGs are non-enforceable health based goals set equal to or lower than MCLs.	The MCLs for arsenic and PCE will likely be met through natural attenuation processes. Monitoring would be performed to measure changes in contaminant concentrations or migration; therefore attainment of groundwater ARARs would eventually be confirmed at the two locations (57M-95-04A and 57P-98-02X), where MCL exceedances were detected.
State	Groundwater	Massachusetts Groundwater Quality Standards [314 CMR 6.00]	Relevant and Appropriate	These standards designate and assign uses for which groundwaters of the Commonwealth shall be maintained and protected, and set forth water quality criteria necessary to maintain the designated uses. Groundwater at Fort Devens is classified as Class I, fresh groundwaters designated as a source of potable water supply.	314 CMR 6.00 would be met by achieving MMCLs for arsenic and PCE. The MMCLs for arsenic and PCE will likely be met through natural attenuation processes. Monitoring would be performed to measure changes in contaminant concentrations or migration; therefore attainment of groundwater MMCLs would eventually be confirmed at the two locations (57M-95-04A and 57P-98-02X).
	Groundwater	Massachusetts Drinking	Relevant and	These regulations list MMCLs which	As previously stated, Devens

TABLE 15 (continued)
SYNOPSIS OF FEDERAL AND STATE CHEMICAL-SPECIFIC ARARS FOR ALTERNATIVE II-3

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

REGULATORY AUTHORITY	CHEMICAL MEDIUM	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
		Water Regulations [310 CMR 22.00]	Appropriate	apply to drinking water distributed through a public water system.	groundwater is classified as Class1, and designated as a source of potable water supply. AOC 57 is currently not within a Zone I or II/Interim Wellhead Protection Area. An AUL would be established at Area 2 until the environmental monitoring program indicates that MMCLs have been achieved for at least three years.

Notes:

AOC = Area of contamination
ARARs = Applicable or Relevant and Appropriate Requirements
CFR = Code of Federal Regulations
CMR = Code of Massachusetts Rules
MCL = Maximum Contaminant Level
MCLG = Maximum Contaminant Level Goal
MMCL = Massachusetts Maximum Contaminant Level
PCE = Tetrachloroethylene

TABLE 16
SYNOPSIS OF FEDERAL AND STATE ACTION-SPECIFIC ARARS FOR ALTERNATIVE II-3

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

REGULATORY AUTHORITY	ACTION	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
Federal	Control of surface water runoff, Direct discharge to surface water	Clean Water Act NPDES Permit Program [40 CFR 122,125]	Relevant and Appropriate	The NPDES permit program specifies the permissible concentration or level of contaminants in the discharge from any point source, including surface runoff, to waters of the United States.	Construction activities will be controlled to meet USEPA discharge requirements. Water collected from dewatering and stockpile activities will be collected and treated offsite or discharged to the Devens WWTP. Any on-site runoff discharges (though none expected) will meet the substantive requirements of these regulations.
	Discharge to Devens Treatment Plant	CWA, General Pretreatment Program (40 CFR Part 403)	Applicable	Discharge of nondomestic wastewater to WWTP must comply with the general prohibitions of this regulation, as well as categorical standards, and local pretreatment standards.	Discharge to Devens WWTP would be sampled to evaluate compliance with pre-treatment standards.
	Groundwater	USEPA OSWER Publication 9345.3-03FS, January 1992	To Be Considered	Management of IDW must ensure protection of human health and the environment.	IDW produced from well sampling will comply with ARARs.
	RCRA - Identification and Listing of Hazardous Wastes	Toxicity Characteristics (40 CFR 261.24)	Applicable	Defines those wastes that are subject to regulations as hazardous wastes under 40 CFR Parts 124 and 264.	Soil/sediment analytical results will be evaluated against the criteria and definitions of hazardous waste. The criteria and definition of hazardous waste will be referred to and utilized in development of the Remedial

TABLE 16 (continued)
SYNOPSIS OF FEDERAL AND STATE ACTION-SPECIFIC ARARS FOR ALTERNATIVE II-3

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

REGULATORY AUTHORITY	ACTION	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
					Investigation.
	Disposal of soil that contains hazardous waste	RCRA, Land Disposal Restrictions (40 CFR 268)	Applicable	Land disposal of RCRA hazardous wastes without specified treatment is restricted. LDRs require that such wastes must be treated either by a treatment technology or to a specific concentration prior to disposal in a RCRA Subtitle C permitted facility.	Waste materials from Area 2 will be evaluated to determine whether the waste is subject to LDRs. If so, the materials will be treated in accordance with LDRs prior to disposal at an off-base facility.
	Management of PCB-contaminated soil	TSCA (40 CFR Part 761 Subpart G) PCB Spill Cleanup Policy	To be considered	This policy governs the cleanup of PCB spills occurring after May 4, 1987. Because this policy is not a regulation and only applies to recent spills (reported within 24hours of occurrence), these requirements are not applicable, but will be considered.	This policy would only be considered during the development of Remedial Investigation for areas with expected detected PCBs at concentrations greater than or equal to 50 ppm. The highest concentration of PCBs in soil was detected during the RI at 12 ppm.
	Management of PCB-contaminated soil	TSCA (40 CFR Part 761 Subpart D) Storage and Disposal	Relevant and Appropriate	This regulation governs the storage and final disposal of PCBs. The regulation also specifies procedures to be followed in decontaminating containers and moveable equipment used in storage areas. Section 761.61 pertains to PCB remediation wastes and provides self-implementing on-site cleanup and disposal requirements. Per Section 761.61, the self-implementing cleanup provisions are not binding for cleanups	Section 761.61 cleanup levels for low and high occupancy areas are $\leq$ 1 ppm, respectively. RI calculated RBCs for Aroclor – 1260 are more conservative and will be used as PRGs at AOC 57. Off-site storage, disposal and decontamination requirements specified in this regulation will be applied for soil or sediment containing PCBs.

TABLE 16 (continued)
SYNOPSIS OF FEDERAL AND STATE ACTION-SPECIFIC ARARS FOR ALTERNATIVE II-3

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

REGULATORY AUTHORITY	ACTION	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
				conducted under CERCLA.	
State	Hazardous Waste	Hazardous Waste Management Systems; (RCRA 40 CFR 260)	Relevant and Appropriate	USEPA procedures for making information available to the public; rules for claims of business confidentially.	Does not address cleanup requirements. However, these procedures will be followed when dealing with hazardous waste.
	Hazardous Waste	Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities (RCRA 40 CFR 264)	Relevant and Appropriate	Define requirements for RCRA facility operations and management including impoundments, waste piles, land treatment, landfills, incinerators, storage, closure and post closure.	Operations, management and safety requirements in effect for all portions of remedial process, if hazardous waste is being handled.
	Hazardous Waste	RCRA 40 CFR Part 262, Standards Applicable to Generators of Hazardous Waste	Relevant and Appropriate	These regulations establish standards for generators of hazardous waste. RCRA Subtitle C established standards applicable to treatment, storage, and disposal of hazardous waste and closure of hazardous waste facilities.	Sediments will be tested to determine whether they contain characteristic hazardous waste. If so, management of the hazardous waste would comply with substantive requirements of these regulations.
	Hazardous Waste	Massachusetts Hazardous Waste Management Rules; 310 CMR 30.000	Relevant and Appropriate	These rules set forth Massachusetts definitions and criteria for establishing whether waste materials are hazardous and subject to associated hazardous waste regulations.	These regulations supplement RCRA requirements. Those criteria and definitions more stringent than RCRA take precedence over federal requirements.
	Activities that potentially affect surface water quality	Massachusetts Water Quality Certification and Certification for Dredging [314 CMR 9.00]	Relevant and Appropriate	A Massachusetts Division of Water Pollution Control Water Quality Certification is required pursuant to 314 CMR 9.00 for dredging-related	Excavation and filling activities will meet the substantive criteria and standards of these regulations. Remedial activities will be designed to

TABLE 16 (continued)
SYNOPSIS OF FEDERAL AND STATE ACTION-SPECIFIC ARARS FOR ALTERNATIVE II-3

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

REGULATORY AUTHORITY	ACTION	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
				activities in waters (including wetlands) within the Commonwealth which require federal licenses or permits and which are subject to state water quality certification.	attain and maintain Massachusetts Water Quality Standards in affected waters.
	Activities that affect ambient air quality	Massachusetts Air Pollution Control Regulations [310 CMR 7.00]	Applicable	These regulations pertain to the prevention of emissions in excess of Massachusetts ambient air quality standards.	Remedial activities will be conducted to meet the standards for Visible Emissions (310 CMR 7.06); Dust, Odor, Construction and Demolition (310 CMR 7.09); Noise (310 CMR 7.10); and Volatile Organic Compounds (310 CMR 7.18).

Notes:
ARARs = Applicable or Relevant and Appropriate Requirements
CFR = Code of Federal Regulations
CMR = Code of Massachusetts Regulations
CWA = Clean Water Act
IDW = Investigation derived waste
LDR = Land Disposal Restrictions
NPDES = National Pollutant Discharge Elimination System
RCBs = Risk-based concentrations
RCRA = Resource Conservation and Recovery Act
RI = Remedial Investigation
TSCA = Toxic Substances Control Act
PCB = Polychlorinated biphenyls
PRGs = preliminary remediation goals
USEPA = U.S. Environmental Protection Agency
WWTP = Wastewater Treatment Plant

TABLE 17
SYNOPSIS OF FEDERAL AND STATE LOCATION-SPECIFIC ARARS FOR ALTERNATIVE III-2A

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

REGULATORY AUTHORITY	LOCATION CHARACTERISTIC	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
Federal	Floodplains	Floodplain Management Executive Order 11988 [40 CFR Part 6, Appendix A]	Applicable	Requires federal agencies to evaluate the potential adverse effects associated with direct and indirect development of a floodplain. Alternatives that involve modification/construction within a floodplain may not be selected unless a determination is made that no practicable alternative exists. If no practicable alternative exists, potential harm must be minimized and action taken to restore and preserve the natural and beneficial values of the floodplain.	Contaminated soil removal will be designed to minimize alteration/destruction of the floodplain area. If this alternative is chosen, floodplains affected by Remedial Investigation will be restored to original elevations.
	Wetlands	Protection of Wetlands Executive Order 11990 [40 CFR Part 6, Appendix A]	Applicable	Under this Order, federal agencies are required to minimize the destruction, loss, or degradation of wetlands, and preserve and enhance natural and beneficial values of wetlands. If remediation is required within wetland areas, and no practical alternative exists, potential harm must be minimized and action taken to restore natural and beneficial values.	Contaminated soil removal will be designed to minimize alteration/destruction of the wetlands. If this alternative is chosen, the wetlands will be restored.
	Wetlands, Aquatic Ecosystem	Clean Water Act, Dredge or Fill Requirements Section 404	Relevant and Appropriate	Section 404 of the Clean Water Act (CWA) regulates the discharge of dredged or fill materials to U.S.	The removal of soil will be designed for eventual restoration. A Massachusetts PGP (granted by USACE) is typically

TABLE 17 (continued)
SYNOPSIS OF FEDERAL AND STATE LOCATION-SPECIFIC ARARS FOR ALTERNATIVE III-2A

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

REGULATORY AUTHORITY	LOCATION CHARACTERISTIC	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
		[40 CFR Part 230]		waters, including wetlands. Filling wetlands would be considered a discharge of fill materials. Guidelines for Specification of Disposal Sites for Dredged or Fill material at 40 CFR Part 230, promulgated under CWA Section 404(b)(1), maintain that no discharge of dredged or fill material will be permitted if there is a practical alternative that would have less effect on the aquatic ecosystem. If adverse impacts are unavoidable, action must be taken to restore, or create alternative wetlands.	required prior to excavating/restoring any sediment. The substantive portions of the permit would potentially be required.
	Surface Waters, Endangered Species, Migratory Species	Fish and Wildlife Coordination Act [16 USC 661 et seq.]	Relevant and Appropriate	Actions that affect species/habitat require consultation with USDOI, USFWS, NMFS, and/or state agencies, as appropriate, to ensure that proposed actions do not jeopardize the continued existence of the species or adversely modify or destroy critical habitat. The effects of water-related projects on fish and wildlife resources must be considered. Action must be taken to prevent, mitigate, or compensate for project-related damages or losses to fish and wildlife resources.	To the extent necessary, actions will be taken to develop measures to prevent, mitigate, or compensate for project related impacts to habitat and wildlife. The USFWS, acting as a review agency for the USEPA, will be kept informed of proposed Remedial Investigations.

TABLE 17 (continued)
SYNOPSIS OF FEDERAL AND STATE LOCATION-SPECIFIC ARARS FOR ALTERNATIVE III-2A

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

REGULATORY AUTHORITY	LOCATION CHARACTERISTIC	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
				Consultation with the responsible agency is also strongly recommended for on-site actions. Under 40 CFR Part 300.38, these requirements apply to all response activities under the NCP.	
	Endangered Species	Endangered Species Act [50 CFR Parts 17.11-17.12]	Relevant and Appropriate	This act requires action to avoid jeopardizing the continued existence of listed endangered or threatened species or modification of their habitat.	According to the RI report, no endangered federally-listed species have been identified within one mile of the AOC 57. However, protection of endangered species and their habitat will be considered as part of the design and excavation activities.
	Atlantic Flyway, Wetlands, Surface Waters	Migratory Bird Treaty Act [16 USC 703 et seq.]	Relevant and Appropriate	The Migratory Bird Treaty Act protects migratory birds, their nests, and eggs. A depredation permit is required to take, possess, or transport migratory birds or disturb their nests, eggs, or young.	Remedial Investigations will be performed to protect migratory birds, their nests, and eggs.
State	Floodplains, Wetlands, Surface Waters	Massachusetts Wetland Protection Regulations [310 CMR 10.00]	Applicable	These regulations include standards on dredging, filling, altering, or polluting inland wetlands and protected areas (defined as areas within the 100-year flood plain). A NOI must be filed with the municipal conservation commission and a Final Order of	All work to be performed within wetlands and the 100-foot buffer zone will be in accordance with the substantive requirements of these regulations.

TABLE 17 (continued)
SYNOPSIS OF FEDERAL AND STATE LOCATION-SPECIFIC ARARS FOR ALTERNATIVE III-2A

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

REGULATORY AUTHORITY	LOCATION CHARACTERISTIC	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
				Conditions obtained before proceeding with the activity. A Determination of Applicability or NOI must be filed for activities such as excavation within a 100-foot buffer zone. The regulations specifically prohibit loss of over 5,000 square feet of bordering vegetated wetland. Loss may be permitted with replication of any lost area within two growing seasons.	
	Endangered Species	Massachusetts Endangered Species Regulations [321 CMR 8.00]	Applicable	Actions must be conducted in a manner that minimizes the impact to Massachusetts-listed rare, threatened, or endangered species, and species listed by the Massachusetts Natural Heritage Program.	The RI report identified several state-listed rare, threatened, or endangered species occurring within one mile of AOC 57. The protection of state listed endangered species will be considered during the design and implementation of this alternative.

Notes:

AOC = Area of contamination
ARAR = Area of Contamination
CFR = Code of Federal Regulations
CMR = Code of Massachusetts Regulations
CWA = Clean Water Act
USDOI = U.S. Department of the Interior
USFWS= U.S. Fish and Wildlife Service
NCP = National Contingency Plan
NMFS = National Maine Fisheries Service

TABLE 17 (continued)
SYNOPSIS OF FEDERAL AND STATE LOCATION-SPECIFIC ARARS FOR ALTERNATIVE III-2A

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

NOI	=	Notice of Intent
PGP	=	Programatic General Permit
RI	=	Remedial Investigation
USACE	=	U.S. Army Corps of Engineers
USEPA	=	U.S. Environmental Protection Agency
USC	=	United States Code

TABLE 18
SYNOPSIS OF FEDERAL AND STATE CHEMICAL-SPECIFIC ARARS FOR ALTERNATIVES III-2A

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

REGULATORY AUTHORITY	CHEMICAL MEDIUM	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
Federal	Groundwater	Safe Drinking Water Act, National Primary Drinking Water Regulations, MCLs and MCLGs [40 CFR Parts 141.60 - 141.63 and 141.50 - 141.52]	Relevant and Appropriate	The National Primary Drinking Water Regulations establish Maximum Contaminant Levels (MCLs) and Maximum Contaminant Level Goals (MCLGs) for several common organic and inorganic contaminants. MCLs specify the maximum permissible concentrations of contaminants in public drinking water supplies. MCLs are federally enforceable standards based in part on the availability and cost of treatment techniques. MCLGs specify the maximum concentration at which no known or anticipated adverse effect on humans will occur. MCLGs are non-enforceable health based goals set equal to or lower than MCLs.	The MCLs for arsenic, cadmium, tetrachloroethebne (PCE), and 1,4-dichlorobenzene will likely be met through natural attenuation processes. Monitoring would be performed to measure changes in contaminant concentrations or migration; therefore attainment of groundwater ARARs would eventually be confirmed at the two locations (57M-95-03X and 57M-96-11X), where MCL exceedances were detected.
State	Groundwater	Massachusetts Groundwater Quality Standards [314 CMR 6.00]	Relevant and Appropriate	These standards designate and assign uses for which groundwaters of the commonwealth shall be maintained and protected, and set forth water quality criteria necessary to maintain the designated uses. Groundwater at Fort Devens is classified as Class I, fresh groundwaters designated as a	314 CMR 6.00 would be met by achieving MMCLs for arsenic, cadmium, PCE, and 1,4-dichlorobenzene. The MMCLs will likely be met through natural attenuation processes. Monitoring would be performed to measure changes in contaminant concentrations or

TABLE 18 (continued)
SYNOPSIS OF FEDERAL AND STATE CHEMICAL-SPECIFIC ARARS FOR ALTERNATIVE III-2A

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

REGULATORY AUTHORITY	CHEMICAL MEDIUM	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
				source of potable water supply.	migration; therefore attainment of groundwater MMCLs would eventually be confirmed at the two locations (57M-95-03X and 57M-96-11X).
	Groundwater	Massachusetts Drinking Water Regulations [310 CMR 22.00]	Relevant and Appropriate	These regulations list Massachusetts MCLs applicable to drinking water distributed through a public water system.	As previously stated, Devens groundwater is classified as Class1, and designated as a source of potable water supply. AOC 57 is currently not within a Zone I or II/Interim Wellhead Protection Area. An AUL would be established at Area 3 until the environmental monitoring program indicates that MMCLs have been achieved for at least three years.

Notes:
AOCs = Area of Contamination
ARARs = Applicable or Relevant and Appropriate Requirements
CFR = Code of Federal Regulations
CMR = Code of Massachusetts Rules
MCL = Maximum Contaminant Level
MCLG = Maximum Contaminant Level Goal
MMCL = Massachusetts Maximum Contaminant Level

TABLE 19
SYNOPSIS OF FEDERAL AND STATE ACTION-SPECIFIC ARARS FOR ALTERNATIVE III-2A

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

REGULATORY AUTHORITY	ACTION	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
Federal	Control of surface water runoff, Direct discharge to surface water	Clean Water Act NPDES Permit Program [40 CFR 122,125]	Relevant and Appropriate	The National Pollutant Discharge Elimination System (NPDES) permit program specifies the permissible concentration or level of contaminants in the discharge from any point source, including surface runoff, to waters of the United States.	Construction activities will be controlled to meet USEPA discharge requirements. Water collected from dewatering and stockpile activities will be collected and treated offsite or discharged to Devens WWTP. Any on-site runoff discharges (though none expected) will meet the substantive requirements of these regulations.
	Discharge to Devens Treatment Plant	CWA, General Pretreatment Program (40 CFR Part 403)	Applicable	Discharge of nondomestic wastewater to WWTP must comply with the general prohibitions of this regulation, as well as categorical standards, and local pretreatment standards.	Discharge to Devens WWTP would be sampled to evaluate compliance with pre-treatment standards.
	Groundwater	USEPA OSWER Publicaton 9345.3-03FS, January 1992	To Be Considered	Management of IDW must ensure protection of human health and the environment.	IDW produced from well sampling will comply with ARARs.
	RCRA – Identification and Listing of Hazardous Wastes	Toxicity Characteristics (40 CFR 261.24)	Applicable	Defines those wastes that are subject to regulations as hazardous wastes under 40 CFR Parts 124 and 264.	Soil/sediment analytical results will be evaluated against the criteria and definitions of hazardous waste. The criteria and definition of hazardous waste will be referred to and utilized in development of the remedial action.
	Disposal of soil	RCRA, Land Disposal	Applicable	Land disposal of RCRA hazardous	Waste materials from Area 3 will be

TABLE 19 (continued)
SYNOPSIS OF FEDERAL AND STATE ACTION-SPECIFIC ARARS FOR ALTERNATIVE III-2A

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

REGULATORY AUTHORITY	ACTION	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
	that contains hazardous waste	Restrictions (40 CFR 268)		wastes without specified treatment is restricted. LDRs require that such wastes must be treated either by a treatment technology or to a specific concentration prior to disposal in a RCRA Subtitle C permitted facility.	evaluated to determine whether the waste is subject to LDRs. If so, the materials will not be disposed of on base but will be treated in accordance with LDRs prior to disposal at an off-base facility.
	Hazardous Waste	Hazardous Waste Management Systems; (RCRA 40 CFR 260)	Relevant and Appropriate	USEPA procedures for making information available to the public; rules for claims of business confidentially.	Does not address cleanup requirements. However, these procedures will be followed when dealing with hazardous waste.
	Hazardous Waste	Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities (RCRA 40 CFR 264)	Relevant and Appropriate	Define requirements for RCRA facility operations and management including impoundments, wastepiles, land treatment, landfills, incinerators, storage, closure and post closure.	Operations, management and safety requirements in effect for all portions of remedial process, if hazardous waste is being handled.
	Hazardous Waste	RCRA 40 CFR Part 262, Standards Applicable to Generators of Hazardous Waste	Relevant and Appropriate	RCRA Subtitle C established standards applicable to treatment, storage, and disposal of hazardous waste and closure of hazardous waste facilities.	Sediments will be tested to determine whether they contain characteristic hazardous waste. If so, treatment on-site would comply with substantive requirements of these regulations.
State	Hazardous Waste	Massachusetts Hazardous Waste Management Rules; 310 CMR 30.000	Relevant and Appropriate	These rules set forth Massachusetts definitions and criteria for establishing whether waste materials are hazardous and subject to associated hazardous waste regulations.	These regulations supplement RCRA requirements. Those criteria and definitions more stringent than RCRA take precedence over federal requirements.

TABLE 19 (continued)
SYNOPSIS OF FEDERAL AND STATE ACTION-SPECIFIC ARARS FOR ALTERNATIVE III-2A

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

REGULATORY AUTHORITY	ACTION	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT
	Activities that potentially affect surface water quality	Massachusetts Water Quality Certification and Certification for Dredging [314 CMR 9.00]	Relevant and Appropriate	A Massachusetts Division of Water Pollution Control Water Quality Certification is required pursuant to 314 CMR 9.00 for dredging-related activities in waters (including wetlands) within the Commonwealth which require federal licenses or permits and which are subject to state water quality certification.	Excavation and filling activities will meet the substantive criteria and standards of these regulations. Remedial activities will be designed to attain and maintain Massachusetts Water Quality Standards in affected waters.
	Activities that affect ambient air quality	Massachusetts Air Pollution Control Regulations [310 CMR 7.00]	Applicable	These regulations pertain to the prevention of emissions in excess of Massachusetts ambient air quality standards.	Remedial activities will be conducted to meet the standards for Visible Emissions (310 CMR 7.06); Dust, Odor, Construction and Demolition (310 CMR 7.09); Noise (310 CMR 7.10); and Volatile Organic Compounds (310 CMR 7.18).

Notes:

ARARs = Applicable or Relevant and Appropriate Requirements
CFR = Code of Federal Regulations
CMR = Code of Massachusetts Regulations
CWA = Clean Water Act
IDW = Investigation-derived waste
LDR = Land Disposal Restrictions
NPDES = National Pollutant Discharge Elimination System
PCB = Polychlorinated biphenyls
PRGs = preliminary remediation goals

TABLE 19 (continued)
SYNOPSIS OF FEDERAL AND STATE ACTION-SPECIFIC ARARS FOR ALTERNATIVE III-2A

AOC 57 RECORD OF DECISION
DEVENS RFTA, DEVENS, MASSACHUSETTS

RBCs = Risk-based concentrations
RCRA = Resource Conservation and Recovery Act
RI = Remedial Investigation
TSCA = Toxic Substances Control Act
USEPA = U.S. Environmental Protection Agency
WWTP = Wastewater Treatment Plant

APPENDIX C - RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

RECORD OF DECISION
AREA OF CONTAMINATION 57

DEVENS RFTA
DEVENS, MASSACHUSETTS

SEPTEMBER 2001

PRINTED ON RECYCLED PAPER

RESPONSIVENESS SUMMARY
AREA OF CONTAMINATION 57

DEVENS RFTA
DEVENS, MASSACHUSETTS

TABLE OF CONTENTS

Section	Title	Page No.

PREFACE P-1

1.0 OVERVIEW OF REMEDIAL ALTERNATIVES CONSIDERED IN THE FEASIBILITY STUDY INCLUDING THE SELECTED REMEDY 1-1

1.1 DESCRIPTION OF EVALUATED ALTERNATIVES FOR AOC 57 AREA 1 1-1
1.2 DESCRIPTION OF EVALUATED ALTERNATIVES FOR AOC 57 AREA 2 1-1
1.2.1 Alternative II-1: No Action 1-2
1.2.2 Limited Action 1-2
1.2.3 Alternative II-3: Excavation (For Possible Future Use) and Institutional Controls 1-2
1.2.4 Alternative II-4: Excavation (For Unrestricted Use) and Institutional Controls 1-3
1.2.5 Selected Remedy For AOC 57 Area 2 1-3
1.3 DESCRIPTION OF EVALUATED ALTERNATIVES FOR AOC 57 AREA 3 1-3
1.3.1 No Action 1-4
1.3.2 Alternative III-2: Limited Action 1-4
1.3.3 Alternative III-3: Excavation (For Unrestricted Use) and Institutional Controls 1-4
1.3.4 Selected Remedy 1-4

2.0 BACKGROUND ON COMMUNITY INVOLVEMENT 2-1

3.0 SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND ARMY RESPONSES 3-1

ATTACHMENT A **PUBLIC HEARING TRANSCRIPT**

ATTACHMENT B **PUBLIC COMMENTS**

PREFACE

This Responsiveness Summary has been prepared to meet the requirements of Sections 113(k)(2)(B)(iv) and 117(b) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), which requires response to "... significant comments, criticisms, and new data submitted in written or oral presentations" on a proposed plan for remedial action. The purpose of this Responsiveness Summary is to document the Army's responses to questions and comments expressed during the public comment period by the public, potentially responsible parties, and governmental bodies in written and oral comments regarding the Proposed Plan to Clean Up Areas of Contamination (AOC) 57 at the Devens Reserve Forces Training Area (RFTA), Devens, Massachusetts.

On February 23, 2001, the Army published a public notice announcing the Proposed Plan, the date for a public informational meeting, and the start and end dates of a 31-day public comment period in the Leominster Fitchburg Sentinel & Enterprise, Worcester Telegram, Harvard Post, and papers of the Nashoba Publishing Company (Groton Landmark, Harvard Hillside, Pepperell Free Press, The Public Spirit, Shirley Oracle, and Townsend Times). Notice was published in the Lowell Sun on February 26, 2001. The public notices were republished by the Leominster Fitchburg Sentinel & Enterprise, Lowell Sun, Worcester Telegram and Harvard Post on March 5, 2001, and by Nashoba Publishing Company on March 7, 2001. Notice announcing a 30-day extension of the public comment was published in the Lowell Sun on March 28, 2001, Leominster Fitchburg Sentinel & Enterprise on March 28, 2001, Worcester Telegram on March 28, 2001, Harvard Post on March 30, 2001, and in the Groton Landmark, Harvard Hillside, Pepperell Free Press, The Public Spirit, Shirley Oracle, and Townsend Times on March 30, 2001. The Army also made the Proposed Plan available to the public at the public information repositories at the Ayer Public Library, the Hazen Memorial Library in Shirley, the Harvard Public Library, and the Lancaster Public Library, or by request from the Devens BRAC Environmental Office.

From February 23 through April 25, 2001, the Army held a 61-day public comment period to accept public comments on the Proposed Plan and on other documents released to the public. On March 8, 2001, the Army held an informal public information meeting at Devens RFTA to present the Army's Proposed Plan to the public and to provide the opportunity for open discussion concerning the Proposed Plan. The Army also accepted formal verbal or written comments from the public during a public hearing held as part of the meeting. A transcript of the hearing and formal public comments are attached to this Responsiveness Summary.

This Responsiveness Summary is organized into the following sections:

1. **Overview of Remedial Alternatives Considered in the Feasibility Study Including the Selected Remedy**-This section briefly outlines the remedial alternatives evaluated in detail in the Feasibility Study and presented in the Proposed Plan, including the Army's selected remedy.

2. **Background on Community Involvement**-This section provides a brief history of community involvement and Army initiatives to inform the community of site activities.

3. **Summary of Comments Received During the Public Comment Period and ARMY responses**- This section provides Army responses to verbal and written comments received from the public and not formally responded to during the public comment period. A transcript of the March 8, 2001, public hearing is included as Attachment A to this Responsiveness Summary. Copies of the comment letters are included in Attachment B of this Responsiveness Summary.

1.0 OVERVIEW OF REMEDIAL ALTERNATIVES CONSIDERED IN THE FEASIBILITY STUDY INCLUDING THE SELECTED REMEDY

1.1 DESCRIPTION OF EVALUATED ALTERNATIVES FOR AOC 57 AREA 1

Area 1 consists of a storm water outfall area and drainage ditch (Storm Drainage System 6 of the Storm Sewer System Evaluation [AREE 70] Report [ADL, 1994]) that receives precipitation collected from paved areas around Building 3713. The discharge to the storm drainage ditch eventually flows to Cold Spring Brook. An estimated 50 to 100 gallon spill of No. 4 fuel oil was discharged through the Area 1 outfall in 1977. Approximately 3,000 gallons of mixed oil and water were recovered through use of containment dikes and adsorbent booms in 1977, and approximately 25 cubic yards (cy) of petroleum contaminated soil were removed in 1997. Review of available data indicates that contamination associated with the fuel oil spill has been removed, and a risk assessment indicates that there are no unacceptable risks for unrestricted use.

