



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

Supertund Records Center  
SITE: US Army Material  
BREAK: 8-3  
NUMBER: 248050



SDMS DocID 248050

March 20, 2006

Thomas E. Lederle, Director  
Hampton BRAC Field Office  
DAIM-BD-H  
102 McNair Drive  
Fort Monroe, Virginia 23651-1048

**Re: *Second Five-Year Review Report (2002-2006) for the US Army Materials Technology Laboratory, Watertown, Massachusetts, NPL Site***

Dear Mr. Lederle:

This office is in receipt of the Army's Second Five-Year Review Report, Army Materials Technology Laboratory, dated March 2006. The Environmental Protection Agency (EPA) reviewed the report for compliance with the *Comprehensive Five-Year Review Guidance (OSWER Directive 9355.7-03B-P dated June 2001)*. Upon review of this report, EPA concurs with the findings that all remedies which have been implemented are currently protective of human health and the environment.

EPA also concurs that the follow-up action of bank stabilization along the Charles River near the OU-1 remediated area is necessary to address long-term protectiveness. EPA commits to work with the Army through the BRAC Cleanup Team (BCT) process and via the Federal Facilities Agreement (FFA) procedures to address the recommendations by the milestone dates set forth in the 2006 five-Year Report.

This second comprehensive Five-Year Review was triggered by the first comprehensive Five-Year Review, completed on March 7, 2002. The 2002 Five-Year Review was triggered by the initiation of remediation activities at OU-3 (Area I) in August of 1996. Consistent with Section 121(c) of CERCLA the next statutorily required five-year review must be finalized on or before March 20, 2011.

Sincerely,

  
Susan Studien, Director  
Office of Site Remediation and Restoration

cc: Bryan Olson, EPA-New England  
Mary Sanderson, EPA-New England  
Christine Williams, EPA-New England

Superfund Records Center  
SITE: US Army Material  
BREAK: 8.3  
OTHER: 248049



SDMS DocID 248049

**FINAL  
SECOND FIVE-YEAR REVIEW REPORT  
U.S. ARMY MATERIALS  
TECHNOLOGY LABORATORY  
WATERTOWN, MASSACHUSETTS**



Prepared for:  
**US Army Installation Support Management Activity  
Washington, D.C.**

Prepared by:  
**CALIBRE  
Alexandria, Virginia**

**March 1, 2006**



**DEPARTMENT OF THE ARMY**  
**ARMY BASE REALIGNMENT AND CLOSURE, HAMPTON FIELD OFFICE**  
102 MCNAIR DRIVE  
FORT MONROE VIRGINIA 23651-1048

REPLY TO  
ATTENTION OF

DAIM-BD-H

2 March 2006

U.S. Environmental Protection Agency  
ATTN: Ms. Christina P. Williams  
1 Congress Street, Suite 1100 (HBT)  
Boston, MA 02114-2023

Commonwealth of Massachusetts  
Department of Environmental Protection  
Bureau of Waste Site Clean-up  
ATTN: Craig Durrett  
1 Winter Street, 7<sup>th</sup> Floor  
Boston, MA 02108

**RE: SECOND FIVE-YEAR REVIEW REPORT (FINAL), U.S. ARMY MATERIALS  
TECHNOLOGY LABORATORY WATERTOWN, MASSACHUSETTS**

Dear Ms. Williams and Mr. Durrett,

1. Attached please find the Second Five-Year Review Report (Final) U.S. Army Materials Technology Laboratory (AMTL), Watertown, Massachusetts for Operable Units 1, 2 and 3. The five-year review did not identify any significant issues or concerns that require action beyond that required in the Records of Decision (ROD) for Operable Unit 1 (OU1) Zones 1-4 and Operable Unit 3 (OU3). However, there is a concern that bank erosion is occurring along the Charles River adjacent to Charles River Park. While the integrity of the two foot soil coverage required by the OU1 ROD and ESD remains intact along the riverbanks, the Army is taking preventive measures to ensure the long-term site integrity of the two foot soil coverage.
2. The five-year review concluded that the remedy for each OU as selected by the respective RODs is protective of human health and the environment. It is recommended that Annual Institutional Control Reports occur every year in accordance with the Institutional Control Memorandum of Agreement (IC MOA) and that a five-year review be performed in 2011. The Army will develop a proactive plan to ensure stability along the banks of the Charles River Park as well as continue to evaluate the riverbank for erosion during the inspections required by the IC MOA.
3. Please do not hesitate to contact me at (757) 788-4350 or Mr. Mark Brodowicz of Calibre at (317) 259-1879.



THOMAS E. LEDERLE

Director

Hampton BRAC Field Office

**Copy Furnished with Enclosure:**

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**Scott Weber, AEC**

**Susan Falkoff, RAB Co-Chair**

**Mark Brodowicz, Calibre**

**Frank Stearns, Kirkpatrick & Lockhart**

**Ingrid Marchesano, WADC**

**Stanley Cintron, AMC**

**Mario Traficante, MA DCR**

**James Okun, O'Reilly, Talbort & Okun**

**Robert Davis, USACE New England**

**District**

### Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name (from WasteLAN): U.S Army Materials Technology Laboratory		
EPA ID (from WasteLAN): MAD213820939		
Region: 1	State: MA	City/County: Watertown, Middlesex County
SITE STATUS		
NPL status: <input type="checkbox"/> Final <input checked="" type="checkbox"/> Deleted <input type="checkbox"/> Other (specify) A parcel of the site has been deleted from the NPL based on a partial deletion process		
Remediation status (choose all that apply): <input type="checkbox"/> Under Construction <input type="checkbox"/> Operating <input checked="" type="checkbox"/> Complete		
Multiple OUs? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Construction completion date: N/A	
Has site been put into reuse? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		
REVIEW STATUS		
Lead agency: <input type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input checked="" type="checkbox"/> Other Federal Agency <input type="checkbox"/> US Army		
Author name: Mark Brodowicz		
Author title: BEC Technical Assistant	Author affiliation: Calibre.	
Review period:** November 2001 to January 2006		
Date(s) of site inspection: 06/07/05		
Type of review: <input checked="" 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 type="checkbox"/> Regional Discretion		
Review number: <input type="checkbox"/> 1 (first) <input checked="" 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) Previous Five-Year Review Report (ROD and ESD for OU1 Zone 5) and requirement for a NFA ROD for OU2 - Charles River (triggers a year earlier)		
Triggering action date (from WasteLAN): 03/2002		
Due date (five years after triggering action date): 03/2006 (one year early per ROD 09/30/05)		

\* ["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 (Continued)

### Issues:

The five-year review did not identify any significant issues or concerns that require action beyond that required in the Records of Decision (ROD) for Operable Unit 1 (OU1) Zones 1-4 and Operable Unit 3 (OU3). However, there is a concern that bank erosion is occurring along the Charles River adjacent to Charles River Park. During a 14 April 2005 site walk by the Restoration Advisory Board (RAB) members, there appeared to be areas of isolated erosion in areas where the Army did not perform any remedial action under the OU1 ROD. While the integrity of the two foot soil coverage required by the OU1 ROD and Explanation of Significant Differences (ESD) remains intact along the riverbanks, the Army may need to evaluate preventive measures to ensure the long-term site integrity of the two foot soil coverage.

### Recommendations and Follow-up Actions:

The five-year review concluded that the remedy for each OU as selected by the respective RODs appears to be providing sufficient protection of human health and the environment. It is recommended that Annual Institutional Control Reports occur every year in accordance with the Institutional Control Memorandum of Agreement (IC MOA) and that a five-year review be performed in 2011. The Army needs to develop a proactive plan to ensure stability along the banks of the Charles River Park as well as continue to evaluate the riverbank for erosion during the inspections required by the IC MOA.

### Protectiveness Statement(s):

Remedial actions completed at OU1 and OU3 at the former Army Material Technology Laboratory (AMTL) are protective of human health and the environment. However, in order for the remedy for OU1 Zone 5 to remain protective in the long term, the Army must stabilize the riverbank adjacent to Areas P and Q prior to the next five year review.

### Other Comments:

None.

