



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
NEW ENGLAND - REGION I  
1 CONGRESS STREET, SUITE 1100 (HBT)  
BOSTON, MASSACHUSETTS 02114-2023

March 1, 2007

Mr. John McHugh  
U.S. Department of the Army  
Environmental, Safety, & Health Office  
Soldier Systems Center  
Kansas Street  
Natick, Massachusetts 01760-5049

**Re: *First Five-Year Review Report (2001-2006) for the Natick Soldier Systems Center***

Dear Mr. McHugh:

This office is in receipt of the Army's First Five-Year Review Report for the Natick Soldier System Center (formerly known as Natick Army Labs), dated January 2007. Because the only remedy implemented thus far at the base is a ground water extraction and treatment remedy, the statute does not require a Five-Year Review (FYR) as matter of policy or statute until 5 years after all remedial construction is completed at such a site. However, the Environmental Protection Agency (EPA) and the Army have agreed to conduct this review at their own discretion.

Upon review of this report, EPA concurs with the findings that the CERCLA remedy for operable unit 1 (T-25 Area) is currently protective of human health and the environment. The remedy for the T-25 Area ground water is expected to be protective of human health and the environment upon attainment of the cleanup goals, as presented in the 2001 Record of Decision (ROD). In the interim, exposure pathways that could result in unacceptable risks are being controlled through institutional controls, which restrict use of ground water on-site and off-site.

EPA also agrees with the recommendations and follow-up actions in the following table taken from the FYR document:

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
Extraction well pumping rate decline	Perform regular maintenance and redevelopment of extraction wells to insure optimal pumping rates and maintain containment.	Army	EPA	2007	No	Yes
Residual off-site TCE* concentrations	Continue monitoring off-site wells in accordance with LTMP*, and install additional off-site extraction well to optimize cleanup.	Army	EPA	2007-2011	No	Yes
Limited evidence for MNA*	Continue monitoring for MNA* parameters in accordance with the LTMP*.	Army	EPA	2007-2011	No	Yes
Optimization using enhanced bioremediation	Implement proposed optimization study and perform required long-term monitoring and data evaluation to determine effectiveness of enhanced bioremediation	Army	EPA	2006-2007	No	Yes
January 2004 EPA Manganese Health Advisory lowers cleanup goal	Revise the LTMP to compare groundwater monitoring data to 300 ppm	Army	EPA	2007	No	Yes
Several COC* concentrations are below the 2001 ROD cleanup goals.	Revise the LTMP* to eliminate requirement for monitoring of COCs* below cleanup goals	Army	EPA	2007	No	No

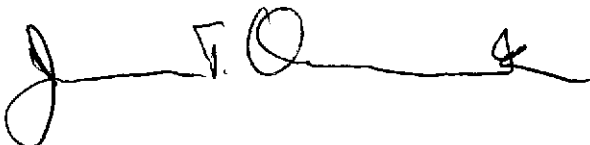
\* Acronyms: TCE-trichloroethene; LTMP-long term monitoring plan; MNA-monitored natural attenuation; COC-contaminant of concern

Consistent with EPA's *Comprehensive Five-Year Review Guidance (OSWER Directive 9355.7-03B-P)*, the next five-year review should be finalized within five years of completing all construction required for clean up at the entire site or within five years of the initiation of the first remedial action that leaves hazardous substances, pollutants or contaminants on site above levels

that allow for unrestricted use, whichever comes first. EPA and the Army may also determine that another discretionary review is warranted at an earlier time.

EPA looks forward to working with the Army as we continue the cleanup at the Natick Soldier System Center. If you have any questions, please call Ms. Christine Williams, Remedial Project Manger, at (617) 918-1384.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. T. Owens', with a stylized flourish at the end.

James T. Owens, Director  
Office of Site Remediation and Restoration

cc: Bryan Olson, EPA-New England  
Mary Sanderson, EPA-New England  
Christine Williams, EPA-New England  
Katherine Garufi, EPA HQ  
Robert Campbell, MassDEP



**First Five-Year Review Report**

**for**

**U.S. Army Soldier Systems Center (SSC)  
Town of Natick  
Middlesex County, Massachusetts**

**Final**

**January 2007**

***Prepared for:***

U.S. Army Soldier Systems Center  
Natick, Massachusetts

***Prepared by:***

ICF International  
33 Hayden Avenue  
Lexington, MA 01460



**First Five-Year Review Report**  
**for**  
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**Middlesex County, Massachusetts**

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Approved by:

A handwritten signature in black ink, appearing to read "John J. McHugh".

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John J. McHugh  
Director, Environmental Safety & Health  
U.S. Army Soldier Systems Center

Date:

January 26, 2007

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## List of Acronyms

ADL	Arthur D. Little, Inc.
ANL	Argonne National Laboratory
ARAR	Applicable or Relevant and Appropriate Requirements
ATSDR	Agency for Toxic Substances and Disease Registry
AWQC	Ambient Water Quality Criteria
bgs	Below Ground Surface
BP	Boiler Plant
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of Concern
COPCs	Chemicals of Potential Concern
CTE	Central Tendency Exposure (Average)
DCE	Dichloroethene
DO	Dissolved Oxygen
EPA	United States Environmental Protection Agency
EPH	Extractable Petroleum Hydrocarbons
ERA	Ecological Risk Assessment
FD	Field Duplicate
Fe <sup>2+</sup>	Ferrous Iron
FFA	Federal Facilities Agreement
FPGS	Former Proposed Gymnasium Site
FS	Feasibility Study
GAC	Granular Activated Carbon
GPM	Gallons per Minute
HHRA	Human Health Risk Assessment
HLA	Harding Lawson Associates
LL	Lake Level
LRP	Little Roundy Pond
LTM	Long Term Monitoring
LTMP	Long Term Monitoring Program
µg/L	Micrograms per Liter
µS/cm	MicroSiemens per Centimeter
mg/L	Milligrams per Liter
mL/min	Milliliters per Minute
MaDEP	Massachusetts Department of Environmental Protection
MCL	Maximum Contaminant Level
MCP	Massachusetts Contingency Plan
MEP	Master Environmental Plan
MNA	Monitored Natural Attenuation
MOE LEL	Ontario Ministry of the Environment Lowest Effect Level
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MSL	Mean Sea Level



MSO	Main Stormwater Outfall
MTBE	Methyl tertbutyl ether
MV	Millivolts
MW	Monitoring Well
NA	Not Applicable
NC	Not Calculated
NERI	Northeast Research Institute
NPL	National Priorities List
NS	Not Sampled
NRDEC	Natick Research, Development, and Engineering Center
NTU	Nephelometric Turbidity Units
ORNL	Oak Ridge National Laboratory
ORP	Oxidation Reduction Potential
PAHs	Polynuclear Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethene or Perchloroethene
PLC	Programmable Logic Control Panel
POL	Petroleum Oil Lubricant
PVC	Polyvinyl Chloride
QAPP	Quality Assurance Project Plan
RAQ	Remedial Action Objectives
RI	Remedial Investigation
RME	Reasonable Maximum Exposure
ROD	Record of Decision
S <sup>2-</sup>	Sulfide
SDW	Small-Diameter Well
SI	Site Investigation
SQT	Sediment Quality Triad
SSC	U.S. Army Soldier Systems Center
SSCOM	U.S. Army Soldier Systems Command
SVL	Springvale Well
SVOC	Semivolatile Organic Compound
S-1/GW-1	Soil and Groundwater Category 1
TCA	Trichloroethane
TCE	Trichloroethene
TEC	Threshold Effect Concentrations
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
TRV	Toxicity Reference Value
TS	Treatability Study
USATHAMA	U.S Army Toxic and Hazardous Materials Agency
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound

VPH  
WAC  
WQP  
WSW

Volatile Petroleum Hydrocarbons  
Waste Acceptance Criteria  
Water Quality Parameters  
Water Supply Well

## Executive Summary

The U.S. Army Soldier Systems Center (SSC) is an active research and testing facility, owned and operated by the Federal government through the Department of the Army. SSC is located approximately 17 miles west-southwest of Boston in Natick, Massachusetts. SSC has been a permanent Army installation since October 1954. Its mission includes research and development activities in food engineering, food science, clothing, equipment, materials engineering, and aero-mechanical engineering. The land use surrounding SSC includes residential, commercial/retail, and light industrial areas. The facility is located approximately 2,500 feet southeast of the town of Natick's Springvale Municipal Water Supply Well Field (Springvale Well Field). The ground water beneath the entire SSC facility has been designated as a Zone II for the town of Natick Springvale Well Field.

In May 1993, SSC, then known as the Natick Laboratory Army Research, Development, and Engineering Center, was proposed for inclusion on the National Priorities List (NPL). It was officially added to the NPL in May 1994 as a result of ground water contamination found at the T-25 Area and its location relative to the town of Natick Springvale Well Field. Currently, in addition to the T-25 Area, there are ten other sites within SSC that have been, or are being, investigated. The cleanup of these sites is being conducted under the Army's IRP and meets the requirements of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act (SARA) of 1986.

The First Five-Year Review was conducted at SSC in accordance with the current and applicable U.S. Environmental Protection Agency (EPA) five-year review guidance (EPA 540-R-01-007, OSWER No. 9355.7-03B-P) and the April 2000 memorandum from the Assistant Chief of Staff for Installation Management (ACSIM), subject: *Interim Army Guidance for Conducting Five-Year Reviews*. The Department of the Army is the lead agency that is remediating the SSC NPL site in accordance with the requirement of CERCLA, as amended by SARA of 1986. The purpose of the five-year review process is to determine whether the remedies at the SSC NPL site are, or are expected to be, protective of human health and the environment, and are functioning as designed.

A Federal Facilities Agreement (FFA) for SSC was signed by the Army on July 23, 2006 and by the EPA on August 2, 2006. The FFA public comment period started on September 3, 2006 and closed on October 18, 2006. The FFA will become effective as early as October 18, 2006 (if no public comments are received), but not later than 51 days following October 18, 2006 (if public comments are received), in accordance with Section 35 of the FFA. The trigger date for the first Five-Year Review is October 29, 2001, based upon the first remedial action start date which left waste in place at SSC, documented to be October 29, 2001 for the T-25 Area (Operable Unit 1).