An assessment of risks was performed as part of the Area of Contamination (AOC) 57 Remedial Investigation (RI) to demonstrate Area 1 does not pose an unacceptable risk for future unrestricted land use. The assessment indicates that there are no unacceptable risks for future unrestricted land use (Refer to Appendix N-1 of the RI report [HLA, 2000a]), and the RI report recommended no further action at AOC 57 Area 1.

Additional or alternative remedies were not evaluated in the Feasibility Study.

The selected remedy for AOC 57 Area 1 is No Further Action.

1.2 DESCRIPTION OF EVALUATED ALTERNATIVES FOR AOC 57 AREA 2

Area 2 consists of upland and floodplain areas downslope of a former vehicle storage yard associated with former motor repair shops. Area 2 was originally thought to have been contaminated by the Area 1 No. 4 fuel oil spill; however, area grading was such that overland flow to Area 2 would not have been possible. When initially investigated, this Area 2 consisted of an eroded drainage ditch created by periodic rainfall runoff from vehicle storage yards. The area has since been regraded (following a soil removal action) and a permanent drainage swale has been installed. Runoff drains into the swale and discharges east to Cold Spring Brook. Portions of Area 2 are within the Cold Spring Brook 100-year flood plain. Data gathered during the RI as well as preceding investigations suggests that Area 2 contamination is the result of the historical disposal of vehicle maintenance related wastes. Contaminant distributions indicate that the disposal occurred along the break in slope above the flood plain.

The Feasibility Study assessed how well the following three alternatives would meet the evaluation criteria while controlling potential adverse human-health effects from exposure to contaminated media at AOC 57 AOC 57 Area 2:

Alternative II-1: No Action
Alternative II-2: Limited Action
Alternative II-3: Excavation (For Possible Future Use) and Institutional Controls

Alternative II-4: Excavation (For Unrestricted Use) and Institutional Controls

1.2.1 Alternative II-1: No Action

The No Action alternative was evaluated as a baseline with which to compare other alternatives. No remedial action, monitoring, further investigation, or five-year site reviews would be performed as part of this alternative. No action would be taken to monitor existing zoning conditions that limit site use and thereby limit potential exposure to site contaminants.

1.2.2 Alternative II-2: Limited Action

Alternative II-2 contains institutional controls and environmental monitoring components to reduce potential human-health risks associated with exposure to contaminated soil and groundwater at the Area 2 wetland. Key components of Alternative II-2 consist of following:

- Institutional Controls
  - Institutional controls that control excavation activities at the Area 2 wetland
  - Existing zoning that prohibits residential use of flood plain property and proposed deed restrictions that prohibit residential use of flood plain property and potable use of groundwater
- Environmental Monitoring
  - Long-term groundwater monitoring
  - Long-term surface water monitoring
- Institutional Control Inspections
- Five-year Site Reviews

1.2.3 Alternative II-3: Excavation (For Possible Future Use) and Institutional Controls

Alternative II-3 adds soil excavation to protect future construction workers and wetland protection components to the components of Alternative II-2 to reduce potential human-health risks associated with exposure to contaminated soil and groundwater at the Area 2 wetland. Alternative II-3 at AOC 57 Area 2 includes the following key components:

- Soil Excavation and Treatment/Disposal at an Approved Facility
- Wetlands Protection
- Institutional Controls
  - Existing zoning that prohibits residential use of flood plain property and proposed deed restrictions that prohibit residential use of flood plain property and potable use of groundwater
- Environmental Monitoring
  - Long-term groundwater monitoring
  - Long-term surface water monitoring
- Institutional Control Inspections
- Five-year Site Reviews

1.2.4 Alternative II-4: Excavation (For Unrestricted Use) and Institutional Controls

Alternative II-4 contains components similar to those of Alternative II-3, but increases the extent of soil excavation to reduce potential human-health risks associated with contaminated soil and groundwater at the Area 2 flood plain. Key components of Alternative II-4 consist of following:

- Soil Excavation and Treatment/Disposal at an Approved Facility
- Wetlands Protection
- Institutional Controls
  - Existing zoning that prohibits residential use of flood plain property and proposed deed restrictions that prohibit potable use of groundwater
- Environmental Monitoring
  - Long-term groundwater monitoring
  - Long-term surface water monitoring
- Institutional Control Inspections
- Five-year Site Reviews

1.2.5 Selected Remedy For AOC 57 Area 2

The selected remedy for AOC 57 Area 2 is Alternative II-3: Excavation (For Possible Future Use) and Institutional Controls. This alternative provides institutional and engineering controls to limit exposure to site-related contaminants and to reduce source-area contaminant concentrations as a measure to cleanup groundwater to protective levels. The remedy does not include a management of migration component.

1.3 DESCRIPTION OF EVALUATED ALTERNATIVES FOR AOC 57 AREA 3

Similar to Area 2, Area 3 consists of upland and floodplain areas downslope of a former motor pool and vehicle storage yard. Area 3 was the site of a historic garage and vehicle waste disposal area. A soil removal action was performed in 1999, and much of the area has since been regraded. Runoff from Area 3 drains into the Cold Spring Brook floodplain and wetland.

The Feasibility Study assessed how well the following three alternatives would meet the evaluation criteria while controlling potential adverse human-health effects from exposure to contaminated media at AOC 57 Area 3:

- Alternative III-1: No Action
- Alternative III-2: Limited Action
- Alternative III-3: Excavation (For Unrestricted Use) and Institutional Controls

1.3.1 No Action

The No Action alternative was evaluated as a baseline with which to compare other alternatives. No remedial action, monitoring, further investigation, or five-year site reviews would be performed as part of

this alternative. No action would be taken to monitor existing zoning conditions that limit site use and thereby limit potential exposure to site contaminants.

1.3.2 Alternative III-2: Limited Action

Alternative II-2 contains institutional controls and environmental monitoring components to reduce potential human-health risks associated with exposure to contaminated soil and groundwater at Area 3. Key components of Alternative III-2 consist of following:

- Institutional Controls
  - Existing zoning that prohibits residential use of property and proposed deed restrictions that prohibit residential use of flood plain property and potable use of Area 3 groundwater
- Environmental Monitoring
  - Long-term groundwater monitoring
  - Long-term surface water monitoring
- Institutional Control Inspections
- Five-year Site Reviews

1.3.3 Alternative III-3: Excavation (For Unrestricted Use) and Institutional Controls

Alternative III-3 adds soil excavation to the components of Alternative III-2 to reduce potential human-health risks associated with exposure to contaminated soil and groundwater at the Area 3. Alternative III-3 at AOC 57 Area 3 includes the following key components:

- Soil Excavation and Treatment/Disposal at an Approved Facility
- Wetlands Protection
- Institutional Controls
  - Existing zoning that prohibits residential use of property and proposed deed restrictions that prohibit potable use of Area 3 groundwater
- Environmental Monitoring:
  - Long-term groundwater monitoring
  - Long-term surface water monitoring
- Institutional Control Inspections
- Five-year Site Reviews

1.3.4 Selected Remedy For AOC 57 Area 3

The selected remedy for AOC 57 Area 3 is Alternative III-2a: Excavation (to Accelerate Groundwater Cleanup) and Institutional Controls. This remedy was not evaluated in the Feasibility Study, but was developed and selected in response to comments on the Proposed Plan which indicated that the Army's preferred remedy for Area 3 was Alternative III-2: Limited Action. The commentors expressed concern that groundwater cleanup would not occur quickly enough under that remedial approach.

Alternative III-2a contains the same components as Alternative III-3, but is based on the need to accelerate groundwater cleanup rather than to protect unrestricted use residents from potential risks from exposure to

contaminated soil. Implementation of Alternative III-3, which is based on soil removal to protect potential residents, is not necessary because floodplain and wetland conditions and existing zoning controls in the Devens Reuse Plan will prevent residential development. Alternative III2a retains the restrictive deed covenants to prohibit potable use of groundwater at Parcel A6a (AOC 57).

Alternative III-2a at AOC 57 Area 3 includes the following key components:

- Soil Excavation and Treatment/Disposal at an Approved Facility
- Wetlands Protection
- Institutional Controls
  - Existing zoning that prohibits residential use of property and proposed deed restrictions that prohibit potable use of Area 3 groundwater
- Environmental Monitoring:
  - Long-term groundwater monitoring
  - Long-term surface water monitoring
- Institutional Control Inspections
- Five-year Site Reviews

2.0 BACKGROUND ON COMMUNITY INVOLVEMENT

The Army has held regular and frequent informational meetings, issued fact sheets and press releases, and held public meetings to keep the community and other interested parties informed of activities at AOC 57. Community interest in AOC 57 was low throughout this process until issuance of the Proposed Plan. At that time, several community members and local groups expressed strong concerns about the Army's preferred alternatives and time frames to achieve groundwater cleanup goals.

In February 1992, the Army released, following public review, a community relations plan that outlined a program to address community concerns and keep citizens informed about and involved in remedial activities at Fort Devens. As part of this plan, the Army established a Technical Review Committee (TRC) in early 1992. The TRC, as required by SARA Section 211 and Army Regulation 200-1, included representatives from USEPA, U.S. Army Environmental Center, Devens RFTA, MADEP, local officials, and the community. Until January 1994, when it was replaced by the Restoration Advisory Board (RAB), the committee generally met quarterly to review and provide technical comments on schedules, work plans, work products, and proposed activities for the SAs and AOCs at Devens RFTA. The AREE, SI, RI, and FS reports, Proposed Plan, and other related support documents were all submitted to the TRC or RAB for their review and comment.

The Army, as part of its commitment to involve the affected communities, forms a RAB when an installation closure involves transfer of property to the community. The Fort Devens RAB was formed in February 1994 to add members of the Citizen's Advisory Committee (CAC) to the TRC. The CAC had been established previously to address Massachusetts Environmental Policy Act/Environmental Assessment issues concerning the reuse of property at Devens RFTA. The RAB consists of 28 members (15 original TRC members plus 13 new members) who are representatives from the Army, USEPA Region I, MADEP, local governments and citizens of the local communities. It meets monthly and provides advice to the installation and regulatory agencies on the Devens RFTA cleanup programs. Specific responsibilities include: addressing cleanup issues such as land use and cleanup goals, reviewing plans and documents, identifying proposed requirements and priorities, and conducting regular meetings that are open to the public.

On February 23, 2001, the Army issued the Proposed Plan, to provide the public with a brief explanation of the Army's proposal for remedial action at AOC 57. The Proposed Plan also described the opportunities for public participation and provided details on the upcoming public comment period and public meeting.

On February 23, 2001, the Army published a public notice announcing the Proposed Plan, the date for a public informational meeting, and the start and end dates of a 31-day public comment period in the Leominster Fitchburg Sentinel & Enterprise, Worcester Telegram, Harvard Post, and papers of the Nashoba Publishing Company (Groton Landmark, Harvard Hillside, Pepperell Free Press, The Public Spirit, Shirley Oracle, and Townsend Times). The Public Notice was published in the Lowell Sun on February 26, 2001. The public notices were republished by the Leominster Fitchburg Sentinel & Enterprise, Lowell Sun, Worcester Telegram and Harvard Post on March 5, 2001, and by Nashoba Publishing Company on March 7, 2001. Notice announcing a 30-day extension of the public comment was published in the Lowell Sun on March 28, 2001, Leominster Fitchburg Sentinel & Enterprise on March 28, 2001, Worcester Telegram on March 28, 2001, Harvard Post on March 30, 2001, and in the Groton Landmark, Harvard Hillside, Pepperell Free Press, The Public Spirit, Shirley Oracle, and Townsend Times

on March 30, 2001. The Army also made the Proposed Plan available to the public at the public information repositories at the Ayer Public Library, the Hazen Memorial Library in Shirley, the Harvard Public Library, and the Lancaster Public Library, or by request from the Devens BRAC Environmental Office.

From February 23 through April 25, 2001, the Army held a 61-day public comment period to accept public comments on the Proposed Plan. On March 8, 2001, the Army held an informal public information meeting at Devens RFTA to present the Army's Proposed Plan to the public and to provide the opportunity for open discussion concerning the Proposed Plan. The Army also accepted formal verbal or written comments from the public during a public hearing held as part of the meeting.

All supporting documentation for the decision regarding AOC 57 is contained in the Administrative Record for review. The Administrative Record is a collection of all the documents considered by the Army in choosing the plan of action for AOC 57. On February 23, 2001, the Army made the Administrative Record available for public review at the Devens BRAC Environmental Office and at the Ayer Town Hall, Ayer, Massachusetts. An index to the Administrative Record is available at the USEPA Records Center, 90 Canal Street, Boston, Massachusetts and is provided as Appendix D of this Record of Decision.

3.0 SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND ARMY RESPONSES

The Army received verbal comments from five people during the public hearing on March 8, 2001, and written comments from 14 people during the public comment period (see Attachment A to this Appendix). The following paragraphs summarize the comments and provide the Army's responses.

The commentors are listed below:

Provided comments at hearing

Cornelius Sullivan, Chairman, Ayer Board of Selectmen, Ayer, Massachusetts
Dina Samfield, Ayer, Massachusetts
Laurie S. Nehring, People of Ayer Concerned About the Environment, Ayer, Massachusetts
Richard Doherty, GeoInsight, Westford, Massachusetts
Mildred Chandler, Citizens to Protect Residential Harvard, Harvard, Massachusetts

Provided written comments

Dina Samfield, Ayer, Massachusetts (March 7, 2001)
Mildred Chandler, Citizens to Protect Residential Harvard, Harvard, Massachusetts (March 8, 2001)
Ruth and Morton Miller, 75 Westcott Rd., Harvard, Massachusetts (March 8, 2001)
Richard Doherty, GeoInsight, Westford, Massachusetts (March 14, 2001)
Helen Fiori, 37 Blanchard Rd. Harvard, Massachusetts (March 14, 2001)
Robert Burkhardt, 12 Harvard Rd., Shirley, Massachusetts (March 20, 2001)
Laurie S. Nehring, People of Ayer Concerned About the Environment, Ayer, Massachusetts (March 26, 2001)
Pam Resor, Senator, and Goeffrey Hall, Representative (March 26, 2001)
Ayer Board of Selectmen (March 30, 2001), Forwarding of submittals by Laurie S. Nehring (March 26, 2001), Richard Doherty (March 14, 2001), Mildred Chandler (March 8, 2001), and David Salvadore, MADEP (February 17, 2000).
Don Kochis, 26 Park Lane, Harvard, Massachusetts (April 1, 2001)
Claire Rindenello, 14 Blanchard Rd., Harvard, Massachusetts (April 4, 2001)
Mildred Chandler, Citizens to Protect Residential Harvard, Harvard, Massachusetts (April 10, 2001)
William Ashe, Harvard Board of Selectmen, Harvard, Massachusetts (April 23, 2001)
Elizabeth Ainsley Campbell, Nashua River Watershed Association, Groton, Massachusetts (April 24, 2001)

1. Public Hearing Statement from Cornelius Sullivan, Ayer, Massachusetts

Comment No. 1. Although the Areas 2 and 3 that have been discussed earlier tonight appear outside of the Zone II, it's not clear to me what effect groundwater or surface water may have on migration of those contaminants into Cold Spring Brook. The brook seems to enter part of the outer range of our Zone II to the Grove Pond Wells. I understand that Areas 2 and 3 are not to be returned, the drinking water, that is, to drinking water standards. And where our Zone II is so nearby and connected to these areas through Cold Spring Brook, that does just does not seem acceptable, at least to the people of Ayer.

Response: While AOC 57 Areas 2 and 3 are not within the Zone II, groundwater at AOC 57 does discharge to Cold Spring Brook which in turn discharges to Grove Pond. However, historical data suggest that AOC 57 is not contributing contaminants of concern to Cold Spring Brook.

As indicated in the Feasibility Study report and Proposed Plan, the Army's goal is to attain drinking water standards in AOC 57 groundwater. To accomplish this goal, the Army removed approximately 1,300 cubic yards of contaminated soil from Area 2 in 1994 and 1,860 cubic yards of contaminated soil from Area 3 in 1999. This soil was interpreted to be both a potential source of organic compound contamination to groundwater and the cause of reducing (i.e., anaerobic) conditions that result in release of arsenic to groundwater from natural soil materials. The Feasibility Study Report estimated that the length of time for attainment of the arsenic drinking water standard following soil removal might reasonably be within a range of less than 1 to 2 years at Area 2, and within a range of 1 to 8 years at Area 3. Because of the many variables that influence the cleanup time, accurately predicting an exact duration is difficult. To evaluate the sensitivity of estimated costs to the length of time that groundwater monitoring was performed, the Feasibility Study evaluated a 3 year and 30 year duration for Area 2 and a 7 year and 30 year duration at Area 3.

To better evaluate progress toward attainment of groundwater cleanup goals, the USEPA and MADEP collected groundwater samples from 6 AOC 57 Area 3 monitoring wells (57M-95-03X, 57M-96-09X, 57M-96-10X, 57M-96-11X, 57M-96-12X, and 57M-96-13X) on April 11, 2001. The samples were split three ways and analyzed by the USEPA, MADEP, and Army for volatile organic compounds and inorganics. Those analyses show exceedance of the arsenic cleanup level at one Area 3 monitoring well (analytical results of 91, 80, and 104 µg/L, respectively, at 57M-96-11X). This represents a significant reduction in arsenic from the 1997 concentration of 170 µg/L, but suggests that reducing conditions that result in arsenic mobilization still remain at location 57M-96-11X. Therefore, although only two years of the estimated 8 years necessary to attain drinking water standards have passed since the Area 3 soil removal, the Army has decided it is appropriate in this instance to remove additional contaminated soil to accelerate the groundwater cleanup process. The Record of Decision indicates that Alternative III-2a, which was developed in response to public comments and includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3.

Comment No. 2. If a private organization was involved in a cleanup effort such as this, the private organization would have to remediate to drinking water standards. That doesn't appear to be the case here, and I'm not sure why.

Response: Cleanup activities are base on attainment of drinking water standards and will meet Massachusetts standards. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP) set drinking water standards as cleanup goals for

CERCLA groundwater cleanup actions, unless a waiver is obtained. This applies both to cleanups performed by the Army and by private organizations. The Feasibility Study identifies both the federal drinking water standards and the similar Massachusetts drinking water standards (Massachusetts Drinking Water Regulations [310 CMR 22.00]) as applicable or relevant and appropriate requirements that must be attained at AOC 57. In addition, attainment of MCLs will also result in attainment of MADEP GW-1 standards.

2. Public Hearing Statement from Dina Stamfield, Ayer, Massachusetts

Comment No. 1. Will this area be returned to drinking water standards within a defined period of time? If so, what is the time frame?

Response: As indicated in the Feasibility Study report and Proposed Plan, the Army's goal is to attain drinking water standards in AOC 57 groundwater. The Feasibility Study Report estimated that the length of time for attainment of the arsenic drinking water standard following soil removal might reasonably be within a range of less than 1 to 2 years at Area 2 and within a range of 1 to 8 years at Area 3. Because of the many variables that influence the cleanup time, accurately predicting an exact duration is difficult. To accomplish this goal, the Army removed approximately 1,300 cubic yards of contaminated soil from Area 2 in 1994 and 1,860 cubic yards of contaminated soil from Area 3 in 1999. This soil was interpreted to be both a potential source of organic compound contamination to groundwater and the cause of reducing (i.e., anaerobic) conditions that result in release of arsenic to groundwater from natural soil materials.

Comment No. 2. Will there be more excavation of Area 3? I thought Massachusetts DEP was recommending excavation in both areas 2 and 3.

Response: Yes. The Record of Decision indicates that Alternative III-2a, which was developed in response to public comments and includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3.

The USEPA and MADEP collected groundwater samples from 6 AOC 57 Area 3 monitoring wells (57M-95-03X, 57M-96-09X, 57M-96-10X, 57M-96-11X, 57M-96-12X, and 57M-96-13X) on April 11, 2001. The samples were split three ways and analyzed by the USEPA, MADEP, and Army for volatile organic compounds and inorganics. Those analyses show exceedance of the arsenic cleanup level at one Area 3 monitoring well (analytical results of 91, 80, and 104 µg/L, respectively, at 57M-96-11X). This represents a significant reduction in arsenic from the 1997 concentration of 170 µg/L, but suggests that reducing conditions that result in arsenic mobilization still remain at location 57M-96-11X. Therefore, although only two years of the estimated 8 years necessary to attain drinking water standards have passed since the Area 3 soil removal, the Army has decided it is appropriate in this instance to remove additional contaminated soil to accelerate the groundwater cleanup process.

Comment No. 3. Would the area east of Barnum Road and west of Cold Spring Brook be considered for rezoning as conservation land and open space?

Response: Although the Army has included institutional controls (i.e., deed restrictions in conjunction with existing zoning controls) as part of the remedy at AOC 57, achieving protectiveness does not require

rezoning the entire area between Barnum Road and Cold Spring Brook for conservation and open space. Such extensive land use controls are not part of the selected remedies. Further, it should be noted that with the exception of the 16-acre parcel A6a that contains AOC 57, the property on the east side of Barnum Road has already been transferred to Mass Development. The Joint Boards of Selectmen and the Devens Enterprise Commission are the appropriate organizations to which to address further questions on rezoning.

Comment No. 4. Does the level of cleanup being offered in the Proposed Plan meet the minimum standard for other cleanups in Massachusetts?

Response: Yes. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP) set drinking water standards as cleanup goals for CERCLA groundwater cleanup actions, unless a waiver is obtained. This applies both to cleanups performed by the Army and by private organizations. The Feasibility Study identifies both the federal drinking water standards and the similar Massachusetts drinking water standards (Massachusetts Drinking Water Regulations [310 CMR 22.00]) as applicable or relevant and appropriate requirements that must be attained at AOC 57. In addition, attainment of MCLs will also result in attainment of MADEP GW-1 standards. Compliance with CERCLA and the NCP, combined with review and inputs from the Massachusetts Department of Environmental Protection throughout the investigation and remediation process, ensures that cleanup actions are protective and satisfy applicable or relevant and appropriate Massachusetts requirements.

5. Public Hearing Statement from Laurie Nehring, Ayer, Massachusetts

Comment No. 1. Figure 2 of the Proposed Plan would have been more helpful if landmarks that are currently in existence could have been included so that people could do drive-bys and see the site for themselves.

Response: Figure 2 shows the locations of several permanent buildings that could be used as landmarks. Because the soil storage piles adjacent to AOC 57 are temporary and are subject to relocation and removal the Army did not consider them good landmarks. The Proposed Plan did provide contact information so that anyone having difficulty in finding the site during a drive by could request more detailed directions.

Comment No. 2. In talking with PACE members, it was revealed to me that this plan was very difficult to read and follow, and the text was very dense. And I include myself in finding this to be true. Even people who had a previous overview of AOC 57 found that the format and content were confusing. For example, the Army's preferred alternative, as stated in the "Introduction," goes like this:

> "The Army's preferred alternative for Area 2 is Alternative II-3: Excavation (for Possible Future Use) and Institutional Controls. The preferred alternative for Area 3 is Alternative III-2: Limited Action."

I found that the Codes II-3 and III-2 are very confusing, even today in preparation for tonight. I was especially confused because there are other numeric codes used in the text, such as Area 2 and Area 3. You

also referred to tables. The tables in Figures 5 and 6 did not help me to clarify the codes. Those codes were omitted entirely from the tables. Then when you look at the text, the text describes the alternatives in some detail, but they did not identify which method was preferred by the Army within the context of those descriptions. The reader had to catch this important statement in the "Introduction" or find it at the very end of the document on Page 8 and then go back and reread the Army's recommended alternatives and try to determine their significance. I found that very confusing.

Response: For consistency, and in an effort to avoid confusion, the Proposed Plan followed the naming introduced in the Remedial Investigation and Feasibility Study reports. To have done otherwise would have made reference to work reported in those documents difficult.

The Army identified the preferred alternatives in the Introduction so that the reader would be alerted to which alternative was preferred at the outset and be prepared for it in the text. In addition, the Proposed Plan text on page 6 under the heading Why Does the Army Recommend Alternatives II-3 and III-2 clearly identifies the preferred alternatives of the Proposed Plan and discusses the reasons for the preference.

Comment No. 3. The proposal was too technical for local residents to follow. Only with a great deal of time and patience and with the assistance of a qualified environmental professional, i.e., Rich Doherty, would individuals feel capable of commenting intelligently on this plan.

Response: The Proposed Plan followed a format used for other sites and approved by USEPA. It represents a compromise between former 30-page Proposed Plans, which had great deal of detail, and 1 or 2 page fact sheets that could not provide all the needed information in the available space. The purpose of the question and answer session at the March 8, 2001 public meeting was to answer questions concerning AOC 57 and the preferred alternatives.

Comment No. 4. It's not clear to us how the public comment period was made known to the public. Who was selected to receive the nine-page Proposed Plan? How big was the mailing list? How prominent was the information displayed in public libraries? How prominent and helpful were the legal notices in the newspapers?

Response: On February 23, 2001, the Army published a public notice announcing the Proposed Plan, the date for a public informational meeting, and the start and end dates of the initial 31-day public comment period in the Leominster Fitchburg Sentinel & Enterprise, Worcester Telegram, Harvard Post, and papers of the Nashoba Publishing Company (Groton Landmark, Harvard Hillside, Pepperell Free Press, The Public Spirit, Shirley Oracle, and Townsend Times). Notice was published in the Lowell Sun on February 26, 2001. The public notices were republished by the Leominster Fitchburg Sentinel & Enterprise, Lowell Sun, Worcester Telegram and Harvard Post on March 5, 2001, and by Nashoba Publishing Company on March 7, 2001. The Army also made the Proposed Plan available to the public at the public information repositories at the Ayer Public Library, the Hazen Memorial Library in Shirley, the Harvard Public Library, and the Lancaster Public Library, or by request from the Devens BRAC Environmental Office.

Copies of the Proposed Plan were also mailed to approximately 660 individuals on a mailing list prepared for previous Devens announcements.

Comment No. 5, (Recommendations).
Recommendation 1. Continue the use of maps which are helpful and prominently located in your brochures.

Response: The Army agrees that good figures and maps are valuable tools in describing sites and site activities.

Recommendation 2. Remove much of the technical language from the summaries, enabling the general public to read about the project in layman's terms without struggling to get through it. Eliminate abbreviations and acronyms such as RI/FS, AOC 57, COC, and all those code words that were described previously.

Response: The Army agrees that Proposed Plans should be as approachable by the public as possible while still providing detail necessary to describe the site and evaluated alternatives. It is easy to overuse acronyms and abbreviations. Unfortunately, some of the terms are still necessary. For this reason, a glossary of terms was included in the Proposed Plan.

Recommendation 3. Always refer to a place where more detailed information can be found. Try a Web site or mention the libraries. Identify a specific list of documents, arranged chronologically or by defined categories, which people could use. Likewise, identify local, state, and federal people who could have assisted in answering questions in the EPA and MADEP in case people didn't feel comfortable contacting the Army directly.

Response: The Introduction specifically refers the reader to the Remedial Investigation and Feasibility Study reports for additional information and indicates where they and other useful documents can be found in the local libraries. The Army feels that constantly referring the reader to external documents would be overwhelming and confusing.

Recommendation 4. Employ more effective public outreach. In all public announcements and legal notices, we suggest replacing meaningless code names like "AOC 57" with descriptive names and locations.

To get the information out in a more cost-effective way, please consider doing a larger initial mailing using postcards, such as NRWA does, to make an initial announcement. On that postcard you can tell people how they can obtain the nine-page summary document, with direct mailing as an option, or they can pick it up at several designated locations in each town, which I suggest would not be just the library, because it has limited hours, but perhaps town halls and other commonly visited places.

Consider taking advantage of the use of the Internet, making information available electronically, but also keeping in mind that not everyone has access to the Internet. Please set up a rapid response system to send the nine-page summary to all those who request it. Continue to send the document to all those who have attended any RAB meetings or other environmentally related meetings in the last couple of years, specifically I'm thinking of people who have attended environmentally related things with Mass Development, by sharing mailing lists.

Response: The Army has initiated extensive public outreach efforts at Devens in the past with only limited success. The notification process followed for AOC 57 was based on the experience of those past activities as well as more formal public notice requirements. The Army remains interested in any approach that is capable of cost-effectively reaching the potentially interested segment of the public.

Comment No. 6. (Specific Comment No. 1) PACE is greatly concerned that the Proposed Plan does not address how drinking water standards will be met at AOC 57. We consider it unacceptable to allow the Army unlimited time to reach these standards. Acceptable resolution of these issues is very important to the community's acceptance of the final plans for AOC 57.

Let me emphasize that this important resource area, at least part of it being a Potentially Productive Aquifer and recharge area defined by MADEP, must be returned to drinking water standards within a defined period of time. The Army's proposal does not appear to stipulate how drinking water standards will be reached but insinuates that natural attenuation will occur. But how? How long will it take? How will it be proven? When will we know it has failed? And if it fails, what will be done? As with other sites the Army has worked on, additional remedial work must be planned for if the standards are not met within a specified time frame. PACE suggests that a specific five-year time frame be used to evaluate the need for additional work. We further urge that the Record of Decision be worded in such a way as to prevent the unacceptable postponing of the contingency remedy that has occurred at Shepley's Hill Landfill.

Response: The selected remedies contain requirements to perform long-term monitoring of groundwater and five-year-reviews. The five-year reviews will assess progress at attaining cleanup goals and whether the remedies remain protective of human health and the environment (i.e., to assess whether contamination, site conditions, or land use have changed in manner that means the remedy is no longer protective). The long-term monitoring and five-year review process will allow the Devens BCT to remain informed about cleanup progress at AOC 57. If warranted, the five-year review may recommend additional remedial actions to protect human health and the environment.

As indicated in the Feasibility Study report and Proposed Plan, the Army's goal is to attain drinking water standards in AOC 57 groundwater. To accomplish this goal, the Army removed approximately 1,300 cubic yards of contaminated soil from Area 2 in 1994 and 1,860 cubic yards of contaminated soil from Area 3 in 1999. This soil was interpreted to be both a potential source of organic compound contamination to groundwater and the cause of reducing (i.e., anaerobic) conditions that result in release of arsenic to groundwater from natural soil materials. The Feasibility Study Report estimated that the length of time for attainment of the arsenic drinking water standard following soil removal might reasonably be within a range of less than 1 to 2 years at Area 2, and within a range of 1 to 8 years at Area 3. Because of the many variables that influence the cleanup time, accurately predicting an exact duration is difficult. To evaluate the sensitivity of estimated costs to the length of time that groundwater monitoring was performed, the Feasibility Study evaluated a 3 year and 30 year duration for Area 2 and a 7 year and 30 year duration at Area 3.