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## **1. INTRODUCTION**

The Department of the Army contracted with CALIBRE to prepare the Second Five-Year Review Report covering the period of November 2001 – January 2006 for the U.S. Army Materials Technical Laboratory (AMTL) located in Watertown, Massachusetts (Appendix 1).

### **1.1 OVERVIEW OF THE FIVE-YEAR PROCESS**

This Second Five-Year Review Report has been prepared in accordance with the 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 National Oil Hazard Substances Pollution Contingency Control Plan, 42 U.S.C 9621.

The purpose of the five-year review process is to determine whether the remedy at the AMTL National Priorities List (NPL) site (the Site) in Watertown, Massachusetts are, or are expected to be, protective of human health and the environment based on review of the existing reports and field inspections. The findings and conclusions of the review are documented in this report for the Site.

Under Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Section 121(c) and the National Contingency Plan (NCP), initiation of a selected remedial action for a site at an installation that will result in hazardous substances, pollutants, or contaminants remaining at the Site above levels that allow for unlimited use and unrestricted exposure after the remedial action is complete is the “trigger” that starts the five-year review clock. The trigger date for the five-year review was determined by the initiation of remedial action at Area I as shown in EPA’s WasteLAN database: 26 August 1996.

The Site was placed on the CERCLA NPL in May 1994. A Federal Facilities Agreement (FFA) was signed by the Army and EPA on 24 April 1995. The FFA outlines the response action requirements under CERCLA and was developed in part to ensure that environmental impacts associated with past activities at the Site are thoroughly

investigated and remediated as necessary. The first five-year review was completed in January 2002. This is the second five-year review of the Site and covers the period from November 2001 – January 2006.

#### **1.1.1 Community Involment**

At the 29 June 2005 Restoration Advisory Board (RAB) meeting, the community was informed of the second five-year review process for the Site. A public notice (Appendix 2) was run in the Boston Globe (25 July 2005), Boston Herald (25 July 2005), and Watertown Tab & Press (29 July 2005). Any persons with related comments and/or information were asked to contact the Army's Technical Manager, Robert Davis, U.S. Army Corps of Engineers - New England District, Engineering/Planning Division, 696 Virginia Road, Concord, MA 01742-2751, (978) 318-8236 or email at [Robert.W.Davis@usacc.army.mil](mailto:Robert.W.Davis@usacc.army.mil).

Upon completion of the second five-year review, a summary of the findings of this report is scheduled to be presented to the public during the spring 2006 RAB meeting. The summary will include a description of remedial actions, deficiencies, recommendations, and follow-up actions that are directly related to protectiveness of the remedy, and the determination(s) of whether the remedy is or is expected to be protective of human health and the environment. The summary will also provide the location of where a copy of the complete report can be reviewed, and provide the date of the next five-year review or notify the community that five-year reviews will no longer be necessary. Five-year reviews are Administrative Record material, and the Army will ensure that the signed Five-Year Review Report is placed in the Site information repository for public review.

The local citizens, members of the RAB, provided extensive input into the cleanup of the Site. The citizen members of the RAB have been participating in the Site cleanup process since 1989 and have drawn upon the assistance provided by the Technical Assistance Grant to provide informed input. The RAB continues to meet and is open to the public.

### **1.1.2 AMTL Location**

The Site consists of 48 acres of land located in Watertown, Massachusetts (Appendix 1). The property is bordered by Arsenal Street and a commercial area to the north; commercial and residential properties to the west; Talcott Avenue to the east; and the Charles River to the south. A public park and a yacht club are located on what was formally an 11-acre easement granted in 1920 by the U.S. Army to the Metropolitan District Commission, predecessor to the Commonwealth of Massachusetts Department of Conservation and Recreation (DCR). The property was transferred to the DCR in May 2005. The western third of the DCR property is permitted for use to the Watertown Yacht Club (WYC) by the DCR. This 11-acre Charles River Park parcel is known as Zone 5. The other 36.5 acres represent the final footprint of the AMTL physical plant; this property was divided into Zones 1, 2, 3, and 4 for the purposes of environmental remediation and re-use.

### **1.2 ROLES AND RESPONSIBILITIES**

CALIBRE has been contracted by the Army to prepare this second five-year review for the Site. The Army will review and provide input into this report before it is finalized. The review team includes the U.S. Army Base Realignment and Closure Office (BRACO), U.S. Army Environmental Center (AEC), U.S. Army Corp of Engineers New England District (CENAE), EPA, and Massachusetts Department of Environmental Protection (MASSDEP). The Army is the lead agency for performing cleanup at the Site with oversight by EPA and MASSDEP.

### **1.3 ORGANIZATION OF REPORT**

Section 1 presents the introduction and description of the five-year review process, description and background of the Site, and community awareness. Sections 2 covers the Soil and Groundwater OU, OU1 (Zones 1-4) and the Area I OU, OU3 (AREA I) since both had common contamination and similar cleanup actions. Due to the high level of public interest regarding the Charles River Park (OU1 - Zone 5), this site is broken out and presented in Section 3. Section 4 covers the Charles River OU, OU2. Attachments are included in the appendix.

#### **1.4 NEXT FIVE-YEAR REVIEW**

The third five-year review for the Site should be performed within five years of the completion of this review, which is anticipated to be in March 2011. The completion date is the date on which EPA issues its letter to the U.S. Army either concurring with its findings, or documenting reasons for non-concurrence.

## **2. OU1 – OUTDOOR AREAS ZONES 1-4 AND OU 3 AREA I**

### **2.1 OU1 and OU3 INTRODUCTION**

Refer to Section 1.1 for a description of the purpose of the five-year review.

### **2.2 OU1 and OU3 CHRONOLOGY**

The AMTL facility was established in 1816 by President James Madison, and was originally used for the storage, cleaning, and issuance of small arms. During the mid-1800s, the mission was expanded to include ammunition and pyrotechnics production; materials testing and experimentation with paints, lubricants, and cartridges; and the manufacture of breech loading steel guns and cartridges for field and siege guns. The mission, staff, and facilities continued to expand until World War II, at which time the facility encompassed 131 acres, including 53 buildings and structures, and employed 10,000 people. Arms manufacturing continued until an operational phasedown was initiated in 1967. At the time of the operational phasedown, much of the Watertown Arsenal property was transferred to General Services Administration (GSA). In 1968, GSA sold approximately 55 acres to the Town of Watertown. This property was subsequently used for the construction of apartment buildings, the Arsenal Mall, and a public park and playground. The Site contained 15 major buildings and 15 associated structures. In 1969, the Army's first material research nuclear reactor was completed at AMTL. The reactor was used actively in molecular and atomic structure research activities until 1970, when it was deactivated. The research reactor was decommissioned under the jurisdiction of the Nuclear Regulatory Commission in 1992 and the structure was demolished in 1994. In 1987, the U.S. Army Toxic and Hazardous Material Agency initiated preliminary site studies, the first stage of the facility's closure plan. In late 1993, Congress officially recommended the closure of the facility. On 29 September 1995, the Site was closed and reverted to a caretaker status.

The Site was placed on the EPA NPL as a Superfund Site in May 1994 and in 1995 the Army signed an Interagency Agreement with the EPA stipulating that site investigations and cleanup actions would follow CERCLA/Superfund Amendments and

Reauthorization Act (SARA), under the regulatory guidance of the NCP 40 CFR Part 300. A Technical Review Committee (TRC) was formed at the time which has subsequently become the RAB. In 1994, AMTL was placed on the Base Realignment and Closure (BRAC94) list.

In August 1998, 36.5 acres of the 48-acre CERCLA site were transferred from the ownership of United States Army. At that time, the Watertown Arsenal Development Corporation (WADC) acquired 29.44 acres of the Site. The Town of Watertown took ownership of 7.21 acres. In March of 2005, the remaining 11 acres of the Site were transferred to the Commonwealth of Massachusetts, Department of Conservation and Recreation. At the time of each transfer, the United States of America, acting by and through the Secretary of the Army, granted the MASSDEP a Grant of Environmental Restriction and Easement for each appropriate zone of the AMTL Site. The purpose of this Grant was to provide a mechanism for the creation and enforcement of the necessary land use controls as required by the CERCLA RODs for the Site (August and September 1996). The Grant redesignated areas into lots for property transfer and future deed tracking. Environmental Zones 1, 2, and 3 (the parcel that was initially transferred to WADC) were designated Lot 1. Lot 1 was sold to Charles River Business Center Associates (CRBCA) in December 1998. CRBCA sold the Lot 1 property to President and Fellows of Harvard College (Harvard) in May 2001. Environmental Zone 4 (the parcel transferred to the Town of Watertown) was designated as Lot 2. Lots 1, 2, 3 and 4 were deleted from the NPL through the partial deletion process on November 22, 1999.