A total of 11 sites were reviewed during the First Five-Year Review, including one site in active long-term monitoring, eight sites currently under investigation, and two anticipated no further action sites. The T-25 Area Ground Water site (Operable Unit 1) is the only site currently in active long-term monitoring. Groundwater at a number of other sites is being monitored under a comprehensive, facility-wide program, even though these sites do not have either RODs or formal long-term monitoring plans. The remedy at Operable Unit 1, as presented in the 2001 Record of Decision (ROD), was reviewed to ensure that it is functioning as designed and that it continues to be protective of human health and the environment. The remedy for the T-25 Area ground water is in place and is expected to be protective of human health and the environment upon attainment of the cleanup goals, as presented in the 2001 ROD. In the interim, exposure pathways that could result in unacceptable risks are being controlled through institutional controls, which restrict use of ground water on-site and off-site. Please see Appendix D for the annual certification letters.

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## Five-Year Review Summary Form

<i><b>SITE IDENTIFICATION</b></i>		
EPA ID (from WasteLAN): MA1210020631		
Region: 1	State: MA	City/County: Natick/Middlesex County
<i><b>SITE STATUS</b></i>		
NPL status: Final <input checked="" type="checkbox"/> Deleted <input type="checkbox"/> Other (specify) _____		
Remediation status (choose all that apply): <input type="checkbox"/> Under Construction <input checked="" type="checkbox"/> Operating <input type="checkbox"/> Complete		
Multiple OUs? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Construction completion date: _____	
Has site been put into reuse? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
<i><b>REVIEW STATUS</b></i>		
Author name: Prepared by ICF International under contract to U.S. Army Soldier Systems Center (SSC)		
Author title: _____	Author affiliation: _____	
Review period:** 10 / 29 / 2001 to 10 / 29 / 2006		
Date(s) of site inspection: 03 / 06 / 2006		
Type of review: <input type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only <input type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead <input checked="" type="checkbox"/> Regional Discretion		
Review number: <input checked="" type="checkbox"/> 1 (first) <input type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify) _____		
Triggering action: <input type="checkbox"/> Actual RA Onsite Construction at OU # _____ <input type="checkbox"/> Actual RA Start at OU# _____ <input type="checkbox"/> Construction Completion <input type="checkbox"/> Previous Five-Year Review Report <input checked="" type="checkbox"/> Other (specify) First Remedial Action Start date which left waste in place at SSC, October 29, 2001 for OU-1 ( T-25 Area)		
Triggering action date (from WasteLAN): 10 / 29 / 2001		
Due date (five years after date of PCOR): _____		
NOTES:		
<u>Army Designation</u>	<u>EPA Designation</u>	<u>Name</u>
NRDEC 05	OU-1	T-25 Area Ground Water
NRDEC 15	None Given	Storage Area
NRDEC 04	None Given	Pit Area Waste Oil Storage Tank
NRDEC 16	OU-4	Buildings 22&36
NRDEC 11	OU-5	Buildings 63/2/45
NRDEC 14	None Given	Boiler Plant Area
NRDEC 03	OU-7	T62/T68
NRDEC 06	OU-3	Former Proposed Gym Site
NRDEC 09	OU-6	Building 14
NRDEC 12	OU-6	Building 13
NRDEC 07,10,17	OU-2	SSC Shoreline Surface Water and Sediments

\* ["OU" refers to operable unit.]

\*\* [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

## Five-Year Review Summary Form, cont'd.

### Issues:

*Summarize issues.*

### Active Sites in Long-Term Monitoring:

#### **NRDEC 05 (OU-1) – T-25 Area Ground Water**

1. Recent extraction system pumping rate has decreased from historical rates.
2. Trichloroethene (TCE) and tetrachloroethene (PCE) contaminant concentrations in excess of cleanup goals are currently present in ground water off-site and may be in the future.
3. Review of natural attenuation parameters suggests only limited evidence exists for ongoing biologic reduction of the primary contaminants of concern (COCs) (PCE and TCE).
4. Remedy optimization using enhanced bioremediation may not provide significant reduction in concentrations due to insufficient contact time in silts and unidentified areas of elevated contaminant concentrations.
5. Secondary COC concentrations [chromium, lead, manganese, nickel, thallium, and vanadium], DDT, and bis(2-ethylhexyl)phthalate] from recent and previous ground water monitoring events (based on the low-stress sampling technique) do not exceed the cleanup goals in the 2001 ROD.

### Sites Under Investigation:

#### **NRDEC 16 (OU-4) – Buildings 22 and 36**

1. The preferred alternative, ground water extraction and treatment with mass reduction (through biological enhancement), needs to demonstrate containment of the plume given the proximity to the lake and the demonstrated hydrologic connection of the aquifer to the lake.
2. FS has not been finalized.
3. Proposed Plan and ROD (or ROD amendment) for ground water has not been prepared.

#### **NRDEC 11 (OU-5) – Post Drinking Water Wells (Buildings 63, 2, and 45 Area)**

1. Additional delineation may be required to identify source and extent of TCE and/or 1,4-dioxane associated with the Buildings 63, 2, and 45 area.
2. SI (Harding ESE, 2005) and RI (Harding ESE, 2001) have not been finalized. A baseline ERA has not been performed using the more recently collected SI soil or ground water data.
3. FS for ground water has not been prepared.
4. Proposed Plan and ROD (or ROD amendment) for ground water has not been prepared.

#### **NRDEC 14 – Boiler Plant Site (Building 19)**

1. Dieldrin concentrations in ground water at MW-40B-2 continue to sporadically exceed MCP GW-1 standards.
2. Annual ground water monitoring of 10 Boiler Plant wells for SVOC's have been performed since the completion of the Phase II SI. SVOC and PAH concentrations have remained below relevant drinking water criteria since this time.
3. A Proposed Plan and ROD for the soils at the Boiler Plant site have not been prepared.

#### **NRDEC 03 (OU-7) – T62/68 Lab Pack Waste Storage Area (NRDEC 13 combined with NRDEC 03)**

1. A Proposed Plan and ROD for the soils at the Buildings 62 and 68 area has not been prepared.

## Five-Year Review Summary Form, cont'd.

### Issues, cont'd.

#### **NRDEC 06 (OU-3) – Former Proposed Gymnasium Site**

1. PCE and TCE have been detected in wells at and near FPGS. The site history, initial actions, and removal actions all relate to POL constituents. Ground water data do not historically indicate chlorinated solvent issues, however recent monitoring shows the presence of these compounds. Although concentrations in MW-5R are below EPA MCLs, PCE concentrations in MW-114B-2 are above MCLs. It is unclear from the ground water data if MW-114B-2 is an effective monitoring point for the FPGS because it is over 400 feet downgradient and screened in a deeper aquifer zone than the originally identified contaminants.
2. 13 Quarterly sampling events have been performed at the FPGS wells since the soil removal action, and benzene no longer appears to be a COC in ground water.
3. FPGS RI Report (Harding ESE, 2001) has not been finalized.
4. A Proposed Plan and ROD for the soils at the FPGS have not been prepared.

#### **NRDEC 09 (OU-6) – Building 14 POL Hazardous Site**

1. Ground water is contaminated with 2-methylnaphthalene, C9-C10 aromatics, and C11-C22 aromatics at concentrations exceeding current MCP GW-1 standards in one well (MW-128A) located to the west-northwest of Building 15. This well and others in the vicinity of Building 14 have been incorporated into the facility-wide ground water monitoring program.
2. Implement soil removal action and prepare Removal Action Closure Report.
3. Incomplete removal of subsurface soil contamination during the removal action, due to the presence of a dense utility line network, could leave contamination at concentrations that do not allow for unrestricted use and unlimited exposure.
4. A Proposed Plan and ROD at the Building 14 site have not been prepared

#### **NRDEC 12 (OU-6) – Building 13 Classified Incinerator**

1. Implement soil removal action and prepare Removal Action Closure Report.
2. A Proposed Plan and ROD at the former Building 13 site have not been prepared.

#### **NRDEC 07/10/17 (OU-2) – Overall Lake Cochituate and SSC Shoreline**

1. Investigations indicate that no significant human health or ecological risks are associated with exposures to surface water along the SSC shoreline.
2. If an active remedial action is deemed necessary, additional horizontal and vertical profiling of sediment PCB concentrations may be necessary to refine the area and cost of the remedy.
3. Ground water contaminated with chlorinated solvents is discharging to the near-shore areas of Lake Cochituate near Buildings 22 and 36 and Buildings 63, 2, and 45 area.
4. A lake-specific angler survey has recently been completed and revised ingestion rates have been calculated. However, the impact of the new ingestion rates on the risk calculations has not been determined.
5. FS, Proposed Plan, and ROD for site-wide sediments have not been prepared.
6. Public concerns have been expressed about various sediment remedial alternatives and their potential affect on the overall quality of the South Pond of Lake Cochituate.



## Five-Year Review Summary Form, cont'd.

### **Recommendations and Follow-up Actions:**

*Summarize recommendations and follow-up actions.*

### **Active Sites in Long-Term Monitoring:**

#### **NRDEC 05 (OU-1) – T-25 Area Ground Water**

1. Perform regular maintenance and redevelopment of extraction wells to insure optimal pumping rates and maintain containment.
2. Continue monitoring off-site wells in accordance with LTMP, and install additional off-site extraction well to optimize cleanup.
3. Continue monitoring for MNA parameters in accordance with the LTMP.
4. Implement proposed optimization study and perform required long-term monitoring and data evaluation to determine effectiveness of enhanced bioremediation
5. Revise the LTMP to eliminate requirement for monitoring of secondary COCs.

### **Anticipated No Further Action Sites:**

#### **NRDEC 15 - Storage Area/Chlordane Contamination**

This site is not included in the ROD for the T-25 Area ground water (OU-1). It is anticipated that this site will be included in an all inclusive ROD all the soil sites of interest at SSC.

#### **NRDEC 04 - Pit Area Waste Oil Tank**

This site is not included in the ROD for the T-25 Area ground water (OU-1). It is anticipated that this site will be included in an all inclusive ROD all the soil sites of interest at SSC.

### **Sites Under Investigation:**

#### **NRDEC 16 (OU-4) – Buildings 22 and 36**

1. Additional delineation and hydrogeological studies may be required as part of the remedial design or implementation to characterize this issue.
2. Finalize FS.
3. Prepare Proposed Plan and ROD.

#### **NRDEC 11 (OU-5) – Post Drinking Water Wells (Buildings 63, 2, and 45 Area)**

1. Additional delineation and hydrogeological studies may be required to address this issue.
2. Conduct ERA using SI soil and ground water data. Finalize SI and RI.
3. Prepare FS.
4. Prepare Proposed Plan and ROD.