To better evaluate progress toward attainment of groundwater cleanup goals, the USEPA and MADEP collected groundwater samples from 6 AOC 57 Area 3 monitoring wells (57M-95-03X, 57M-96-09X, 57M-96-10X, 57M-96-11X, 57M-96-12X, and 57M-96-13X) on April 11, 2001. The samples were split three ways and analyzed by the USEPA, MADEP, and Army for volatile organic compounds and inorganics. Those analyses show exceedance of the arsenic cleanup level at one Area 3 monitoring well (analytical results of 91, 80, and 104

µg/L, respectively, at 57M-96-11X). This represents a significant reduction in arsenic from the 1997 concentration of 170 µg/L, but suggests that reducing conditions that result in arsenic mobilization still remain at location 57M-96-11X. Therefore, although only two years of the estimated 8 years necessary to attain drinking water standards have passed since the Area 3 soil removal, the Army has decided it is appropriate in this instance to remove additional contaminated soil to accelerate the groundwater cleanup process. The Record of Decision indicates that Alternative III-2a, which was developed in response to public comments and includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3.

Comment No. 7. (Specific Comment No. 2) We are confused about why the Army has recommended Alternative III-2: Limited Action, for Area 3. This appears to be a complete reversal from recommendations made in January of this year, in which the Army and MADEP supported Alternative III-3, Excavation and Institutional Controls.

Support for the Excavation and Institutional Controls alternative is clearly expressed in a comment letter on the Draft Proposed Plan for AOC 57 from MADEP dated January 5, 2001, and signed by David Salvadore. It states:

> "The MADEP has completed its review ...and concurs with the Army's recommendation for ...the excavation of approximately 640 cubic yards and approximately 120 cubic yards petroleum material from Area No. 1 and Area No. 3 respectively."

The focus of this letter from Mr. Salvadore is to express MADEP's concerns about making sure that wetlands are restored properly, after excavation occurs in both areas, for a total removal of 760 cubic yards.

Why has this reversal taken place since the Draft plan? According to the Army's current Proposed Plan, the Alternative III-3 would result in wetland destruction with "limited benefit considering that residential development is improbable in wetland areas." As stated above, this is a Potentially Productive Aquifer, and now I assume in part at least, and accordingly, it should be returned to drinking water standards, regardless of how it may or may not be developed.

We know that wetland protection is being considered as well; however, it has not been demonstrated to us that the additional removal of 120 cubic yards from Area 3 would result in irreversible or unrepairable damage. We need to weigh the importance of excavating hot spots of COCs found in the groundwater and petroleum ground in the soil, removing continuing sources of pollution.

We searched Army documentation for some time, but we could not locate any information that showed us, with overlays, what the excavation impact would be on the wetlands. How deep would the 120 cubic yards of removal be? How does this overlay with the identified contaminants of concern? And finally, how will the excavation impact specific portions of the wetland?

Since the cost differential between these alternatives is minimal, we need to better understand why the more complete remediation is no longer recommended y the Army, when it was recommended and supported by DEP only two months ago.

We believe that this question requires some additional investigation utilizing the skills of a wetland expert, perhaps NRWA, during the spring season so that a site-specific impact/benefit analysis could be done. In conclusion, unless proven to cause damage within a sensitive area of the wetland, PACE advocates Alternative III-3, which would excavate source contamination in Area 3.

Response: The Army has decided it is appropriate to remove additional contaminated soil at AOC 57 Area 3 to accelerate the groundwater cleanup process. The Record of Decision indicates that Alternative III-2a, which includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3. Implementation of Alternative III-3, which is based on soil removal to protect potential residents from risks resulting from soil exposure, is not necessary because floodplain and wetland conditions and existing zoning controls in the Devens Reuse Plan will prevent residential development. Restrictive deed covenants will be developed to prohibit potable use of groundwater at Parcel A6a (AOC 57).

As stated in a previous response, the Army's goal is to attain drinking water standards in AOC 57 groundwater. To accomplish this goal, the Army removed approximately 1,300 cubic yards of contaminated soil from Area 2 in 1994 and 1,860 cubic yards of contaminated soil from Area 3 in 1999. This soil was interpreted to be both a potential source of organic compound contamination to groundwater and the cause of reducing (i.e., anaerobic) conditions that result in release of arsenic to groundwater from natural soil materials. The Feasibility Study Report estimated that the length of time for attainment of the arsenic drinking water standard following soil removal might reasonably be within a range of less than 1 to 2 years at Area 2, and within a range of 1 to 8 years at Area 3. Because of the many variables that influence the cleanup time, accurately predicting an exact duration is difficult.

Please note that Mr. Salvadore was mistaken when he stated that the Army recommended excavation of approximately 120 cubic yards of soil from Area 3. Although the Army has decided to include this removal as part of Alternative III-2a, the removal was not considered prior to the most recent sampling effort.

Comment No. 8. (Specific Comment No. 3) AOC 57 is located in a sensitive area, within wetlands and along Cold Spring Brook. Not only is it a Potentially Productive Aquifer, it is also located very near or within Zone II recharge area for Ayer's Grove Pond wells. The proximity of the recharge area for the Devens Grove Pond wells also should be considered.

Future use of this aquifer for additional water resources may not have been adequately calculated for current growth patterns. Has the Army interviewed planning boards in the Towns of Ayer, Harvard, and Shirley and added them to the buildout at Devens? Future rapid growth in this region and on Devens may indeed demand use of the Cold Spring Brook Aquifer. I firmly believe that to be true.

Future changes in zoning must be considered in the level of cleanup by the Army. This land needs to be returned to drinking water standards and protected from future impacts. Industrial use of this property, as currently zoned, does not appear to be protective of these water resources.

PACE strongly recommends that the area east of Barnum Road and west of Cold Spring Brook which contains AOC 57, along with sensitive wetlands, a Potentially Productive Aquifer at Cold Spring Brook, and portions of Ayer's Zone II, be considered for rezoning as conservation land and open space. We will

actively promote that. Community acceptance of this request is supported by the recent passage of the Community Preservation Act in both Ayer and Harvard.

Response: As indicated in response to the previous comment, the Army has decided it is appropriate to remove additional contaminated soil at Area 3 to accelerate the groundwater cleanup process. The Record of Decision indicates that Alternative III-2a, which was developed in response to public comments and includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3.

Although the Army has included institutional controls (i.e., deed restrictions in conjunction with existing zoning controls) as part of the remedy at AOC 57, achieving protectiveness does not require rezoning the entire area between Barnum Road and Cold Spring Brook for conservation and open space. Such extensive land use controls are not part of the selected remedies. Further, although the Army is held responsible to cleanup AOC 57 groundwater, it is not the Army's role to preemptively implement rezoning to restrict development adjacent to the Cold Spring Brook floodplain/wetland. In addition, it should be noted that with the exception of the 16-acre parcel A6a that contains AOC 57, the property on the east side of Barnum Road has already been transferred to Mass Development. The Joint Boards of Selectmen and the Devens Enterprise Commission are the appropriate organizations to which to address further questions on rezoning.

Comment No. 9. (Conclusions). PACE cannot accept the AOC 57 Proposed Plan in its current form. The following issues need to be resolved before PACE can support the AOC 57 remedy:

1. The Army must adequately address the technical issues raised in GeoInsight's letter, including fully adopting the recommendations contained in the GeoInsight letter.

2. Drinking water quality must be restored at AOC 57 within five years or an ironclad contingency remedy must be implemented to achieve drinking water standards within the following five years.

3. Alternative III-3 should be adopted for Area 3, unless proven that irreversible and unrepairable damage to the wetland will result.

Response: The Army has responded to the technical issues raised by PACE, as it understands them, and to PACE's recommendations. Most significantly, following review of recent groundwater monitoring data, the Army has decided it is appropriate to remove additional contaminated soil at Area 3 to accelerate the groundwater cleanup process. The Record of Decision indicates that Alternative III-2a, which includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3. Implementation of Alternative III-3, which is based on soil removal to protect residents from potential risks resulting from soil exposure, is not necessary because floodplain and wetland conditions and existing zoning controls in the Devens Reuse Plan will prevent residential development. Restrictive deed covenants will be developed to prohibit potable use of groundwater at Parcel A6a (AOC 57).

4. Public Hearing Statement from Richard Doherty, GeoInsight, Westford, Massachusetts

Comment No. 1. The Army acknowledges in their reports that the cleanup goals for AOC 57 groundwater are drinking water standards. This is regardless of whether the area is in a Potentially Productive Aquifer or not. However, the Proposed Plan includes no measures to achieve these standards. The Proposed Plan is worded to imply that drinking water standards will eventually be met, but the time required for this to happen is open-ended. For example, the plan states that the time required to meet drinking water standards at Area 2 is from, and I quote, "three to greater than 30 years." Greater than 30 years. To my mind, I can only interpret this as meaning that the Army is unwilling to state that they will ever meet drinking water standards at AOC 57. Based on the contents of the Proposed Plan, it's my professional opinion that the Proposed Plan does not meet the Army's own goal of achieving drinking water quality. Therefore, the only conclusion can be that the Proposed Plan is deficient because it does not meet the goals that have been set out for the cleanup.

Response: As indicated in the Feasibility Study report and Proposed Plan, the Army's goal is to attain drinking water standards in AOC 57 groundwater. To accomplish this goal, the Army removed approximately 1,300 cubic yards of contaminated soil from Area 2 in 1994 and 1,860 cubic yards of contaminated soil from Area 3 in 1999. This soil was interpreted to be both a potential source of organic compound contamination to groundwater and the cause of reducing (i.e., anaerobic) conditions that result in release of arsenic to groundwater from natural soil materials. The Feasibility Study Report estimated that the length of time for attainment of the arsenic drinking water standard following soil removal might reasonably be within a range of less than 1 to 2 years at Area 2, and within a range of 1 to 8 years at Area 3. Because of the many variables that influence the cleanup time, accurately predicting an exact duration is difficult. To evaluate the sensitivity of estimated costs to the length of time that groundwater monitoring was performed, the Feasibility Study evaluated a 3 year and 30 year duration for Area 2 and a 7 year and 30 year duration at Area 3.

To better evaluate progress toward attainment of groundwater cleanup goals, the USEPA and MADEP collected groundwater samples from 6 AOC 57 Area 3 monitoring wells (57M-95-03X, 57M-96-09X, 57M-96-10X, 57M-96-11X, 57M-96-12X, and 57M-96-13X) on April 11, 2001. The samples were split three ways and analyzed by the USEPA, MADEP, and Army for volatile organic compounds and inorganics. Those analyses show exceedance of the arsenic cleanup level at one Area 3 monitoring well (analytical results of 91, 80, and 104 µg/L, respectively, at 57M-96-11X). This represents a significant reduction in arsenic from the 1997 concentration of 170 µg/L, but suggests that reducing conditions that result in arsenic mobilization still remain at location 57M-96-11X. Therefore, although only two years of the estimated 8 years necessary to attain drinking water standards have passed since the Area 3 soil removal, the Army has decided it is appropriate in this instance to remove additional contaminated soil to accelerate the groundwater cleanup process. The Record of Decision indicates that Alternative III-2a, which was developed in response to public comments and includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3.

Comment No. 2. A clean-up at Devens should not be held to a lower standard just because it happens to be part of a Superfund site. On the contrary, we should expect a Superfund site to be held to a standard at least as high as that required for any other site in Massachusetts. In my opinion, the regulations clearly require that Massachusetts' standards should be met, but this is not the case at AOC 57.

Response: Cleanup activities will meet Massachusetts standards. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP) set drinking water standards as cleanup goals for CERCLA groundwater cleanup actions, unless a waiver is obtained. This applies both to cleanups performed by the Army and by private organizations. The Feasibility Study identifies both the federal drinking water standards and the similar Massachusetts drinking water standards (Massachusetts Drinking Water Regulations [310 CMR 22.00]) as applicable or relevant and appropriate requirements that must be attained at AOC 57. In addition, attainment of MCLs will also result in attainment of MADEP GW-1 standards. Compliance with CERCLA and the NCP, combined with review and inputs from the Massachusetts Department of Environmental Protection throughout the investigation and remediation process, ensures that cleanup actions are protective and satisfy applicable or relevant and appropriate Massachusetts requirements.

5. Public Hearing Statement from Mildred Chandler, Harvard, Massachusetts

Comment No. 1. The Proposed Plan's indefinite cleanup time is inadequate and unacceptable. The indefiniteness of the "estimate greater than 30 years" allows a conclusion that the Army does not know and therefore is hedging. This produces a feeling of distrust based on the possibility of the lack of adequate study. It may not be there, but it produces that feeling.

Response: The Feasibility Study Report estimated that the length of time for attainment of the arsenic drinking water standard following soil removal might reasonably be within a range of less than 1 to 2 years at Area 2, and within a range of 1 to 8 years at Area 3. Because of the many variables that influence the cleanup time, accurately predicting an exact duration is difficult. To evaluate the sensitivity of estimated costs to the length of time that groundwater monitoring was performed, the Feasibility Study evaluated a 3 year and 30 year duration for Area 2 and a 7 year and 30 year duration at Area 3. The references to 3-to-30 year and 7-to-30 year time frames in the Proposed Plan did not make this distinction clear.

Comment No. No. 2. The Proposed Plan is unacceptable in that the standard of cleanup is lower than that on private property in Massachusetts. The statement: "Since groundwater at and beneath AOC 57 is not used as a source of drinking or industrial water," continues and makes an assumption that it will never be used as a source, thus belying its present status as a Potentially Productive Aquifer. With the level of contaminants in the ground and the indefinite period of attenuation mentioned previously, it is a denial of rights to put land in jeopardy that is on the east side of Cold Spring Brook and to threaten wells at Grove Pond. This proposal is precedent setting and may be recommended when other areas are examined in the future.

Response: Cleanup activities will meet Massachusetts standards. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP) set drinking water standards as cleanup goals for CERCLA groundwater cleanup actions, unless a waiver is obtained. This applies both to cleanups performed by the Army and by private organizations. The Feasibility Study identifies both the federal drinking water standards and the similar Massachusetts drinking water standards (Massachusetts Drinking Water Regulations [310 CMR 22.00]) as applicable or relevant and appropriate requirements that must be attained at AOC 57. In addition, attainment of MCLs

will also result in attainment of MADEP GW-1 standards. Compliance with CERCLA and the NCP, combined with review and inputs from the Massachusetts Department of Environmental Protection throughout the investigation and remediation process, ensures that cleanup actions are protective and satisfy applicable or relevant and appropriate Massachusetts requirements.

The Feasibility Study did not assume that the groundwater would never be used be use as a source of drinking water, but rather that it would be unwise to do so before attainment of cleanup goals. As stated in response to the previous comment, the estimated time to reach drinking water standards was less than 1 to 2 years at Area 2, and within a range of 1 to 8 years at Area 3.

The Army believes that the available data do not indicate any threat to the east side of Cold Spring Brook or the Ayer Grove Pond Wells from AOC 57 Areas 2 and 3. The USEPA has also concluded that adverse affects on the Grove Pond wells are unlikely.

Comment No. No. 3. The Proposed Plan does not demonstrate this government agency's responsibility to achieve the highest standards for its citizens. The community we represent is almost totally dependent upon private wells for its drinking water and for all other purposes. We take seriously our personal responsibility to protect our properties from contamination with the knowledge that each person's ethical standard creates the national environmental ethic.

Avoiding responsibility to restore land despoiled by the Army's past carelessness or ignorance when it could achieve a better cleanup is blatant side stepping. I object to the Army's spirit that if land is not decontaminated, institutional controls for restricted use, that is, rezoning, are the solution.

Response: The Army also takes seriously its responsibility and has devoted considerable time and resources toward characterizing contamination and potential exposure risks at AOC 57 and lower Cold Spring Brook, and to removing over 3,100 cubic yards of contaminated soil to date.

As indicated in the Feasibility Study report and Proposed Plan, the Army's goal is to attain drinking water standards in AOC 57 groundwater. Recent sampling of several AOC 57 monitoring wells and piezometers shows progress in achieving this goal, but also suggests that reducing conditions that result in arsenic mobilization remain at location 57M-96-11X. Therefore, although only two years of the estimated 8 years necessary to attain drinking water standards have passed since the Area 3 soil removal, the Army has decided it is appropriate in this instance to remove additional contaminated soil to accelerate the groundwater cleanup process. The Record of Decision indicates that Alternative III-2a, which was developed in response to public comments and includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3.

Please note that rezoning has never been considered. Risk based decisions take into account the reuse plan provided by Massachusetts Development Finance Authority.

Written Comments by Dina Samfield, Ayer, Massachusetts (March 7, 2001)

Comment No. 1. Will this area be returned to drinking water standards within a defined period of time? If so, what is the timeframe for this?

Response: The Feasibility Study Report estimated that the length of time for attainment of the arsenic drinking water standard following soil removal might reasonably be within a range of less than 1 to 2 years at Area 2, and within a range of 1 to 8 years at Area 3. Because of the many variables that influence the cleanup time, accurately predicting an exact duration is difficult. To evaluate the sensitivity of estimated costs to the length of time that groundwater monitoring was performed, the Feasibility Study evaluated a 3 year and 30 year duration for Area 2 and a 7 year and 30 year duration at Area 3. The references to 3-to-30 year and 7-to-30 year time frames in the Proposed Plan did not make this distinction clear.

Comment No. 2. Will there be any excavation at Area 3? Isn't Massachusetts DEP recommending excavation in both areas 2 and 3?

Response: Yes. The Record of Decision indicates that Alternative III-2a, which was developed in response to public comments and includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3.

As indicated in the Feasibility Study report and Proposed Plan, the Army's goal is to attain drinking water standards in AOC 57 groundwater. Recent sampling of several AOC 57 monitoring wells and piezometers shows progress in achieving this goal, but also suggests that reducing conditions that result in arsenic mobilization remain at location 57M-96-11X. Therefore, although only two years of the estimated 8 years necessary to attain drinking water standards have passed since the Area 3 soil removal, the Army has decided it is appropriate in this instance to remove additional contaminated soil to accelerate the groundwater cleanup process.

Comment No. 3. Will the area east of Barnum Road and west of Cold Spring be considered for rezoning as conservation land and open space? Is future use of the aquifer for additional water resources being considered?

Response: Although the Army has included institutional controls (i.e., deed restrictions in conjunction with existing zoning controls) as part of the remedy at AOC 57, achieving protectiveness does not require rezoning the entire area between Barnum Road and Cold Spring Brook for conservation and open space. Such extensive land use controls are not part of the selected remedies. Further, although the Army is held responsible to cleanup AOC 57 groundwater, it is not the Army's role to preemptively implement rezoning to restrict development adjacent to the Cold Spring Brook floodplain/wetland. In addition, it should be noted that with the exception of the 16-acre parcel A6a that contains AOC 57, the property on the east side of Barnum Road has already been transferred to Mass Development. The Joint Boards of Selectmen and the Devens Enterprise Commission are the appropriate organizations to which to address further questions on rezoning.

Comment No. 4. Does the level of clean-up being offered in the proposed plan meet the minimum standard for other clean-ups within Massachusetts?

Response: Yes, cleanup activities will meet Massachusetts standards. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP) set drinking water standards as cleanup goals for CERCLA groundwater cleanup actions, unless a waiver is obtained. This applies both to cleanups performed by the Army and by private organizations. The Feasibility Study identifies both the federal drinking water standards and the similar Massachusetts drinking water standards (Massachusetts Drinking Water Regulations [310 CMR 22.00]) as applicable or relevant and appropriate requirements that must be attained at AOC 57. In addition, attainment of MCLs will also result in attainment of MADEP GW-1 standards. Compliance with CERCLA and the NCP, combined with review and inputs from the Massachusetts Department of Environmental Protection throughout the investigation and remediation process, ensures that cleanup actions are protective and satisfy applicable or relevant and appropriate Massachusetts requirements.

Written Comments by Mildred Chandler, Citizens to Protect Residential Harvard, Harvard, Massachusetts (March 8, 2001)

Comment No. 1. The Proposed Plan's indefinite clean up time is inadequate and unacceptable. The indefiniteness of the estimate "greater than 30 years" allows a conclusion that the Army does not know and therefore is hedging. This produces a feeling of distrust based on the possibility of the lack of adequate study

Response: The Feasibility Study Report estimated that the length of time for attainment of the arsenic drinking water standard following soil removal might reasonably be within a range of less than 1 to 2 years at Area 2, and within a range of 1 to 8 years at Area 3. Because of the many variables that influence the cleanup time, accurately predicting an exact duration is difficult. To evaluate the sensitivity of estimated costs to the length of time that groundwater monitoring was performed, the Feasibility Study evaluated a 3 year and 30 year duration for Area 2 and a 7 year and 30 year duration at Area 3. The references to 3-to-30 year and 7-to-30 year time frames in the Proposed Plan did not make this distinction clear.

Comment No. 2. The Proposed Plan is unacceptable in that the standard of clean up is lower than that on private property in Massachusetts. The statement: "Since groundwater at and beneath AOC 57 is not used as a source of drinking or industrial water..." continues and makes an assumption that it will never be used as a source, thus belying its present status as a Potentially Productive Aquifer. With the level of contaminants in the ground and the indefinite period of attenuation mentioned previously, it is a denial of rights to put land in jeopardy that is on the East Side of Cold Spring Brook and to threaten wells at Grove Pond. This proposal is precedent setting and may be recommended when other areas are examined in the future.

Response: Cleanup activities will meet Massachusetts standards. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP) set drinking water standards as cleanup goals for CERCLA groundwater cleanup actions, unless a waiver is

obtained. This applies both to cleanups performed by the Army and by private organizations. The Feasibility Study identifies both the federal drinking water standards and the similar Massachusetts drinking water standards (Massachusetts Drinking Water Regulations [310 CMR 22.00]) as applicable or relevant and appropriate requirements that must be attained at AOC 57. In addition, attainment of MCLs will also result in attainment of MADEP GW-1 standards. Compliance with CERCLA and the NCP, combined with review and inputs from the Massachusetts Department of Environmental Protection throughout the investigation and remediation process, ensures that cleanup actions are protective and satisfy applicable or relevant and appropriate Massachusetts requirements.

The Feasibility Study did not assume that the groundwater would never be used be use as a source of drinking water, but rather that it would be unwise to do so before attainment of cleanup goals. As stated in response to the previous comment, the estimated time to reach drinking water standards was less than 1 to 2 years at Area 2, and within a range of 1 to 8 years at Area 3.

The Army believes that the available data do not indicate any threat to the east side of Cold Spring Brook or the Ayer Grove Pond Wells from AOC 57 Areas 2 and 3.

Comment No. 3. The Proposed Plan does not demonstrate this government agency's responsibility to achieve the highest standard for its citizens. The community we represent is almost totally dependent upon private wells for its drinking water and for all other purposes. We take seriously our personal responsibility to protect our properties from contamination with the knowledge that each person's ethical standard creates the national environmental ethic. Avoiding responsibility to restore land despoiled by the Army's past carelessness or ignorance when it could achieve a better cleanup is blatant side stepping. I object to the Army's theory that if land is not decontaminated, institutional controls for restricted use (rezoning) are the solution.

Response: The Army also takes seriously its responsibility and has devoted considerable time and resources toward characterizing contamination and potential exposure risks at AOC 57 and lower Cold Spring Brook, and to removing over 3,100 cubic yards of contaminated soil.

As indicated in the Feasibility Study report and Proposed Plan, the Army's goal is to attain drinking water standards in AOC 57 groundwater. Recent sampling of several AOC 57 monitoring wells and piezometers shows progress in achieving this goal, but also suggests that reducing conditions that result in arsenic mobilization remain at location 57M-96-11X. Therefore, although only 2 years of the estimated 8 years necessary to attain drinking water standards have passed since the Area 3 soil removal, the Army has decided it is appropriate in this instance to remove additional contaminated soil to accelerate the groundwater cleanup process. The Record of Decision indicates that Alternative III-2a, which was developed in response to public comments and includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3.

Please note that rezoning has never been considered. Risk based decisions take into account the reuse plan provided by Massachusetts Development Finance Authority.

Written Comments by Ruth and Morton Miller, 75 Westcott Rd., Harvard, Massachusetts (March 8, 2001)

Comment No. 1. It is our understanding that the contamination of AOC 57 was one of the reasons that Fort Devens was designated a Superfund site. Various parties to the original planning for Devens recall that AOC 57 was to be cleaned up to the highest standard.

Response: Fort Devens was designated a Superfund Site because of Shepley's Hill Landfill and Cold Spring Brook Landfill. However, once a single site at an installation is designated as a Superfund site, the entire installation is considered a Superfund Site. Superfund cleanups are performed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP). Because of AOC 57's presence at Fort Devens, its cleanup is proceeded according to CERCLA.

CERCLA and the NCP soil cleanup actions are generally based on reducing potential exposure risks to a range of 1 in 10,000 to 1 in 1,000,000 for carcinogenic substances and to a hazard index of 1 or less for noncarcinogenic substances. Groundwater cleanup actions are generally based on attaining drinking water standards.

Comment No. 2. We think the Proposed Plan should have specifically addressed remediation alternatives designed to clean up the aquifer to a drinking water standard in a reasonable time.

Leaving the contaminated soils in place as contemplated in the Army's chosen options for both Area 2 and Area 3 could result in a continuing source of further groundwater contamination and even in the appearance of compounds not yet identified as COPCs.

Response: The Feasibility Study Report estimated that the length of time for attainment of the arsenic drinking water standard following soil removal might reasonably be within a range of less than 1 to 2 years at Area 2, and within a range of 1 to 8 years at Area 3. Because of the many variables that influence the cleanup time, accurately predicting an exact duration is difficult. To evaluate the sensitivity of estimated costs to the length of time that groundwater monitoring was performed, the Feasibility Study evaluated a 3 year and 30 year duration for Area 2 and a 7 year and 30 year duration at Area 3. The references to 3-to-30 year and 7-to-30 year time frames in the Proposed Plan did not make this distinction clear.

As indicated in the Feasibility Study report and Proposed Plan, the Army's goal is to attain drinking water standards in AOC 57 groundwater. To accomplish this goal, the Army removed approximately 1,300 cubic yards of contaminated soil from Area 2 in 1994 and 1,860 cubic yards of contaminated soil from Area 3 in 1999. This soil was interpreted to be both a potential source of organic compound contamination to groundwater and the cause of reducing (i.e., anaerobic) conditions that result in release of arsenic to groundwater from natural soil materials.

To better evaluate progress toward attainment of groundwater cleanup goals, the USEPA and MADEP collected groundwater samples from 6 AOC 57 Area 3 monitoring wells and piezometers (57M-95-03X, 57M-96-09X, 57M-96-10X, 57M-96-11X, 57M-96-12X, and 57M-96-13X) on April 11, 2001. The samples were split three ways and analyzed by the USEPA, MADEP, and Army for volatile organic compounds and inorganics. Those

analyses show exceedance of the arsenic cleanup level at one Area 3 monitoring well (analytical results of 91, 80, and 104 µg/L, respectively, at 57M-96-11X). This represents a significant reduction in arsenic from the 1997 concentration of 170 µg/L, but suggests that reducing conditions that result in arsenic mobilization still remain at location 57M-96-11X. Therefore, although only two years of the estimated 8 years necessary to attain drinking water standards have passed since the Area 3 soil removal, the Army has decided it is appropriate in this instance to remove additional contaminated soil to accelerate the groundwater cleanup process. The Record of Decision indicates that Alternative III-2a, which was developed in response to public comments and includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3.

Comment No. 3. The Massachusetts Contingency Plan should be an Applicable or Relevant and Appropriate Requirement. CERCLA should demand no less a remedy than the Commonwealth of Massachusetts.

Response: Because Fort Devens is a Superfund Site, the Army is performing the cleanup at AOC 57 according to CERCLA. CERCLA requires, as part of that process, that the Army identify Massachusetts applicable or relevant and appropriate requirements (ARARs) pertinent to the cleanup. The Army must comply with substantive portions of those requirements (e.g., drinking water standards), although compliance with administrative portions such as permitting is not required. This process helps ensure that CERCLA cleanups are consistent with Massachusetts requirements, but helps prevent introduction of conflicting procedures that could slow the cleanup process.

The Massachusetts Contingency Plan (310 CMR 40.0000) is not considered an ARAR for CERCLA actions at Devens. The provisions of the MCP are mostly administrative in nature and, therefore, do not have to be complied with in connection with the response action selected for AOC 57. Further, the MCP contains a specific provision (310 CMR 40.0111) for deferring application of the MCP at CERCLA sites. 310 CMR 40.0111(1)(a) provides that response actions at CERCLA sites shall be deemed adequately regulated for purposes of compliance with the MCP, provided the MADEP concurs in the CERCLA Record of Decision. The cleanup goals developed for AOC 57 under CERCLA meet the substantive requirements of the MCP.

In the case of AOC 57, CERCLA is more protective than state regulations in that if the MCP were applied to the site, cleanup standards could be adjusted through implementation of technical justifications (310 CMR 40.0193) and feasibility evaluations (40.0860).

Comment No. 4. If lands in AOC 57 are to be used as recreational open space in the future, the Army should clean up to protect the most vulnerable little soccer players. Health-risk potential is yet another good reason to clean up the toxic chemicals and heavy metals in AOC 57 soils.

Response: The portions of AOC 57 earmarked for open space are predominantly wooded floodplain and wetland, and not well suited for soccer. Designated uses in the Devens Reuse Plan include nature trails and bird watching. Further, upland portions of the site are designated for commercial/industrial use and would not be utilized for recreational purposes. The selected soil cleanup action is based on potential health risks associated with the planned/reasonable use of the area.

Comment No. 5. The presence of numerous potentially dangerous agents at high levels found in AOC 57, including but not limited to PCBs, PAHs, TPHCs, VOCs, and heavy metals, is intolerable. They should be removed to the fullest extent possible to allow nature to recoup. For all the reasons above, we support options II-4 and III-3 as preferable to the other choices offered.

Response: Soil cleanup at AOC 57 has been based on reduction of potential exposure risks associated with planned/reasonable reuse to levels considered acceptable by USEPA, while groundwater cleanup is based on attainment of drinking water standards.

The Army has not changed its preference for Alternative II-3 at Area 2. However, although only two years of the estimated 8 years necessary to attain drinking water standards have passed since the 1999 Area 3 soil removal, the Army has decided it is appropriate in this instance to remove additional contaminated soil to accelerate the groundwater cleanup process. The Record of Decision indicates that Alternative III-2a, which was developed in response to public comments and includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3.

Written Comments by Richard Doherty, GeoInsight, Westford, Massachusetts (March 14, 2001)

Comment No. 1. The Proposed Plan does not adequately comply with Applicable or Relevant and Appropriate Requirements (ARARs).