Annual Institutional Control Reports are required by the MOA that was signed on 7 August 1998 by the EPA, MASSDEP and the Army. The purpose of the reports is to document the condition of the institutional controls. The MOA recognizes that these Annual Reports are the responsibility of the Army. Currently, the Army has an agreement in place with the WADC and the DCR to develop the reports each year for their respective property. Since the last 5 year review, reports were submitted in August 2002 (fourth), August 2003 (fifth), October 2004 (sixth), and September 2005 (seventh).

## **2.3 BACKGROUND**

### **2.3.1 Physical Characteristics**

The Site is relatively flat with slopes generally less than 1 percent. The southern portion of the Site slopes 2 to 3 feet downward to the Charles River along its banks. The original land topography has been greatly altered since the turn of the century by construction and demolition fill. The majority of the Site was covered by a layer of fill, consisting of sand, gravel, and non-hazardous construction debris. Surface drainage on the Site, other than direct infiltration or surface flow to the river, exists as a stormwater drainage system off the adjacent roadways.

### **2.3.2 Land and Resource Use**

There is a private drinking well located 2 miles northwest of the property. The municipal drinking water within 4 miles of the Site is supplied by surface water sources located to the west of the Site and is unaffected by the Site. The Charles River is used for recreational boating. As previously stated, the Site closed in the Fall of 1995. Since its transfer to WADC and CRBCA, the property has been developed for commercial and open space. A list of current tenants of the AMTL property (Lot 1) is included in Appendix 3.

### **2.3.3 History of Contamination**

Because of the complexity of this industrial complex, the Site was divided into three areas for investigation. OU1, as specified in the September 1996 ROD, addressed most outdoor soil, except for a small area near building 131 which was included in OU3 to facilitate reuse, and all underlying groundwater. The indoor areas and petroleum-related clean-ups were addressed under the Commonwealth of Massachusetts cleanup authority. Environment Zones 1-5 includes Areas A, B, C, D, E, F, G, H, J, K, L, M, N, O, P, Q, T, metal hot spots based on ecological risk, and lead hot spots (WESTON, 1998). Zone 1 included Area A2, Zone 2 included Areas A1, A3, B, C, D, E, and G (west side). Area F was initially physically located in Zone 2; however, due to its potential reuse as a residential area, it was moved into Zone 3. Zone 3 included Area F, G (east side), and H.

Zone 4 included J1, J2, K1, K2, K3, L1, L2, L3, and L4. Cleanup goals were based on background except for Polychlorinated Biphenyl (PCBs) and lead, which were based on EPA guidance levels.

#### **2.3.4 Initial Response**

Remedial Investigations of these two operable units were conducted between 1987 and 1995 and generally found the following contamination across the Site:

**Groundwater:** With the exception of one well, all upgradient wells showed detectable quantities of chlorinated solvents, which suggests that off-site sources have caused the groundwater contamination. No evidence of on-site contamination migrating off-site was found in groundwater samples collected from on-site wells because the majority of contamination was detected in the upgradient wells. The on-site, and farthest downgradient wells bordering the Charles River, showed the lowest levels of contamination. Although some contamination is present in certain areas of on-site groundwater, this does not pose a current or future risk because the groundwater is not used as a water supply, and no significant migration of contamination is occurring. The Site groundwater meets the Commonwealth of Massachusetts definition of a non-drinking water aquifer (GW-3) as defined in 310 CMR40. Therefore, there is no risk of exposure to human receptors. Groundwater does discharge from the Site into the Charles River. A model of contaminant contribution via groundwater to the Charles River was developed. This model, as presented in the Feasibility Study (FS), shows that no significant concentration of contaminants migrating to the river from the Site groundwater. Hence, there was no apparent risk to human health or the environment from Site groundwater and No Further Action (NFA) was documented in the OU1 ROD for all groundwater across the AMTL facility.

**Surface Soil:** Semi-volatiles, pesticides, PCBs and metals were detected at levels exceeding the Massachusetts Contingency Plan (MCP) S-1/GW-1 standards (the most protective) at zero to two feet BGS. These detections were scattered and in hot spots, as opposed to site-wide distribution. PCBs were detected at levels above the EPA action

level. The analytical results showed that the total uranium activity in all soil was below the federal maximum allowable standards.

Sub-surface Soil: Volatile organics, semi-volatile organics, Poly-Aromatic Hydrocarbons (PAHs), pesticides, and metals were found at many sampling locations above MCP S-1/GW-1 standards at two to 8 feet BGS.

Surface Water and Sediment: Surface water contained arsenic and lead above human health Ambient Water Quality Standards. Sediment was contaminated with low levels of metals and pesticides above EPA Region 1 sediment screening values.

Below is a summary of the contaminants of concern for soil and the corresponding cleanup levels.

**Table 1.1**

Soil Contaminant of Concern	Maximum Concentration (mg/kg)	ROD Cleanup Level (mg/kg) (Surface and subsurface soil)	ESD Cleanup Level (mg/kg) (Subsurface soil only)	Zones where cleanup levels pertain
<b>(PAH)</b>				
Benzo(a)anthracene	3.2E+01	8.5E+00	1.76E+03	2,3,4
Benzo(a)pyrene	3.7E+01	2.0E+00	1.54E+02	1,2,3,4
Benzo(b)fluoranthene	1.5E+01	7.9E+00	1.76E+03	2,3,4
Benzo(k)fluoranthene	2.4E+01	6.2E+00	1.76E+04	2,3,4
Indeno (1,2,3-cd)pyrene	1.4E+00	3.0E+00	1.76E+03	1,2,3,4
Chrysene	3.4E+01	1.11E+01	1.76E+05	3,4
Dibenzo(a,h)anthracene	3.3E+00	2.7E-01	1.54E+02	3
<b>(Pesticides)</b>				
DDD	3.5E+00	1.37E+01		3,4
DDE	6.3E+00	1.4E-01		3,4
DDT	5.2E+00	1.7E-01		3,4
Dieldrin	4.0E+00	3.5E-01		3,4
Chlordane	9.4E+00	1.4E+00**		3,4
<b>(PCB)</b>				
Arochlor-1260 (PCB)	4.9E+00	1.0E+00		3,4
<b>(Metals)</b>				
Lead*	1.3E+03	1.0E+03		2

\*Cleanup goals for all other metals were not determined because levels generally were consistent with background levels. Cleanup goal for lead was agreed to in the Remedial Design.

\*\* Cleanup goal for chlordane in Zone 3 was 1.5E+00 based on human risk.

Human Health Risks for OUs 1 and 3 were evaluated for future use. The future use included a residential scenario, which is the most protective assessment for human health. Risks were unacceptably high under the residential conditions (maximum cancer risks  $3E-05$  and maximum Hazard Index 0.4) and therefore remediation was required. Some areas were remediated to commercial risk levels and required a Grant of Environmental Restriction (see Appendix 4 for Zone's Chemical of Concern).

The Ecological Risks center on two scenarios: 1) exposure to Site groundwater in the Charles River and 2) exposure to Site soil in the limited open space areas. Contaminants in groundwater are possibly migrating toward the Charles River but the low level of contamination is not expected to adversely affect aquatic organisms. Most of the AMTL Site is not prime terrestrial habitat due to the lack of open space. Suitable habitat for terrestrial vegetation and wildlife is restricted to the southeastern corner of the Site. Receptors evaluated in the risk assessment with unacceptable hazard indices were: northern short-tailed shrew, white-footed mouse, American robin, song sparrow and earthworms. Major risk drivers were metals and pesticides. Metals cleanup goals except lead were not established because on-site metals were found to be generally consistent with normal background levels. Any areas with metals contamination posing an unacceptable risk always were co-located with pesticides and remediated to reduce ecological risk by greater than 25% (except lead, which met the cleanup goal in Table 1-1).