#### **NRDEC 14 – Boiler Plant Site (Building 19)**

1. Continue quarterly monitoring of MW-40B-2 under facility-wide CERCLA monitoring program.
2. Discontinue sampling and analysis of SVOCs at the Boiler Plant monitoring wells.
3. Prepare Proposed Plan and ROD.

**Five-Year Review Summary Form, cont'd.**

**Recommendations and Follow-up Actions, cont'd.**

**NRDEC 03 (OU-7) – T62/68 Lab Pack Waste Storage Area (NRDEC 13 combined with NRDEC 03)**

1. Prepare Proposed Plan and ROD.

**NRDEC 06 (OU-3) – Former Proposed Gymnasium Site**

1. The relationship of the chlorinated compounds to the original site description (POL releases) should be defined, and if not related, the POL site should be closed out through a ROD. Additional investigation to the south and east should be conducted to determine the source and extent of non-POL contaminants.
2. Reduce frequency of VOC sampling and analysis to annual for most FPGS wells, with the exception of wells MW-5R and MW-114B-2, which should continue on a quarterly basis.
3. Finalize RI Report.
4. Prepare Proposed Plan and ROD.

**NRDEC 09 (OU-6) – Building 14 POL Hazardous Site**

1. Continue monitoring MW-128A and other wells in the vicinity of Building 14 during the facility-wide ground water monitoring program. If GW-1 exceedances persist, perform additional soil and groundwater sampling in the area to the northwest of Building 15, to evaluate the extent of contamination associated with the former 1,500 gallon fuel oil UST.
2. Implement planned soil removal action during 2006 and prepare Removal Action Closure Report.
3. Implement planned soil removal action and collect confirmatory soil samples in vicinity of utility lines to evaluate whether remaining contaminant concentrations exceed cleanup goals.
4. Prepare Proposed Plan and ROD for Building 14 site.

**NRDEC 12 (OU-6) – Building 13 Classified Incinerator**

1. Implement planned soil removal action during 2006 and prepare Removal Action Closure.
2. Report. Prepare Proposed Plan and ROD for former Building 13 site.

**NRDEC 07/10/17 (OU-2) - Overall Lake Cochituate and SSC Shoreline**

1. No further evaluation or assessment of surface waters is recommended.
2. If required, additional horizontal and vertical profiling of PCB contamination should be performed as part of the remedial design or construction phase.
3. Monitor lake surface water and sediment quality in the near-shore areas at Buildings 22 and 36 and Buildings 63, 2, and 45, as part of the ground water ROD for each of these areas.
4. If agreed to with regulators, recalculate human health risks based on new angler-survey ingestion rates.
5. Prepare an FS (as necessary), Proposed Plan, and ROD for site-wide sediments.
6. If an FS is developed, address public concerns regarding remedial alternatives on overall lake quality.

## Five-Year Review Summary Form, cont'd.

### **Protectiveness Statement(s):**

*Include individual operable unit protectiveness statements. For sites that have reached construction completion and have more than one OU, include an additional and comprehensive protectiveness statement covering all of the remedies at the site.*

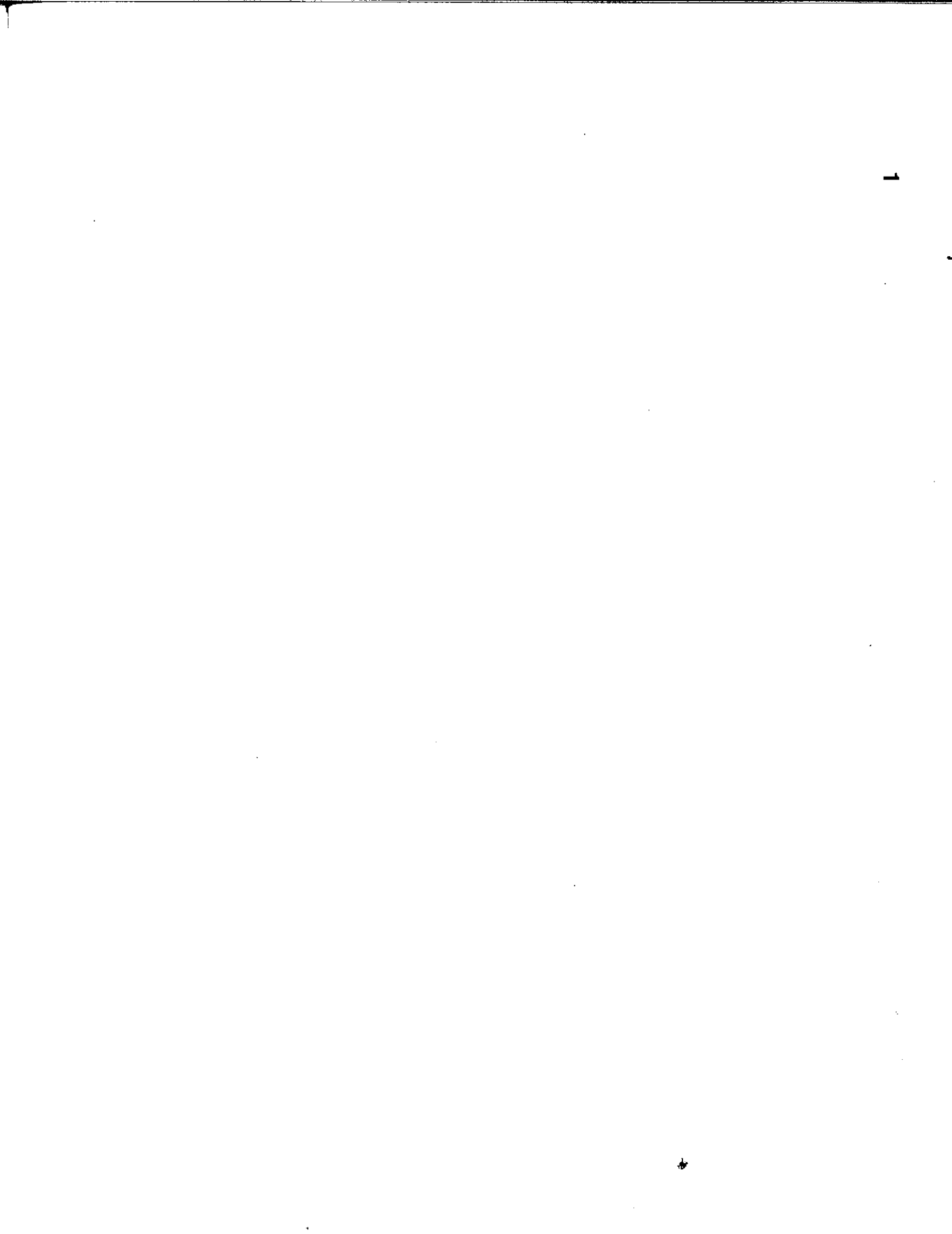
### **Active Sites in Long-Term Monitoring:**

#### **NRDEC 05 (OU-1) – T-25 Area Ground Water**

The remedy for the T-25 Area ground water is expected to be protective of human health and the environment upon attainment of the cleanup goals, as presented in the 2001 ROD. In the interim, exposure pathways that could result in unacceptable risks are being controlled through institutional controls, which restrict use of ground water on-site and off-site.

### **Sites Under Investigation:**

For all sites still under investigation, a ROD has not been signed (i.e., the remedy for the sites has not been selected). Therefore, a protectiveness determination of the remedies cannot be made at this time until further information is obtained.



## 1.0 Introduction

Under Contract Number GS-10F-0124J, W911QY-04-F-0297, the U.S. Army Soldier Systems Center (SSC) contracted with ICF International (ICF) to prepare the First Five-Year Review Report for the U.S Army SSC in Natick, Massachusetts. The location of the SSC facility is shown in Figure 1-1.

### 1.1 Overview of the Five-Year Process

This First Five-Year Review Report has been prepared in accordance with the *Final Work Plan for First Five-year Review, U.S. Army Soldier Systems Center, Natick, MA* (ICF Consulting, 2006); U.S. Environmental Protection Agency (EPA) *Comprehensive Five-Year Review Guidance*, June 2001, EPA 540-R-01-007, OSWER No. 9355.7-03B-P; and the April 2000 memorandum from the Assistant Chief of Staff for Installation Management (ACSIM), subject: *Interim Army Guidance for Conducting Five-Year Reviews*.

The purpose of the five-year review process is to determine whether the remedies at National Priorities List (NPL) sites at SSC are, or are expected to be, protective of human health and the environment based on review of the existing reports, interviews with SSC and regulator personnel, and site inspections. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, this report identifies issues found during the review and identifies recommendations to address them.

The requirements for five-year reviews are:

- The statutory requirement for five-year reviews was added to CERCLA as part of the Superfund Amendments and Reauthorization Act (SARA) of 1986. A five-year review is required when both of the following conditions are met, whether the site is on the NPL or not:
  - Upon completion of the remedial actions at a site, hazardous substances, pollutants or contaminants will remain above levels that allow for unlimited use and unrestricted exposure. For example, if a site is restricted to industrial use because hazardous substances, pollutants or contaminants remain above levels that allow for unlimited use and unrestricted exposure, five-year reviews must be conducted.
  - The Record of Decision (ROD) or Decision Document for the site was signed on or after 17 October 1986 (the effective date of the SARA).
- The National Contingency Plan (NCP), 42 U.S.C. § 9621 (c), implementing regulations, 40 CFR Part 300.430(f)(4)(ii), provide:
  - *If the President selects a remedial action that results in any hazardous*

*substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

- The Agency interpreted this requirement further in the NCP; 40 CFR §300.430(f)(4)(ii) states:
  - *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

In keeping with the requirements of CERCLA Section 121 (c) and the NCP, EPA-New England identified the date for the first Five-Year Review as October 29, 2006, based on the first Remedial Action Start date, documented as October 29, 2001 for OU-1 (T-25 Area), consistent with the provisions of EPA's Comprehensive Five-Year Review Guidance, EPA 540-R-01-007 (OSWER Directive 9355.7-03B, June 2001). The U.S. Army SSC conducted the five-year review of the SSC site in Natick, Massachusetts. Because the remedial action for the T-25 Area will not leave waste in place upon its completion, a five-year review is not officially required at this time. However, the Army complied with a request from EPA – New England to perform a discretionary five-year review. EPA New England also noted that, in accordance with the Comprehensive Five-Year Review Guidance concerning sites with multiple remedies or operable units, the SSC five-year review should cover the **entire site**, although the trigger date for the first five-year review was based upon the start date for the OU-1. This Five -Year Review includes data collected through June and/or August 2005.