Response: Because Fort Devens is a Superfund Site, the Army is performing the cleanup at AOC 57 according to CERCLA. CERCLA requires, as part of that process, that the Army identify Massachusetts applicable or relevant and appropriate requirements (ARARs) pertinent to the cleanup. The Army must comply with substantive portions of those requirements (e.g., drinking water standards), although compliance with administrative portions such as permitting is not required. This process helps ensure that CERCLA cleanups are consistent with Massachusetts requirements, but helps prevent introduction of conflicting procedures that could slow the cleanup process.

The Massachusetts Contingency Plan (310 CMR 40.0000) is not considered an ARAR for CERCLA actions at Devens. The provisions of the MCP are mostly administrative in nature and, therefore, do not have to be complied with in connection with the response action selected for AOC 57. Further, the MCP contains a specific provision (310 CMR 40.0111) for deferring application of the MCP at CERCLA sites. 310 CMR 40.0111(1)(a) provides that response actions at CERCLA sites shall be deemed adequately regulated for purposes of compliance with the MCP, provided the MADEP concurs in the CERCLA Record of Decision. The cleanup goals developed for AOC 57 under CERCLA meet the substantive requirements of the MCP.

In the case of AOC 57, CERCLA is more protective than state regulations in that if the MCP were applied to the site, cleanup standards could be adjusted through implementation of technical justifications (310 CMR 40.0193) and feasibility evaluations (40.0860).

Comment No. 2. The Proposed Plan's estimates of time for ground water cleanup are inadequate, unsubstantiated, and conflicting.

Response: The Feasibility Study Report estimated that the length of time for attainment of the arsenic drinking water standard following soil removal might reasonably be within a range of less than 1 to 2 years at Area 2, and within a range of 1 to 8 years at Area 3. Because of the many variables that influence the cleanup time, accurately predicting an exact duration is difficult. To evaluate the sensitivity of estimated costs to the length of time that groundwater monitoring was performed, the Feasibility Study evaluated a 3 year and 30 year duration for Area 2 and a 7 year and 30 year duration at Area 3. The references to 3-to-30 year and 7-to-30 year time frames in the Proposed Plan did not make this distinction clear.

Comment No. 3. The Proposed Plan is not acceptable to the community because a lower standard of cleanup is being offered relative to other sites in Massachusetts.

Response: Cleanup activities will meet Massachusetts standards. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP) set drinking water standards as cleanup goals for CERCLA groundwater cleanup actions, unless a waiver is obtained. This applies both to cleanups performed by the Army and by private organizations. The Feasibility Study identifies both the federal drinking water standards and the similar Massachusetts drinking water standards (Massachusetts Drinking Water Regulations [310 CMR 22.00]) as applicable or relevant and appropriate requirements that must be attained at AOC 57. In addition, attainment of MCLs will also result in attainment of MADEP GW-1 standards. Compliance with CERCLA and the NCP, combined with review and inputs from the Massachusetts Department of Environmental Protection throughout the investigation and remediation process, ensures that cleanup actions are protective and satisfy applicable or relevant and appropriate Massachusetts requirements.

Written Comments by Helen Fiori, 37 Blanchard Rd., Harvard, Massachusetts (March 14, 2001)

Comment No. 1. As participant in the formulation of the Devens Reuse Plan, I understood that the Army is responsible for the remediation of the areas of Fort Devens designated as a Superfund site and that those areas would be returned to a condition comparable to that before occupation by the Army. Alternatives II-3 and II-2 fall far short of that standard.

Response: CERCLA and the NCP soil cleanup actions are generally based on reducing potential exposure risks to a range of 1 in 10,000 to 1 in 1,000,000 for carcinogenic substances and to a hazard index of 1 or less for noncarcinogenic substances. Groundwater cleanup actions are generally based on attaining drinking water standards. CERCLA does not require cleanup to background conditions or before occupation by the Army.

Comment No. 2. The contamination involves a medium yield aquifer (PPA). The host communities cannot afford to be cavalier about writing off a water resource. I believe the Army should clean up the aquifer to drinking water standards in a much shorter period of time.

Response: The Feasibility Study Report estimated that the length of time for attainment of the arsenic drinking water standard following soil removal might reasonably be within a range of less than 1 to 2 years at Area 2, and within a range of 1 to 8 years at Area 3. Because of the many variables that influence the cleanup time, accurately predicting an exact duration is difficult. To evaluate the sensitivity of estimated costs to the length of time that groundwater monitoring was performed, the Feasibility Study evaluated a 3 year and 30 year duration for Area 2 and a 7 year and 30 year duration at Area 3. The references to 3-to-30 year and 7-to-30 year time frames in the Proposed Plan did not make this distinction clear.

As indicated in the Feasibility Study report and Proposed Plan, the Army's goal is to attain drinking water standards in AOC 57 groundwater. To accomplish this goal, the Army removed approximately 1,300 cubic yards of contaminated soil from Area 2 in 1994 and 1,860 cubic yards of contaminated soil from Area 3 in 1999. This soil was interpreted to be both a potential source of organic compound contamination to groundwater and the cause of reducing (i.e., anaerobic) conditions that result in release of arsenic to groundwater from natural soil materials.

To better evaluate progress toward attainment of groundwater cleanup goals, the USEPA and MADEP collected groundwater samples from 6 AOC 57 Area 3 monitoring wells (57M-95-03X, 57M-96-09X, 57M-96-10X, 57M-96-11X, 57M-96-12X, and 57M-96-13X) on April 11, 2001. The samples were split three ways and analyzed by the USEPA, MADEP, and Army for volatile organic compounds and inorganics. Those analyses show exceedance of the arsenic cleanup level at one Area 3 monitoring well (analytical results of 91, 80, and 104 µg/L, respectively, at 57M-96-11X). This represents a significant reduction in arsenic from the 1997 concentration of 170 µg/L, but suggests that reducing conditions that result in arsenic mobilization still remain at location 57M-96-11X. Therefore, although only two years of the estimated 8 years necessary to attain drinking water standards have passed since the Area 3 soil removal, the Army has decided it is appropriate in this instance to remove additional contaminated soil to accelerate the groundwater cleanup process. The Record of Decision indicates that Alternative III-2a, which was developed in response to public comments and includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3.

Comment No. 3. I particularly noted that the alternatives chosen would not protect residential receptors, but would not produce adverse effects to any plants or animals. I would like an explanation.

Response: Estimates of potential risk are based on the combination of chemical concentration, frequency and duration of exposure, and sensitivity of the plant or animal to the chemical. Although a potential resident and a plant or animal may be exposed to the same concentration of a chemical in soil, differences in exposure frequency and duration, and differences in sensitivity result in different estimates of potential risk. It should be noted that the site will not be used for residential purposes.

Comment No. 4. Really only options II-4 and III-3 seem to be acceptable. Full restoration of the wetland and Cold Spring Brook is the goal and AOC must be cleaned up to the best of the Army's considerable ability.

Response: Because of AOC 57's presence at Fort Devens, its cleanup is proceeding according to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National

Contingency Plan (NCP). CERCLA and the NCP soil cleanup actions are generally based on reducing potential exposure risks to a range of 1 in 10,000 to 1 in 1,000,000 for carcinogenic substances and to a hazard index of 1 or less for noncarcinogenic substances. Groundwater cleanup actions are generally based on attaining drinking water standards. CERCLA does not require cleanup to background conditions or before occupation by the Army.

Consistent with the requirements of CERCLA, the selected soil cleanup actions at AOC 57 are based on potential health risks associated with the planned/reasonable use of the area, while groundwater cleanup is based on attainment of drinking water standards

As part of the cleanup process, portions of the wetland disturbed by remedial activities will be restored.

Written Comments by Robert Burkhardt, 12 Harvard Rd., Shirley, Massachusetts (March 20, 2001)

Comment No. 1. I think possibilities for actively cleansing the groundwater the groundwater should be explored.

Response: The Army believes that the most important factor in cleaning up groundwater at AOC 57 is cleaning up soils that are a potential source of contaminants and/or reducing (anaerobic) conditions that result in release of arsenic from native soil materials. Soil removal is a relatively quick process (a few days or weeks); however, several months or years may be needed after soil removal for groundwater conditions to stabilize and for existing groundwater contamination to disperse.

The Army removed approximately 1,300 cubic yards of contaminated soil from Area 2 in 1994 and 1,860 cubic yards of contaminated soil from Area 3 in 1999. This soil was interpreted to be both a potential source of organic compound contamination to groundwater and the cause of reducing (i.e., anaerobic) conditions that result in release of arsenic to groundwater from natural soil materials. The Feasibility Study Report estimated that the length of time for attainment of the arsenic drinking water standard following soil removal might reasonably be within a range of less than 1 to 2 years at Area 2, and within a range of 1 to 8 years at Area 3. Because of the many variables that influence the cleanup time, accurately predicting an exact duration is difficult. To evaluate the sensitivity of estimated costs to the length of time that groundwater monitoring was performed, the Feasibility Study evaluated a 3 year and 30 year duration for Area 2 and a 7 year and 30 year duration at Area 3. The references to 3-to-30 year and 7-to-30 year time frames in the Proposed Plan did not make this distinction clear.

To better evaluate progress toward attainment of groundwater cleanup goals, the USEPA and MADEP collected groundwater samples from 6 AOC 57 Area 3 monitoring wells (57M-95-03X, 57M-96-09X, 57M-96-10X, 57M-96-11X, 57M-96-12X, and 57M-96-13X) on April 11, 2001. The samples were split three ways and analyzed by the USEPA, MADEP, and Army for volatile organic compounds and inorganics. Those analyses show exceedance of the arsenic cleanup level at one Area 3 monitoring well (analytical results of 91, 80, and 104 µg/L, respectively, at 57M-96-11X). This represents a significant reduction in arsenic from the 1997 concentration of 170 µg/L, but suggests that reducing conditions that result in arsenic mobilization still remain at location 57M-96-11X. Therefore, although only two years of the estimated 8 years necessary to attain drinking water standards have passed since the Area 3 soil removal, the Army has decided it is appropriate in this instance to remove additional contaminated soil to accelerate the groundwater cleanup process. The Record of Decision

indicates that Alternative III-2a, which was developed in response to public comments and includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3.

Comment No. 2. It may be advisable to restore the wetlands to a greater area than the previously occupied. His would help compensate for losses of BVW elsewhere on the base due to the Army's activities. Both of these are valuable assets whose values should be considered when weighing alternatives and their costs.

Response: Loss of wetlands and subsequent restoration/mitigation have been dealt with on an AOC specific basis at Devens. The selected remedies for AOC 57 include wetlands restoration to address potential adverse effects from remedy implementation. There will be no loss of wetlands at AOC 57. Further, there is no need to include compensatory wetland restoration as part of the remedies at AOC 57 as a result of activities at other sites. It should be noted that as part of base closure activities, Devens has made substantial wetland transfers to the U.S. Fish & Wildlife Service. Management of those areas by the Fish & Wildlife Service will help maintain the region's wetland resources.

Written Comments by Laurie S. Nehring, People of Ayer Concerned About the Environment, Ayer, Massachusetts (March 26, 2001)

Comment No. 1. The Army's proposed cleanup goal to reach drinking water standards at AOC 57 should be restated to include a clearly defined timeframe. We recommend five years. Additionally, this should be stated in the ROD as a specific date, i.e., by June 1, 2006, these standards should be met. This will remove future ambiguity for all parties concerned.

We recommend the ROD include specific definitions of what constitutes reaching drinking water standards. For example, a single monitoring well below drinking water standards would not be sufficient for the Army to claim the goal has been reached. PACE would like to be included in technical discussions to clearly define the cleanup endpoint in the ROD.

Response: The response to this comment is combined with the response to Comment No. 2.

Comment No. 2. If the drinking water standards are not restored within five years, then an iron -clad contingency remedy must be fully implemented in a reasonable time frame to achieve drinking water standards within the following five years.

Response: The Feasibility Study Report estimated that the length of time for attainment of the arsenic drinking water standard following soil removal might reasonably be within a range of less than 1 to 2 years at Area 2, and within a range of 1 to 8 years at Area 3. Because of the many variables that influence the cleanup time, accurately predicting an exact duration is difficult. The references to 3-to-30 year and 7-to-30 year time frames in the Proposed Plan did not make this distinction clear.

The Army believes that the most important factor in cleaning up groundwater at AOC 57 is cleaning up soils that are a potential source of contaminants and/or reducing (anaerobic) conditions that result in release of arsenic from native soil materials. Soil removal is a relatively quick process (a few days or weeks); however, several months or years may be needed after soil removal for groundwater conditions to stabilize and for existing groundwater contamination to disperse.

The Army removed approximately 1,300 cubic yards of contaminated soil from Area 2 in 1994 and 1,860 cubic yards of contaminated soil from Area 3 in 1999. This soil was interpreted to be both a potential source of organic compound contamination to groundwater and the cause of reducing (i.e., anaerobic) conditions that result in release of arsenic to groundwater from natural soil materials.

Recent sampling by USEPA and MADEP suggests that reducing conditions that result in arsenic mobilization remain at location 57M-96-11X at Area 3. Therefore, although only two years of the estimated 8 years necessary to attain drinking water standards have passed since the Area 3 soil removal, the Army has decided it is appropriate in this instance to remove additional contaminated soil to accelerate the groundwater cleanup process. The Record of Decision indicates that Alternative III-2a, which was developed in response to public comments and includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3.

The selected remedies also require long-term monitoring of groundwater and five-year-reviews to assess progress toward attaining cleanup goals and whether the remedies remain protective of human health and the environment (i.e., to assess whether contamination, site conditions, or land use have changed in manner that means the remedy is no longer protective). If warranted, the five-year review may recommend additional remedial actions to protect human health and the environment.

Comment No. 3. Groundwater monitoring will be required in order to determine if the cleanup goals are being attained. We recommend the following schedule: quarterly sampling during the first year (minimally). This will enable the Army to determine seasonal cycles of highest concentrations so that future sampling can be done during 'worst case' scenarios. Years two and three could be sampled biannually. If the levels of contaminates are decreasing as we anticipate, then the final two years of sampling could be done annually.

PACE would like to request an opportunity to review and discuss the number and the placement of the monitoring wells to be monitored during a technical meeting with the BCT team, when the time comes for this decision.

Response: The schedule for long-term monitoring will be developing in a Long-term Monitoring Plan for the site, and these suggestions will be considered during the plan's development. USEPA and MADEP will review the draft plan to ensure its adequacy and completeness.

Comment No. 4. As stated in the AOC 57 Feasibility Study, the selected remedy will utilize natural attenuation. As described by GeoInsight, this should be fully demonstrated for each chemical constituent, and substantiated according to accepted remedial practices.

Response: The Army believes that the most important factor in cleaning up groundwater at AOC 57 is cleaning up soils that are a potential source of contaminants and/or reducing (anaerobic) conditions that result in release of arsenic from native soil materials. Because of this, the Army removed approximately 1,300 cubic yards of contaminated soil from Area 2 in 1994 and 1,860 cubic yards of contaminated soil from Area 3 in 1999.

Although soil removal is a relatively quick process (a few days or weeks), several months or years may be needed after soil removal for groundwater conditions to stabilize and for existing groundwater contamination to disperse. The Feasibility Study Report estimated that the length of time for attainment of the arsenic drinking water standard following soil removal might reasonably be within a range of less than 1 to 2 years at Area 2, and within a range of 1 to 8 years at Area 3. Because of the many variables that influence the cleanup time, accurately predicting a more exact duration is difficult.

The Army will perform long-term monitoring of groundwater and five-year-reviews to assess progress at achieving cleanup goals and whether the remedies remain protective of human health and the environment (i.e., to assess whether contamination, site conditions, or land use have changed in manner that means the remedy is no longer protective). If warranted, the five-year review may recommend additional remedial actions to protect human health and the environment.

Comment No. 5. We recognize that the Army has done extensive remediation projects over many years, since first declaring it a Superfund site. Likewise, we also recognize the Army used this land with varying degrees of intensity for over 70 years. With such heavy use, it's certainly possible that some (perhaps many) areas of contamination were never discovered, and will be missed during the BRAC cleanups.

Since much of the Deven's land will revert back to the three towns, the land should be returned in as clean a state as possible. Therefore, we recommend that the Army adopt the more aggressive Alternative III-3 for Area 3 of AOC 57, unless proven that irreversible and un-repairable damage to the wetland will result.

Response: As stated in response to a previous comment, the Army has decided it is appropriate to remove additional contaminated soil to accelerate the groundwater cleanup process at Area 3. Sampling performed by the USEPA and MADEP at six AOC 57 Area 3 monitoring wells (57M-95-03X, 57M-96-09X, 57M-96-10X, 57M-96-11X, 57M-96-12X, and 57M-96-13X) on April 11, 2001, indicates that groundwater quality is improving. The samples were split three ways and analyzed by the USEPA, MADEP, and Army for volatile organic compounds and inorganics. Those analyses show exceedance of the arsenic cleanup level at one Area 3 monitoring well (analytical results of 91, 80, and 104 µg/L, respectively, at 57M-96-11X). This represents a significant reduction in arsenic from the 1997 concentration of 170 µg/L, but suggests that reducing conditions that result in arsenic mobilization still remain at location 57M-96-11X and that additional soil removal is appropriate to accelerate the groundwater cleanup process. The Record of Decision indicates that Alternative III-2a, which was developed in response to public comments and includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3. Implementation of Alternative III-3, which is based on soil removal to protect potential residents from risks resulting from soil exposure, is not necessary because floodplain and wetland conditions and existing zoning controls in the Devens Reuse Plan will prevent residential development. Restrictive deed covenants will be developed to prohibit potable use of groundwater at Parcel A6a (AOC 57).

Written Comments by Pam Resor, Senator, and Goeffrey Hall, Representative (March 26, 2001)

Comment. A number of constituents and government officials have apprised us their views and concerns regarding the proposed plan for Area of Contamination (AOC) 57 at Devens. In some cases they have sent us copies of their comments to your office. It is evident that there are issues of serious concern yet to be resolved to the satisfaction of all parties.

As elected representatives of the region, the concerns of the constituents are also ours. We would expect that the interests of those people most affected by any decisions you ultimately make would receive priority consideration and accommodation in the process, for these are the people who must finally live with the decisions. They should be assured that no possibility of substandard conditions would exist after remediation.

Response: The Superfund process ensures that citizen comments are solicited and considered during the cleanup process. The Army has reviewed all the comments received on the Proposed Plan for ACC 57, and has decided that it is appropriate in this instance to remove additional contaminated soil at AOC 57 Area 3 to accelerate the groundwater cleanup process. The Record of Decision indicates that Alternative III-2a, which was developed in response to public comments and includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3.

Written Comments by Ayer Board of Selectmen (March 30, 2001), Forwarding of submittals by Laurie S. Nehring (March 26, 2001), Richard Doherty (March 14, 2001), Mildred Chandler (March 8, 2001), and David Salvadore, MADEP (February 17, 2000)

Comment. The Board of Selectmen unanimously endorses and supports the comments submitted by Richard Doherty of GEO and Laurie Nehring, President of PACE for (AOC) 57 Devens.

Response: The Army has provided responses to comments by Mildred Chandler (March 8, 2001), Richard Doherty (March 14, 2001), and Laurie S. Nehring (March 26, 2001) elsewhere in this Responsiveness Summary.

Because D. Salvadore was commenting on the draft Remedial Investigation report in his February 17, 2000 letter and not the Proposed Plan, his comments in that letter are now somewhat out of context. The Army offers the following generalized responses.

- The Proposed Plan proposed institutional controls to restrict development as recommended in the letter.
- Groundwater monitoring was performed at Area 3 in year 2000 to further evaluate the vertical extent of VOC contamination. Additional sampling was also performed in year 2001. The results were considered in preparing the Feasibility Study, Proposed Plan, and Record of Decision.
- Potential risks from exposure to contaminants were evaluated in a detailed risk assessment. The Feasibility Study and the Proposed Plan contained alternatives to control exposure and risk at both

Areas 2 and 3 for possible (i.e., anticipated) future use and for unrestricted, but unanticipated, future use.

- Neither CERCLA nor Massachusetts regulations require cleanup to uncontaminated levels. The extent of cleanup evaluated in the Feasibility Study and discussed in the Proposed Plan for the various alternatives are consistent with the results of risk estimates prepared for possible and unrestricted future use scenarios.
- Following review of recent groundwater monitoring data, the Army has decided it is appropriate to remove additional contaminated soil at Area 3 to accelerate the groundwater cleanup process. The Record of Decision indicates that Alternative III-2a, which was developed in response to public comments and includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3.
- Implementation of Alternative III-3, which is based on soil removal to protect potential residents from risks resulting from soil exposure, is not necessary because floodplain and wetland conditions and existing zoning controls in the Devens Reuse Plan will prevent residential development. Restrictive deed covenants will be developed to prohibit potable use of groundwater at Parcel A6a (AOC 57).

Written Comments by Don Kochis, 26 Park Lane, Harvard, Massachusetts (April 1, 2001)

Comment No. 1. As a Harvard resident dependent upon our own well for water, I am concerned with any contaminants or potential contaminants to groundwater and - especially in this case -potential contaminants of a medium yield aquifer as the Cold Spring Brook area is considered.

Knowing that our well goes down at least 175 feet, its location risks being affected by contamination to the aquifer.

It seems to me to be only common sense that when a site has been identified as being contaminated with PCB's, lead, elevated levels of arsenic and "volatile organic compounds", the site should be completely cleanup or at least the level of cleanup should be with the goal of eventually providing, potable water.

Response: The Army considers it unlikely that contaminants from AOC 57 would migrate into Harvard southeast of Cold Spring Brook. Cold Spring Brook and its tributaries, such as Bowers Brook, are discharge areas for groundwater migrating north from Harvard. Groundwater from AOC 57 would not migrate against the regional groundwater gradient. In response to specific concerns about contamination of your well, Park Lane is about 2½ miles from AOC 57 and at an elevation of approximately 490 feet. If your well is 175 feet deep, its screen is at an elevation about 315 feet, well above the elevation of AOC 57. Considering the distance involved, the northward regional movement of groundwater, and the differences in elevation, contamination of your well by AOC 57 should not be a concern.

On a general note, the Army's goal is to attain drinking water standards in AOC 57 groundwater. To accomplish this goal, the Army removed approximately 1,300 cubic yards of contaminated soil from Area 2 in 1994 and 1,860 cubic yards of contaminated soil from Area 3 in 1999. This soil was interpreted to be both a potential source of organic compound contamination to groundwater and the cause of reducing (i.e., anaerobic) conditions that result in release of arsenic to groundwater from natural soil materials. The Feasibility Study Report estimated that the length of time for attainment of the arsenic drinking water standard following soil removal might

reasonably be within a range of less than 1 to 2 years at Area 2, and within a range of 1 to 8 years at Area 3. Because of the many variables that influence the cleanup time, accurately predicting an exact duration is difficult. To evaluate the sensitivity of estimated costs to the length of time that groundwater monitoring was performed, the Feasibility Study evaluated a 3 year and 30 year duration for Area 2 and a 7 year and 30 year duration at Area 3. The references to 3-to-30 year and 7-to-30 year time frames in the Proposed Plan did not make this distinction clear.

To better evaluate progress toward attainment of groundwater cleanup goals, the USEPA and MADEP collected groundwater samples from 6 AOC 57 Area 3 monitoring wells (57M-95-03X, 57M-96-09X, 57M-96-10X, 57M-96-11X, 57M-96-12X, and 57M-96-13X) on April 11, 2001. The samples were split three ways and analyzed by the USEPA, MADEP, and Army for volatile organic compounds and inorganics. Those analyses show exceedance of the arsenic cleanup level at one Area 3 monitoring well (analytical results of 91, 80, and 104 µg/L, respectively, at 57M-96-11X). This represents a significant reduction in arsenic from the 1997 concentration of 170 µg/L, but suggests that reducing conditions that result in arsenic mobilization still remain at location 57M-96-11X. Therefore, although only two years of the estimated 8 years necessary to attain drinking water standards have passed since the Area 3 soil removal, the Army has decided it is appropriate in this instance to remove additional contaminated soil to accelerate the groundwater cleanup process. The Record of Decision indicates that Alternative III-2a, which was developed in response to public comments and includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3.

Comment No. 2. I never received any reply to my Jan. 11, 1999 letter to you (copy attached), if you have information which would provide answers to my questions, please forward.

Response: Responses to comments offered during the public comment period for the Landfill Remediation at Fort Devens are provided in the Responsiveness Summary that is Appendix C of the Landfill Remediation Record of Decision[1]. Review of that Responsiveness Summary shows that your letter was received and considered in those responses.

In the case of the Landfill Remediation Responsiveness Summary, the Army prepared responses to generalized comments on the proposed plan. Specific responses to individual comments were not prepared. The Army does not send letters of response to individual commentors.

The selection of a remedial approach for the several Devens landfills addressed by the Landfill Remediation Record of Decision is complete, and the consolidation landfill is under construction. If you have continuing questions, you may review the Responsiveness Summary in the Landfill Remediation Record of Decision. It is available for review at the information repository at the Harvard Public Library, and at the Ayer, Lancaster, and Shirley libraries.

[1] *Record of Decision Landfill Remediation Study Areas 6, 12, and 13 and Areas of Contamination (AOC) 9, 11, 40, and 41*; prepared for U.S. Army Corps of Engineers, Concord, Massachusetts; prepared by Harding Lawson Associates, Portland, Maine. July, 1999.

Written Comments by Claire Rindenello, 14 Blanchard Rd., Harvard, Massachusetts (April 4, 2001)

Comment. The medium yield aquifer underlying AOC 57 should be cleaned up and protected from further contamination. This area may some day be part of a buffer zone used for open space recreational purposes: For these as well as other reasons given above, we support thorough excavation of the contaminants, restoration of the Cold Spring Brook wetlands, and measures to bring the groundwater to drinking water quality within five years.

Response: The Army believes that the most important factor in cleaning up groundwater at AOC 57 is cleaning up soils that are a potential source of contaminants and/or reducing (anaerobic) conditions that result in release of arsenic from native soil materials. Soil removal is a relatively quick process (a few days or weeks); however, several months or years may be needed after soil removal for groundwater conditions to stabilize and for existing groundwater contamination to disperse.

The Army removed approximately 1,300 cubic yards of contaminated soil from Area 2 in 1994 and 1,860 cubic yards of contaminated soil from Area 3 in 1999. This soil was interpreted to be both a potential source of organic compound contamination to groundwater and the cause of reducing (i.e., anaerobic) conditions that result in release of arsenic to groundwater from natural soil materials. The Feasibility Study Report estimated that the length of time for attainment of the arsenic drinking water standard following soil removal might reasonably be within a range of less than 1 to 2 years at Area 2, and within a range of 1 to 8 years at Area 3. Because of the many variables that influence the cleanup time, accurately predicting an exact duration is difficult. To evaluate the sensitivity of estimated costs to the length of time that groundwater monitoring was performed, the Feasibility Study evaluated a 3 year and 30 year duration for Area 2 and a 7 year and 30 year duration at Area 3. The references to 3-to-30 year and 7-to-30 year time frames in the Proposed Plan did not make this distinction clear.

Recent sampling suggests that reducing conditions that result in arsenic mobilization remain at location 57M-96-11X at Area 3. Therefore, although only 2 years of the estimated 8 years necessary to attain drinking water standards have passed since the Area 3 soil removal, the Army has decided it is appropriate in this instance to remove additional contaminated soil to accelerate the groundwater cleanup process. The Record of Decision indicates that Alternative III-2a, which was developed in response to public comments and includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3.

The selected remedies also require long-term monitoring of groundwater and five-year-reviews to assess progress toward attaining cleanup goals and whether the remedies remain protective of human health and the environment (i.e., to assess whether contamination, site conditions, or land use have changed in manner that means the remedy is no longer protective). If warranted, the five-year review may recommend additional remedial actions to protect human health and the environment.

Written Comments by Mildred Chandler, Citizens to Protect Residential Harvard, Harvard, Massachusetts (April 10, 2001)

Comment. As the enclosed petitions indicate, residents of the Town of Harvard want to see AOC 57 cleaned up as thoroughly as possible, including complete excavation and removal of the contaminants,

restoration of the Cold Spring Brook wetlands, and remediation of the groundwater to drinking water quality within 5 years.

Response: The Army believes that the most important factor in cleaning up groundwater at AOC 57 is cleaning up soils that are a potential source of contaminants and/or reducing (anaerobic) conditions that result in release of arsenic from native soil materials. Soil removal is a relatively quick process (a few days or weeks); however, several months or years may be needed after soil removal for groundwater conditions to stabilize and for existing groundwater contamination to disperse.

The Army removed approximately 1,300 cubic yards of contaminated soil from Area 2 in 1994 and 1,860 cubic yards of contaminated soil from Area 3 in 1999. This soil was interpreted to be both a potential source of organic compound contamination to groundwater and the cause of reducing (i.e., anaerobic) conditions that result in release of arsenic to groundwater from natural soil materials. The Feasibility Study Report estimated that the length of time for attainment of the arsenic drinking water standard following soil removal might reasonably be within a range of less than 1 to 2 years at Area 2, and within a range of 1 to 8 years at Area 3. Because of the many variables that influence the cleanup time, accurately predicting an exact duration is difficult. To evaluate the sensitivity of estimated costs to the length of time that groundwater monitoring was performed, the Feasibility Study evaluated a 3 year and 30 year duration for Area 2 and a 7 year and 30 year duration at Area 3. The references to 3-to-30 year and 7-to-30 year time frames in the Proposed Plan did not make this distinction clear.

Recent sampling suggests that reducing conditions that result in arsenic mobilization remain at location 57M-96-11X at Area 3. Therefore, although only 2 years of the estimated 8 years necessary to attain drinking water standards have passed since the Area 3 soil removal, the Army has decided it is appropriate in this instance to remove additional contaminated soil to accelerate the groundwater cleanup process. The Record of Decision indicates that Alternative III-2a, which was developed in response to public comments and includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3.

The selected remedies also require long-term monitoring of groundwater and five-year-reviews to assess progress toward attaining cleanup goals and whether the remedies remain protective of human health and the environment (i.e., to assess whether contamination, site conditions, or land use have changed in manner that means the remedy is no longer protective). If warranted, the five-year review may recommend additional remedial actions to protect human health and the environment.

Written comments by William Ashe, Harvard Board of Selectmen, Harvard, Massachusetts (April 23, 2001)

Comment. The Army's current approach appears based largely on the following factors: 1) the site is vacant; 2) it is not located near active land use areas; 3) the site is within an area zoned for Rail Industrial and Trade related uses; and 4) the site and adjacent lands will eventually be redeveloped for commercial and/or industrial use. Further, there is no significant adverse affect to wildlife. The Army's solution is limited to excavation of contaminated soils, institutional controls and imposition of land use restrictions until cleanup goals are reached. We note no time frame to reach cleanup goals, or how and went drinking water standards will be attained.