### **2.3.5 Basis For Taking Action**

A ROD for OU3 was signed on July 28, 1996. For OU1, a ROD was signed September 26, 1996. Both RODs selected the following remedy:

- Excavation of areas with contaminated soil that was above cleanup goals.
- Confirmatory soil sampling within excavations after contaminated soil removal.
- Off-site landfill disposal or reuse of the excavated soil.
- Backfilling of clean fill soil into the excavations.

- Institutional controls with 5-year site reviews. \*

\* OU3 did not require any institutional controls.

Institutional controls for this Site include land use controls and restrictions, which were necessary only in the areas that did not allow for unrestricted future use (i.e., residential) as well as for potentially contaminated soil underneath buildings. The restrictions also control the demolition of buildings under which soil contamination may be above cleanup goals by dictating the proper handling of any contaminated soil (i.e., excavation and disposal). To the extent required by law, EPA and the U.S. Army shall review the Site at least once every 5 years after the initiation of remedial action at the Site for areas where any hazardous contaminants remain to ensure that the remedy remains protective of human health and the environment. Specifically, the reviews are to be performed to determine if land use and other controls are effective and that land use has not changed, or if it has changed, changes are consistent with the procedures outlined in the Grant of Environmental Restriction and Easement at the Site are still protective of human health and the environment.

An ESD that addressed Lot 1 for OU1 was signed January 12, 1998. The ESD changed the subsurface PAH cleanup levels to be protective of construction workers.

## **2.4 REMEDIAL ACTIONS**

### **2.4.1 Remedy Implementation**

Soil clean-up goals were established in the ROD for different zones at the Site based on the intended future use of particular areas (see Table 1-1). The clean-up goals were developed to provide a mix of future uses at the Site, including residential, commercial and recreational scenarios. The only exception was for the contaminants of concern and for chlordane in Zone 3 where the residential cleanup level was slightly higher than the ecologically protective level. In addition, during remediation and excavation activities, the Army and regulators determined that a construction worker excavation scenario was a more realistic and appropriate exposure scenario for soil at a depth greater than one (1)

foot BGS in Zones 1 & 2. Because the Baseline Risk Assessment did not include the construction worker exposure scenario, additional risk assessment work was performed. The construction worker exposure scenario recognized that periodic maintenance and/or installation of subsurface utilities/structures would be required in the future. In general, the construction worker exposure scenario differs from the commercial exposure by evaluating risks from contaminated soil below one (1) foot BGS using an exposure duration that mimics the potential need to perform periodic subsurface utility work.

The addition of one foot of clean soil meets the appropriate risk-based cleanup goals and no changes were made to the cleanup goals in the subsurface soil. In addition, the subsurface soil construction worker exposure scenario is recognized as an appropriate risk scenario for the public benefit reuse areas (Zone 4) because the "open space" user will not be excavating below one foot.

The Revised Cleanup Goals were documented in the ESD. Remedial action objectives remained the same: mitigate the risks to human health and the environment posed by direct contact with and incidental ingestion of contaminated soil. The revised cleanup goals were applied at Areas B, E, G, J and L. The confirmation samples taken prior to the revision of the cleanup goals indicated that the soil below one foot met these goals and the excavations were considered complete. Final remedial action for the northern zone of the Site was started on November 20, 1996 and completed on July 27, 1998. All soil was disposed of off-site in accordance with state and federal requirements. Institutional Controls were implemented during the transfer.

Remedial action in OU3 (Area I) started on August 26, 1997 and was completed on January 10, 1997. All soil was disposed of off-site in accordance with state and federal requirements. No institutional goals were necessary as the ROD specified cleanup goals that were protective of residential exposure to soil.

#### **2.4.2 System Operation/Operation and Maintenance**

There is not any system in place that requires operation or maintenance in Zones 1-4.

## **2.5 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW**

Annual IC inspections have continued in OU1 (Zones 1-4) since the last five year review, with the fourth, fifth, sixth and seventh on file. Most of the buildings now have a tenant (99% leased).

There were three Applications for Amendments to the Grant of Environmental Restrictions and Easements since the last five year review. The Fifth Grant Amendment was approved on 4 November 2004 and accounted for changes in benchmark elevations and reductions in grade at Areas B, E, and G resulting from construction and utility work. The Fifth Grant Amendment also provided improved benchmark design standards, removal of building areas that no longer existed due to demolition activities, and added a requirement for an Integrated Grant attachment that incorporated all amendments to date for use as reference only. All subsequent Grant Amendments are to include an updated Integrated Grant attachment. The Sixth Grant Amendment was approved 4 May 2005 for the Building 311 Area. The Sixth Grant Amendment was requested to remove all restrictions for the land immediately surrounding and encompassing the Building 311 Area and to remove this area from the commercial Re-Use Area. An application for Seventh Amendment to the Grant has been submitted requesting removal of most restrictions from the Building 312 Area and removal of this area from the Commercial Re-use Area. The application for Seventh Amendment to the Grant is currently pending revisions and approval.

## **2.6 FIVE-YEAR REVIEW PROCESS**

### **2.6.1 Administrative Components**

Refer to Section 1.1.

### **2.6.2 Community Involvement**

Refer to Section 1.1.

### **2.6.3 Document Review**

Documents Reviewed are referenced in Appendix 5.

### **2.6.4 Data Review**

The OU1 ROD, OU3 ROD and ESD do not require data collection.

### **2.6.5 Site Inspections**

The Site inspection for the five-year review was conducted simultaneously with the 2005 annual inspection on June 7, 2005 by Mark Brodowicz of CALIBRE (acting Base Environmental Coordinator Technical Assistant and Army Representative) and Todd Alving of McPhail & Associates. For AMTL, Rob Weikel, of the Beal Companies and Site manager for Harvard, was present. Site Inspection Reports can be found in Attachment 1.

### **2.6.6 Interviews**

Rob Weikel, of the Beal Companies and site manager for Harvard, was interviewed as part of the five-year process (Appendix 6 Interview Record). No other interviews were conducted.

## **2.7 TECHNICAL ASSESSMENT**

### **Questions A:** *Is the Remedy functioning as intended by the decision documents?*

The remedy for OU1 Zones 1-4 is functioning as intended by the September 26, 1996 RODs and January 12, 1998 ESD. The remedy for OU3 Area I is functioning as intended by the July 28, 1996 ROD. Depending on the location of property within the Site, the Army has concluded that the highest and best use is either commercial or residential (Appendix 4).

### **Question B:** *Are the exposure assumptions, toxicity data, cleanup values, and Remedial Action Objectives (RAOs) used at the time of the remedy selection still valid?*

The human health and ecological risk assessments for this Site resulted in risk-based goals designed to comply with CERCLA as well as the MCP. In the human health and ecological risk assessments in the Remedial Investigation (RI) report, the levels of contaminants were compared to available standards and guidance values using federal and state environmental and public health laws that were identified as potentially Applicable or Relevant and Appropriate Requirements (ARARs) at the Site. Chemical-specific ARARs are usually health- or risk- based numerical values or methodologies that result in a numerical value when applied to site-specific conditions. Other non-promulgated federal and state advisories and guidance values, referred to as To-Be-Considereds (TBCs), and background levels of the contaminants in the absence of TBCs, were also considered. This comparison was used in the selection of the preferred remedial action.

For soil cleanup less than one foot BGS, an EPA-approved statistical evaluation of the background soil data set was used to calculate the 90% Upper Confidence Limit (UCL). The UCL calculated for each contaminant was used at the contaminant's background level, which were above the calculated human health risk-based goals for all contaminants found at AMTL. Since background levels were used for soil cleanup goals less than 1 foot BGS, any changes to exposure assumption, toxicity data or cleanup values since the last five year review will not have any affect.