A Federal Facilities Agreement (FFA) for SSC was signed by the Army on July 23, 2006 and by the EPA on August 2, 2006. The FFA public comment period started on September 3, 2006 and closed on October 18, 2006. The FFA will become effective as early as October 18, 2006 (if no public comments are received), but not later than 51 days following October 18, 2006 (if public comments are received), in accordance with Section 35 of the FFA.

The operable units (or sites) reviewed are summarized below. Their locations are provided in Figure 1-2..

**T-25 Area Ground Water (OU-1) Area is an active site in long term monitoring.**

<b>Army Designation</b>	<b>EPA Designation</b>	<b>Site Name (also known as)</b>	<b>Report Section</b>
NRDEC 05	OU-1: T-25 Area Ground Water	T-25 Area Ground Water (Operable Unit 1, T-25 Area, T-25 Area Bulk Hazardous Waste Storage Area, Pit Area)	Section 2.0

The description and status of the two sites for which a removal action has been taken and No Further Action is anticipated are given in Appendix A and indicated below:

<b>Army Designation</b>	<b>EPA Designation</b>	<b>Site Name (also known as)</b>	<b>Report Section</b>
NRDEC 15	None given. Will likely be combined into a single operable unit for all soil media.	Storage Area (Chlordane Contamination, Chlordane Soil Removal)	Appendix A.2
NRDEC 04 (soil removal under NRDEC 15)	None given. Will likely be combined into a single operable unit for all soil media.	Pit Area Waste Oil Storage Tank	Appendix A.3

The description and status of the eight sites currently under investigation are given in Appendix B and indicated below:

<b>Army Designation</b>	<b>EPA Designation</b>	<b>Site Name (also known as)</b>	<b>Report Section</b>
NRDEC 16	OU-4: Buildings 22/36	Buildings 22&36	Appendix B.2
NRDEC 11	OU-5: Buildings 2/45	Post Drinking Water Wells (Buildings 63, 2, 45; WSW)	Appendix B.3
NRDEC 14	None given. Will likely be combined into a single operable unit for all soil media.	Boiler Plant Area (Building 19)	Appendix B.4
NRDEC 03 (combined with NRDEC 13*)	OU-7: Buildings 62/68	T62/T68 (Lab Pack Waste Storage Area)	Appendix B.5
NRDEC 06	OU-3: Former Proposed Gym Site	Former Proposed Gymnasium Site (FPGS)	Appendix B.6
NRDEC 09	OU-6: Buildings 13/14	Building 14 (POL Hazardous Site)	Appendix B.7
NRDEC 12	OU-6: Buildings 13/14	Building 13 (Classified Incinerator)	Appendix B.8
NRDEC 7, 10,17	OU-2: SSC Shoreline Surface Water and Sediments	Shoreline Surface Water and Sediment Investigations including Building 2 and 45, Parking Lot Outfall combined; Building 5, PCB Contamination Site and Pad (includes Main Stormwater Outfall)	Appendix B.9

\* NRDEC 13 is PAH Contamination, and has been combined with NRDEC 03.

### **1.1.1 Community Involvement**

During the October 2005 and January 2006 Restoration Advisory Board (RAB) meetings held at SSC, the community was informed of the five-year review process. During the January 2006 RAB meeting, the Army provided a presentation reviewing the process, purpose, sites to be covered, schedule, and various contacts. Contact information was provided for the relevant U.S. Army, EPA New England, and Massachusetts Department of Environmental Protection (MaDEP) representatives. The community was invited to review and provide comments on the Draft Final Five-Year Review report.

On March 16, 2006, the Army held an Environmental Open House at the Morse Institute Public Library in Natick, Massachusetts. The community was provided with an update on the sites to be covered during the five-year review and information about the five-year review process. EPA New England provided a handout titled *The Five-Year Review-SUPERFUND*.

During the summer of 2005, the Army distributed its *Environmental Report* newsletter (Summer 2005, Number 12) to over 6,000 community members. The newsletter included an announcement of the first five-year review and invited the public to participate in the process. A public notice inviting the public to comment on the *Draft Final First Five - Year Review* was posted in the *MetroWest Daily News* and the *Boston Globe* on September 8, 2006.

Upon completion of the *Draft Final First Five -Year Review*, a summary of the findings of this report was presented to the public during a Fall 2006 RAB meeting and a draft copy of the report was provided for review. Additionally, the Army placed the *Draft Final First Five -Year Review* in the site repositories, including the Morse Institute Library, the town of Natick Board of Health, and the U.S. Army SSC. Copies of the *Draft Final First Five -Year Review* were also distributed to each of the RAB members on July 18, 2006.

Any member of the public interested in obtaining more information about the SSC site will be able to find the final document, when it is completed, on the EPA Region 1 Superfund website ([www.epa.gov/region01/superfund](http://www.epa.gov/region01/superfund))<sup>1</sup>. Appendix A of the *Comprehensive Five -Year Review Guidance* provides further information on the participation process.

The Army point of contact is Mr. James Connolly, who can be reached at (508) 233-5550 or [James.B.Connolly@us.army.mil](mailto:James.B.Connolly@us.army.mil).

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<sup>1</sup> Once at the Web address, follow the directions to find a cleanup site in Massachusetts. Type in Natick, MA. The SSC website is under the old name of Natick Laboratory Army Research, Development, and Engineering Center.



### 1.1.2 U.S. Army Soldier Systems Center Location and Description

The U.S. Army SSC<sup>2</sup> is an active research and testing facility, owned and operated by the Federal government through the Department of the Army. SSC is located approximately 17 miles west-southwest of Boston in Natick, Massachusetts. SSC has been a permanent Army installation since October 1954. Its mission includes research and development activities in food engineering, food science, clothing, equipment, materials engineering, and aero-mechanical engineering. A brief history of SSC is provided below.

Date	Event
Prior to 1954	The SSC peninsula was a largely wooded, vegetated area, except for the T-25 Area in the northern portion of SSC-which was a gravel pit (Argonne, 1993). Little Roundy Pond appears to have been used as a settling pond for residential storm water runoff from the mid- to late-1800s to early 1900s (HLA, 1999a).
1952-1954	Constructed 10 reinforced concrete buildings (Argonne, 1993).
1954-1955	Constructed five major research and administrative buildings (Buildings 1, 2, 3, 4, and 5), in addition to support Building 19, Building 8 (previously a Hazardous Research building, later a Communications Center), Building 7, and enlisted men's barracks (Argonne, 1993).
1964	Constructed Building 36 (Argonne, 1993).
1960s	Constructed Buildings 42, 7, and 86 (Argonne, 1993).
1980	Installation Assessment conducted by USATHAMA to assess the use, storage, treatment, and disposal of hazardous materials (USATHAMA, 1980).
1992	MEP conducted by Argonne National Laboratory for USAEC (Argonne, 1993).
May 1993	SSC, then known as the Natick Laboratory Army Research, Development, and Engineering Center was proposed for inclusion on the NPL.
May 1994	SSC officially added to the Superfund NPL.

SSC occupies a small peninsula extending from the eastern shoreline of the South Pond of Lake Cochituate, and encompasses approximately 74 acres (see Figure 1-1). Lake Cochituate is made up of three connected ponds (North, Middle, and South Ponds). The region surrounding SSC is underlain by unconsolidated sediments of glacial origin dominated by ice contact, till, and glaciofluvial and glaciolucustrine deposits. The regional surficial geology is complicated and heterogeneous due to the coalescing and overlapping lacustrine deposits from the many ice fronts of the retreating glacier. The result of this depositional history is a complex distribution of stratigraphic horizons and laterally discontinuous beds of glacial deposits. A geologic cross-section of SSC is given in Figure 1-3.

The northern portion of the site, known as the North Campus, T-25 Area, or Pit Area, was a former gravel pit owned by the town of Natick and forms a depression with a steep

<sup>2</sup> SSC has previously been called the Quartermaster Research and Engineering Command, the U.S. Army Natick Research and Development Command (NARADCOM), the U.S. Army Natick Research, Development, and Engineering Center (NRDEC), and the Soldier Systems Command (SSCOM).

embankment on the north, east, and west perimeters. This area is largely paved with asphalt with the largest unpaved portion being a baseball field in northwest corner. Perimeter roads and embankments near the baseball fields and some limited areas in the southern portion of the T-25 Area are also unpaved. The T-25 Area overburden deposits are generally sand and gravel (which continues to thicken further north of the site) underlain by layers of silt, clayey silt, and till. Bedrock tends to dip to the west-northwest.

The middle to southern portion of SSC is a mix of buildings, parking lots, roads, and grassed areas. The southern tip of SSC has an upper layer of peat, while the central portions of the site are largely fine to medium sand.

On the eastern portion of SSC, the Former Proposed Gymnasium area is a backfilled wet meadow adjacent to Lake Cochituate, located about 1,200 feet southeast of the T-25 Area. This area is landscaped, primarily manicured lawns and ornamental trees; a portion of the area was filled and paved for a parking lot. The upper layer beneath the Former Proposed Gymnasium area is silty sand fill material followed by a 10-foot thick layer of peat.

The facility employs approximately 2,000 employees. (The facility has a number of different tenants.) The entire perimeter of SSC, including the shoreline, is fenced and guarded; access is restricted and visitors must obtain a pass at the main gate. There is on-property housing for approximately 100 military personnel, including the family housing area located at Heritage Lane. Under the current land use conditions, the only populations of people who occupy SSC are SSC employees (both military and civilian), some of whom are residents. Due to the high amount of activity at the facility during the work-day, and the secured nature of the installation, it is highly unlikely that people would gain unauthorized access to SSC.

The land use surrounding SSC includes residential, commercial/retail, and light industrial areas. The facility is located approximately 2,500 feet southeast of the town of Natick's Springvale Municipal Water Supply Well Field (Springvale Well Field). The ground water beneath the entire SSC facility has been designated as a Zone II for the town of Natick Springvale Municipal Well System.

SSC is participating in the Army's Installation Restoration Program (IRP). In May 1993, SSC, then known as the Natick Laboratory Army Research, Development and Engineering Center was proposed for inclusion on the NPL. It was officially added to the NPL in May 1994 as a result of ground water contamination found at the T-25 Area (OU-1) and its location relative to the town of Natick Springvale Well Field. In addition to the T-25 Area, ten sites within SSC have been, or are being, investigated. Cleanup is being conducted under the Army's IRP and meets the requirements of CERCLA, as amended by SARA.