Considering the above, with emphasis on the sensitivity and uniqueness of this riverine habitat, and noting the determined concern and interest of Harvard residents, the Board of Selectmen recommends the highest level of cleanup and restoration for the AOC 57 site. We support the recommendations of PACE and CPHR and, specifically urge the Army to adopt:

- Alternative II-4 for Area 2, unrestricted use;
- Alternative III-3 for Area 3, unrestricted use;
- A five year goal to achieve drinking water standards; and
- An aggressive program of wetland restoration.

Response: Because of AOC 57's presence at Fort Devens, its cleanup is proceeding according to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP). CERCLA and the NCP soil cleanup actions are generally based on reducing potential exposure risks to a range of 1 in 10,000 to 1 in 1,000,000 for carcinogenic substances and to a hazard index of 1 or less for noncarcinogenic substances. Groundwater cleanup actions are generally based on attaining drinking water standards. CERCLA does not require cleanup to background conditions or conditions before occupation by the Army.

Consistent with the requirements of CERCLA, the selected soil cleanup actions at AOC 57 are based on potential health risks associated with the planned/reasonable use of the area (i.e., commercial/industrial use rather than residential use), while groundwater cleanup is based on attainment of drinking water standards.

The Army believes that the most important factor in cleaning up groundwater at AOC 57 is cleaning up soils that are a potential source of contaminants and/or reducing (anaerobic) conditions that result in release of arsenic from native soil materials. Soil removal is a relatively quick process (a few days or weeks); however, several months or years may be needed after soil removal for groundwater conditions to stabilize and for existing groundwater contamination to disperse.

The Army removed approximately 1,300 cubic yards of contaminated soil from Area 2 in 1994 and 1,860 cubic yards of contaminated soil from Area 3 in 1999. This soil was interpreted to be both a potential source of organic compound contamination to groundwater and the cause of reducing (i.e., anaerobic) conditions that result in release of arsenic to groundwater from natural soil materials. The Feasibility Study Report estimated that the length of time for attainment of the arsenic drinking water standard following soil removal might reasonably be within a range of less than 1 to 2 years at Area 2, and within a range of 1 to 8 years at Area 3. Because of the many variables that influence the cleanup time, accurately predicting an exact duration is difficult. To evaluate the sensitivity of estimated costs to the length of time that groundwater monitoring was performed, the Feasibility Study evaluated a 3 year and 30 year duration for Area 2 and a 7 year and 30 year duration at Area 3. The references to 3-to-30 year and 7-to-30 year time frames in the Proposed Plan did not make this distinction clear.

Recent sampling suggests that reducing conditions that result in arsenic mobilization remain at location 57M-96-11X at Area 3. Therefore, although only 2 years of the estimated 8 years necessary to attain drinking water standards have passed since the Area 3 soil removal, the Army has decided it is appropriate in this instance to remove additional contaminated soil to accelerate the groundwater cleanup process. The Record of Decision indicates that Alternative III-2a, which was developed in response to public comments and includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3.

As part of the cleanup process, portions of the wetland disturbed by remedial activities will be restored.

The selected remedies also require long-term monitoring of groundwater and five-year-reviews to assess progress toward attaining cleanup goals and whether the remedies remain protective of human health and the environment (i.e., to assess whether contamination, site conditions, or land use have changed in manner that means the remedy is no longer protective). If warranted, the five-year review may recommend additional remedial actions to protect human health and the environment.

Written comments by Elizabeth Ainsley Campbell, Nashua River Watershed Association, Groton, Massachusetts (April 24, 2001)

Comment No. 1. The Association sees it as the Army's responsibility to undertake remediation approaches that enable the highest level of cleanup possible. For Area 2, while we are tempted to request Alternative II-4 at the outset, we feel that perhaps the money could be better spent elsewhere at this point, and it is reasonable to monitor the situation before taking more action than outlined in Alternative II-3. With a five year time table and monitoring plan in place to assure drinking water standards are met. We can support the Army's recommendation of Alternative II-3 for Area 2. If, within five years, drinking water standards have not been met, then further remediation must be undertaken.

Response: Because of AOC 57's presence at Fort Devens, its cleanup is proceeding according to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP). CERCLA and the NCP soil cleanup actions are generally based on reducing potential exposure risks to a range of 1 in 10,000 to 1 in 1,000,000 for carcinogenic substances and to a hazard index of 1 or less for noncarcinogenic substances. Groundwater cleanup actions are generally based on attaining drinking water standards. CERCLA does not require cleanup to background conditions or before occupation by the Army.

Consistent with the requirements of CERCLA, the selected soil cleanup actions at AOC 57 are based on potential health risks associated with the planned/reasonable use of the area (i.e., commercial/industrial use rather than residential use), while groundwater cleanup is based on attainment of drinking water standards.

The selected remedies also require long-term monitoring of groundwater and five-year-reviews to assess progress toward attaining cleanup goals and whether the remedies remain protective of human health and the environment (i.e., to assess whether contamination, site conditions, or land use have changed in manner that means the remedy is no longer protective). If warranted, the five-year review may recommend additional remedial actions to protect human health and the environment.

Comment No. 2. With regard to Area 3, we have tried to evaluate if there are credible scenarios under which any potential contaminants could impact drinking water supplies in the future. We feel that the situation is not 100% clear and definite, and for that reason recommend Alternative III-3.

Response: Recent sampling suggests that reducing conditions that result in arsenic mobilization remain at location 57M-96-11X. Therefore, although only two years of the estimated 8 years necessary to attain drinking

water standards have passed since the Area 3 soil removal, the Army has decided it is appropriate in this instance to remove additional contaminated soil to accelerate the groundwater cleanup process. The Record of Decision indicates that Alternative III-2a, which includes soil removal to accelerate groundwater cleanup, has been selected for implementation at AOC 57 Area 3. Implementation of Alternative III-3, which is based on soil removal to protect potential residents from risks resulting from soil exposure, is not necessary because floodplain and wetland conditions and existing zoning controls in the Devens Reuse Plan will prevent residential development. Restrictive deed covenants will be developed to prohibit potable use of groundwater at Parcel A6a (AOC 57).

The selected remedies contain requirements to perform long-term monitoring of groundwater and five-year-reviews. The five-year reviews will assess progress at attaining cleanup goals and whether the remedies remain protective of human health and the environment (i.e., to assess whether contamination, site conditions, or land use have changed in manner that means the remedy is no longer protective). The long-term monitoring and five-year review process will allow the Devens BCT to remain informed about cleanup progress at AOC 57. If warranted, the five-year review may recommend additional remedial actions to protect human health and the environment.

Comment No. 3. In restoring disturbed wetlands to native vegetation, we recommend carefully monitoring to be sure that invasive exotic species are not introduced.

Response: A Wetlands Restoration Plan will be prepared to outline proposed wetland restoration and monitoring activities for areas where wetlands may be disturbed. The Army does not plan to introduce invasive exotic species.

PUBLIC HEARING TRANSCRIPT

Volume I
Pages 1-31

PUBLIC MEETING ON

PROPOSED CLEANUP PLAN FOR AOC 57

DEVENS RESERVE FORCES TRAINING AREA

DEVENS, MASSACHUSETTS

BEFORE MODERATOR: James Chambers,
BRAC Environmental Coordinator

Held at:
Devens RFTA Commander's Conference Room
Building 679
31 Quebec Street
Devens, Massachusetts
Thursday, March 8, 2001
8:00 p.m.

(Anne H. Bohan, Registered Diplomate Reporter)

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I N D E X

SPEAKER	PAGE
Cornelius Sullivan	3
Dina Samfield	5
Laurie S. Nehring	7
Richard Doherty	21
Mildred Chandler	25

P R O C E E D I N G S

(Presentation off public record)

MR. CHAMBERS: Good evening. My name is James Chambers, I'm the Base Realignment and Closure Environmental Coordinator for the Devens Reserve Forces Training Area. Thank you for coming to the Public Hearing for the Remedial Proposed Plan for Area of Contamination 57.

Tonight we're going to hold the public hearing. If you have a comment to make, you can make it either orally this evening or in writing. The public comment period is open through March 26th. If you choose to make a comment this evening, please state your name and your address and your comment, as all comments received, either this evening or in writing, will be responded to in the response and summary that will be included in the Record of Decision.

MR. SULLIVAN: My name is Cornelius Sullivan, Chairman of the Board of Selectmen in the Town of Ayer. The address would be Town Hall, Ayer, Mass. 01432.

I'm here tonight because of the concern my board has for the proximity of Areas 2 and 3 of

AOC 57 to the Zone II four-hour Grove Pond wells. Although the Areas 2 and 3 that have been discussed earlier tonight appear to be outside of the Zone II, it's not clear to me what effect migration through groundwater or surface water may have on the contaminants found at Areas 2 and 3; in particular, the migration of those contaminants into or towards the wetland area known as Cold Spring Brook. The brook does in fact travel in a northerly direction from Areas 2 and 3 and seems to, at least on the map that I have from our planning board, enter part of the outer range of our Zone II to the Grove Pond wells.

So with the remedial action that's being proposed, I understand that Areas 2 and 3 are not to be returned, the groundwater, that is, to drinking water standards. And where our Zone II is so nearby and connected to these areas through the Cold Spring Brook, that just does not seem acceptable, at least to the Town of Ayer.

Secondly -- and I'll stand corrected, if I'm mistaken -- if a private organization was involved in a clean-up effort such as this, it's my understanding -- and again I'll stand corrected if

I'm mistaken -- that the private organization would have to remediate and return any contamination to drinking water standards. And that doesn't appear to be the case here, and I'm not sure why. So those would be the two comments that I would make for the record.

MR. CHAMBERS: Thank you. Is there anybody else now who would like to make a public comment at this time?

MS. SAMFIELD: My name is Dina Samfield. I live at 18 Westford Road, No. 20 in Ayer. And I have some questions that I would like to have added into the record.

First of all, I'd like to know if this area will be returned to drinking water standards within a defined period of time? If so, what the time frame is for that.

Secondly, I wasn't clear as to whether there will be more excavation of Area 3. I thought Massachusetts DEP was recommending excavation in both Areas 2 and 3.

My third question is, would the area east of Barnum Road and west of Cold Spring be considered for rezoning as conservation land and open space?

Is future use of the aquifer for additional water resources being considered?

And my fourth question is, does the level of cleanup being offered in the Proposed Plan meet the minimum standard for other cleanups within Massachusetts?

MR. CHAMBERS: Thank you. Is there anybody else at this time?

MR. SULLIVAN: Thanks for the opportunity to come in.

MR. CHAMBERS: Thank you. At this time I'd like to temporarily close the public hearing. We'll continue on with the presentation and reopen the hearing afterwards.

(Public record portion of meeting suspended)

MR. CHAMBERS: We'll again open up the public hearing process. I think I already stated for the record who I am, no need to do that again, but again, please, the comments you make for the public hearing tonight, we will respond to in writing. You may also submit your comments in writing, and the public comment period ends on March 26th.

Is there anybody that would like to make a comment for the public record?

MRS. NEHRING: I believe several others are going to make comments. I'll start. I'm Laurie Nehring, 35 Highland Avenue, Ayer, Mass. 01432. I'm also the president of People of Ayer Concerned about the Environment. I made a lengthy presentation, and I'm going to go ahead and read what I have written as it's written, and I will ad lib based on some of the comments that were made tonight.

I would like to also state for the record that a number of people who would have liked to have been here tonight were required to be at other meetings that are also environmentally related, and we may perhaps have had a larger turnout had it not conflicted with other meetings that are occurring tonight. And some of my comments are going to address sort of the format of this process.

So now looking at the comments I prepared, I do want to thank you, Mr. Chambers, for the opportunity to formally present and comment on the Proposed Plan for the Area of Contamination located on Devens known as AOC 57. Community acceptance of the Proposed Plan is a critical component of the

Superfund process. We appreciate the Army's efforts in seeking our public comments: our suggestions, modifications, and objections.

On behalf of PACE, I have been working closely with Mr. Rich Doherty of GeoInsight, Incorporated, to review the Army's Proposed Plan for AOC 57. For the record, Mr. Doherty is a certified Professional Engineer and Licensed Site Professional who was hired by PACE through the U.S. EPA's Technical Assistant Grant program.

The purpose of this grant is to enable communities impacted by Superfund sites to review technical documentation by a qualified environmental professional, enabling that community to make appropriate and useful comments in just this kind of arena. Mr. Doherty has extensive professional experience advising and overseeing all stages of remediation for both state and Superfund sites in New England and particularly in Massachusetts.

The technical comments Mr. Doherty will submit in writing to the record and on behalf of PACE are ones we fully endorse. PACE strongly supports all the recommendations presented in Mr.

Doherty's letter, and our acceptance and support of the final remedy at AOC 57 is contingent on the Army's adopting these recommendations in their entirety. But rather than duplicate his presentation or his written comments and recommendations, I will make some general comments and recommendations about this process and then some specific comments about this site.

First, general comments. No. 1, the format. The intent of the Army's nine-plus-page summary report Proposed Plan for AOC 57 is, of course, to educate and inform the general public. Comments and suggestions on this format are as follows:

First, great maps, Jim. Figure 1 was particularly useful in visualizing the general location of the site, and I thank you for including the numerous recognizable features for proper orientation by the general public.

I believe, based on the presentation today, that Figure 2 would have been more helpful if landmarks that are currently in existence could have been included so that people could do drive-bys and see the site for themselves.

Despite the inclusion of some of the good maps, in talking with PACE members, it was revealed to me that this plan was very difficult to read and follow, and the text was very dense. And I include myself in finding this to be true. Even people who had a previous overview of AOC 57 found that the format and content were confusing. For example, the Army's preferred alternative, as stated in the "Introduction," goes like this:

"The Army's preferred alternative for Area 2 is Alternative II-3: Excavation (for Possible Future Use) and Institutional Controls. The preferred alternative for Area 3 is Alternative III-2: Limited Action."

I found that the Codes II-3 and III-2 are very confusing, even today in preparation for tonight. I was especially confused because there are other numeric codes used in the text, such as Area 2 and Area 3.

You also referred to tables. The tables in Figures 5 and 6 did not help me to clarify the codes. Those codes were omitted entirely from the tables. Then when you look at the text, the text describes the alternatives in some detail, but they

did not identify which method was preferred by the Army within the context of those descriptions. The reader had to catch this important statement in the "Introduction" or find it at the very end of the document on Page 8 and then go back and reread the Army's recommended alternatives and try to determine their significance. I found that very confusing.

No. 2, comments on public outreach. I interviewed several local residents who received the Proposed Plan in the mail. The proposal was too technical for them to follow. Only with a great deal of time and patience and with the assistance of a qualified environmental professional, i.e., Rich Doherty, would individuals feel capable of commenting intelligently on this plan.

I just want to read you one little section that, frankly, I still don't understand. This is on Page 7 of the Proposed Plan. And I'm going to read couple of sentences:

"Alternatives II-3 and III-2 would temporarily impose land-use restrictions at Areas 2 and 3 to prohibit potable use of groundwater until cleanup goals are achieved. Ground water COCs and

their respective cleanup levels are arsenic and tetrachloroethylene at 50" -- and some people might not know micrograms/L -- "micrograms per liter for Area 2, and arsenic, cadmium, tetrachloroethylene, and 1,4-dichlorobenzene at 50 micrograms per liter, 5 micrograms per liter, 5 micrograms per liter, and 5 micrograms per liter for Area 3."

I'm sorry, I don't really quite grasp what that means. That could have been written in layman's terms much more easily.

We respectfully request, therefore, that the comments which the Army does receive on the Proposed Plan for AOC 57 within the comment period are perceived as representing the concerns of at least a dozen other people who did not feel comfortable responding because of the style of the presentation.

In addition, it's not clear to us how the public comment period was made known to the public. Who was selected to receive the nine-page Proposed Plan? How big was the mailing list? How prominent was the information displayed in public libraries? How prominent and helpful were the legal notices in the newspapers?

On behalf of PACE, I respectfully make the following specific recommendations be incorporated into all future public comment processes:

One. Continue the use of maps which are helpful and prominently located in your brochures.

Two. Remove much of the technical language from the summaries, enabling the general public to read about the project in layman's terms without struggling to get through it. Eliminate abbreviations and acronyms such as RI/FS, A0C 57, COC, and all those code words that were described previously.

Three. Always refer to a place where more detailed information can be found. Try a Web site or mention the libraries. Identify a specific list of documents, arranged chronologically or by defined categories, which people could use. Likewise, identify local, state, and federal people who could have assisted in answering questions in the EPA and MA DEP in case people didn't feel comfortable contacting the Army directly.

Four. Employ more effective public outreach. In all public announcements and legal notices, we suggest replacing meaningless code names

like "AOC 57" with descriptive names and locations.

To get the information out in a more cost-effective way, please consider doing a larger initial mailing using postcards, such as NRWA does, to make an initial announcement. On that postcard you can tell people how they can obtain the nine-page summary document, with direct mailing as an option, or they can pick it up at several designated locations in each town, which I suggest would not be just the library, because it has limited hours, but perhaps town halls and other commonly visited places.

Consider taking advantage of the use of the Internet, making information available electronically, but also keeping in mind that not everyone has access to the Internet. Please set up a rapid response system to send the nine-page summary to all those who request it. Continue to send the document to all those who have attended any RAB meetings or other environmentally related meetings in the last couple of years, specifically I'm thinking of people who have attended environmentally related things with Mass Development, by sharing mailing lists.

The next section I would like to go into are specific comments on this Proposed Plan for AOC 57.

In No. 1, I address Potentially Productive Aquifers and Zone II considerations. And we had some discussion on that earlier this evening. I'm going to pretty much read the comments as I have prepared them, as I had prepared them.

AOC 57, it was my understanding that AOC 57 is located within a Potentially Productive Aquifer known as Cold Spring Brook, it appears part of it. It's also very near or directly within the zone, the Ayer Zone II. The contamination has been partially remediated through excavation. However, the Army's Remedial Investigation found that areas still contained levels of contaminants in the groundwater exceeding MCL's for arsenic, cadmium, 1,4-dichlorobenzene, chloroform, bis(2-ethylhyxyl)phthalate and tetrachloroethylene. Rich Doherty of GeoInsight will present detailed technical comments in writing on this issue on behalf of PACE and other local communities benefitting from the TAG program.

PACE is greatly concerned that the Proposed

Plan does not address how drinking water standards will be met at AOC 57. We consider it unacceptable to allow the Army unlimited time to reach these standards. Acceptable resolution of these issues is very important to the community's acceptance of the final plans for AOC 57.

Let me emphasize that this important resource area, at least part of it being a Potentially Productive Aquifer and recharge area defined by MA DEP, must be returned to drinking water standards within a defined period of time. The Army's proposal does not appear to stipulate how drinking water standards will be reached but insinuates that natural attenuation will occur. But how? How long will it take? How will it be proven? When will we know it has failed? And if it fails, what will be done?

As with other sites the Army has worked on, additional remedial work must be planned for if the standards are not met within a specified time frame. PACE suggests that a specific five-year time frame be used to evaluate the need for additional work. We further urge that the Record of Decision be worded in such a way as to prevent the unacceptable

postponing of the contingency remedy that has occurred at Shepley's Hill Landfill.

Now comments on Area 3. We are confused about why the Army has recommended Alternative III-2: Limited Action, for Area 3. This appears to be a complete reversal from recommendations made in January of this year, in which the Army and MA DEP supported Alternative III-3, Excavation and Institutional Controls.

Support for the Excavation and Institutional Controls alternative is clearly expressed in a comment letter on the Draft Proposed Plan for AOC 57 from MA DEP dated January 5, 2001, and signed by David Salvadore. It states:

"The MA DEP has completed its review...and concurs with the Army's recommendation for...the excavation of approximately 640 cubic yards and approximately 120 cubic yards petroleum material from Area No. 1 and Area No. 3 respectively."

The focus of this letter from Mr. Salvadore is to express MA DEP's concerns about making sure that wetlands are restored properly, after excavation occurs in both areas, for a total removal of 760 cubic yards.

Why has this reversal taken place since the Draft plan? According to the Army's current Proposed Plan, the Alternative III-3 would result in wetland destruction with "limited benefit considering that residential development is improbable in wetland areas." As stated above, this is a Potentially Productive Aquifer, and now I assume in part at least, and accordingly, it should be returned to drinking water standards, regardless of how it may or may not be developed.

We know that wetland protection is being considered as well; however, it has not been demonstrated to us that the additional removal of 120 cubic yards from Area 3 would result in irreversible or unrepairable damage. We need to weigh the importance of excavating hot spots of COCs found in the groundwater and petroleum ground in the soil, removing continuing sources of pollution.

We searched Army documentation for some time, but we could not locate any information that showed us, with overlays, what the excavation impact would be on the wetlands. How deep would the 120 cubic yards of removal be? How does this overlay

with the identified contaminants of concern? And finally, how will the excavation impact specific portions of the wetland?

Since the cost differential between these alternatives is minimal, we need to better understand why the more complete remediation is no longer recommended by the Army, when it was recommended and supported by DEP only two months ago.

We believe that this question requires some additional investigation utilizing the skills of a wetland expert, perhaps NRWA, during the spring season so that a site-specific impact/benefit analysis could be done.

In conclusion, unless proven to cause damage within a sensitive area of the wetland, PACE advocates Alternative III-3, which would excavate source contamination in Area 3.

Item 3, considerations of open space/zoning changes. AOC 57 is located in a sensitive area, within wetlands and along Cold Spring Brook. Not only is it a Potentially Productive Aquifer, it is also located very near or within Zone II recharge area for Ayer's Grove Pond wells. The proximity of

the recharge area for the Devens Grove Pond wells also should be considered.

Future use of this aquifer for additional water resources may not have been adequately calculated for current growth patterns. Has the Army interviewed planning boards in the Towns of Ayer, Harvard, and Shirley and added them to the buildout at Devens? Future rapid growth in this region and on Devens may indeed demand use of the Cold Spring Brook Aquifer. I firmly believe that to be true.

Future changes in zoning must be considered in the level of cleanup by the Army. This land needs to be returned to drinking water standards and protected from future impacts. Industrial use of this property, as currently zoned, does not appear to be protective of these water resources.

PACE strongly recommends that the area east of Barnum Road and west of Cold Spring Brook which contains AOC 57, along with sensitive wetlands, a Potentially Productive Aquifer at Cold Spring Brook, and portions of Ayer's Zone II, be considered for rezoning as conservation land and open space. We will actively promote that. Community acceptance of

this request is supported by the recent passage of the Community Preservation Act in both Ayer and Harvard.

Finally, my conclusions. PACE cannot accept the AOC 57 Proposed Plan in its current form. The following issues need to be resolved before PACE can support the AOC 57 remedy:

One. The Army must adequately address the technical issues raised in GeoInsight's letter, including fully adopting the recommendations contained in the GeoInsight letter.

Two. Drinking water quality must be restored at AOC 57 within five years or an ironclad contingency remedy must be implemented to achieve drinking water standards within the following five years.

And three, Alternative III-3 should be adopted for Area 3, unless proven that irreversible and unrepairable damage to the wetland will result. Thank you.

MR. CHAMBERS: Next?

MR. DOHERTY: My name is Richard Doherty, I work at GeoInsight at 319 Littleton Road in Westford, and I am the environmental consultant for

PACE.

On behalf of PACE I have reviewed the Proposed Plan and prepared a detailed comment letter. Although I won't be reading the letter into the record tonight, I would be happy to discuss the contents of the letter and address questions on the letter with anyone who has any questions on it.

I just want to summarize some of the main points. I'd like to talk for a minute about how this Proposed Plan addresses groundwater at AOC 57.

The Army acknowledges in their reports that the cleanup goals for AOC 57 groundwater are drinking water standards. This is regardless of whether the area is in a Potentially Productive Aquifer or not. However, the Proposed Plan includes no measures to achieve these standards. The Proposed Plan is worded to imply that drinking water standards will eventually be met, but the time required for this to happen is open-ended.

For example, the plan states that the time required to meet drinking water standards at Area 2 is from, and I quote, "three to greater than 30 years." Greater than 30 years. To my mind, I can

only interpret this as meaning that the Army is unwilling to state that they will ever meet drinking water standards at AOC 57.

Based on the contents of the Proposed Plan, it's my professional opinion that the Proposed Plan does not meet the Army's own goal of achieving drinking water quality. Therefore, the only conclusion can be that the Proposed Plan is deficient because it does not meet the goals that have been set out for the cleanup.

Now, I've heard tonight that the way drinking water standards are going to be achieved is through natural attenuation. But it's standard practice in the industry, in the environmental remediation field, that natural attenuation processes cannot be assumed to be effective. You have to show their effectiveness; you have to investigate it, document it, and confirm it. And the Army has not done this at AOC 57. The AOC 57 feasibility study does not include an initial screening or a detailed evaluation of natural attenuation. It's not even an alternative in the feasibility study.

Now I'd like to take a minute to look at

the groundwater issue from another perspective. We've talked a lot about Potentially Productive Aquifers off the record, but I'd like to illustrate what our points are in this regard. If we suppose for a minute that AOC 57 wasn't part of Fort Devens and that everything else was, we have part of the site as nonpotentially productive, part is potentially productive, and we have one well with TCE in it, above the drinking water standards one time and below it the other time.

Now, in this case -- and let's assume instead of it being the Army, it's just a local business such as a trucking company or whatever. In this case the local businessperson would be required by Massachusetts regulations to come up with a workable plan to meet drinking water standards.

In my years of experience with many environmental sites in Massachusetts, if the local businessperson were to do no more than state that it would take between three and greater than 30 years to meet drinking water standards and provided no plan for how the drinking water standards were going to be met, that businessperson's Proposed Plan would be rejected by the Commonwealth of

Massachusetts.

And that brings me to the point, a clean-up at Devens should not be held to a lower standard just because it happens to be part of a Superfund site. On the contrary, we should expect a Superfund site to be held to a standard at least as high as that required for any other site in Massachusetts. In my opinion, the regulations clearly require that Massachusetts standards should be met, but this is not the case at AOC 57.

By saying this, I don't mean to say that the DEP personnel working on this project are not working as hard as they can. What I am saying is that Devens is in Massachusetts, and the Massachusetts regulations should apply. Right now they do not.

In conclusion, I'd just like to restate my opinion that AOC 57 and other environmental sites in Devens should be held to the minimum standards of cleanup that are required at other sites within the Commonwealth, and I further recommend that the Army develop a workable plan for how and when drinking water standards will be met at AOC 57. Thank you.

MR. CHAMBERS: Anyone else?

MS. CHANDLER: Mildred Chandler, representing an organization called Citizens to Protect Residential Harvard, address 295 Littleton County Road, Harvard.

On behalf of the Citizens to Protect Residential Harvard, I wish to thank you for this opportunity to comment on the Proposed Plan, Area of Contamination (AOC) 57, Devens Reserve Forces Training Area, Devens, Massachusetts.

The purpose of Citizens to Protect Residential Harvard is to protect the residents from the negative impact of unreasonable development in surrounding towns. The development and reuse of the former Fort Devens and the possibility for its being rejoined to the rest of Harvard and the other towns have made CPRH concerned about the cleanup and the potential for contamination affecting its land and groundwater both now and in the future.

No. 1. The Proposed Plan's indefinite cleanup time is inadequate and unacceptable. The indefiniteness of the "estimate greater than 30 years" allows a conclusion that the Army does not know and therefore is hedging. This produces a feeling of distrust based on the possibility of the

lack of adequate study. It may not be there, but it produces that feeling.

No. 2. The Proposed Plan is unacceptable in that the standard of cleanup is lower than that on private property in Massachusetts. The statement: "Since groundwater at and beneath AOC 57 is not used as a source of drinking or industrial water," continues and makes an assumption that it will never be used as a source, thus belying its present status as a Potentially Productive Aquifer.

With the level of contaminants in the ground and the indefinite period of attenuation mentioned previously, it is a denial of rights to put land in jeopardy that is on the east side of Cold Spring Brook and to threaten wells at Grove Pond. This proposal is precedent setting and may be recommended when other areas are examined in the future.

No. 3. The Proposed Plan does not demonstrate this government agency's responsibility to achieve the highest standards for its citizens. The community we represent is almost totally dependent upon private wells for its drinking water and for all other purposes. We take seriously our

personal responsibility to protect our properties from contamination with the knowledge that each person's ethical standard creates the national environmental ethic.

Avoiding responsibility to restore land despoiled by the Army's past carelessness or ignorance when it could achieve a better cleanup is blatant side stepping. I object to the Army's spirit that if land is not decontaminated, institutional controls for restricted use, that is, rezoning, are the solution. Thank you.

MR. CHAMBERS: Is there anybody else that would like to speak? One more time. Is there anybody else that would like to speak? I'd like to close the public hearing at 9:02.

MRS. MILLER: I might say something.

MR. CHAMBERS: Is this for the record?

MRS. MILLER: I really don't want to read the complete statement because --

MR. CHAMBERS: Mrs. Miller, is this for the record?

MRS. MILLER: I suppose so.

MR. CHAMBERS: I just closed the hearing. I need to reopen it if you're going to make it for

the record.

MRS. MILLER: I think I'll submit it in writing.

MR. CHAMBERS: Is this for the record?

MS. AINSLEY CAMPBELL: I'd like to ask Mrs. Miller if she would like to read it. I thought that was just a little bit quick on your part.

MR. CHAMBERS: I'm not saying you shouldn't read it, Mrs. Miller. I'm not suggesting you not read it. I just wanted to know, we closed the hearing. If you want to read it and it not be on the record, you can say it now and then submit it in writing, if that's what you want to do, or do you want to record it tonight as part of the public hearing?

MRS. MILLER: I think I'll pass for now.

All right. I'll make you aware of some of this, then, and I'll submit the comments later.

MR. CHAMBERS: Okay. Again, so we're certain, so that we know whether the stenographer should record this.

MRS. MILLER: This is not official. I'm going to modify it, but I'll make some comments.

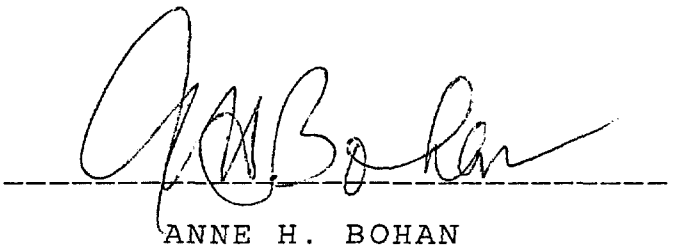
MR. CHAMBERS: What I'm going to do, just

so we can formally close it, unless there's any other formal comments, the public hearing is now closed.