For soil cleanups below 1 foot BGS, a construction worker scenario was selected. A risk assessment was performed by WESTON (1997) to estimate the carcinogenic risks and non-cancer hazard indices from exposure to PAHs in soil for a construction worker who may be performing building construction, excavation and/or other similar types of activities in Zones 1, 2 and 4 at AMTL. The construction worker exposure scenario was evaluated for soil using PAHs because the nature and extent of soil contamination encountered at the Site primarily consisted of PAHs. Revised risk-based soil cleanup-up goals were developed for the PAHs of concern based on the construction worker scenario. A final report dated 28 May 1997 was prepared detailing the results of this risk assessment work. The report was reviewed again in November 1999 (in the Draft Final

Feasibility Study Addendum Report for the Charles River Park Parcel, Foster Wheeler, 1999) for consistency with current risk assessment practice.

The risk assessment for the construction worker concluded that the PAH concentrations observed during the remedial activities exhibited an acceptable total cancer risk of less than  $1 \times 10^{-5}$  and an acceptable hazard index less than 0.1. The revised PAH cleanup goals for the Site were presented in Section 2.3.4, Table 1-1 earlier in this 5-Year Review.

Relative to human health, toxicity data for contaminants of concern were reviewed to determine if any revisions have been made since the ESD was issued. Toxicity values for benzo[a]pyrene and dibenzo[a,h]anthracene were confirmed from the EPA Integrated Risk Management System (IRIS) Computerized Database of Hazardous Waste Toxicity Data Maintained by the U.S. EPA (U.S. EPA 2005), a peer-reviewed toxicity database. If toxicity values were not available from the IRIS (specifically dibenzo[a,h]anthracene), specific values were recommended by EPA Region I during development of the original risk assessment communications with WESTON. The Toxicity Equivalency Factor (TEF) approach was used when evaluating toxicity data for this 5-year review.

In order to reduce the risks to terrestrial ecological receptors from the contaminants of concern, ecologically-based clean-up levels were developed. Chemical-specific clean-up levels were calculated for the short-tailed shrew and the American robin based on a hazard index of 10 (*Feasibility Study Report (Outdoor) Army Materials Technology Laboratory, January 1996, WESTON*). A hazard index of 10 was established by EPA for this Site as an acceptable goal, since clean-up goals based on a hazard index of 1 yielded clean-up levels below background and analytical detection limits.

The results of the ecological risk assessment show that the concentrations of the PAHs at AMTL do not pose a risk to ecological receptors. However, the results of the ecological risk assessment show that the concentrations of pesticides in Zone 4 and the Charles River Park (Zone 5) posed a risk to ecological receptors. Hazard Indices (HIs) greater

than 10 were estimated for the shrew and based on concentrations of chlordane and Dichlorodiphenyltrichloroethane (DDT), and HIs greater than 10 were estimated for the robin based on concentrations of DDT, Dichloroethylidene (DDE), and endrin. Concentrations of DDE and chlordane also exceeded toxicity values for soil invertebrates. The results of the ecological risk assessment also showed a risk to the ecological receptors based on exposure to certain metals at the Site. The HIs for the short-tailed shrew exceeded 10 for arsenic, chromium, lead, nickel and zinc. Concentrations of zinc and copper at the Site also exceeded toxicity values for soil invertebrates. The conclusion of the ecological risk assessment provided a clean-up goal of soil removal from areas of concern with contaminant levels measured above the statistical background values. To achieve this goal, soil was excavated to a depth of two feet (2 ft) and backfilled with clean imported fill materials.

Significant changes to screening, ecological and toxicological values have not occurred. The ARARs have not changed for this remedy (see Appendix 7).

**Question C:** *Has any other information come to light that could call into question the protectiveness of the remedy?*

There has been no other information that has come to light to question the protectiveness of the remedy.

#### **Technical Assessment Summary**

Based on the data reviewed and the Site information, the remedy is functioning as intended in the ROD. There have been no changes in ARARs, TBCs, screening levels, or toxicity criteria for the Contaminants of Potential Concern (COPCs), and there have been no changes to the standardized risk assessment methodology that affect the protectiveness of the remedy.

#### **2.8 ISSUES**

This five-year review did not identify any significant issues or concerns that require action beyond that specified in the RODs for OU1 and OU3.

## **2.9 RECOMMENDATIONS AND FOLLOWUP ACTIONS**

This five-year review concluded that the remedy for OU1 and OU3 selected by the respective RODs appear to be providing sufficient protection of human health and the environment. It is recommended that Annual Institutional Control Reports occur every year in accordance with the IC MOA until the next five-year review, at which time the frequency may be changed. All areas that have any land use restrictions and still have some contamination that results in the prohibition of unrestricted use are the subject of future statutory reviews.

## **2.10 PROTECTIVENESS STATEMENT**

Based on the documents review, data review and analysis, site inspection, and an assessment of the remedy protectiveness, the remedy and current institutional controls for the OU-1, Zone 1-4 and OU3 are considered protective of human health and the environment.

## **2.11 NEXT REVIEW**

The next five-year review for OU1 and OU3 should be performed within five years of the completion of this review. The completion date is the date on which EPA issues its letter to the U.S. Army either concurring with its findings or documenting reasons for non-concurrence.

### 3. OUI – CHARLES RIVER PARK – ZONE 5

#### 3.1 SITE INTRODUCTION

Refer to Section 1.1 for a description of the purpose of the five-year review.

#### 3.2 SITE CHRONOLOGY

Refer to section 2.1.2 for a description of the Site.

In 1920, the Army granted a permanent Right-of-Way (ROW) for the Charles River Park parcel to the Commonwealth of Massachusetts. Through the grant, the Commonwealth assumed responsibility for the care, management, and police jurisdiction over the property. The Site was officially closed on 29 September 1995 and the majority of the Site was transferred to the private sector in August 1998. The Charles River Park parcel was transferred to the Commonwealth of Massachusetts DCR (formally the Metropolitan District Commission, MDC) in May of 2005.

The remedial action work at the Site was performed between November 1996 and December 1997 in response to the ROD for the Soil and Groundwater OU, signed under CERCLA. In particular, remedial work in the Charles River Park parcel commenced in May 1997, but was suspended in August 1997 pending a decision by the Army to re-evaluate the ROD for Charles River Park. In September 1999, Foster Wheeler completed the *Feasibility Study Addendum*, in which several different excavation and capping alternatives for Areas M and P/Q were identified, as well as the re-evaluation of PAH cleanup levels originally identified in the ROD. An ESD for the Charles River Park was signed by the Army and the EPA in June 2001. The MASSDEP provided a letter of concurrence on this ESD. The ESD established construction worker cleanup values for PAHs to be used at depths greater than two-feet BGS. The construction worker values were the same as those developed for use on the former AMTL re-use parcels of the Site. Foster Wheeler Environmental Corporation completed the second phase of the remedial action on Areas M, P/Q, and the Riverbank Areas in the Fall of 2001 in accordance with the June 2001 ESD. Site restoration monitoring and maintenance activities of Area P and Q riverbanks continued through 2005. The last action occurred in April 2005 with goose

netting placement in the terrace wetland Area P riverbank to prevent the geese from eating the herbaceous plants that were planted in the spring of 2004, replacing the original plants placed by the Army in 2002.

### **3.3 BACKGROUND**

#### **3.3.1 Physical Characteristics**

See Section 2.3.1.

#### **3.3.2 Land and Resource Use**

Charles River Park consists of approximately 11 acres of land and is bounded between North Beacon Street to the north, the Charles River to the south, the WYC to the west, and the North Beacon Street/Charles River Road intersection to the east. A public park, yacht club and North Beacon Street are located on what was formally the 11-acre easement granted by the U.S. Army to the Commonwealth of Massachusetts DCR and transferred to the DCR in May 2005. The western third of the DCR property is permitted to the WYC by the DCR. This 11-acre parcel is known as Zone 5.

Remediation locations, as defined in the September 1996 ROD, include Areas M, N, O, P, and Q (see Appendix 1). Area M is located within the property occupied by the WYC. The reuse alternative selected for Charles River Park was public/open space access. In Areas M, N, O, P, and Q, soil cleanup goals were established for PAHs based on human health risk and pesticides based on ecological risk.