Remedies that include institutional controls have been incorporated into the ROD for the T-25 Area (OU-1). These include restricting access to the ground water both on-facility

and off-facility for the duration of the remedial action. The Army's Master Plan for SSC restricts the on-facility use of ground water for the entire SSC property and, if the property were transferred out of federal ownership, appropriate enforceable restrictions in all deeds or other transfer documents relating to that property would be incorporated. A town of Natick Board of Health ordinance prohibits the installation of new private drinking water wells and the use of existing private drinking water wells in the area. The SSC point-of-contact for the Master Plan is Gary Pacitto, Architect/Installation Master Planner. The SSC Public Works Directorate is responsible for regulating and enforcing the Master Plan.

## **1.2 Roles and Responsibilities**

ICF has been contracted by SSC to prepare this first five-year review for SSC with their review and input. The review team included EPA New England, MaDEP, and the SSC-RAB. The Army is the lead agency for performing cleanup at SSC with oversight by EPA New England and MaDEP.

## **1.3 Organization of Report**

This Report is organized in the following sections:

**Section 1.0: Introduction:** provides an overview of the five-year review process, description and background of the U.S. Army SSC, community involvement, roles and responsibilities, and the next five-year review.

**Section 2.0: Active Sites in Long-Term Monitoring:** includes a description and history of the T-25 Area OU-1, in addition to a technical assessment, recommendations, and protectiveness statement.

**Section 3.0: References.**

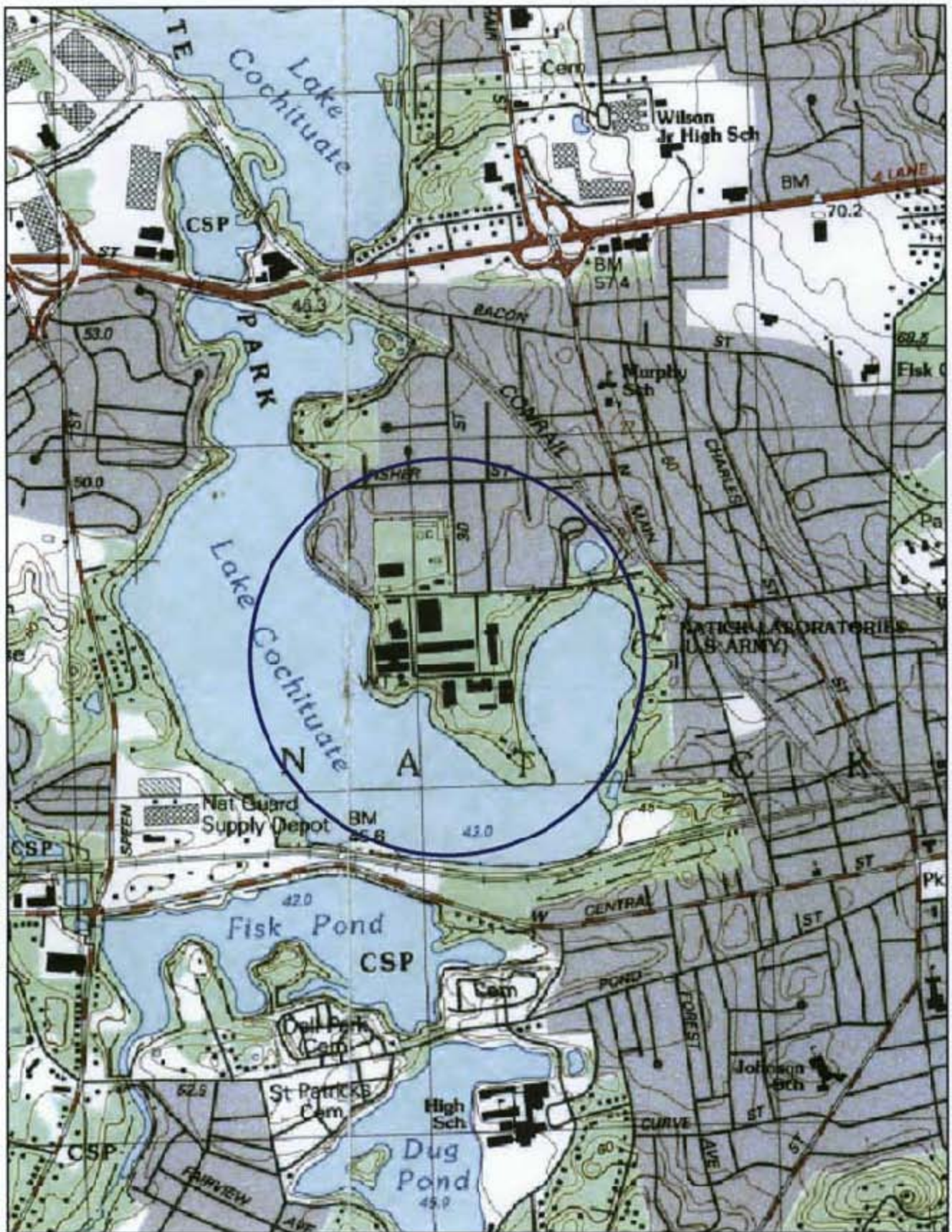
**Appendix A: Status of Anticipated No Further Action Sites:** includes a description, history, risk assessment summary, remedy, and recommendations for sites where a remedy has been selected and implemented and No Further Action is anticipated.

**Appendix B: Sites Under Investigation:** includes information similar, where appropriate, to that for Section 2.0 for sites under investigation at SSC.

**Appendix C: ARARs, Criteria, Advisories, and Guidance:** includes the ARAR's from the 2001 T-25 Area ROD, the current status of the ARARs, the most recent effective dates, and the potential modification/impacts on the current T-25 Area ground water remedy.

## **1.4 Next Five-Year Review**

The Second Five-Year Review for SSC is required on October 29, 2011.



SOURCES  
 ICF Consulting  
 U.S. Geological Survey

FILE INFORMATION  
 File Name: \CAD\TEPS\NATICK\GIS\Figure1-L.mxd

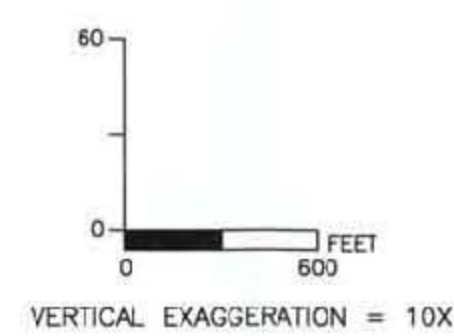
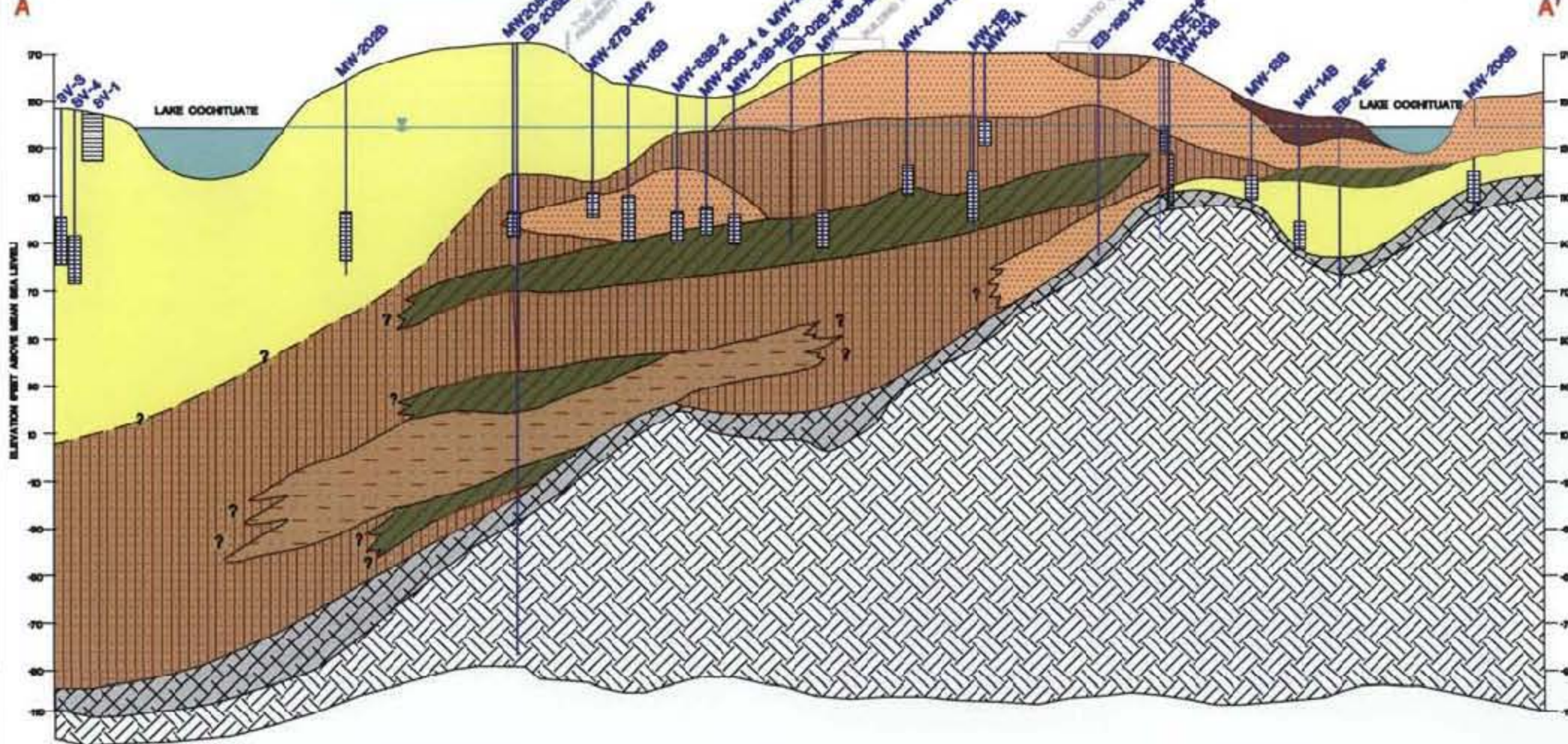


Figure 1-1  
 U.S. Army SSC  
 Site Location Map



**Figure 1-2**  
**U.S. Army SSC Operable Units**  
**and Outfall Locations**

NORTH A SOUTH A'



APPROXIMATE B-INTERVAL GROUND WATER ELEVATION  
 \* BEDROCK SURFACE ELEVATIONS DETERMINED BY BEDROCK BORINGS AND GEOPHYSICAL SURVEY (WESTON)

		TITLE	
		FIGURE 1-3 GEOLOGIC CROSS SECTION (A-A') SSCOM, NATICK, MASSACHUSETTS	
APPROVALS	DATE	PREPARED FOR	SCALE
DRAWN MSB CHECKED KJP QA/CONTROL THC TECH REVIEW LA PROJ MGR KET	8/99 8/99 8/99 8/99 8/99	USAEC	1 IN. = 600 FT. HORIZ. 1 IN. = 60 FT. VERT.
		DATE	DWG. NO.
		AUGUST 1999	XSECT-001
		SOURCE	SHEET 1 OF 1
		ARTHUR D. LITTLE, INC.	