(Public hearing concluded at 9:07 p.m.)

C E R T I F I C A T E

I, Anne H. Bohan, Registered Diplomate Reporter, do hereby certify that the foregoing transcript, Volume I, is a true and accurate transcription of my stenographic notes taken on March 8, 2001.



ANNE H. BOHAN

Registered Diplomate Reporter

- - - -

PUBLIC COMMENTS

Mr. James Chambers
BRAC Environmental Coordinator
30 Quebec Street
Unit 100
Devens, MA 01432-4429

Dina Samfield
18 Westford Road #20
Ayer, MA 01432

March 7, 2001

Dear Mr. Chambers:

I have the following questions about the proposed plan for the clean-up of AOC 57:

1. Will this area be returned to drinking water standards within a defined period of time? If so, what is the timeframe for this?

2. Will there be any excavation at Area 3? Isn't Massachusetts DEP recommending excavation in both areas 2 and 3?

3. Will the area east of Barnum Road and west of Cold Spring be considered for re-zoning as conservation land and open space? Is future use of the aquifer for additional water resources being considered?

4. Does the level of clean-up being offered in the proposed plan meet the minimum standard for other clean-ups within Massachusetts?

I would appreciate it if these questions could be answered at the RAB on March 8, 2001 and in writing at some date in the near future.

Thank you.

Sincerely,

Dina M. Samfield

Hearing

Citizens to Protect Residential Harvard

P.O. Box 424
Harvard, Massachusetts 01451

March 8, 2001

Mr. James Chambers USARFTA
BRAC Environmental Coordinator
30 Quebec St., Unit 100
Devens, MA 01432-4429

Dear Mr. Chambers,

On behalf of Citizens to Protect Residential Harvard (CPRH), I wish to thank you for this opportunity to comment on the Proposed Plan, Area of Contamination (AOC) 57, Devens Reserve Forces Training Area, Devens, Massachusetts.

The purpose of Citizens to Protect Residential Harvard is to protect residents from the negative impact of unreasonable development in surrounding towns. The development and reuse of former Fort Devens, and the possibility for its being rejoined to the rest of Harvard and the other towns, have made CPRH concerned about the cleanup and the potential for contamination affecting its land and ground water both now and in the future.

1. The Proposed Plan's indefinite clean up time is inadequate and unacceptable. The indefiniteness of the estimate "greater than 30 years" allows a conclusion that the Army does not know and therefore is hedging. This produces a feeling of distrust based on the possibility of the lack of adequate study

2. The Proposed Plan is unacceptable in that the standard of clean up is lower than that on private property in Massachusetts. The statement:"Since groundwater at and beneath AOC 57 is not used as a source of drinking or industrial water..." continues and makes an assumption that it will never be used as a source, thus belying its present status as a Potentially Productive Aquifer. With the level of contaminants in the ground and the indefinite period of attenuation mentioned previously, it is a denial

of rights to put land in jeopardy that is on the East Side of Cold Spring Brook and to threaten wells at Grove Pond. This proposal is precedent setting and may be recommended when other areas are examined in the future.

3. The Proposed Plan does not demonstrate this government agency's responsibility to achieve the highest standard for its citizens. The community we represent is almost totally dependent upon private wells for its drinking water and for all other purposes. We take seriously our personal responsibility to protect our properties from contamination with the knowledge that each person's ethical standard creates the national environmental ethic. Avoiding responsibility to restore land despoiled by the Army's past carelessness or ignorance when it could achieve a better cleanup is blatant side stepping. I object to the Army's theory that if land is not decontaminated, institutional controls for restricted use (rezoning) are the solution.

Comment submitted by

Mildred A. Chandler
President
295 Littleton County Road
Harvard, MA 01451

75 Westcott Road
Harvard, MA 01451

March 8, 2001

Mr. James Chambers
BRAC Environmental Office
30 Quebec Street, Box 100
Devens, MA 01432-4429

Dear Mr. Chambers:

It is our understanding that the contamination of AOC57 was one of the reasons that Fort Devens was designated a Superfund site. Various parties to the original planning for Devens recall that AOC 57 was to be cleaned up to the highest standard.

The current options chosen by the Army for the cleanup of Areas 2 and 3 of AOC 57 present us only with a partial cleanup, one which is far below the highest standard. This partial solution leaves most of the remediation and risk-management to nature. However, nature does not always perform as man expects, and natural attenuation is not clearly predictable, as the Army seems to acknowledge by allowing 30 years or more for the process to work.

At AOC 57, the Army has contaminated a medium yield aquifer, a Potentially Productive Aquifer (PPA). In Massachusetts, a PPA cleanup must resore groundwater to drinking water quality in order to be considered a permanent remedy. By omitting discussion of the medium yield aquifer underlying AOC 57 in its Proposed Plan, the Army has minimized the potential importance of this water resource. In an era of dwindling water supplies and water shortages, no one can predict that this aquifer will not one day be needed by the surrounding communities for potable water.We were amazed at the lack of discussion in your brochure, particularly when DEP has noted "Devens' soil and groundwater to be an interconnected system regardless of the disparate locations of the sites." We think the Proposed Plan should have specifically addressed remediation alternatives designed to clean up the aquifer to a drinking water standard In A Reasonable Time. Surely the Massachusetts Contingency Plan is an Applicable or Relevant and Appropriate Requirement. Surely CERCLA should demand no less a remedy than the Commonwealth of Massachusetts.

Leaving the contaminated soils in place as contemplated in the Army's chosen options for both Area 2 and Area 3 could result in a continuing source of further groundwater contamination and even in the appearance of compounds not yet identified as COPCs. It is known that heavy precipitation and snow melt can cause migration of contaminants in Area 3. Moreover, the wetlands in the Cold Spring Brook floodplain, termed in Army literature "a sensitive eco system," have already been contaminated. Will this contamination infiltrate neighboring well-fields?.. Or contaminate the property

(and wells?) of Harvard residents abutting AOC 57? We have followed with growing chagrin the unforeseen trajectory of the plume from Moore Army Airfield and, as if one plume were not enough, another from Shepley Hill. We think that monitoring and institutional controls are inadequate to address the problem. We believe there should be maximum removal of contaminated soils accompanied by careful restoration of the wetlands in both Areas 2 and 3.

If lands in AOC 57 are to be used as recreational open space in the future, the Army should clean up to protect the most vulnerable little soccer players. Health-risk potential is yet another good reason to clean up the toxic chemicalss and heavy metals in AOC 57 soils. Monitoring will not reduce health risks. Use limitations and deed restrictions simply pass the risks and responsibilities on to successive users of the land.

Reading DEP documents and various Army publications , we are aware that there are many identified "hot spots" in AOC 57. It seems likely that there may be others which have not yet been discovered. Also, DEP has noted that some of the Army's past efforts at excavation have been inadequate. DEP has at times questioned the Army's health risk calculations. The presence of numerous potentially dangerous agents at high levels found in AOC 57, including but not limited to PCBs, PAHs, TPHCs, VOCs, and heavy metals, is intolerable. They should be removed to the fullest extent possible to allow nature to recoup. For all the reasons above, we support options II-4 and III-3 as preferable to the other choices offered.

Thank you for the opportunity to comment on the Plan. We hope you will reconsider your choices and do whatever is required to restore the PPA and AOC57 to their natural state as expeditiously as possible.

Yours truly,

Ruth and Morton Miller

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e-mail: info@geoinc.com

March 14, 2001

GeoInsight Project 2863-001

Mr. James Chambers
BRAC Environmental Coordinator
30 Quebec St., Unit 100
Devens, MA 01432-4429

Re: **Comments on Proposed Plan**
Area of Contamination (AOC) 57
Devens, Massachusetts

Dear Mr. Chambers:

On behalf of People of Ayer Concerned About the Environment (PACE), GeoInsight, Inc. (GeoInsight) reviewed the *Proposed Plan, Area of Contamination (AOC) 57, Devens Reserve Forces Training Area, Devens, Massachusetts* (the "Proposed Plan"). The Proposed Plan summarizes the Army's recommended cleanup plan for Areas 2 and 3 at AOC 57.

COMMENTS

1. The Proposed Plan does not adequately comply with Applicable or Relevant and Appropriate Requirements (ARARs). The AOC 57 Remedial Investigation (RI) identified Federal and State Maximum Contaminant Levels (MCLs), also known as drinking water standards, as ARARs at AOC 57.[1] Results from AOC 57 ground water exceed MCL ARARs for arsenic, cadmium, 1,4-dichlorobenzene, chloroform, bis(2-ethylhexyl)phthalate, and tetrachloroethylene.[2] The Proposed Plan does not include or adequately describe measures to comply with these ARARs and is therefore inadequate.

In the AOC 57 Focused Feasibility Study (FFS), it is stated that MCLs "will likely be met through natural attenuation processes" as a result of implementing the selected alternatives.[3] In GeoInsight's experience, a statement that an ARAR is *likely* to be met would not be considered

[1] *Final Remedial Investigation Report, Area of Contamination 57,* Harding-Lawson Associates, June 2000, Table 4-1.

[2] See Tables 9-12 through 9-15 of the RI, and the *Final Focused Feasibility Study Report, Area of Contamination 57,* Harding ESE, November, 2000, Section 3.3. It is noted that Harding ESE suspects that the bis(2-ethylhexyl)phthalate concentrations are due to laboratory contamination.

[3] *Final Focused Feasibility Study Report, Area of Contamination 57,* Harding ESE, November, 2000, Tables 6-7 and 6-16.

sufficient by Superfund site regulators. Further, it is standard practice in the environmental remediation field that Natural Attenuation processes cannot be *assumed* to be effective; rather, their effectiveness must be investigated, documented, and confirmed. The Army has clearly not done so at AOC 57. The AOC 57 Feasibility Study included neither an Initial Screening nor a Detailed Evaluation of Natural Attenuation.

The contaminants of concern at AOC 57 include compounds with differing Natural Attenuation behaviors. For example, natural attenuation of cadmium and arsenic is significantly less demonstrated than natural attenuation of petroleum hydrocarbons. The Army has not demonstrated mechanisms or effectiveness of natural attenuation for the contaminants of concern.

2. The Proposed Plan's estimates of time for ground water cleanup are inadequate, unsubstantiated, and conflicting . For Area 2, the Proposed Plan states that "Groundwater cleanup duration may range from 3 to greater than 30 years." For Area 3, the Proposed Plan states that "Groundwater cleanup duration is not readily definable, but may range from 7 to greater than 30 years." GeoInsight offers the following comments on these cleanup time estimates:

- Because the estimates do not have an upper bound, the Proposed Plan effectively allows the Army unlimited time to achieve drinking water standards. Adoption of the Proposed Plan allows the Army a basis to continue inaction on AOC 57 ground water even if drinking water standards are not met for decades into the future.

- The broad range of time incorporated in these estimates strongly implies that the Army does not have an adequate understanding of when, how, or even if drinking water standards will be met at AOC 57. In GeoInsight's experience, an estimate such as this would not be considered adequate by regulatory agencies, who would typically require that additional studies be undertaken to obtain sufficient understanding of the factors involved.

- Supporting calculations for these cleanup time estimates were not found in the RI, the FS, or the Proposed Plan. What is the basis for these estimates and where are the supporting calculations?

- The cleanup time estimates are inconsistent with the Army's previous estimates presented in Appendix C of the Feasibility Study. The Appendix C estimates, which *are* supported by calculations, conclude that 1 to 8 years would be required for cleanup of ground water. The fact that the Army's Proposed Plan replaces the 1 to 8 year estimate with one that allows an unlimited cleanup time is further indicative of the Army's uncertainty regarding the achievement of MCL ARARs.

3. The Proposed Plan is not acceptable to the community because a lower standard of cleanup is being offered relative to other sites in Massachusetts. The Massachusetts Department of Environmental Protection (MADEP) has acknowledged that at least some portion

of AOC 57 overlies a Potentially Productive Aquifer, and is therefore considered to be a ground water resource by the Commonwealth of Massachusetts.[4] If AOC 57 were a non-Superfund site, the Proposed Plan would not meet the Massachusetts Response Action Performance Standard (RAPS) because measures to achieve drinking water standards are not included. PACE and other community members have indicated to GeoInsight that they strongly believe that the US Army should be held to a standard at least as high as that required of private parties within the Commonwealth of Massachusetts.

PROPOSED ACTION

GeoInsight, on behalf of PACE, recommends the following actions to address the comments presented above:

- An additional Focused Feasibility Study should be prepared that includes a detailed evaluation of alternatives for achieving MCLs in ground water at AOC 57 Areas 2 and 3. Detailed evaluation of the natural attenuation alternative should include a characterization of the subsurface environment's potential for promoting natural attenuation, and the use of generally accepted models[5] to demonstrate the ability of natural attenuation to achieve ARARs within a reasonable period of time. The evaluation must take into account the different fate and transport characteristics of the contaminants of concern. All estimates of time to achieve ARARs should be fully documented. If a calculated time estimate has no upper bound (e.g., "greater than 30 years") or spans more than one decade (e.g., "3 to 30 years"), the corresponding alternative should be eliminated due to the uncertainty involved.

- A reliable alternative for achieving drinking water standards in a reasonable period of time should be selected based on the FFS. The selected alternative should be presented in a Supplemental Proposed Plan. The *current* Proposed Plan should be modified to clearly state that it is intended as to select a "Source Control" alternative only, and that a Supplemental Proposed Plan will be issued to select a "Management of Migration" alternative. The evaluation of both Source Control and Management of Migration alternatives is consistent with the approach required at Superfund sites.

- To allow the AOC 57 cleanup to attain minimum standards established by the Commonwealth of Massachusetts, GeoInsight repeats our previous recommendation that the Massachusetts cleanup procedures and standards documented in the Massachusetts Contingency Plan (MCP, 310 CMR 40.0000) be adopted as an ARAR throughout the Devens Superfund site.

[4] *Response to Comments on the Draft Focused Feasibility study for Area of Contamination 57*, September 2000, see MADEP General Comment No. 1.

[5] e.g., Bioplume for petroleum hydrocarbons; Biochlor for chlorinated hydrocarbons.

SUMMARY

GeoInsight is greatly concerned with the lack of attention paid to compliance with MCL ARARs (drinking water standards) at AOC 57. Neither the Feasibility Study nor the Proposed Plan describe the means by which the Army will attain drinking water standards. The ground water cleanup time estimates are inadequate, inconsistent with earlier estimates, and reflective of the Army's uncertainty regarding whether or not drinking water standards can ever be reached at AOC 57 without additional action. Finally, the level of cleanup being offered in the Proposed Plan does not meet the minimum standard for other cleanups within the Commonwealth of Massachusetts. While AOC 57 may be relatively uncontaminated relative to other sites at Devens, GeoInsight strongly believes that approval of this Proposed Plan will set a precedent that will not only be detrimental to the cleanup of AOC 57, but also to other sites at Devens including Moore Army Airfield and Shepley's Hill Landfill.

Please feel free to contact me if you have any questions regarding this letter.

Sincerely,

RE Doherty

Richard E. Doherty, P.E., L.S.P.
Senior Associate

cc: Laurie Nehring, PACE

Use This Space to Write Your Comments

The Army wants your comments on the proposed plan for AOC 57. You may use the form below to submit written comments. If you have questions about how to comment, please call the BRAC Environmental Coordinator, Jim Chambers, at (978) 796-3835. Send this form or any other written comments, postmarked no later than March 26, 2001, to:

Jim Chambers
U.S. Army Reserve Forces Training Area
BRAC Environmental Office
30 Quebec Street
Unit 100
Devens, MA 01432-4429
FAX (978) 796-3133

Dear Mr. Chambers:

The contamination of our aquifer is very serious. On March 5, 2001 I attended the thirteen member of the Devens Reuse Steering Board and was unable to comment on the Army's proposed plan for AOC 57 Area 2+3

As a participant in the formation of the Devens Reuse Plan I understood that the Army is responsible for the remediation of the areas of Fort Devens designated as a superfund site and that these areas would be returned to a condition comparable to that before occupation by the Army. Alternatives III-3 (Area 2) and Alternative III-2 (Area 3) fall far short of that standard. There is also the fact that the contamination involves a medium-yield aquifer (PPA) The host communities cannot afford to be shortsighted about writing off a water resource in favor of future growth and possible climate changes. I certainly believe the Army would clean up the aquifer to drinking water standards in a much shorter period than 30 years.

I particularly noted that the area's alternate cleanup chosen would not protect unrestricted (residential) receptors but would not produce adverse effects to any plants or animals I would like an explanation.

Really only options II - 4 and 3 seem to be acceptable. Full restoration of the wetland + Cold Spring Brook (Area 2) is the goal and AOC must be cleaned up to the best of the Army's considerable ability.

Comment Submitted by: Helen Fiore

Address: 39 Blanchard Rd.
Harvard MA 01451

RECEIVED
MAR 14 2001

Use This Space to Write Your Comments

The Army wants your comments on the proposed plan for AOC 57. You may use the form below to submit written comments. If you have questions about how to comment, please call the BRAC Environmental Coordinator, Jim Chambers, at (978) 796-3835. Send this form or any other written comments, postmarked no later than March 26, 2001, to:

Jim Chambers
U.S. Army Reserve Forces Training Area
BRAC Environmental Office
30 Quebec Street
Unit 100
Devens, MA 01432-4429
FAX (978) 796-3133

Dear Mr. Chambers:

I appreciate the opportunity to comment on the Army's plans for the restoration of AOC 57. From the alternatives presented, II-4 and III-3 (Excavation for unrestricted use and institutional controls) are the ones I prefer. In addition, I think possibilities for actively cleansing the groundwater should be explored. With the growing scarcity of potable water supplies, the goal should be to aggressively restore these ~~to~~ to potability since this seems feasible. With the amount of material removed, it may be advisable to restore the wetlands to a greater area than they previously occupied. This would help compensate for losses of BVW ~~elsewhere~~ elsewhere on the base due to the Army's activities. It will also improve the area's flood storage capacity. Both of these (as well as the potable water supply) are valuable assets whose value should be considered when weighing alternatives and their costs. In conclusion, I would like to say I appreciate the Army's decision to excavate AOC 11 and restore that wetland.

Comment Submitted by: Robert Burkhardt

Address: Robert Burkhardt
12 Harvard Rd. #10
Shirley, MA 01464-2433

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People of Ayer
Concerned About the Environment
35 Highland Avenue
Ayer, MA 01432
(978) 772-9749

Mr. James Chambers, Director
U.S. Army Reserve Forces Training Area
BRAC Environmental Office
30 Quebec St.
Unit 100
Devens, MA 01432-4429

March 26, 2001

Re: Comments on the Proposed Plan for AOC 57, February 2001.

Dear Mr. Chambers:

Thank you for the opportunity to comment on the Proposed Plan for AOC 57. This letter is a continuation of the comments submitted to the record on behalf of PACE on March 8, during the Public Hearing. Enclosed are additional comments prepared for PACE by Mr. Richard Doherty, P.E., L.S.P. of GeoInsight, Inc. through the EPA Technical Assistance Grant Program. PACE fully endorses GeoInsight's comments; we respectfully request that they become part of the official record and be responded to in accordance with CERCLA.

At this point in time, I would like to submit the following criteria for your consideration, to be incorporated into the Proposed Plan.

1. The Army's proposed cleanup goal to reach drinking water standards at AOC 57 should be restated to include a clearly defined timeframe. We recommend five years. Additionally, this should be stated in the ROD as a specific date, i.e., by June 1, 2006, these standards should be met. This will remove future ambiguity for all parties concerned.

   We recommend the ROD include specific definitions of what constitutes reaching drinking water standards. For example, a single monitoring well below drinking water standards would not be sufficient for the Army to claim the goal has been reached. PACE would like to be included in technical discussions to clearly define the cleanup endpoint in the ROD.

2. If the drinking water standards are not restored within five years, then an iron – clad contingency remedy must be fully implemented in a reasonable time frame to achieve drinking water standards within the following five years.

3. Groundwater monitoring will be required in order to determine if the cleanup goals are being attained. We recommend the following schedule: quarterly sampling during the first year (minimally). This will enable the Army to determine seasonal cycles of highest concentrations so that future sampling can be done during 'worst case' scenarios. Years two and three could be sampled bi-annually. If the levels of contaminates are decreasing as we anticipate, then the final two years of sampling could be done annually.

   PACE would like to request an opportunity to review and discuss the number and the placement of the monitoring wells to be monitored during a technical meeting with the BCT team, when the time comes for this decision.

4. As stated in the AOC 57 Feasibility Study, the selected remedy will utilize natural attenuation. As described by GeoInsight, this should be fully demonstrated for each chemical constituent, and substantiated according to accepted remedial practices.

5. We recognize that the Army has done extensive remediation projects over many years, since first declaring it a Superfund site. Likewise, we also recognize the Army used this land with varying degrees of intensity for over 70 years. With such heavy use, it's certainly possible that some (perhaps many) areas of contamination were never discovered, and will be missed during the BRAC cleanups.

   Since much of the Deven's land will revert back to the three towns, the land should be returned in as clean a state as possible. Therefore, we recommend that the Army adopt the more aggressive Alternative III-3 for Area 3 of AOC 57, unless proven that irreversible and un-repairable damage to the wetland will result.

Thank you for your consideration.

Sincerely,

Laurie S. Nehring

Laurie Nehring, President of PACE

Electronic copies
Senator Pam Resor
Representative Geoffrey D. Hall
Ms. Carol A. Keating, EPA
Mr. John Regan, DEP
Ayer Board of Selectmen
Harvard Board of Selectmen
Ms. Julie Corenzwit, Community RAB Member, Ayer
Ms. Kathy Bourassa. Community RAB Member, Shirley

Rev. Phil Goff, Community RAB Member, Ayer
Ms. Elizabeth Ainsley Campbell, Executive Director, NRWA
Ms. Heidi Roddis, Mass. Audubon Society
Ms. Ruth Miller, Citizens to Protect Residential Harvard
Ms. Mildred Chandler, President, Citizens to Protect Residential Harvard
PACE Listserv (sent to residents in Ayer, Harvard, Shirley, Littleton & Lancaster)
www.pace-ayer.org PACE Web site
www.devenswatch.org Web Site.
Area newspapers: The Lowell Sun, The Public Spirit, The Harvard Post, The Shirley Volunteer

Hard Copies:

Senator Edward M. Kennedy
Senator John F. Kerry
Congressman Martin T. Meehan
Senator Pam Resor
Representative Geoffrey D. Hall
Ayer Board of Selectmen
Harvard Board of Selectmen
Shirley Board of Selectmen

The Commonwealth of Massachusetts
House of Representatives
State House, Boston 02133-1054

GEOFFREY HALL
STATE REPRESENTATIVE
2ND MIDDLESEX DISTRICT
AYER - PRECINCT 2
HARVARD, LITTLETON, WESTFORD

JOANNE BARNETT
STAFF DIRECTOR

Chairman
Committee on State Administration

ROOM 34, STATE HOUSE
TEL. (617) 722-2320

March 29, 2001

James Chambers, Director
U.S. Army Reserve Forces Training Area
BRAC Environmental Office
30 Quebec Street Unit 100
Devens, MA 01432

Re: AOC 57

Dear Mr. Chambers:

A number of constituents and government officials have apprised us their views and concerns regarding the proposed plan for Area of Contamination (AOC) 57 at Devens. In some cases they have sent us copies of their comments to your office. It is evident that there are issues of serious concern yet to be resolved to the satisfaction of all parties.

As elected representatives of the region, the concerns of the constituents are also ours. We would expect that the interests of those people most affected by any decisions you ultimately make would receive priority consideration and accommodation in the process, for these are the people who must finally live with the decisions. They should be assured that no possibility of substandard conditions would exist after remediation.

We commend you for inviting public discussion on the issue, but also look forward to receiving assurances that the federal government will not absolve itself of its responsibilities over the long term. If we can be of any use in the process, please feel free to contact us.

Sincerely,

GEOFFREY D. HALL, Representative
Chairman
Committee on State Administration

PAM RESOR, Senator
Chair
Committee on Ethics

Cc: Rep. M. Meehan
Sens. E. Kennedy, J. Kerry
And others

RECEIVED APR 2 2001

Board of Selectmen

MEETING TUESDAYS AT 7:00 P.M. • UPPER TOWN HALL • 1 MAIN STREET • AYER, MASSACHUSETTS 01432

Tel. (978) 772-8220
Fax. (978) 772-3017

Town Administrator
(978) 772-8210

March 30, 2001

James Chambers
BRAC Environmental Coordinator
30 Quebec Street, Unit 100
Devens, MA 01432-4429

Re: Comments on Proposed Plan
Area of Contamination (AOC) 57
Devens, Massachusetts

Dear Mr. Chambers:

Enclosed please find two (2) letters, and various attachments thereto received by the Ayer Board of Selectmen at their meeting on Tuesday, March 13, 2001. The Board of Selectmen unanimously endorses and supports the comments submitted by Richard Doherty of GEO Insight and Laurie Nehring, President of PACE for (AOC) 57 Devens.

Sincerely,

Edward McCann, Interim Town Administrator

EM/jl

Cc: Board of Selectmen
Laurie Nehring
Richard Doherty
File

Enc; 2

People of Ayer
Concerned About the Environment
35 Highland Avenue
Ayer, MA 01432
(978) 772-9749

Mr. James Chambers, Director
U.S. Army Reserve Forces Training Area
BRAC Environmental Office
30 Quebec St.
Unit 100
Devens, MA 01432-4429

March 26, 2001

Re: Comments on the Proposed Plan for AOC 57, February 2001.

Dear Mr. Chambers:

Thank you for the opportunity to comment on the Proposed Plan for AOC 57. This letter is a continuation of the comments submitted to the record on behalf of PACE on March 8, during the Public Hearing. Enclosed are additional comments prepared for PACE by Mr. Richard Doherty, P.E., L.S.P. of GeoInsight, Inc. through the EPA Technical Assistance Grant Program. PACE fully endorses GeoInsight's comments; we respectfully request that they become part of the official record and be responded to in accordance with CERCLA.

At this point in time, I would like to submit the following criteria for your consideration, to be incorporated into the Proposed Plan.

1. The Army's proposed cleanup goal to reach drinking water standards at AOC 57 should be restated to include a clearly defined timeframe. We recommend five years. Additionally, this should be stated in the ROD as a specific date, i.e., by June 1, 2006, these standards should be met. This will remove future ambiguity for all parties concerned.

   We recommend the ROD include specific definitions of what constitutes reaching drinking water standards. For example, a single monitoring well below drinking water standards would not be sufficient for the Army to claim the goal has been reached. PACE would like to be included in technical discussions to clearly define the cleanup endpoint in the ROD.

2. If the drinking water standards are not restored within five years, then an iron – clad contingency remedy must be fully implemented in a reasonable time frame to achieve drinking water standards within the following five years.

Rev. Phil Goff, Community RAB Member, Ayer
Ms. Elizabeth Ainsley Campbell, Executive Director, NRWA
Ms. Heidi Roddis, Mass. Audubon Society
Ms. Ruth Miller, Citizens to Protect Residential Harvard
Ms. Mildred Chandler, President, Citizens to Protect Residential Harvard
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Congressman Martin T. Meehan
Senator Pam Resor
Representative Geoffrey D. Hall
Ayer Board of Selectmen
Harvard Board of Selectmen
Shirley Board of Selectmen

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GeoInsight, Inc.
319 Littleton Road, Suite 100
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e-mail: info@geoinc.com

March 14, 2001

GeoInsight Project 2863-001

Mr. James Chambers
BRAC Environmental Coordinator
30 Quebec St., Unit 100
Devens, MA 01432-4429

Re: **Comments on Proposed Plan**
Area of Contamination (AOC) 57
Devens, Massachusetts

Dear Mr. Chambers:

On behalf of People of Ayer Concerned About the Environment (PACE), GeoInsight, Inc. (GeoInsight) reviewed the *Proposed Plan, Area of Contamination (AOC) 57, Devens Reserve Forces Training Area, Devens, Massachusetts* (the "Proposed Plan"). The Proposed Plan summarizes the Army's recommended cleanup plan for Areas 2 and 3 at AOC 57.

COMMENTS

1. The Proposed Plan does not adequately comply with Applicable or Relevant and Appropriate Requirements (ARARs). The AOC 57 Remedial Investigation (RI) identified Federal and State Maximum Contaminant Levels (MCLs), also known as drinking water standards, as ARARs at AOC 57.[1] Results from AOC 57 ground water exceed MCL ARARs for arsenic, cadmium, 1,4-dichlorobenzene, chloroform, bis(2-ethylhexyl)phthalate, and tetrachloroethylene.[2] The Proposed Plan does not include or adequately describe measures to comply with these ARARs and is therefore inadequate.

In the AOC 57 Focused Feasibility Study (FFS), it is stated that MCLs "will likely be met through natural attenuation processes" as a result of implementing the selected alternatives.[3] In GeoInsight's experience, a statement that an ARAR is *likely* to be met would not be considered

[1] *Final Remedial Investigation Report, Area of Contamination 57,* Harding-Lawson Associates, June 2000, Table 4-1.

[2] See Tables 9-12 through 9-15 of the RI, and the *Final Focused Feasibility Study Report, Area of Contamination 57,* Harding ESE, November, 2000, Section 3.3. It is noted that Harding ESE suspects that the bis(2-ethylhexyl)phthalate concentrations are due to laboratory contamination.

[3] *Final Focused Feasibility Study Report, Area of Contamination 57,* Harding ESE, November, 2000, Tables 6-7 and 6-16.

of AOC 57 overlies a Potentially Productive Aquifer, and is therefore considered to be a ground water resource by the Commonwealth of Massachusetts.[4] If AOC 57 were a non-Superfund site, the Proposed Plan would not meet the Massachusetts Response Action Performance Standard (RAPS) because measures to achieve drinking water standards are not included. PACE and other community members have indicated to GeoInsight that they strongly believe that the US Army should be held to a standard at least as high as that required of private parties within the Commonwealth of Massachusetts.

PROPOSED ACTION

GeoInsight, on behalf of PACE, recommends the following actions to address the comments presented above:

- An additional Focused Feasibility Study should be prepared that includes a detailed evaluation of alternatives for achieving MCLs in ground water at AOC 57 Areas 2 and 3. Detailed evaluation of the natural attenuation alternative should include a characterization of the subsurface environment's potential for promoting natural attenuation, and the use of generally accepted models[5] to demonstrate the ability of natural attenuation to achieve ARARs within a reasonable period of time. The evaluation must take into account the different fate and transport characteristics of the contaminants of concern. All estimates of time to achieve ARARs should be fully documented. If a calculated time estimate has no upper bound (e.g., "greater than 30 years") or spans more than one decade (e.g., "3 to 30 years"), the corresponding alternative should be eliminated due to the uncertainty involved.