#### **3.3.3 History of Contamination**

The Charles River Park has had no role in the Site's mission related activities since the Army granted the ROW to the MDC in 1920. However, some portion of the property was used for employee parking to accommodate increased personnel stationed at the Site during World War II. As part of the Remedial Investigation field activities at the Site in 1991 and 1992, WESTON collected surface soil samples and installed borings to

various depths throughout the Site. The overall areas targeted for remediation were delineated in the site Feasibility Study using the Remedial Investigation data.

### 3.3.4 Initial Response

Using information gathered during the RI/FS, remedial action objectives were identified for cleanup of the AMTL Site (see Table 1-1).

**Table 1-2  
Remedial Investigation Detected Contaminants of Concern  
(Charles River Park)**

Location/ RI Sample ID	Sample Depth (ft BGS)	Contaminant (s)	RI Detected Concentration (mg/kg)	Soil Cleanup Goal (mg/kg)	Cleanup Goal Basis
<b>Area M</b>					
Boring GRSB-11	0-2	Benzo(a)anthracene	>12	8.5	Human Health
		Benzo(a)pyrene	>6.2	2.0	Human Health
		Benzo(b)fluoranthene	14.8	7.9	Human Health
		Benzo(k)fluoranthene	24.7	6.2	Human Health
		Chrysene	>12	11.1	Human Health
		Dieldrin	0.44	0.35	Ecological
		Lead	1,330	1,000	Ecological
<b>Area N</b>					
Boring GRSB-19	0-2	Chlordane	1.7	1.4	Ecological
		DDT	0.188	0.17	Ecological
<b>Area O</b>					
Boring 17SUB02	1.5-2.5	Benzo(a)anthracene	31.5	8.5	Human Health
		Benzo(a)pyrene	36.5	2.0	Human Health
		Benzo(b)fluoranthene	15.4	7.9	Human Health
		Benzo(k)fluoranthene	23.6	6.2	Human Health
		Chrysene	33.9	11.1	Human Health
		Dibenz(a,h)anthracene	3.34	0.27	Human Health
		Indeno(1,2,3-cd)pyrene	10.4	3.0	Human Health
<b>Area P</b>					
Boring 17SB-2	0-2	Benzo(a)pyrene	8.41	2.0	Human Health
		Indeno(1,2,3-cd)pyrene	8.22	3.0	Human Health
<b>Area Q</b>					
Boring 17SB-3	0-2	Benzo(a)pyrene	3.14	2.0	Human Health
		Indeno(1,2,3-cd)pyrene	4.51	3.0	Human Health
		DDE	6.33	0.14	Ecological
		DDT	3.83	0.17	Ecological

Note: mg kg= milligrams per kilogram

As the table indicates, the cleanup of the Charles River Park parcel included delineation and remediation of soil contaminated with PAHs, pesticides, and metals having concentrations above acceptable risk levels to human and ecological receptors. The selected remedy was soil excavation and off-site disposal/reuse (Alternative S6) (WESTON September 1996). This remedy included the following:

- Excavation of areas with contaminated soil that were above cleanup goals.
- Confirmatory soil sampling within excavations after contaminated soil removal.
- Off-site landfill disposal or reuse of the excavated soil.
- Backfilling of clean fill soil into the excavations.
- Institutional controls with five-year site reviews.

ICs for this portion of the site include restrictions to prevent the use of the area for residential-related activities, as well as to limit activities related to potentially contaminated soil under buildings, and to ensure that at least two feet of clean fill remains in place in remediated areas. To the extent required by law, EPA and the U.S. Army will review the Site at least once every five years after the initiation of remedial action at the Site for the areas where any hazardous contaminants remain to ensure that the restrictions continue to protect human health and the environment. Specifically, the reviews will be performed to determine if restrictions are effective and that the remedy remains protective of human health and the environment.

### **3.3.5 Basis For Taking Action**

It was originally agreed upon by EPA and the Army on 10 June 1997 that the maximum excavation depth for excavation in Charles River Park would be 4 ft. BGS or to groundwater if encountered first. This maximum excavation depth was established because:

- 1) Potential future building in Charles River Park is expected to be limited due to open space future use and existing environmental regulations (e.g. Massachusetts River Protection Act);
- 2) Groundwater is located at a shallow depth (generally around 4 ft. BGS.);
- 3) Groundwater was not a CERCLA media of concern;

- 4) The 4 ft. depth provides a definitive limit; and
- 5) The 4 ft. depth is protective of human health and the environment for the intended reuse. In June 2001 an ESD was signed revising the depth of the excavation for Areas M, P, and Q. Areas N and O were remediated in accordance with the ROD. Details of this ESD are provided below.

The original cleanup goals in the ROD were developed based on the future mixed use for the entire Site, including residential, commercial, and recreational scenarios. For human health, risk-based goals were calculated to comply with CERCLA as well as the MCP. However, the risk based goals were lower than background concentrations. Background concentrations were determined using soil data collected from numerous points off-site from the AMTL property and from points near or along the northern property boundary (Arsenal Street). Since the EPA does not typically require cleanup below background as a matter of policy, the actual site cleanup goals were established equivalent to the background levels.

During the remediation excavation activities at the main part of Watertown installation, it was realized that for the commercial and open space zones, the most appropriate cleanup values for soil greater than one foot BGS would be those developed for the construction worker scenario. Public Access exposures are typically limited to interaction with the surface soil and possible minimal intrusive activity in the soil to a maximum depth of one foot (e.g., from incidental digging by children, dirt bikes, picnicking). The construction worker exposure scenario recognizes that the periodic maintenance and/or installation of subsurface utilities/structures may be required in the Park area in the future. The construction worker scenario mimics the potential need to perform periodic subsurface work.

In a subsequent assessment report, *Supplemental Risk Assessment for Polycyclic Aromatic Hydrocarbons in Soil Samples* (WESTON 1997), revised PAH soil cleanup goals were established based on a construction worker exposure scenario for selected areas of the Site, including the Charles River Park. These revised PAH cleanup levels

applied to soil at depths greater than one foot BGS. However, the depth was extended to two feet BGS to address issues related to ecological risk. These revised PAH soil cleanup levels were presented in the ESD in 2001. Table 1-3 lists these revised ESD cleanup levels. The differences between the ROD and ESD goals are based on the duration of time a construction worker is exposed to the soil.

**Table 1-3**  
**Charles River Park Soil Cleanup Goals for Site Reuse**

Chemical	Cleanup Goal (mg/kg)	
	ROD	ESD
<b>PAHs</b>		
Benzo(a)anthracene	8.5	1,760
Benzo(a)pyrene	2.0	154
Benzo(b)fluoranthene	7.9	1,760
Benzo(k)fluoranthene	6.2	17,600
Chrysene	11.1	176,000
Dibenzo(a,h)anthracene	0.27	154
Indeno(1,2,3-cd)pyrene	3.0	1,760
<b>Pesticides</b>		
Chlordane	1.4	
4,4'-DDD	13.7	
4,4'-DDE	0.14	
4,4'-DDT	0.17	
Dieldrin	0.35	

For the Charles River Park, the ROD PAH cleanup levels applied to soil in the zero to two foot interval. For the soil below two feet, the ESD cleanup levels governed the PAH clean-up. The ROD cleanup levels for pesticides applied to the upper two feet of soil were based on the ecological risk assessment (*Feasibility Study Report (Outdoor) Army Materials Technology Laboratory, Weston, January 1996*).

### 3.4 REMEDIAL ACTIONS

#### 3.4.1 Remedy Implementation

The initial phase of the remedial action in Charles River Park was conducted in 1997. Upon completion of the soil removal at each area, the excavation was filled with an equal volume of clean fill brought in from an outside source. The landscaping in the excavated

area and other areas affected by excavation activities was generally restored to pre-excavation conditions. Trees were replaced as agreed upon in the 24 April 1997 meeting between CENAE, WESTON, the Watertown Conservation Commission (WCC), AMTL Staff, MDC (now DCR), and the WYC. Sidewalks, roadways, and parking areas were also restored to pre-excavation conditions.