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**Appendix C: ARARs, Criteria, Advisories, and Guidance**  
**SELECTED REMEDY**  
**T-25 AREA GROUND WATER AT US ARMY SOLDIER SYSTEMS CENTER**

Appendix C: ARARs, Criteria, Advisories, and Guidance

SELECTED REMEDY  
T-25 AREA GROUND WATER AT US ARMY SOLDIER SYSTEMS CENTER

ARARs	REQUIREMENT	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT	STATUS (2001 ROD)	CURRENT STATUS	MOST RECENT EFFECTIVE DATE	MODIFICATIONS/IMPACT TO REMEDY
<b>CHEMICAL-SPECIFIC REQUIREMENTS</b>						
<u>Federal</u>	<p>Safe Drinking Water Act (SDWA) – Maximum Contaminant Levels (MCLs); 40 CFR 141.11, 141.61, 141.62</p> <p><b>Synopsis:</b> MCLs are enforceable standards that have been promulgated for a number of organic and inorganic contaminants in public drinking water systems.</p>	<p>The remedy will consist of ground water extraction followed by air stripping/carbon adsorption for the on-facility contamination, with MNA for on-facility contamination not contained by the ground water extraction system while it is in operation, and for any on-facility and off-facility contamination remaining after system shut-off. It will also include long-term monitoring and institutional controls. The remedy will meet federal MCLs for the primary COCs PCE and TCE, and the secondary COCs chromium, lead, nickel, and thallium throughout the ground water plume at completion.</p>	Relevant and Appropriate	Relevant and Appropriate	<p><b>40 CFR 141.11</b> 40 FR 59570, Dec. 24, 1975 Last amended 66 FR 7063, Jan. 22, 2001</p> <p><b>40 CFR 141.61</b> 56 FR 3593, Jan. 30, 1991 Last amended 59 FR 34324, July 1, 1994</p> <p><b>40 CFR 141.62</b> 56 FR 3593, Jan. 30, 1991 Last amended 69 FR 38855, June 29, 2004</p>	<p>The remedy will meet federal MCLs for the primary and secondary COCs.</p> <p>No applicable changes in MCLs were found for the primary COCs PCE and TCE and secondary COCs chromium, lead, and thallium. At the time of the ROD, an MCL for nickel of 100 ug/L was proposed, but it was remanded.</p> <p>No effect on selected remedy.</p>

Appendix C: ARARs, Criteria, Advisories, and Guidance

SELECTED REMEDY  
T-25 AREA GROUND WATER AT US ARMY SOLDIER SYSTEMS CENTER

ARARs	REQUIREMENT	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT	STATUS (2001 ROD)	CURRENT STATUS	MOST RECENT EFFECTIVE DATE	MODIFICATIONS/IMPACT TO REMEDY
	<p>SDWA – Non-Zero Maximum Containment Level Goals (MCLGs), 40 CFR 141.50–141.51</p> <p><b>Synopsis:</b> MCLGs are non-enforceable health goals for public water systems that are set at levels that would result in no known or expected adverse health effects with an adequate margin of safety.</p>	<p>For those contaminants for which MCLs have not been established, at completion the remedy will meet non-zero MCLGs throughout the ground water plume.</p>	<p>Relevant and Appropriate</p>	<p>Relevant and Appropriate</p>	<p>40 CFR 141.50 50 FR 46901, Nov. 13, 1985 Last amended 57 FR 31846, July 17, 1992</p> <p>40 CFR 141.51 50 FR 47155, Nov. 14, 1985 Last amended 66 FR 7063, Jan. 22, 2001</p>	<p>MCLGs are not applicable to the cleanup goals for primary or secondary COCs.</p> <p>No MCLGs were available for those COCs without MCLs.</p> <p>No effect on the selected remedy.</p>
	<p>USEPA Carcinogen Assessment Group, Cancer Slope Factors (CSFs)</p> <p><b>Synopsis:</b> CSFs are used to compute the incremental cancer risk from exposure to site contaminants and represent the most up-to-date information on cancer risk from USEPA's Carcinogen Assessment Group.</p>	<p>CSFs were considered to assess health risks at the site.</p>	<p>To Be Considered</p>	<p>To Be Considered</p>	<p>TCE – EPA/NCEA, 2001 PCE – CALEPA, 2001</p>	<p>CSFs for TCE and PCE have been updated since the 2001 ROD.</p> <p>No effect on the selected remedy.</p>
	<p>U.S. EPA Risk Reference Doses (RfDs)</p> <p><b>Synopsis:</b> RfDs were considered the levels unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure for a lifetime.</p>	<p>RfDs were considered to assess health risks from contaminants at the site.</p>	<p>To Be Considered</p>	<p>To Be Considered</p>	<p>DDT – IRIS, 1996 BEHP – IRIS, 1991 Cr – IRIS, 1998 Mn – IRIS, 1996 V – EPA/NCEA, undated TCE – EPA/NCEA, 2001</p>	<p>RfDs for DDT, TCE, bis(2-ethylhexyl)phthalate, chromium, manganese, and vanadium have been updated since the 2001 ROD.</p> <p>No effect on the selected remedy.</p>

**Appendix C: ARARs, Criteria, Advisories, and Guidance**

**SELECTED REMEDY  
T-25 AREA GROUND WATER AT US ARMY SOLDIER SYSTEMS CENTER**

ARARs	REQUIREMENT	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT	STATUS (2001 ROD)	CURRENT STATUS	MOST RECENT EFFECTIVE DATE	MODIFICATIONS/IMPACT TO REMEDY
	<p>EPA Region 9 Preliminary Remediation Goals</p> <p><b>Synopsis:</b> EPA Region 9 Preliminary Remediation Goals (PRGs) are risk-based guidelines for evaluating and cleaning up contaminated sites. PRGs can be used to screen pollutants in environmental media, trigger further investigation, and provide an initial cleanup goal if applicable, but are not enforceable regulatory standards. The PRGs are developed using accepted risk assessment algorithms and default exposure factors for residential exposure scenarios, assuming exposure in each medium occurs through multiple routes, in combination with current EPA toxicity values. PRGs are based on a risk level of <math>1 \times 10^{-6}</math> and/or a hazard quotient of 1.</p>	<p>The remedy will consist of ground water extraction followed by air stripping/carbon adsorption for the on-facility contamination, with MNA for on-facility contamination not contained by the ground water extraction system while it is in operation, and for any on-facility and off-facility contamination remaining after system shut-off. It will also include long-term monitoring and institutional controls. The remedy will meet the EPA Region 9 PRG for the secondary COC manganese (which is a drinking water risk-based guideline) throughout the ground water plume at completion.</p>	<p>To Be Considered</p>	<p>Considered as the cleanup goal for manganese, which did not have an MCL.</p>	<p>October 2004</p>	<p>The EPA Region 9 PRG for manganese has been updated from 1,700 ug/L to 880 ug/L.</p> <p>No effect on the selected remedy.</p>



Appendix C: ARARs, Criteria, Advisories, and Guidance

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ARARs	REQUIREMENT	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT	STATUS (2001 ROD)	CURRENT STATUS	MOST RECENT EFFECTIVE DATE	MODIFICATIONS/IMPACT TO REMEDY
<p><u>State</u></p>	<p>Massachusetts Drinking Water Standards, 310 CMR 22.06–22.07</p> <p><b>Synopsis:</b> These standards establish Massachusetts MCLs (MMCLs) for a number of organic and inorganic contaminants in public water systems.</p>	<p>The remedy will consist of ground water extraction followed by air stripping/carbon adsorption for the on-facility contamination, with MNA for on-facility contamination not contained by the ground water extraction system while it is in operation, and for any on-facility and off-facility contamination remaining after system shut-off. It will also include long-term monitoring and institutional controls. The remedy will meet MMCLs for the primary COCs PCE and TCE, and the secondary COCs chromium, lead, nickel, and thallium throughout the ground water plume at completion.</p>	<p>Relevant and Appropriate</p>	<p>Relevant and Appropriate</p>	<p>December 6, 2002</p>	<p>The remedy will meet MMCLs for the primary and secondary COCs.</p> <p>MMCLs found for the primary COCs PCE and TCE and secondary COCs bis(2-ethylhexyl)phthalate, chromium, lead, and thallium are consistent with the Federal MCLs.</p> <p>No effect on selected remedy.</p>

**Appendix C: ARARs, Criteria, Advisories, and Guidance**

**SELECTED REMEDY  
T-25 AREA GROUND WATER AT US ARMY SOLDIER SYSTEMS CENTER**

ARARs	REQUIREMENT	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT	STATUS (2001 ROD)	CURRENT STATUS	MOST RECENT EFFECTIVE DATE	MODIFICATIONS/IMPACT TO REMEDY
	<p>Massachusetts Contingency Plan (MCP) Method 1 GW-1 Standards, 310 CMR 40.0974</p> <p><b>Synopsis:</b> These standards consider the potential impacts on the ground water at a site.</p>	<p>The remedy will consist of ground water extraction followed by air stripping/carbon adsorption for the on-facility contamination, with MNA for on-facility contamination not contained by the ground water extraction system while it is in operation, and for any on-facility and off-facility contamination remaining after system shut-off. It will also include long-term monitoring and institutional controls. The remedy will meet the MCP Method 1 GW-1 standards for the secondary COCs bis(2-ethylhexyl)phthalate, DDT, and vanadium throughout the ground water plume at completion.</p>	<p>Applicable</p>	<p>Applicable</p>	<p>October 29, 1999 Proposed – January 12, 2006</p>	<p>GW-1 standards for the secondary COCs bis(2-ethylhexyl)phthalate and DDT are consistent with those used in the 2001 ROD.</p> <p>The GW-1 standard for vanadium has been updated from 50 ug/L (1999) to 30 ug/L (proposed 2006). These proposed standards are expected to become effective in April 2006.</p> <p>No effect on the selected remedy.</p>