- A reliable alternative for achieving drinking water standards in a reasonable period of time should be selected based on the FFS. The selected alternative should be presented in a Supplemental Proposed Plan. The *current* Proposed Plan should be modified to clearly state that it is intended as to select a "Source Control" alternative only, and that a Supplemental Proposed Plan will be issued to select a "Management of Migration" alternative. The evaluation of both Source Control and Management of Migration alternatives is consistent with the approach required at Superfund sites.

- To allow the AOC 57 cleanup to attain minimum standards established by the Commonwealth of Massachusetts, GeoInsight repeats our previous recommendation that the Massachusetts cleanup procedures and standards documented in the Massachusetts Contingency Plan (MCP, 310 CMR 40.0000) be adopted as an ARAR throughout the Devens Superfund site.

---

[4] *Response to Comments on the Draft Focused Feasibility study for Area of Contamination 57*, September 2000, see MADEP General Comment No. 1.

[5] e.g., Bioplume for petroleum hydrocarbons; Biochlor for chlorinated hydrocarbons.

Citizens to Protect Residential Harvard

P.O. Box 424
Harvard, Massachusetts 01451

March 8, 2001

Mr. James Chambers USARFTA
BRAC Environmental Coordinator
30 Quebec St., Unit 100
Devens, MA 01432-4429

Dear Mr. Chambers,

On behalf of Citizens to Protect Residential Harvard (CPRH), I wish to thank you for this opportunity to comment on the Proposed Plan, Area of Contamination (AOC) 57, Devens Reserve Forces Training Area, Devens, Massachusetts.

The purpose of Citizens to Protect Residential Harvard is to protect residents from the negative impact of unreasonable development in surrounding towns. The development and reuse of former Fort Devens, and the possibility for its being rejoined to the rest of Harvard and the other towns, have made CPRH concerned about the cleanup and the potential for contamination affecting its land and ground water both now and in the future.

1. The Proposed Plan's indefinite clean up time is inadequate and unacceptable. The indefiniteness of the estimate "greater than 30 years" allows a conclusion that the Army does not know and therefore is hedging. This produces a feeling of distrust based on the possibility of the lack of adequate study

2. The Proposed Plan is unacceptable in that the standard of clean up is lower than that on private property in Massachusetts. The statement:"Since groundwater at and beneath AOC 57 is not used as a source of drinking or industrial water..." continues and makes an assumption that it will never be used as a source, thus belying its present status as a Potentially Productive Aquifer. With the level of contaminants in the ground and the indefinite period of attenuation mentioned previously, it is a denial

Shows Max. detection levels of chemicals

TABLE 3-3
PROPOSED PRELIMINARY REMEDIATION GOALS
FOR SOILS
AOC 57

Source: FOCUSED FEASIBILITY STUDY REPORT, Nov 2000
DEVENS MASSACHUSETTS

LAND USE SCENARIO	AREA	COC (a)	MAXIMUM DETECTION (mg/kg)	BKGRND (b) (mg/kg)	HUMAN HEALTH RBC (c) (mg/kg)	MCP(d) Method 1 S-1/GW-1 (mg/kg)	MCP(d) Method 1 S-2/GW-1 (mg/kg)	PRG (mg/kg)
Possible Future (Construction Worker)	Area 2 Wetland - Subsurface Soil	Aroclor-1260	12	ND	3.5	(f)	(f)	3.5
		Lead	* 5060	48	400 (e)	300	600	600 (g)
Unrestricted (Residential)	Area 2 Wetland - Surface Soil	Aroclor-1260	4.2	ND	0.5	(f)	(f)	0.5
		Arsenic	61.2	19	21	(f)	(f)	21
	Area 2 Wetland - Subsurface Soil	Chromium	* 2410	33	550	(f)	(f)	550
		Aroclor-1260	12	ND	0.5	(f)	(f)	0.5
		C11-C22	990 (h)	ND	930	(f)	(f)	930
		Lead	* 5060	48	400 (e)	(f)	(f)	400
*	Area 3 Wetland - Surface Soil	C11-C22	* 3100	ND	930	(f)	(f)	930

Note:

(a) CPCs that present cancer risks above 1E-06 or target-organ specific HI above 1.0 based on the baseline risk assessment (HLA, 1999a).

(b) Background concentrations for inorganic analytes based upon chemical data gathered from 20 soils samples collected as part of Group 1A and 1B investigations. (See Appendix L of the RI Report (HLA, 1999a)

(c) PRGs are based on receptor risks to soil. Achieving the PRGs listed in this table should enable the residual receptor risks to be at or below a target-organ specific HI of 1 for soil and a cummulative receptor cancer risk at or below 1E-04 for soil.

(d) Massachusetts Contingency Plan Method 1 Risk Characterization S-1/GW-1 and S-2/GW-1 Soil Standards (MADEP, 1997)

(e) USEPA residential soil lead screening level per OSWER Directive 9355.4-12 (USEPA, 1994)

(f) Risk characterization performed following USEPA guidance. Method 1 MCP methods are not applied.

(g) No USEPA commercial/industrial soil lead screening level currently exists. PRG is based upon MCP Method 1 S-2/GW-1 standards (potentially accessible soil, children present, low frequency, and high intensity for construction worker.)

(h) Maximum C11-C22 aromatic concentration was 990 mg/kg. Maximum TPHC concentration was 31,800 mg/kg or an estimated 7,050 mg/kg C11-C-2. converting TPHC concentrations to EPH/VPH concentrations. The computed site-specific average composition of petroleum detected at the site is presented in Appendix N of the RI Report (HLA, 1999a).

(i) Exceedance above 930 mg/kg C11-C12 or the equivalent calculated value 4,195 mg/kg TPHC for Area 2.

ACRONYMS

BKGRND - Background
COC - Contaminant of Concer
CPCs- Contaminants of Potential Concern
MCP - Massachusetts Contingency Plan
ND - Not determined
PRG - Preliminary Remediation Goal
RBC - Risk-Based Concentration

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Central Regional Office, 627 Main Street, Worcester, MA 01608

ARGEO PAUL CELLUCCI
Governor

JANE SWIFT
Lieutenant Governor

BOB DURAND
Secretary

LAUREN A. LISS
Commissioner

CERTIFIED MAIL: RETURN RECEIPT REQUESTED

February 17, 2000 ← Note date

BRAC Environmental Office
30 Quebec Street
Box 100
Devens, MA 01432

Attn: James Chambers

Dear Mr. Chambers:

RE: Army response to MADEP comments on Draft Final Remediation Investigation reports Area of contamination (AOC) 57 Report, January 28, 1999.

The Massachusetts Department of Environmental Protection (MADEP) has completed its review of the above reference document. Although the majority of the regulatory agencies comments have been addressed, the MADEP still has several concerns regarding residual contamination at AOC 57 and recommends that these concerns they be further evaluated in the final remedial investigation or be addressed through specific remedial alternatives in the feasibility study as appropriate. Our specific concerns include the following:

The possibility exist that human receptors could be exposed to contaminants through inhalation and dermal contact of residual contamination at the site. Therefore the MADEP requests that the future ROD for AOC57 require Institutional Controls to restrict development in the open space areas at this site. Our review of the RI's risk calculations indicates continued potential human health risk under both residential and construction worker scenario. Although the MADEP realizes that the current reuse plan precludes construction in the open or buffer zone located in AOC 57, we are concerned that future changes to the reuse plan may alter the use of the site, creating a scenario for potential expose.

RE: Army response to MADEP comments on Draft Final Remediation Investigation reports Area of contamination (AOC) 57 Report, January 28, 1999, page 2.

The existent of surface soil hot spots at AOC 57 poses an unacceptable risk and requires the excavation and removal of the impacted surface soil. MADEP has identified the immediate area surface soil sample 57E-95-13X as a hot spot.

A review of the data indicates that the detected concentrations of chromium (2410 ug/g) and lead (5660) ug/g in surface soil sample 57E-95-13X in Area 2 are greater than 100 times the concentration of these analytes in surrounding samples. Since both of these are recognized as COPCs, it is recommended that subsurface soil sampling location 57E- 95-13X be evaluated separately as a hot spot. MADEP also recommends that the data be reevaluated to determine if other hot spots exist.

The MADEP is concerned with the low concentrations of chlorinated VOCs present in groundwater. The possibility of an unknown up gradient groundwater contamination source of chlorinated solvents may exist. MADEP recommends additional investigation to determine the possible source of the VOCs in groundwater at Area 3. The Petrucci Company Inc. detected an unknown source of VOCs in soil and groundwater in December 1998 directly upgradient of AOC 57 during a limited. Fig. 7-5. Groundwater1996 field Analytical Detects Area 3, reveal elevated levels of chlorinated VOC in groundwater.. Based on the current groundwater analytical data, the vertical extent of chlorinated VOCs in groundwater has not been adequately defined. MADEP recommends the installation of 1 monitoring well at depth with field or laboratory GC screening of groundwater during well installation to define the vertical extent of chlorinated VOCs. This well could be installed as part of the RI/FS or included as part of a long term monitoring plan.

It appears that the oil recovery trench located in Area 2 was not properly remediated and sampled before being backfilled MADEP is requesting the remediation and confirmatory sampling of the oil recovery trench. Table 7-8 lists oil recovered from a trench excavated in the wetland at Area 2 had PCBs contamination of Aroclor 1254, at concentrations 28.4 ppm, Aroclor 1242, 29.7 ppm and Aroclor 1260 81.9 ppm.

MADEP agrees with the Army that the timing for a soil removal at test pit 57E -95-15X during the investigation phase of the RI may not been practical. However a future soil removal action at this location is anticipated. Table 7-10. Soil screening at Test pit 57E -95-15X had TPH, results of 5000 ppm at 0 feet depth and 28000 ppm at 5 feet. In addition to TPH a laboratory confirmed analysis of 7.3 ppm of PCB 1260 was detected at a depth of 2 feet.

Total Petroleum Hydrocarbons

RE: Army response to MADEP comments on Draft Final Remediation Investigation reports Area of contamination (AOC) 57 Report, January 28, 1999, page 3.

Based on the confirmatory soil samples taken at the final excavation at Area 3 it does not appear that the Army met the soil cleanup objectives. The residual soil contamination at the south end of the excavation should have been removed. Samples EX57W14X, EX57W15X and EX57W16X soil samples revealed elevated petroleum contamination in the EPH ranges of C9 - C8, C19-C32, Aliphatics and C11- C22 Aromatics. These samples were taken from the open excavation in the immediate area of the Coldspring Brook wetland at Area 3. They represent samples of the impacted soil remaining at the site. The MADEP recommends additional soil removal at this site.

Was this done?

A meeting to dicuss these concerns at AOC 57 can be arranged at your earliest conveints. Please contact the undersigned at (508) 767 2842.

Very Truly Yours,

David M. Salvadore

P:\SAL\AOC57.2
Information Repositories

Don Kochis
26 Park Lane
Harvard, MA 01451-1436

4/1/01

Mr. Jim Chambers, Environmental Manager
U.S. Army Reserve Forces Training Area
BRAC Environmental Office
30 Quebec Stree, Unit 100
Devens, MA 01432- 4429

RE: Cleanup of Cold Spring Brook, AOC 57

Dear Mr. Chambers:

I am pleased that the Army has extended the deadline from March 26 to April 24 for public comment on the cleanup plan for AOC 57.

As a Harvard resident dependent upon our own well for water, I am concerned with any contaminants or potential contaminants to groundwater and - especially in this case - potential contaminants of a medium yield aquafier as the Cold Spring Brook area is considered.

Knowing that our well goes down at least 175 feet, its location risks being affected by contamination to the aquafier.

It seems to me to be only common sense that when a site has been identified as being contaminated with PCB's, lead, elevated levels of arsenic and "volatile organic compounds", the site should be completely cleanup or at least the level of cleanup should be with the goal of eventually providing, potable water.

Request, therefore that the standards for the cleanup of Area Of Concern #57 be raised beyond what is presently planned.

Also, since I never received any reply to my Jan. 11, 1999 letter to you (copy attached), if you have information which would provide answers to my questions, please foward.

Sincerely,

Don Kochis

Don Kochis

Don Kochis
26 Park Lane
Harvard, MA 01451-1436

1/11/99

Mr. Jim Chambers
U.S. Army, Reserve Forces Training Area
BRAC Environmental Office
30 Quebec Street, Box 100
Devens ~~Defendants~~, MA 01432-4429

RE: Proposed Plan for Landfill Cleanup at Fort Devens

Dear Mr. Chambers:

As a Formal Comment to the Proposed Army Cleanup of the seven landfills listed in the subject Plan, I pose the following questions:

1) Although page 13 of the plan indicates that "none of the landfills currently affect groundwater quality", is there any evidence that the landfills have affected groundwater quality in the past?

2) What is the criteria used for the determination that a particular site presents "acceptable human risks"? What is acceptable? At what point do the risks become unacceptable?

3) What specifically are the "contaminants" mentioned and several places in the Plan such as on page 3: "chorinated solvents and metals"?

4) Do any of the contaminants have a history of causing any specific diseases? If so, what specific diseases?

5) The plan makes reference to the Nashua River likely being "a significant contributor to floodplain sentiment contamination". What are the studies that serve as the basis for this statement or studies referenced that I may access?

Thank you.

Sincerely,

Don Kochis

Don Kochis

Faxed 1/11/99

Mr. James Chambers
US Army RFTA, BRAC Environmental Office
30 Quebec Street
Devens, MA 01432

Dear Mr. Chambers,

This is to express my concern about the cleanup of AOC57, between Barnum Road and Cold Spring Brook abutting Harvard land. The Army's preferred options described in the Proposed Plan do not go far enough in cleaning up Area 2 and Area 3 of AOC57. I advocate the most thorough cleanup option, one that removes the contaminants to the fullest extent possible and restores the Cold Spring Brook wetlands.

I am disturbed that the Army has not committed itself to restoring the groundwater to drinking water quality in a timely manner. The Army's open-ended estimate of 30 or more years suggests that the groundwater may never attain that standard. I am also concerned about the potential spread of contaminants to other areas, such as property in Harvard or the Grove Pond wellfield in Ayer. We are aware that other plumes of contaminants have migrated elsewhere on Devens, such as at the Moore Army Airfield and at Shepley's Hill Landfill.

The medium yield aquifer underlying AOC57 should be cleaned up and protected from further contamination. This area may some day be part of a buffer zone used for open space recreational purposes. For these as well as other reasons given above, we support thorough excavation of the contaminants, restoration of the Cold Spring Brook wetlands and measures to bring the groundwater to drinking water quality within five years..

Thank you for this opportunity to comment on your proposed plan. I hope you will factor the preferences of the Harvard community into your final decision on AOC57.

Yours

Claire Rindell

Claire Rindell
143 Blanchard Rd
Harvard, Ma
01451

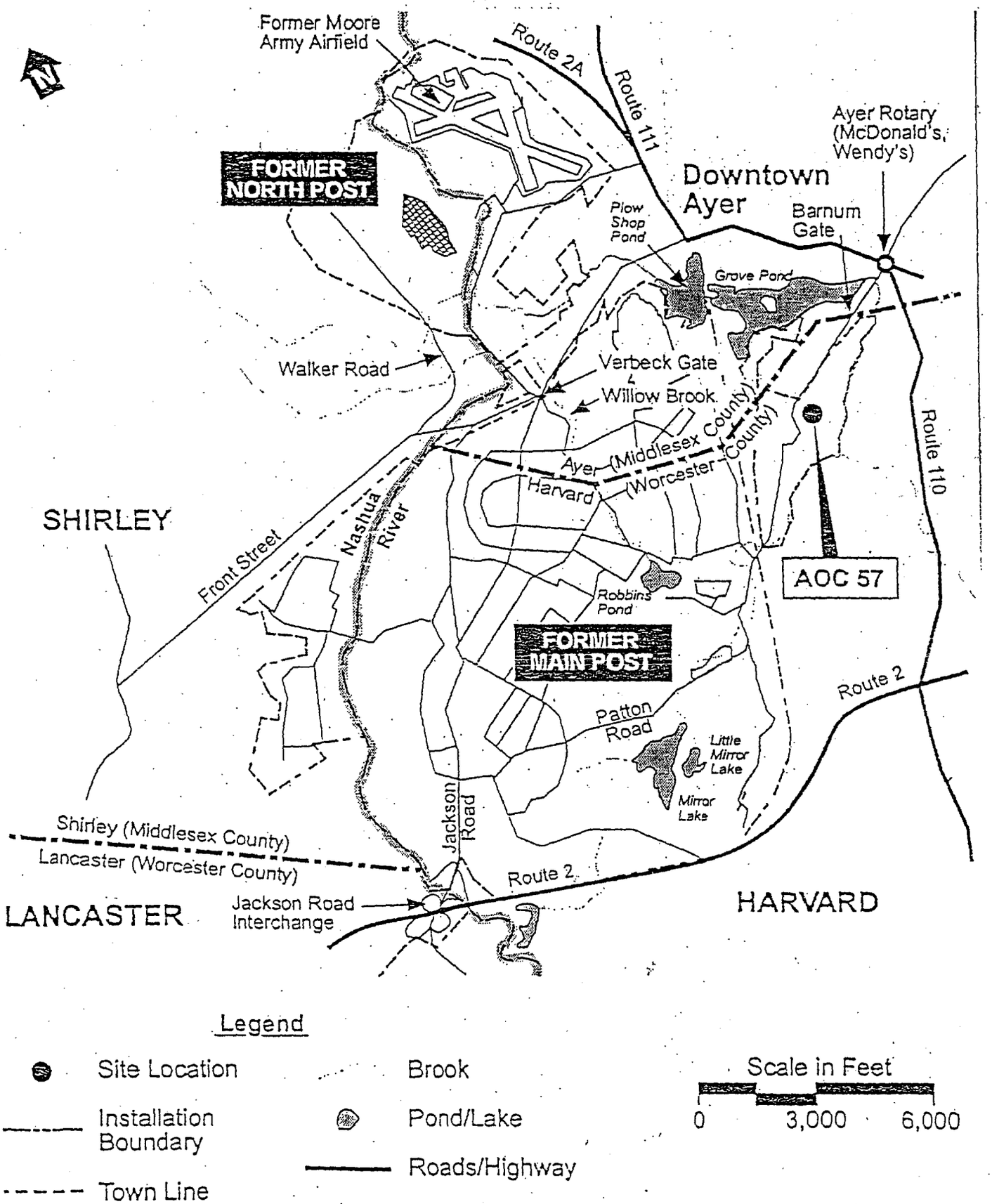

Figure 1: Location of AOC 57 at U.S. Army RFTA.

Citizens to Protect Residential Harvard

P.O. Box 424
Harvard, Massachusetts 01451

April 10, 2001

Mr. James Chambers, Director
U.S. Army Reserve Forces Training Area
BRAC Environmental Office
30 Quebec Street, Unit 100
Devens, MA 01432

Dear Mr. Chambers,

We appreciate the opportunity to comment on the Army's Proposed Plan for AOC 57. As the enclosed petitions indicate, residents of the Town of Harvard want to see AOC 57 cleaned up as thoroughly as possible, including complete excavation and removal of the contaminants, restoration of the Cold Spring Brook wetlands, and remediation of the groundwater to drinking water quality within 5 years. Harvard residents have long been concerned with safeguarding the Devens aquifers and are troubled by reports of soil and groundwater contamination in the Cold Spring Brook area impacting the wetlands.

The enclosed petitions contain 250 signatures obtained at the March 31 Annual Town Meeting. Please note that four members of the current Board of Selectmen and numerous members of other town boards including the Conservation Commission, Planning Board and Board of Health signed this petition.

Citizens to Protect Residential Harvard, a non-profit citizen's organization, believes that the cleanup alternatives advocated by the Army do not go far enough. We therefore support Alternative 11-4 for Area 2 and Alternative 111-3 for Area 3, for Unrestricted Use. We concur with Richard Doherty, PE, L.S.P., the consultant for PACE, that a five year time frame be adopted to reach drinking water standards at AOC 57 and that this five year timetable be stated in the Record of Decision, along with a mutually agreed upon definition of what kind of monitoring results will determine that the ground water has met the drinking water standard. We agree with Mr. Doherty's recommendations for quarterly sampling, at the outset, to identify periods of high contamination in order to indicate when future sampling can best be done. And we agree that natural attenuation needs to be demonstrated for each contaminant so that appropriate remediation may be

carried out. The cleanup must remove contaminants precluding their further migration, protect future users of the land, and return the groundwater to drinking water quality in the period defined above.

The Army made a commitment to clean up Devens. The good faith of that promise needs to be demonstrated at AOC 57. This land on Harvard's boundary overlies a medium yield aquifer and will likely be part of a buffer area used for recreation. It is not throwaway land. Potable water is a dwindling resource. The AOC 57 aquifer may some day be needed and should be restored to drinking water quality by those whose activities polluted it. If the Army dodges its responsibility to clean up this area to the highest standard, it will set an unfortunate precedent for the rest of the cleanup of Devens, resulting in increased skepticism of the Army's credibility and the Superfund process.

We urge you and the governmental regulators to listen to public opinion, do the right thing, and clean up AOC 57 to the highest standard within 5 years.

Yours truly,

Mildred A. Chandler
President

Cc: Senator Edward M Kennedy
Senator John F. Kerry
Congressman Martin T. Meehan
Secretary Robert A. Durand
Senator Pamela P. Resor
Representative Geoffrey D. Hall
Representative Robert S. Hargraves
James Murphy, EPA
John Regan, EQE
Elizabeth Ainsley Campbell, NRWA
Harvard Board of Selectmen
Ayer Board of Selectmen
PACE
Editor, Harvard Post

A PETITION FOR A THOROUGH CLEANUP OF THE DEVENS AOC 57 SITE

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Signature	Name(Printed)	Address
Delena Reid	Delena Reid	78 E. Bare Hill Rd
Elaine M Ritchie	Elaine Ritchie	6 Glenview Dr
Richard Bates Harris	RICHARD BATES HARRIS	221 STOW RD
Elizabeth Ashe	Elizabeth Ashe	25 Myrick Ln.
Mark D Hastings	Mark D. Hastings	110 Warren Ave
Shirley Washington	Shirley Washington	5-5 Myrick Ln.
Eileen Myers	Eileen Myers	73 Wetherbee Rd.
Amanda R. Goodwin	Amanda Goodwin	8 Bowers Road
Donald Goodwin	Donald Goodwin	8 Bowers Road
Gina Marksteiner	Gina Marksteiner	98 Tahanto Trl.
Marc Sevigny	Marc Sevigny	10 Old Shirley Rd
Suzanne Artemieff	Suzanne Artemieff	19 Craggs Rd.
Sheila La Farge	SHEILA LAFARGE	70 LITTLETON COUNTY RD
William J Marinell	William J. Marinell	50 Stow Rd.
Eric Nestler	ERIC NESTLER	31 CRUFT LN
Philip R Shutt	PHILIP R SHUTT	66 WHITNEY ROAD
Kenneth S Nickerson	Kenneth S Nickerson	13 Cameron Rd
Robert Mayerson	Robert Mayerson	139 Stow Rd

A PETITION FOR A THOROUGH CLEANUP OF THE DEVENS AOC 57 SITE

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Signature	Name(Printed)	Address
Kathleen Hewett	Kathryn Hewett	3 Elm
Holly Rothlopf	Holly Rothlopf	14 Old Boston Tpk
Mary Turner	Mary Turner	247 Littleton Cty Rd
John Wagner	John Wagner	247 STOW RD.
Penelope Jotterbury Wagner	Penelope Jotterbury Wagner	247 Stow Rd
Constance Clark Gagnon	Constance Clark Gagnon	20 Mt Hacomett Rd
Eric Peterson	ERIC PETERSON	31 E. Bare Hill
John Devoti	John Devoti	70 Slough Rd.
Diane L. Cordner	Diane L. Cordner	299 Stow Rd.
Roberta Atkinson	Roberta Atkinson	100 Tahanto Trail

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Signature	Name(Printed)	Address
[illegible]	PHILIP C CUTLER	56 STOW RD
[illegible]	Deborah Levering	71 Finn Rd
[illegible]	JEFF LEVERING	71 FINN RD
[illegible]	LAWRENCE M. FINNEGAN	12 Tahanto Trail
[illegible]	MILDRED CHANDLER	29 Little Cb Rd
[illegible]	[illegible] Smith	136 Oak Hill Rd
[illegible]	Susan Bigelow	81 Woodside Rd
[illegible]	DONALD D. GIRARD	95 Pinnacle Rd
[illegible]	Michèle A. Girard	95 Pinnacle Rd.
[illegible]	Robin Macy	122 W. Bare Hill Rd
[illegible]	STEVEN ABRAMS	30 JACOB GATES
[illegible]	Robin Cavlaw	54 Woodchuck Hill
[illegible]	Rob Egan	20 Westcott Rd
[illegible]	William H. White	11 BOWERS RD
[illegible]	FAY MARTIN	5 FAIRBANK ST
[illegible]	John Martin	" "
[illegible]	DEBORAH RICCI	19 E. Bare Hill RD
[illegible]	R[illegible] V Ricci	19 E Bare Hill Rd
[illegible]	Randy Hobbs	15 Slough Rd
[illegible]	W H PARKINSON	211 OLD LITTLETON RD
[illegible]	JOHN HELDORFER	338 STOW RD.
[illegible]	JAMES HARTE	341 LITTLETON
[illegible]	30 ROY MOFFAT	30 OAK HILL

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Signature	Name(Printed)	Address
	Susan Osthers	41 Women Circle
	Lou Russo	116 Oak Hill Rd
	PAUL WILLARD	218 STILL RIVER Rd
	SETH ATKINSON	60 TAHANTO TR
	Mary Essam	239 Stow Rd.
	Lisa Aciukewicz	61 Depot Road
	NELSON NORTHERN	604 WOODSIDE Rd
	Joann Hallowski	290 Stow Rd
	Paula Brown	PO 628 Harvard
	PIALI DE	8 MILL RD
	HUGH STODDART	8 MILL RD
	Julie malchow	76 Woodside Rd
	Dan Farber	76 Woodside Rd
	Denise Keating	63 Wyndcliff
	Julie Nacka	84 Shaker
	Karl Nocka	"
	Bruce A Grant	12 Ayer Rd
	Mia MacRae	9 Woodside Rd.
	David Kendall	67 Still River Rd.
	W KERNS	112 Bolton Rd
	Sharon Kerns	" " "
	JAMES DUNLAP	131 OLD LITTLETON RD

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Signature	Name(Printed)	Address
	Ruth H. Silman	114 Bolton Road.
	Jean C. McCroskey	193 Old Littleton
	Patricia W White	162 East Bare Hill Rd
	Susan J. Loring	69 Still River Rd.
	Mary M. Cutler	56 Stow Rd.
	MARKA HARDY	18 ANN LEE RD
	Wm J SALTER	3 ELM ST
	MARILYN S. CLARK	71 BOLTON RD.
	WILLIAM CLARK	71 BOLTON RD
	ROBERT McHERNEY	55 PARK LANE
	Charlanne B. Van Wormer	127 Oak Hill Rd.
	Joe Dzekevich	17 Withington Ln
	Josephine S. Carothers	85 Depot Rd.
	ROBERT HARLEY	73 Bolton Rd
	JAMES FARRELL	3 ONCIN LN
	LAUREN T FARRELL	3 ONCIN LANE
	Mark V. Roux	82 Whitney Rd
	Cindy Steeves	36 Simon Atherton
	MINA LEVITSKY	305 OLD LITTLETON RD
	Jeff Schwarz	48 E Bare Hill
	JAMES MAHONEY	263 LITTLETON RD
	Dennis Wagner	389 Still River Rd.
2 →	Donald & Janet Fowke	335 Ayer Rd.
	SANDRA L. LEFKOVITS	18 DEPOT RD

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Signature	Name(Printed) MAY	Address
Elizabeth S. Mac	ELIZABETH S	W. Bare Hill Rd.
Alice Rennie	Alice Rennie	27 Ann Lee Harvard
Sharon McCarthy	SHARON MCCARTHY	90 E. Bare Hill Rd. Harvard
Kelly Bollman	Kelly Bollman	9 Westcott Rd.
Gary Wenger	Gary Wenger	2 Westcott Rd.
	Coleen Williams	120 Bolton Rd
S. Alan Williamson	S. Alan Williamson	224 Still River Rd
Bruce Blain	BRUCE BLAIN	40 BLANCHARD RD
Karen M. Green	Karen M. Green	90 Oak Hill Rd.
Marjorie A Darby	MARJORIE A DARBY	8 AYER RD
C. Ron Ostberg	C. Ron Ostberg	41 Warren Ave.
Mary Bowkes	MARY BOWKES	170 Littleton Rd.
John Mazzola	John MAZZOLA	170 Poor Farm Rd
Eric Dyer	ERIC DYER	6 WESTCOTT RD
Willie D Wickman	WILLIE WICKMAN	7 Still River Rd
Susan Hardy	SUSAN HARDY	18 Ann Lee Rd
Darrell Wickman	Darrell Wickman	7 Still River
Eric P. Cody	Eric P. Cody	3 Tahanto Trail
	AMES HARRIMAN SCHNEIER	12 OLD BOSTON TPKE
Toni Spaccigali	Toni Spaccigali	143 Ayer Rd
Ralph DeFlorio	Ralph DEFLORIO	20 HILLCREST DRIVE
	Vic Myer	292 Ayer Rd.
Chatanika Stoop-Myer	Chatanika Stoop-Myer	292 Ayer Rd.
Sarah Y. Arnold	Sarah Arnold	21 Glenview Dr.