#### **3.4.1.1 Remedy Implementation of Area M**

Area M was initially excavated around soil boring GRSB-11 to dimensions of 25 ft x 25 ft x 3 ft (L x W x D) to remove soil contaminated with PAHs, pesticides, and lead. Excavation at Area M occurred between 12 May and 12 June 1997. Some of the soil sample results from the excavation bottom (3 ft. BGS) following the final expansion exceeded applicable PAH cleanup goals. As a result, it was decided by Army that the entire excavation footprint should be excavated to 4-ft BGS prior to backfill. This excavation was completed on 12 June 1997.

During the excavation at Area M, several samples from the excavation sidewalls exceeded PAH cleanup goals. As a result, a program of soil borings was initiated in lieu of continued excavation in an attempt to define the lateral extent of contaminated area(s). Soil borings were performed at Area M in an attempt to define the contaminated area without performing substantial physical disturbance to the WYC operations. These 24 soil boring locations were performed on 10 June and 13 June 1997. Laboratory analytical results generally showed PAHs in excess of soil cleanup goals approximately 75 to 100 ft from the excavation sidewalls, with the exception of the North Beacon Street embankment to the north, which was below the PAH cleanup goals.

Three expansions were performed at Area M and approximately 382 tons of soil were removed. The final excavation depth at Area M was 4-ft BGS with a maximum length and width of 55 ft and 40 ft, respectively.

Based on these findings, work at Area M was suspended pending re-evaluation of the ROD. Once the revised ESD was agreed to by the Army and EPA, Foster Wheeler

Environmental Corporation resumed remedial activities in July 2001 at Area M. The area was excavated to a total depth of two feet BGS. The area was then backfilled and covered with a layer of asphalt. The total soil removal from Area M was 3,077 cy (5,325.22 tons). All confirmation soil sample concentrations were below the PAH, lead and pesticide cleanup goals.

#### **3.4.1.2 Remedy Implementation of Area N**

Area N was initially excavated around soil boring GRSB-19 to dimensions of 10 ft x 10 ft x 3 ft (L x W x D) to remove pesticide-contaminated soil, which were the only Contaminants of Concern (COC) at Area N. Excavation at Area N occurred between 14 May and 30 June 1997. During the excavations at Area N, one large oak tree was removed from the excavation area.

Two excavation expansions were performed at Area N and approximately 133 tons of soil was removed. The final excavation dimensions at Area N were 30 ft x 33 ft x 3 ft (L x W x D). The northeast corner of the excavation was excavated to 4-ft BGS. All confirmation soil sample concentrations were below the pesticide cleanup goals. No further remediation was required.

Area N restoration was performed on 30 June and 1 July 1997 using common borrow material as a base under 0.5 ft of loam. Trees were planted in June 1998 according to the restoration plan agreed upon between CENAE and the WCC.

#### **3.4.1.3 Remedy Implementation of Area O**

Area O was initially excavated around soil sample 17SUB02 to dimensions of 10 ft x 10 ft x 3 ft (L x W x D) to remove PAH-contaminated soil, which were the only COC's at Area O. Excavation at Area O occurred between 14 May and 11 June 1997. During the excavation at Area O, one red oak tree was removed from the excavated area.

Two excavation expansions were performed at Area O and approximately 86 tons of soil was removed. The final excavation dimensions at Area O were 23 ft x 10 ft x 3 ft (L x W

x D). All confirmation soil sample concentrations were below ROD PAH cleanup goals. No further remediation was required. Area O restoration was performed on 30 June and 1 July 1997 using common borrow material as a base under 0.5 ft of loam. Three-quarter inch diameter stone was placed around the outfall of a drain pipe located just to the north of the excavation area. This stone was placed to prevent erosion during heavy drainage events. Trees were planted in June 1998 according to the restoration plan agreed upon by the CENAE and the WCC.

#### **3.4.1.4 Remedy Implementation of Area P**

Area P was initially excavated around soil boring 17SB-2 to dimensions of 25 ft x 25 ft x 3 ft (L x W x D) to remove PAH-contaminated soil, which were the only COC's at Area P. Excavation at Area P occurred between 1 May and 18 July 1997.

Three excavation expansions were performed at Area P and approximately 2,730 tons of soil was removed. Final dimensions of the Area P excavation at its longest and widest points were 135 ft and 115 ft, respectively. The final excavation depth at Area P ranged from 3 to 4 ft BGS. Some confirmation sample results from the Area P excavation sidewalls still exceeded the PAH cleanup goals established in the September 1996 ROD. Work at Area P was temporarily suspended at this time. Remedial activities recommenced at Area P in September 2000. All confirmation soil sample concentrations were below the ESD PAH cleanup goals. The ESD was ultimately signed in May 2001.

Because of the pre-historical significance of the Charles River Park parcel, WESTON arranged for archaeological oversight of the excavation activities in Area P during the initial phase of remedial work. Excavation activities at Area P were monitored and documented by The Public Archaeology Laboratory, Inc. (PAL) of Pawtucket, Rhode Island. No items of historical significance were found during excavation activities in Area P.

#### **3.4.1.5 Remedy Implementation of Area Q**

Area Q was initially excavated around soil boring 17SB-3 to dimension of 25 ft x 25 x 3 ft (L x W x D) to remove PAH- and pesticide-contaminated soil. Excavation at Area Q occurred between 14 May and 30 June 1997, see Figure 3-1.

Two expansions were performed at Area Q and approximately 1,030 tons of non-Resource Conservation and Recovery Act (RCRA) soil and 117 tons of RCRA soil were removed. Final dimensions of the Area Q excavation at its longest and widest points were 125 ft and 66 ft, respectively. The final excavation depth at Area Q was 4-ft BGS. Confirmation sample results from the Area Q excavation sidewalls still exceeded the PAH cleanup goals established in the September 1996 ROD. Work in Area Q was temporarily suspended in June 1997. Remaining contamination associated with Area Q was excavated between September and November 2000 during remediation of the combined Area P/Q.

Because of the historical significance of the Charles River Park parcel, WESTON arranged for archaeological oversight of the excavation activities in Area Q. Excavation activities at Area Q were monitored and documented by PAL. No items of historical significance were found during excavation activities in Area Q.

Area Q restoration was performed on between 30 July and 9 September 1997 using common borrow material as a base under 0.5 ft. of loam. The fence surrounding the Area Q excavation area remained in-place until 23 October 1997 when the new grass was deemed established. During the excavation at Area Q, several trees including four small pines, one large pine, and two small boxwood trees were removed from the excavation area. No replacement of trees was required in Area Q.

#### **3.4.1.6 Remedy Implementation of Area P/Q**

Area P/Q was designed as the area between the Area P and Area Q excavations. A total of 7,556 cy of soil was removed from Area P/Q during September through November 2000.

For the Charles River Park, the ROD PAH cleanup levels applied to soil in the 0 to 2 foot depth interval. For soil below 2 ft, the ESD PAH cleanup levels governed. The excavation of Area P/Q was completed in a continuous fashion, starting at the western end and proceeding to the east (Appendix 1). Once the excavation reached a depth of two feet, confirmatory soil samples were collected from the excavation bottom and exterior sidewalls. A total of 100 samples were collected from this area (66 floor samples and 34 sidewall samples).

The laboratory analytical results were compared to the appropriate cleanup goals to determine if further excavation was required. All 100 confirmatory soil sample results were below the established criteria; therefore, additional excavation was not necessary.

Upon completion of the soil removal, the excavated area was filled with an equal volume of clean fill brought in from an outside source and was restored to pre-excavation conditions. A geo-textile marker fabric was also installed at the base of the 2-ft BGS excavation prior to clean backfilling to serve as a future warning to construction/utility workers in the event that excavation is needed.

#### **3.4.1.7 Remedy Implementation of Riverbank Excavations**

In support of the riverbank remediation in Area P/Q that occurred in the Fall of 2000 and in Area M in July 2001, two separate riverbank sampling programs were completed in Areas P/Q and M. The first sampling event was conducted between 31 July and 3 August 2000 in accordance with the EPA-approved *Final Sampling and Analysis Plan Addendum*, dated August 2000. This event involved the collection of soil samples at ten sampling locations along the approximate 10 ft wide riverbank strip in Area P/Q (samples RB1-S01 through RB1-S12). All of the samples were collected from 0 to 2 ft (BGS) and were analyzed for PAHs and pesticides.