Appendix C: ARARs, Criteria, Advisories, and Guidance

SELECTED REMEDY  
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ARARs	REQUIREMENT	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT	STATUS (2001 ROD)	CURRENT STATUS	MOST RECENT EFFECTIVE DATE	MODIFICATIONS/IMPACT TO REMEDY
<b>LOCATION-SPECIFIC REQUIREMENTS</b>						
<b>Federal</b> <b>Other Natural Resources</b>	Fish and Wildlife Coordination Act; 16 USC 661-666, 40 CFR Part 6.302(g)  <i>Synopsis:</i> These regulations require protection of fish and wildlife resources related to federal actions that control or modify water bodies.	Remedial activities will be in compliance with these regulations.	Applicable	Applicable	<b>40 CFR 6.302</b> 16 USC 661 et seq. 44 FR 64177, Nov. 6, 1979  Last amended 50 FR 26316, June 25, 1985	No applicable changes found.
<b>ACTION-SPECIFIC REQUIREMENTS</b>						

Appendix C: ARARs, Criteria, Advisories, and Guidance

SELECTED REMEDY  
T-25 AREA GROUND WATER AT US ARMY SOLDIER SYSTEMS CENTER

ARARs	REQUIREMENT	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT	STATUS (2001 ROD)	CURRENT STATUS	MOST RECENT EFFECTIVE DATE	MODIFICATIONS/IMPACT TO REMEDY
<p><u>Federal</u></p>	<p>CWA – National Pollutant Discharge Elimination System, 40 CFR Part 122–125, 131</p> <p><b>Synopsis:</b> These regulations contain discharge limitations, monitoring requirements and best management practices for discharges into navigable waters, i.e., surface waters.</p>	<p>The aqueous discharge from the treatment system will be treated using aeration, filtration, air stripping, and carbon adsorption and will be regularly monitored to comply with these regulations. Discharges of treated ground water to surface waters will comply with these regulations.</p>	<p>Applicable</p>	<p>Applicable. Monitoring data have shown compliance with these regulations.</p>	<p>40 CFR 122 48 FR 14153, Apr. 1, 1983, unless otherwise noted.</p> <p>40 CFR 123 48 FR 14178, Apr. 1, 1983, unless otherwise noted.</p> <p>40 CFR 124 48 FR 14264, Apr. 1, 1983, unless otherwise noted.</p> <p>40 CFR 125 44 FR 32948, June 7, 1979, unless otherwise noted.</p> <p>40 CFR 131 48 FR 51405, Nov. 8, 1983, unless otherwise noted.</p> <p>One or more parts amended after ROD: Dec. 18, 2001; Nov. 8, 2002; Dec. 3, 2002; Feb. 12, 2003; Mar. 10, 2003; Jun. 19, 2003; Apr. 9, 2004; July 9, 2004; Aug. 4, 2004; Oct. 29, 2004; Nov. 16, 2004; Mar. 9, 2005; Sept. 8, 2005; Oct. 13, 2005; Oct. 14, 2005; Feb. 10, 2006.</p>	<p>No applicable changes found.</p>

Appendix C: ARARs, Criteria, Advisories, and Guidance

SELECTED REMEDY  
T-25 AREA GROUND WATER AT US ARMY SOLDIER SYSTEMS CENTER

ARARs	REQUIREMENT	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT	STATUS (2001 ROD)	CURRENT STATUS	MOST RECENT EFFECTIVE DATE	MODIFICATIONS/IMPACT TO REMEDY
	<p>Resource Conservation and Recovery Act (RCRA) – Identification and Listing of Hazardous Wastes; Toxicity Characteristic, 40 CFR Part 261.24</p> <p><b>Synopsis:</b> These requirements identify the maximum concentrations of contaminants for which the waste would be a RCRA-characteristic hazardous waste for toxicity.</p>	<p>Wastes generated from ground water treatment will be analyzed to determine if they are RCRA-characteristic hazardous waste. If analysis results exceed the standards in 261.24, the waste will be disposed of in a RCRA Subtitle C facility.</p>	Applicable	Applicable	<p><b>40 CFR Part 261.24</b> 55 FR 11862, Mar. 29, 1990 Last amended 67 FR 11254, Mar. 13, 2002</p>	No applicable changes found.
	<p>RCRA – Standards Applicable to Generators of Hazardous Waste, 40 CFR Part 262</p> <p><b>Synopsis:</b> These standards establish standards for generators of hazardous waste. Massachusetts has been delegated the authority to administer these standards through its state hazardous waste regulations. The applicable portions of 40 CFR Part 262 are incorporated by reference.</p>	<p>Management of hazardous waste generated from ground water treatment will be managed in accordance with these regulations.</p>	Applicable	Applicable	<p><b>40 CFR Part 262</b> 45 FR 33142, May 19, 1980, unless otherwise noted.</p> <p>One or more parts amended after ROD: Mar. 12, 2004; Apr. 9, 2004; Apr. 22, 2004; Oct. 25, 2004; Mar. 4, 2005; May 24, 2005; Jun. 16, 2005</p>	No applicable changes found.
	<p>RCRA – Air Emission Standards for Process Vents, 40 CFR Part 264, Subpart AA</p> <p><b>Synopsis:</b> These regulations establish requirements for controlling emissions from process vents associated with treatment processes that manage hazardous wastes with organic concentrations of 10 ppmw or more.</p>	<p>The air streams from the air stripper and the equalization tank will be treated using carbon adsorption and monitored before and after the carbon tanks to meet these standards. To date these streams have not exceeded 10 ppmw.</p>	Relevant and Appropriate	Relevant and Appropriate	<p><b>40 CFR Part 264, Subpart AA</b> 55 FR 25494, June 21, 1990 Last amended 70 FR 34581, June 14, 2005</p>	No applicable changes found.

**Appendix C: ARARs, Criteria, Advisories, and Guidance**

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	<p>RCRA – Air Emission Standards for Equipment Leaks, 40 CFR Part 264, Subpart BB</p> <p><b>Synopsis:</b> These regulations contain standards for equipment that contains or contacts hazardous waste with organic concentrations of at least 10% by weight.</p>	<p>The air streams from the air stripper and the equalization tank will be treated using carbon adsorption and monitored before and after the carbon tanks to meet these standards. To date these streams have not exceeded 10 ppmw.</p>	<p>Relevant and Appropriate</p>	<p>Relevant and Appropriate</p>	<p>40 CFR Part 264, Subpart BB 55 FR 25501, June 21, 1990 Last amended 70 FR 34581, June 14, 2005</p>	<p>No applicable changes found.</p>
	<p>USEPA Policy on Control of Air Emissions from Superfund Air Strippers at Superfund Groundwater Sites, Office of Solid Waste and Emergency Response (OSWER) Directive 9355.0-28</p> <p><b>Synopsis:</b> This policy provides guidance on the control of air emissions from air strippers used at Superfund sites.</p>	<p>The air streams from the air stripper and the equalization tank will be treated using carbon adsorption and monitored before and after the carbon tanks to satisfy this policy.</p>	<p>To Be Considered</p>	<p>The treatment system was designed to meet these standards.</p>	<p>June 15, 1989</p>	<p>No applicable changes found.</p>
	<p>USEPA Region I Memorandum, 12 July 1989 from Louis Gitto to Merrill S. Hohman</p> <p><b>Synopsis:</b> This memorandum states that Superfund air strippers in ozone nonattainment areas generally merit controls on all VOC emissions.</p>	<p>The air streams from the air stripper and the equalization tank will be treated using carbon adsorption and monitored before and after the carbon tanks to satisfy this policy.</p>	<p>To Be Considered</p>	<p>The treatment system was designed to meet these standards.</p>	<p>July 12, 1989</p>	<p>No applicable changes found.</p>

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SELECTED REMEDY  
T-25 AREA GROUND WATER AT US ARMY SOLDIER SYSTEMS CENTER

ARARs	REQUIREMENT	ACTION TO BE TAKEN TO ATTAIN REQUIREMENT	STATUS (2001 ROD)	CURRENT STATUS	MOST RECENT EFFECTIVE DATE	MODIFICATIONS/IMPACT TO REMEDY
<u>State</u>	<p>Massachusetts Surface Water Discharge Permit Program, 314 CMR 3.00</p> <p><b>Synopsis:</b> These standards regulate the discharge of pollutants to Massachusetts surface waters.</p>	<p>The aqueous discharge from the treatment system will be treated by carbon adsorption after the air stripper and monitored before and after the carbon to meet these standards.</p>	Applicable	Applicable	Amended November 15, 2002	<p>Monitoring data have shown compliance with these emission standards.</p> <p>No applicable changes found.</p>
	<p>Massachusetts Air Pollution Control Regulations, 310 CMR 7.06, 7.09, 7.18</p> <p><b>Synopsis:</b> These regulations set emissions limits necessary to attain ambient air quality standards.</p>	<p>Remedial actions will be conducted to meet the standards for visible emissions (310 CMR 7.06); dust, odor, construction and demolition (310 CMR 7.09); and volatile organic compounds (310 CMR 7.18). If standards are exceeded, emissions will be managed through engineering controls.</p>	Applicable	Applicable	September 23, 2005	<p>Monitoring data have shown compliance with these emission standards.</p> <p>No applicable changes found.</p>
	<p>Massachusetts Hazardous Waste Management Regulations (HWMR), Requirements for Generators, 310 CMR 30.300</p> <p><b>Synopsis:</b> These regulations contain requirements for generators, including testing of wastes to determine if they are hazardous wastes and accumulation of hazardous waste prior to off-facility disposal.</p>	<p>Any hazardous waste generated from ground water treatment will be managed in accordance with these regulations.</p>	Applicable	Applicable	February 27, 2004	No applicable changes found.