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Signature	Name(Printed)	Address
Rhonda L Cotton	Rhonda L. Cotton	109 Slough Rd
Helen Fiore	Helen Fiore	37 Blanchard Rd
Phyllis M Luck	Phyllis M Luck	85 Tahanto Trail
Pamela B Durrant	Pamela B Durrant	159 E. Bare Hill Rd
Charles McCormack	Charles M. Cormack	27 Ann Lee Rd
Dorothy C Braat Peggy Braat	DOROTHY C. BRAAT PEGGY	72 Bolton Rd
Rita Lancaster	Rita Lancaster	17 Withington Lane
[illegible]	[illegible]	122 TAHANTO
Betsy Williams	Betsy Williams	120 Bolton Rd.
Sarah Hamill	SARAH HAMILL	34 Oak Hill Rd
Lucy B Wallace	Lucy B Wallace	18 Orchard Hill
Linda Kafarle	Linda Kafarle	70 Woodside Rd.
Robin Bedell	Robin Bedell	46 Stow Rd
William R Veno	William R Veno	28 PARTRIDGE HILL RD.
Judith M Veno	Judith M Veno	28 Partridge Hill Rd
Cynthia A Bittner	Cynthia A Bittner	345 Stow Rd
Laurie Lingham	Laurie Lingham	40 Oak Hill Rd
Paul Wormser	PAUL WORMSER	3 WHITE LA.
Kathleen Marble	Kathleen Marble	84 Littleton County Rd
Anne Perkins	Anne Perkins	212 Bolton Rd.
Richard High	RICHARD HIGH	212 Bolton Rd.
Louise Potter	LOUISE Potter	267 Littleton Rd.
Jeanie Colony	Jeanie Colony	244 Old Littleton Rd
Roger Bowser	ROGER BOWSER	120 LITTLETON ROAD

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Signature	Name(Printed)	Address
[illegible]	Dwight Harshbarger	2 Madigan Lane
Donald Boyce	Donald Boyce	310 Stow Rd
[illegible]	J M BOYCE	310 Stow Rd
Richard B Watson	R. B. Watson, Jr	310 Ayer Rd
Nancy W. Reifenstein	Nancy W. Reifenstein	8 Houghton Lane
Linda A Moore	Linda A Moore	12 Slough Rd
W L Patton	W.L. Patton	74 E. Bare Hill Rd.
[illegible]	DAVID WESTFALL	63 Slough Rd.
Lisa Dagnigian	Lisa Dagnigian	42 Simon Atherton Road
Jeffrey H Harris	JEFFREY H HARRIS	69 WHITNEY RD
[illegible]	DAVID MAGATELLE	62 W Bare Hill Rd
Kristine Forsgard	Kristine Forsgard	44 Oak Hill Rd.
Wade Holtzman	WADE HOLTZMAN	104 BOLTON RD.
Margot Holtzman	Margot Holtzman	104 Bolton Rd.
Patricia C Wenger	Patricia Wenger	2 Westcott Rd
Heather Jordan	Heather Jordan	38 Westcott Rd
E A Solod	E.A. Solod	61 Myrick Ln
Donna J Solod	Donna J. Solod	61 Myrick Lane
John Osborn	John Osborn	14 Park Ln
Cynthia S Russo	Cynthia S. Russo	116 Oak Hill Rd
Margaret A Grogan	Margaret A. Grogan	19 Pond Road
Valerie Hurley	Valerie Hurley	25 Candleberry Lane
Peter Calkins	Peter Calkins	117 E Bare Hill Rd

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Signature	Name(Printed)	Address
Marie Finnegan	Marie Finnegan	12 Tahanto Trail
Pam Frederick	Pam Frederick	144 Littleton Rd
[illegible]	GEORGE WATKINS	9C SHAKER RD
C Lahar	C. J. Lahanas	23 Woodside Rd.
Ralph Williams	Ralph Williams	112 Old Shirley Rd
Joan Allard	Joan Allard	112 Old Shirley Rd
[illegible]	James ELKINS	23 Slough Rd Harvard
[illegible]	GREG GEORGALLUS	165 Littleton Cty Rd Harvard
Ellen Harasimowicz	Ellen Harasimowicz	117 Ayer Rd
Cynthia Elder	Cynthia A Elder	76 E Bare Hill
Elizabeth Egan	Elizabeth Egan	70 Westcott Rd
Steve Darby	STEVE DARBY	8 AYER RD.
James H. Wallace	James H. Wallace	18 Orchard Hill
Ronna Levin	RONNA LEVIN	99 Tahanto TR
Anne DeBoalt	Anne DeBoalt	79 Shaker Rd
[illegible]	Mark Finnegan	126 Oak Hill Rd
[illegible]	Hilary Finnegan	126 Oak Hill Rd
Lorrie Coleman	Lorrie Coleman	39 Joes Farm Rd.
Robert HARRAH	[illegible]	2 Willow Rd.
Ann Whitney	Ann Whitney	113 Old Mill
Mark Mandozzi	Mark Mandozzi	349 Stow Rd
Sharon Briggs	Sharon Briggs	74 S. Shaker Rd
Todd Lainhart	TODD LAINHART	" "

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Signature	Name(Printed)	Address
	Mitchell Wangh	359 Old Littleton Rd Harvard MA
	Jo-Ann Wangh	"
	Susan Toll	87 Ann Lee Harvard
	Edward Toll	" " "
	Lois Ann Suarez	35 Sandy Pond Road #14 Ayer, MA 01431
	John F Chandler	183 Prospect Hill Rd
	Bill Cordner	299 Stow Rd.
	JACK PURDY	10 Littleton Rd

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Signature	Name(Printed)	Address
Pat Rettew	Pat Rettew	13 Abbot Lane
S E Rettew	STEVE RETTEW	13 ABBOT.
Mark E Kelley	Mark E. Kelley III	85 Depot Rd.

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Signature	Name(Printed)	Address
[illegible]	P. ENDICOTT	44 Littleton Co Rd
[illegible]	Larry Hettinger	57 Myrick Lane
[illegible]	STUART SKLAR	39 SCOTT
Jan Perry	Janice Perry	42 Old Mill
John Whelan	John Whelan	389 Still River Rd.

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Signature	Name(Printed)	Address
Heidi Edwards	Heidi Edwards	332 Stow Rd. Harvard
Lisa R Stanley	Lisa R Stanley	73 Tahanto Tr. Harvard
Paul F. Jäger	PAUL F. JÄGER	145 DEPOT RD HARVARD
Margaret Sisson	Margaret Sisson	281 Stow Rd Harvard
Nancy S Brown	NANCY S BROWN	15 Old Littleton Rd Harvard
Joyce Smith	Joyce Smith	96 old mill rd Harv
Vera K. Dunkley	Vera Dunkley	96 old Mill
Sue Mozer	SUE MOZER	25 SHAKER RD
Joseph F. Mozer	JOE MOZER	25 Shaker Rd
	Caroline Fish	53 park
Keith Turner	Keith Turner	217 Littleton Cnty Rd
Belinda Sowizral	Belinda Sowizral	1 St. John Lane
Peter Jackson	Peter Jackson	46 Jacob Coates Rd
Charles L. Gagnebin II	Charles L. Gagnebin II	120 Nettacomet Path
Elizabeth S. Peterson	Elizabeth S. Peterson	31 East Bare Hill Rd.
Barbara D. White	Barbara D. White	11 Bowers Rd. Harvard
Stephen Finnegan	Stephen Finnegan	29 Whitney Rd 01451
Ruth Miller	Ruth Miller	75 Westcott Rd Ayer

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Signature	Name(Printed)	Address
Audrey A. Ball	Audrey A. Ball	85 Oak Hill Road
John A. Ball	JOHN A. BALL	85 OAK HILL ROAD
[illegible]	Laura Rogers	32 Sawyer Lane
B. William Spacciapoli	B WILLIAM SPACCIAPOLI	143 AYER ROAD HARVARD
J. Brinton Ferguson	J. BRINTON FERGUSON	11 Willow Harvard
[illegible]	Thomas Acinkiewicz	61 Depot Rd, Harvard
H. R. Kenna	H.R. KENNA	187 W. BARE HILL, HARVARD
[illegible]	Finnmert, Tim	77 W B are H[illegible]
[illegible]	JAMES L. WARE	90 E. BARE HILL Rd
[illegible]	Christopher Schnier	12 Old Boston Tpke
[illegible]	R DANTEDE[illegible]	221 Littleton Cnty Rd
[illegible]	Roy W. Pector	25 PARK LANE
Sue Fust	Sue First	42 STOW ROAD
David Cruise	David Cruise	113 Tahanto Tr.
Katherine R. Elkin	Katherine R. Elkin	23 Slough rd
[illegible]	John L. Finnmer	25 Hynes LANE
[illegible]	BRADIGH ROWERE	205 Stow Rd
D. Dancy	DESSA DANCY	145 Depot Rd
S. Hayward	SCOTT HAYWARD	5 ELM ST.
Cynthia Heibeld	Cynthia Heibeld-Davison	154 [illegible]
Barbara S Hendorfer	Barbara S Hendorfer	338 Stow Rd
Susan C. Jorgensen	Susan C. Jorgensen	39 Cleaves Hill Rd
Andrea Christiansen	ANDREA CHRISTIANSON	16 Mettacomett Path
Lisa Fox	LISA FOX	51 WESTCOTT RD.

OFFICES OF THE
BOARD OF SELECTMEN
TOWN ADMINISTRATOR

13 AYER ROAD • HARVARD, MASSACHUSETTS 01451 • (978) 456-4100
FAX: (978) 456-4107

April 23, 2001

Mr. James Chambers, USARFTA
BRAC Environmental Coordinator
30 Quebec Street, Unit 100
Devens, MA 01432-4429

Dear Mr. Chambers:

This is the Town of Harvard's response to the U.S. Army's proposed cleanup plan for AOC 57 Areas 2 and 3 at Devens, MA. According to your Proposed Plan dated February 2001, the intent of the cleanup is "to protect human health and the environment". We point out the contaminated sites are within the geographic bounds of our town and more significantly near Harvard's residential neighborhoods. Significantly, AOC 57 lies within the Cold Spring Brook flood plain, thus impacts important wetland habitats, overlays a medium yield aquifer, and appears to be within, or immediately adjacent to the Zone 2 area for the Grove Pond Wellsite. Therefore, the environmental implications, particularly as it relates to water quality, are a serious concern to us.

From the Proposed Plan, we discern the Army's current thinking as reflected in the preferred alternative is based largely on the following factors: 1) the site is vacant; 2) it is not located near active land use areas; 3) is within an area zoned for Rail Industrial and Trade related uses; and 4) the site and adjacent lands will eventually be redeveloped for commercial and/or industrial use. Further, your studies indicate no "significant adverse affects" to wildlife. Thus, the Army's solution to the AOC 57 problem is limited excavation of contaminated soils, institutional controls and imposition of land use restrictions "until cleanup goals are achieved". We note no timeframe to reach clean up goals, or how and when drinking water standards will be attained.

The Army's preferred alternative is not acceptable to the Town of Harvard. It does not provide sufficient effort "to protect human health and the environment", nor does it appear to comply with USEPA's nine criteria to balance the pros and cons of cleanup alternatives. Cost appears to be the overriding factor.

The AOC 57 site is vacant. However, its geographic (neighborhoods), biological (wetlands and wildlife) and geologic (aquifer) makeup combine to make it an Area of Concern, to our town, whereby any environment impact – whether soil contamination, water degradation, noise or visual impact – becomes a matter of serious concern and debate. MDFA understands this well. Such concern has caused MDFA to initiate a master plan process, now in progress, to determine what uses are appropriate in the area between Barnum Road and Cold Spring Brook. AOC 57 is in this zone.

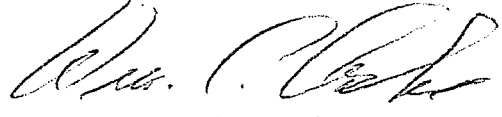
One-third of the Barnum Road/Cold Spring Brook area is "Preservation and Conservation" land, as classified in the Devens Open Space and Recreation Plan. Preservation and Conservation zones, according to this Plan, are locations "deserving of high standards of preservation, due to their unusual characteristics...". The Harvard Devens Environmental Committee in commenting on the master plan, has recommended to MDFA that the entire Barnum Road/Cold Spring Brook area be classified as a Preservation and Conservation zone. This, of course, would preclude any commercial or industrial development on lands abutting Cold Spring Brook or its flood plain.

Considering the above, with emphasis on the sensitivity and uniqueness of this riverine habitat, and noting the determined concern and interest of Harvard residents, the Board of Selectmen recommends the **highest level of cleanup and restoration** for the AOC 57 site. And the work must be done quickly. Therefore, we support the recommendations of PACE and CPRH and, specifically, we urge the Army to adopt:

- Alternative II – 4 for Area 2, unrestricted use;
- Alternative III – 3 for Area 3, unrestricted use;
- A Five (5) year goal to achieve drinking water standards; and
- An aggressive program of wetland restoration.

Thank you for the opportunity to comment.

Sincerely,



William C. Ashe, Chair
Board of Selectmen

cc: Senator Edward M. Kennedy
Senator John F. Kerry
Congressman Martin T. Meehan
Secretary Robert A. Durand
Senator Pamela P. Resor
Representative Geoffrey D. Hall
Representative Robert S. Hargraves
Ayer Board of Selectmen
James Murphy, USEPA
John Regan, MassDevelopment
Elizabeth Ainsley Campbell, NRWA
Mildred A. Chandler, CPRH
Laurie Nehring, PACE

Nashua River Watershed Association
592 Main Street, Groton, Massachusetts 01450-1230
Tel: 978/448-0299 Fax: 978/448-0941
E-mail: nrwa@ma.ultranet.com

April 24, 2001

Mr. James Chambers, Director
U.S. Army Reserve Forces Training Area
BRAC Environmental Office
30 Quebec Street, Unit 100
Devens, MA 01432

Dear Mr. Chambers:

Thank you for the opportunity to comment on the Army's Proposed Plan for AOC 57, located between Barnum Road and Cold Spring Brook on the northeast side of the former Main Post of Fort Devens.

The Nashua River Watershed Association concurs with Richard Doherty, the consultant for PACE, that a five year timetable be established to reach drinking water standards at AOC 57. We recognize that the monitoring plan to determine *if* drinking water standards have been met is important, and endorse Mr. Doherty's suggested approach. Further, we agree that natural attenuation needs to be demonstrated for *each* contaminant separately.

The Association sees it as the Army's responsibility to undertake remediation approaches that enable the highest level of clean up possible. For Area 2, we have considered recommending Alternative II-4. However, while we are tempted to request Alternative II-4 at the outset, we feel that perhaps the money could be better spent elsewhere at this point, and it is reasonable to monitor the situation before taking more action than outlined in Alternative II-3. With a five year timetable and monitoring plan in place to assure drinking water standards have been met, we can support the Army's recommendation of Alternative II-3 for Area 2. If, within the five years, drinking water standards have not been met, then further remediation must be undertaken.

With regard to Area 3, we have tried to evaluate if there are credible scenarios under which any potential contaminants remaining after completion of Alternative III-2 could impact drinking water supplies in the future. We feel that situation is not 100% clear and definite, and for this reason recommend Alternative III-3. While we do have some

concerns regarding the additional disturbance of the wetlands, we believe, on balance, that in this instance it is better to pursue the more thorough clean-up entailed in Alternative III-3.

In restoring the disturbed wetlands to native vegetation, we recommend carefully monitoring to be sure that invasive exotic species are not introduced.

Again, thank you for the opportunity to comment on AOC 57.

Sincerely,

Elizabeth Ainsley Campbell
Executive Director

cc: Senator Edward M. Kennedy
Senator John F. Kerry
Congressman Martin T. Meehan
Secretary Robert A. Durand
Senator Pamela P. Resor
Representative Geoffrey D. Hall
Representative Robert S. Hargraves
James Murphy, EPA
John Regan, DEP
Harvard Board of Selectmen
Ayer Board of Selectmen
Laurie Nehring, PACE
Mildred Chandler, Citizens to Protect Residential Harvard

APPENDIX D - ADMINISTRATIVE RECORD INDEX

Fort Devens – Area of Contamination 57

Administrative Record File

Index

Prepared for

New England District
Corps of Engineers

Prepared by
Harding ESE
107 Audubon Road, Suite 301, Wakefield, MA 01880
(781) 245-6606

ADMINISTRATIVE RECORD FILE INDEX

for

Fort Devens – AOC 57

Updated: July 18, 2001

2.0 REMOVAL RESPONSE

2.1 CORRESPONDENCE

1. MADEP Environmental Concerns and Recommendations for the Removal Action/ Contamination at Study Area 57 and the Cold Spring Brook Study, Barnum Road, Fort Devens, MA. filed in Group 1A. October 7, 1994.

2.2 REMOVAL RESPONSE REPORTS

Reports 2.2

1. Draft Removal Action Report, Study Area 57 - Area 2, Fort Devens, MA, OHM Remediation Services Corp., filed in Group 2&7. October 17, 1995.
2. Final Updates to Draft Removal Action Reports, Study Area 57 (Area 2) and AREE 63BE, OHM/Hopkinton, MA, filed in Group AREE. dated February 15, 1996.
3. USEPA Review of the Final Removal Action Reports for SA 57 and AREE 63BE, James P. Byrne, USEPA Region I, filed in Group 2&7, dated February 27, 1996.
4. Removal Action Report, Contaminated Soil Removal - Phase II, Study Area 57, Area 1, Storm Drain System No. 6 Outfall, Weston, filed in Group 2&7, dated July 1998.

Comments 2.2

4. Comments from USEPA New England on the Draft Removal Action reports for SA 57 - Area 2 and AREE 63BE, filed in Group AREE. comments dated November 20, 1995.
5. Comments from MADEP on the Draft Removal Action Report, Study Area 57, Area 2, Fort Devens MA (OHM, Inc., October 17, 1995). filed in Group 2&7. Comments Dated November 30, 1995.
6. MADEP letter from Christopher J. Knuth, MADEP re: Final Removal Action Report, Study Area 57 (OHM), filed in Group 2&7. Dated February 27, 1996.
7. Comments from James P. Byrne, USEPA New England, Review of the Removal Action Report for Study Area 57, Area 1 Storm Drain System No. 6 Outfall, filed in Group 2&7, dated August 25, 1998.
8. Comments from David M. Salvadore, MADEP on the Study Area 57, Area 1, Storm Drain System #6, Contaminated Soil Removal Phase II, Removal Action Report, prepared by Weston in July 1998. filed in Group 2&7. Comments dated September 14, 1998.

2.3

Reports 2.3

1. Devens - AOC 57 Area 2, Supplemental Soil Sampling Letter Report, prepared by Rod R. Rustad, Harding ESE, filed in Group 2&7. January 12, 2001.

2.6 WORK PLANS AND PROGRESS REPORTS

Comments 2.6

1. Comments from Christopher J. Knuth, MADEP on Contaminated Soil Removal - Phase II, Study Area 57, Area 1 Storm Drain System (SDS), No. 6 Outfall. filed in Group 2&7. Comments dated February 7, 1997.

2.9 ACTION MEMORANDA

Reports 2.9

1. Action Memorandum, Area of Contamination (AOC) 57, Devens, Massachusetts, Harding ESE. filed in Group 2&7. Document dated February 1999.

Comments 2.9

2. Comments from James P. Byrne, USEPA on the Action Memorandum & Field Sampling Plan for Study Area 57, Study Area 1, Storm Drain System No. 6 Outfall, filed in Group 2&7. Comments dated November 20, 1996.
3. Comments from Christopher J. Knuth, MADEP on Action Memorandum, Contaminated Soil Removal - Phase II, Study Area 57, Area 1 Storm Drain System (SDS), No. 6 Outfall, filed in Group 2&7. Comments dated January 31, 1997.
4. Comments from Jerry Keefe, USEPA on the Action Memorandum for Area of Contamination 57 (AOC 57). filed in Group 2&7. Comments dated February 5, 1999.
5. Comments from David M. Salvadore, MADEP on Action Memorandum, Area of Contamination (AOC) 57, Devens, Massachusetts, HLA, filed in Group 2&7. dated February 10, 1999.

Responses to Comments 2.9

6. U.S. Army Corps of Engineers Response to Comments on the Action Memorandum for Area of Contamination (AOC) 57, Devens, Massachusetts. filed in Group 2&7. Resp. to comments dated February, 1999.

3.0 REMEDIAL INVESTIGATION (RI)

3.4 INTERIM DELIVERABLES

Workplan 3.4

1. Risk Assessment Approach Plan, Remedial Investigation Reports, AOCs 57 and 63AX, Fort Devens, MA, prepared by ABB Environmental Services, Inc. filed in Group 2&7. Dated March 12, 1996.

Comments 3.4

2. Comments from James P. Byrne, USEPA Region I on the Risk Assessment Approach Plan, Remedial Investigation Reports, AOCs 57 and 63AX, Fort Devens, MA. filed in Group 2&7. Dated April 15, 1996.
3. Comments from Christopher J. Knuth, MADEP on the Risk Assessment Approach Plan, Remedial Investigation Reports, AOCs 57 and 63AX, Fort Devens, MA. filed in Group 2&7. Dated April 23, 1996.

3.6 REMEDIAL INVESTIGATION (RI) REPORTS

Reports 3.6

1. Draft Remedial Investigation Report, AOC 57, ABB Environmental Services, Inc. filed in Group 2&7. Dated March 1997.
2. Final Remedial Investigation Report for Area of Contamination (AOC) 57, Devens, Massachusetts. Prepared by Harding Lawson Associates, filed in Group 2&7. Dated June 2000.

Comments 3.6

3. Comments from Christopher J. Knuth, MADEP on the Draft Remedial Investigation Report, AOC 57, Volumes I through III. filed in Group 2&7. Dated May 5, 1997.
4. Comments from James P. Byrne, USEPA on the Draft Remedial Investigation Report for AOC 57. filed in Group 2&7. Dated May 19, 1997.
5. Comments from James P. Byrne, USEPA on the Response to Comments on the Draft Remedial Investigation Report for AOC 57. filed in Group 2&7. Dated September 18, 1997.
6. Comments by Jerry Keefe, USEPA on the Draft Final Remedial Investigation Report, Area of Contamination (AOC) 57, Volumes I - III, Devens, Massachusetts, October 1999. filed in Group 2&7. Comments dated December 16, 1999.

Responses to Comments 3.6

7. Responses Dated August 1997 to Comments from MADEP and USEPA on the "Draft Remedial Investigation Report for Area of Contamination (AOC) 57", ABB Environmental Services, Inc., March 1997.

Responses to Responses to Comments 3.6

8. Rebuttal from James P. Byrne Dated September 18, 1997, from James P. Byrne, USEPA Region I, to the Response to Comments on the Draft Remedial Investigation Report for AOC 57. filed in Group 2&7.
9. MADEP Rebuttals from David M. Salvadore (dated October 16, 1997) to US Army Responses to MADEP Comments on the Draft Remedial Investigation Report for AOC 57, Fort Devens, Massachusetts. filed in Group 2&7.

3.7 WORK PLANS AND PROGRESS REPORTS

Workplan 3.7

1. Draft Task Order Work Plan, AOCs 57, 63AX and 69W, Data Item A002, ABB Environmental Services, Inc. filed in Group 2&7. Dated July 1995.
2. Final Task Order Work Plan, AOCs 57, 63AX and 69W, Data Item A002, ABB Environmental Services, Inc. filed in Group 2&7. Dated January 1996.
3. Draft RI/FS Supplemental Workplan for Area of Contamination (AOC) 57, Areas 2 and 3, Rod R. Rustad, ABB Environmental Services, Inc. filed in Group 2&7. Dated March 12, 1998.
4. Final RI/FS Letter Work Plan for Area of Contamination (AOC) 57 Area 3, Devens, Massachusetts. Prepared by Harding Lawson Associates. filed in Group 2&7. Dated June 1, 2000.

Reports 3.7

5. Request for extensions on AREE 61 Final Report, AREE 63 Final Report, Draft Work Plan for AOCs 57, 63X & 69W and the Draft Remedial Investigation Reports for AOCs 41, 43G & 43J. James P. Byrne. filed in Group 2&7. Dated August 16, 1995.

Comments 3.7

6. Comments from Jerome C. Keefe, USEPA Region 1 on the Draft Task Order Work Plan, AOCs 57, 63AX and 69W, Data Item A002. filed in Group 2&7. Comments dated August 18, 1995.
7. Comments from Christopher J. Knuth, MADEP on Task Order No. 0001, Modification No. 1, Fort Devens Final RI/FS Task Work Plan Addendum for AOC 57 (ABB-ES, August 28, 1996). filed in Group AREE. Comments dated September 12, 1996.
8. Comments from D. Lynne Welsh, MADEP on the Draft Task Order Work Plan, AOCs 57, 63AX and 69W, Data Item A002. filed in Group 2&7. Comments dated September 15, 1995.
9. Comments from Christopher J. Knuth, MADEP on the Rebuttals to Army Responses to Comments for Draft Task Order Work Plan, AOC 57 and 69W and Comments on Final Task Order Work Plan AOC 57, 63AX and 69W. filed in Group 2&7. Dated February 27, 1996.
10. Comments from Christopher J. Knuth, MADEP on the Final Task Order Work

Plan, AOCs 57, 63AX, & 69W, Data Item 002. filed in Group 2&7. Dated February 27, 1996.

11. Comments from Jerome C. Keefe, USEPA Region I USEPA Comments on the Final Task Order Work Plan for Areas of Contamination 57, 63AX, & 69W. filed in Group 2&7. Comments dated February 27, 1996.
12. Comments from James P. Byrne, USEPA Region I on the RI/FS Work Plan Addendums for AOCs 57 and 69W, (ABB-ES). filed in Group 2&7. Comments dated July 11, 1996.
13. Comments from David M. Salvadore, MADEP on the Draft RI/FS Supplemental Workplan, Area of Contamination (AOC) 57, Areas 2 and 3. filed in Group 2&7. Comments dated March 24, 1998.
14. Comments from James P. Byrne, USEPA on the Draft RI/FS Supplemental Work Plan for AOC 57 - Areas 2 & 3. filed in Group 2&7. Comments dated March 31, 1998.
15. Comments from Jerry Keefe, USEPA regarding the Draft RI/FS Letter Work Plan for (AOC) 57 - Area 3. Jerry Keefe, USEPA. filed in Group 2&7. Comments dated May 18, 2000.

Responses to Comments 3.7

16. Response to Comments, Draft Task Order Work Plan, AOCs 57, 63AX and 69W, Data Item A002, ABB Environmental Services, Inc. filed in Group 2&7. Dated January 1996.
17. Response to Comments on the Draft RI/FS Supplemental Workplan for AOC 57, Areas 2 and 3 from Army Corps of Engineers. filed in Group 2&7. Dated April 1998.
18. Response to Comments on the RI/FS Letter Work Plan for Area of Contamination (AOC) 57 Area 3, Devens, Massachusetts. Prepared by Harding Lawson Associates for the US Army Corps of Engineers. filed in Group 2&7. Dated June 2000.

Responses to Responses to Comments 3.7

19. Christopher J. Knuth, MADEP, MADEP Rebuttals to the Army Response to Comments for the Draft Task Order Work Plan, AOCs 57, 63AX, & 69W, Data Item 002, AND (2) MADEP Comments on the Final Task Order Work Plan, AOCs 57, 63AX, & 69W, Data Item 002. filed in Group 2&7. Dated February 27, 1996.

Meeting Notes 3.7

20. Letter to Mark Applebee from Rod Rustad, ABB-ES, re: Supplemental Workplan for AOC 57 Areas 2 and 3. filed in Group 2&7. Dated March 12, 1998

4.0 FEASIBILITY STUDY (FS)

4.6 FEASIBILITY STUDY (FS) REPORTS

Reports 4.6

1. Draft Focused Feasibility Study Report, Area of Contamination 57, Devens, Massachusetts. Prepared by Harding Lawson Associates. filed in Group 2&7. Dated June 2000.
2. Final Focused Feasibility Study Report, Area of Contamination 57, Devens, Massachusetts. Prepared by Harding ESE for the US Army Corps of Engineers, New England District. filed in Group 2&7. Dated November 2000.

4.7 WORK PLANS AND PROGRESS REPORTS

Comments 4.7

1. Comments from James P. Byrne, USEPA on the Draft RI/FS Task Work Plan Addendum for AOCs 69W and 57. filed in Group 2&7. Comments dated June 1996.
2. Comments from Christopher J. Knuth, MADEP on Task Order No. 0001, Modification No. 1, RI/FS Task Work Plan Addendum for AOC 57, Fort Devens, Mass. (ABB-ES, June 28, 1996). filed in Group 2&7. Comments dated August 8, 1996.
3. Christopher J. Knuth, MADEP, Review of Response to Comments, Draft RI/FS Task Work Plan Addendum for AOCs 69W and 57. filed in Group 2&7. Dated September 12, 1996.

4.9 PROPOSED PLAN FOR SELECTED REMEDIAL ACTION

Reports 4.9

1. Proposed Plan, AOC 57, U.S. Army Reserve Forces Training Area, Devens, Massachusetts, Harding ESE. filed in Group 2&7. Dated February 2001.

5.0 RECORD OF DECISION (ROD)

5.4 RECORD OF DECISION

Reports 5.4

1. Final No Further Action Decision Document, AREE 66C: Building 3657 Transformer #767-1845, Fort Devens, Massachusetts. Prepared by ABB Environmental Services, Inc. filed in Group AREE. Dated December 1995.

APPENDIX E - DECLARATION OF STATE CONCURRENCE

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Central Regional Office, 627 Main Street, Worcester, MA 01608

JANE SWIFT
Governor

BOB DURAND
Secretary

LAUREN A. LISS
Commissioner

September 11, 2001

Ms. Patricia Meaney
Director
Office of Site Remediation and Restoration
U.S. Environmental Protection Agency
JFK Federal Building
1 Congress Street
Boston, MA 02114

RE: Final Record of Decision, Area of Contamination 57, U.S. Army Reserve Forces Training Area, Devens, Massachusetts (Sept 2001)

Dear Ms. Meaney,

The Massachusetts Department of Environmental Protection (MADEP) has reviewed the Record of Decision (ROD) proposed by the United States Army for AOC 57. The MADEP has worked closely with both the Army and the U.S. Environmental Protection Agency and is pleased to concur with the Army's selected remedial action for the site.

The remedy presented in the ROD is the culmination of a long effort to remediate contaminated soil at AOC 57. The Army's completion of additional sampling and analyses at Areas II and III as well as agreeing to remove additional soil has favorably resolved MADEP's concerns regarding contaminated site media.

Key actions detailed in the proposed ROD at both areas include:

- Soil Excavation and Treatment/Disposal at an Approved Facility
- Wetlands Protection
- Institutional Controls
- Long Term Environmental Monitoring
- Institutional Control Inspections
- Five Year site Reviews

The MADEP has worked closely with the Army, EPA and the public for the past five years in the development of a remedy for AOC 57. Our concurrence with the remedial alternative is based on this involvement as well as the remedy's compliance with Applicable or Relevant and Appropriate Requirements (ARAR) and it's overall protectiveness of human health and the environment. We greatly appreciate the Army's efforts to encourage public participation as well as developing remedial options that that incorporate concerns that were raised throughout the process . We look forward to continuing to work with the EPA and the Army during the implementation of the remedy.

Sincerely,

Robert W. Golledge Jr.
Regional Director
Central Regional Office

cc: Fort Devens Mailing List
Carol Keating, EPA
Benjamin Goff, BRAC