**Appendix C: ARARs, Criteria, Advisories, and Guidance**

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T-25 AREA GROUND WATER AT US ARMY SOLDIER SYSTEMS CENTER**

<b>ARARs</b>	<b>REQUIREMENT</b>	<b>ACTION TO BE TAKEN TO ATTAIN REQUIREMENT</b>	<b>STATUS (2001 ROD)</b>	<b>CURRENT STATUS</b>	<b>MOST RECENT EFFECTIVE DATE</b>	<b>MODIFICATIONS/IMPACT TO REMEDY</b>
	Massachusetts HWMR, Use and Management of Containers, 310 CMR 30.689  <b>Synopsis:</b> These regulations set forth requirements for use and management of containers at hazardous waste facilities.	Any hazardous waste generated from ground water treatment will be managed in accordance with these regulations.	Applicable	Applicable	February 27, 2004	No applicable changes found.
	Massachusetts HWMR, Storage and Treatment in Tanks, 310 CMR 30.699  <b>Synopsis:</b> These regulations set forth requirements for use and management of tanks at hazardous waste facilities.	Any hazardous waste generated from ground water treatment will be managed in accordance with these regulations.	Applicable	Applicable	February 27, 2004	No applicable changes found.
	MADEP Off-Gas Treatment of Point Source Remedial Air Emissions (Policy No. WSC-94-150)  <b>Synopsis:</b> This policy establishes permitting requirements for air stripper installations.	This policy will be considered when planning and designing the use of air strippers in remedial activities at the site.	To Be Considered	The treatment system was designed to meet these standards.	May 25, 1994	No applicable changes found.

**NOTES:**

- ARARs    Applicable or Relevant and Appropriate Requirements
- CFR      Code of Federal Regulations
- CMR      Code of Massachusetts Regulations
- MADEP   Massachusetts Department of Environmental Protection



**Appendix D: Institutional Control Certifications and U.S. Army SSC Real Property  
Master Plan - Selected Sections**



DEPARTMENT OF THE ARMY  
US ARMY SOLDIER SYSTEMS CENTER  
KANSAS STREET  
NATICK, MASSACHUSETTS 01780-5049

REPLY TO  
ATTENTION OF

Environmental, Safety and Health Office

July 18, 2005

Christine Williams  
U.S. Environmental Protection Agency  
1 Congress Street  
Suite 1100 (HBT)  
Boston, MA 02114-2023

SUBJECT: Record of Decision, T-25 Area Ground Water (Operable Unit 1)  
Annual Institutional Controls Certification

Dear Christine:

The Environmental health and Safety Office has conducted the required assessment and has determined that the U.S. Army Soldier System Center (SSC) is in compliance with ground water use restrictions outlined in the SSC Real Property Master Plan. No new projects involving use of ground water at the SSC facility were proposed during calendar year 2004. .

Attached please find the required letter from the Town of Natick documenting that they are in compliance with the ROD and the Board of Health regulation.

Please call me at (508) 233-5404 if you have any questions.

Sincerely,

John J. McHugh  
Director

Environmental, Safety and Health Office



BUILDING

PLANNING

ZONING

CONSERVATION

## COMMUNITY DEVELOPMENT

July 18, 2005

Mr. John McHugh  
Director, Environmental Health and Safety  
U.S. Army Soldier Systems Center  
Kansas Street  
Natick, MA 01760-5049

Dear Mr. McHugh:

Enclosed please find the certification required in accordance with the Record of Decision, T-25 Area Ground Water (Operable Unit 1), U.S. Army Soldier Systems Center (SSC), Natick, Massachusetts dated April 1, 2001 (the ROD). The certification is required annually to document the maintenance of institutional controls. Institutional controls were implemented as a component of the T-25 Area ground water remedy to restrict access to and human contact with the ground water both on-facility and off-facility throughout the remedial action.

Off-facility, ground water use restrictions are affected through a municipal ordinance that covers the area where contaminated ground water has been found. More specifically, a town of Natick Board of Health regulation prohibits both the installation of new private drinking water wells and the use of existing private drinking water wells in the area to prevent any access or exposure to contaminated ground water. On February 24, 1999 the town of Natick Board of Health published an amendment to its regulations that states:

*Private wells for drinking water shall not be allowed where a public water supply is available in sufficient quantity and pressure so as to meet U.S. and Massachusetts safe drinking water standards.*

This restriction was imposed within the area bounded by North Main Street (Route 27), Lake Cochituate, West Central Street (Route 135), and the Massachusetts Turnpike (Route 90).

In accordance with the requirements of the ROD, I hereby certify for calendar year 2004 that:

- The Board of Health regulation is in place, and is being properly enforced;

- I have reviewed private well permits issued by the town during the past year, and have determined that these permits are in compliance with the Board of Health regulation; and,
- I have reviewed private well permits issued by the town during the past year. No new potable wells have been installed within the area covered by the Board of Health regulation.

Town of Natick records indicate no private wells used for drinking water were installed in the past year within the area covered by the Board of Health regulation.

Please call me if you have any questions.

Sincerely,



Robert Bois  
Environmental Compliance Officer  
Town of Natick

CC: Philip Lemnios, Town Administrator  
Roger Wade, Board of Health

FINAL SUBMITTAL



# REAL PROPERTY MASTER PLAN LONG RANGE COMPONENT

For

SOLDIER SYSTEMS CENTER  
NATICK, MASSACHUSETTS

February 2004

Prepared for:

Commander  
Soldier Systems Center

Prepared by:

**R&K**  
Engineering, Inc.

FINAL SUBMITTAL

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indicate that further investigation is not required (MEP, Jan. 1993). However, dredging of contaminated sediment in Lake Cochituate may be required under the current Tier III investigation.

## G. WATER TREATMENT AND QUALITY

### On Post Well Field

The on-post well field is at the south end of the peninsula and contains 2 artesian wells that were used from 1978 to 1995 to supply potable water to the laboratory complex. Low concentrations of chlorinated VOCs have been detected in potable water samples from these two wells, but have never exceeded the primary drinking water standards. Since 1991, investigation of this contamination has been continuous, including the installation of monitoring wells at both well locations, ranging in depth between the surface (143 ft. MSL) and the bedrock (69 ft. below land surface). (MEP, Jan. 1993) A soil-gas study was also conducted in 1991 to locate the source of the VOCs. Based on this and other studies conducted in the area, a Remedial Investigation was completed in 1999 for this well supply area and Lake Cochituate was ruled out as a source of the contamination in the well water. (Harding Lawson, Mar. 1999) However, the study concluded that there is an unknown off-post source to the well-water contamination, up gradient of Pegan Brook Park. Since this water supply is a major health concern for individuals on post, the Department of the Army (DA) chose to take advantage of a utility privatization initiative and use a public water supply. SSC was officially declassified as a public water supply in December 1996, and the on-post groundwater wells were physically disconnected from the water supply system in June 1996. There are no plans to activate these wells in the future and the groundwater is not used as a source of potable or non-potable water under current, or future, land-use conditions. Thus the potential threat of any contamination leaving these wells and entering another water source is minimal. As well, the human and ecological health risks are considered to be minimal since groundwater contamination concentrations are below EPA limits. No further action for this closed well supply area was recommended under CERCLA, but the RI recommended a monitoring ROD and continuing monitoring of selected wells during future installation-wide groundwater sampling events (Harding Lawson, Water Supply, 1999).

SSC began using the town of Natick's water supply in 1995. The drinking water supply is now from aquifers and reservoirs in the surrounding region. The public water supply system consists of two reservoirs, 10 wells, and a distribution of water mains located throughout Natick. Like SSC, the town of Natick detected low levels of PCE and TCE in some of their wells in the late 1980s. As a result, they discontinued use of the Evergreen Well #1 for drinking water. Since that time, the town has renovated their Springvale Water Treatment Plant to include 3 air strippers that transfer all or most of the VOCs from the drinking water into the air. The Army has contributed 3.1 million dollars towards this renovation. Testing of the water supply, on and off post, is conducted on a routine basis. As well, there are approximately 50 backflows on the facility, which provide backflow protection for the water supply. The town of Natick and the SSC test them annually. (Fawkes, Doug, 2002)

Installation of any new potable water supply well on SSC is prohibited. Installation of any new water supply well on SSC for the purpose of supplying non-potable water shall be evaluated with respect to potential impact on the operating groundwater treatment system and potential human and environmental health risk prior to installation or use. This restriction shall be in effect as long as site conditions pose an unacceptable risk to human health or the environment and until SSC has received EPA Certification of completion of the response actions for contaminated groundwater.

## **H. WASTEWATER TREATMENT**

### **Sewer Lines**

The SSC is served by a sewer system that is constructed of iron and vitrified clay pipe. The sewage pipes (and waste) go all the way into Boston and are treated at Deer Island sewage treatment plant at Boston Harbor. A 1,000-gallon acid neutralizing tank provides pretreatment of a portion of the sewage prior to releasing it to the town of Natick for treatment. Historic records do not contain information on the installation, maintenance, and repair of the sewer lines. (MEP, 1993) However, some pipes appear to have been replaced with asbestos cement, copper or polyvinyl chloride. Sanitary wastes and laboratory amounts of research chemicals, such as sodium azide, were disposed of through this sewer system. Discharges of mercury have also been found in the sewer system, possibly dumped into the system in much the same manner as the laboratory chemicals. A television survey was conducted on the main sewer line to obtain information on these pipes, such as condition (cracks, leaks, etc.). Terra probes, for possible soil contamination, were completed on either side of the main sewer line but nothing was found. Results of a 1990 soil-gas survey showed evidence of BTX, TCE, and PCE in the soil just above the sewer lines. However, it is possible that the sources of this contamination are something besides potential breaks or cracks in the sewer lines. Two mercury infiltration pretreatment systems were installed on the installation to rectify the problem of mercury in the sewer lines. The first is in the basement of Building 3 and serves to filter lab waste for Buildings 3, 4, 5, and 36. The second infiltration system is located in Building 42 for the medical and laboratory waste. (Fawkes, Doug, 2002) The mercury is collected from both systems and taken to Building 93 for disposal along with other hazardous waste. Concentrations of mercury in the sewer system have decreased in recent years. A program was initiated to dispose of all mercury thermometers on SSC. All thermometers were removed except a select few. Any contaminated mercury that is found, such as the sewer pipes, is disposed of as hazardous waste, but in accordance with 40 CFR 268, which provides disposal restrictions treatment standards. (Fawkes, Doug, 2002) In addition, contaminated sewer pipelines have been removed and replaced, a procedure that is still underway.

## **I. HAZARDOUS MATERIALS STORAGE**

### **Hazardous Material Tracking**