The second riverbank sampling event occurred in January 2001 in order to supplement the original August 2000 riverbank data. The sampling was conducted between 3 and 4

of January 2001 in accordance with the EPA-approved *Sampling and Analysis Plan Addendum*, dated December 2000. This event involved the collection of soil samples at twenty sampling locations along the approximate 10 ft wide riverbank strip in Area P/Q from depths between 0 and 2 ft BGS and 2 to 4 ft BGS. Samples were collected from 2 to 4 ft BGS at the same ten locations as the August sampling event (RB-B1 through RB-B10) as well as from multiple depths at ten new locations (RB-B11 through RB-B20). The samples collected from 0 to 2 ft BGS were analyzed for PAHs and pesticides, while the samples from 2 to 4 ft BGS were analyzed for PAHs only. The ROD cleanup levels for pesticides applied only to the upper two feet of soil based on the ecological risk assessment. The results of both of these sampling events were used as the basis for determining the extent of riverbank excavation required.

The results for Area M riverbank showed that the ROD cleanup levels for some PAH compounds were exceeded in the upper two ft of soil in two locations (RB1-S11 and RB1-S12) at the west end of Area M riverbank. In Area P riverbank, the ROD cleanup level for one pesticide compound (4,4'-DDT) was exceeded in the upper two feet of soil in two locations (RB-B19 and RB-B20). In Area Q riverbank, ROD cleanup levels for some PAH compounds were exceeded in two locations (RB-B10 and RB-B11). No exceedances of ESD criteria were identified in any of the riverbank samples. Since no ESD criteria were exceeded, all riverbank excavations were terminated at 2 ft BGS followed by confirmatory sampling. The horizontal extent between a clean sampling location and one that exceeded ROD criteria was assumed to be half the distance between the two locations. The Areas P, Q, and M riverbank excavations can be seen in Appendix 1. Following completion of the excavation in each area, confirmatory soil samples were collected from the excavation bottom and exterior sidewalls of any excavation that was not backfilled with two feet of cover. All confirmation sample concentrations were below the PAH and pesticide ROD and ESD cleanup goals and were taken at representative locations of all areas where excavation was required.

#### **3.4.1.7.1 Remedy Implementation of Area M Riverbank**

The estimated riverbank area that required excavation was approximately 1,100 square feet. The Area M riverbank was limited by the Charles River along the southern edge, the existing parking lot to the north (Area M), the limit of Area M to the west, and the boat ramp to the east. Excavation to the north was terminated at the edge of the existing pavement, as the paved area was remediated as part of Area M excavation in July 2001. A 2 ft excavation depth was reached and 75 cy of soil (112 tons) was removed. Excavation along the Area M Riverbank was performed using a small backhoe and by hand in places to avoid damage or impacts to existing utilities. The electrical lines servicing the docks in this area were de-energized prior to the start of work. Since the excavations are to be only 2 ft deep, the slope of this excavation was not shored. The excavation sides were sloped as necessary to prevent sidewall collapse. Confirmation sampling determined that ROD and ESD cleanup goals were met as discussed in paragraph 3.1.4.7.

#### **3.4.1.7.2 Remedy Implementation of Areas P and Q Riverbank**

For the Area P Riverbank, the estimated area that required excavation was approximately 1,400 square feet. Using sample locations B-19 and B-20, the area was defined by the existing fence to the north (Area P/Q), half the distance between B-19/B-20 and B-4 to the south, half the distance between B-19 and B-18 to the west, and half the distance between B-20 and B-5 to the east. The southern extent of the excavation remained in the upland portion of the riverbank. A 2 ft excavation depth was reached and 140 cy of soil (210 tons) were removed.

For the Area Q Riverbank, the estimated area that required excavation was approximately 1,820 square feet. Using the sample locations B-10 and B-11, the area was defined by the existing fence to the north (Area P/Q), the Charles River to the south, half the distance between B-10 and B-9 to the west, and half the distance between B-11 and B-12 to the east. The original excavation length of this riverbank was 150 ft, but after a field review, excavation was stopped prior to the root system of one large tree along the riverbank. The final length of excavation was 120 ft. A 2-ft excavation depth was

reached and 127 cy of soil (191 tons) were removed. Confirmation sampling determined that ROD and ESD cleanup goals were met as discussed in paragraph 3.1.4.7.

### **3.4.2 System Operation/Operation and Maintenance**

The remedy required the Army to perform periodic inspections of the installed wetlands. The Army has periodically placed goose netting along the immediate riverbank to assist in the development of the Area P terrace wetland by preventing overgrazing by the large resident population of Canadian geese, which would destroy the new planting.

## **3.5 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW**

All site restoration work was completed by the first five year review (2001) including the riverbank restoration work at Areas P and Q, conducted in May 2001 at Area Q and October 2001 at Area P. An annual monitoring and maintenance program at Riverbank Areas P and Q has been conducted since 2002. Annual IC inspections started in this area in 2004 and will continue in accordance with the IC MOA signed by the Army, EPA and MASSDEP in October 2003. The Park was transferred to the DCR in May of 2005.

## **3.6 RIVE-YEAR REVIEW PROCESS**

### **3.6.1 Adminisitrative Components**

Refer to Section 1.1.

### **3.6.2 Community Involvement**

Refer to Section 1.1.

### **3.6.3 Document Review**

Documents Reviewed are referenced in Appendix 5.

### **3.6.4 Data Review**

The OU1 ROD and ESD do not require data collection. The Army will continue evaluating the riverbank for erosion on an annual basis. IC's required by the Grant have

been implemented and are inspected on an annual basis in accordance with the IC MOA. Minor violations have occurred and have been resolved. See Sections 3.8 and 3.9 below.

### **3.6.5 Site Inspections**

The Site inspection for the five-year review was conducted simultaneously with the 2005 annual inspection on June 7, 2005 by Mark Brodowicz of CALIBRE (acting Base Environmental Coordinator Technical Assistant and Army Representative) and Todd Alving of McPhail & Associates. For the Charles River Park, Scott Murphy of DCR and Robert Davis, CENAE were present. Site Inspection Reports can be found in Attachment 1.

### **3.6.6 Interviews**

Scott Murphy of DCR was interviewed as part of the five-year process (Appendix 6, Interview Records). In addition during the 14 April 2005 RAB meeting and 16 May 2005 Proposed Plan Public Meeting, numerous members of the community expressed their concerns with the apparent erosion of the Charles River Park riverbank. The community continues to keep the Army informed of its concerns through the RAB meetings and can formally contact the Army through the point of contact at CENAE, listed on the publicized notice.

## **3.7 TECHNICAL ASSESSMENT**

**Questions A:** *Is the Remedy functioning as intended by the decision documents?*

The remedy is functioning as intended by the 1996 ROD and 2001 ESD (institutional controls). The Army has concluded that the highest and best use is recreational.

**Question B:** *Are the exposure assumptions, toxicity data, cleanup values, and RAO's used at the time of the remedy selection still valid?*

The human health and ecological risk assessments for this Site evaluated human health, risk-based goals designed to comply with CERCLA as well as the MCP. In the human health and ecological risk assessments in the RI report, the levels of contaminants were compared to available standards and guidance values using federal and state

environmental and public health laws that were identified as potentially ARARs at the Site. Chemical-specific ARARs are usually health- or risk- based numerical values or methodologies that result in a numerical value when applied to site-specific conditions. Other non-promulgated federal and state advisories and guidance values, referred to as TBCs, and background levels of the contaminants in the absence of TBCs, were also considered. This comparison was used in the selection of the preferred remedial action.

For soil cleanup less than two feet BGS, an EPA-approved statistical evaluation of the background soil data set was used to calculate the 90% UCL. The UCL calculated for each contaminant was used at the contaminant's background level, which were above the calculated human health risk-based goals for all contaminants found at the Charles River Park. Since background levels were used for soil cleanup goals less than 2 feet, any changes to exposure assumption, toxicity data or cleanup values since the last five year review will not have any affect.

For soil cleanups below 2 feet BGS, a construction worker scenario was selected. A risk assessment was performed by WESTON (1997) to estimate the carcinogenic risks and non-cancer hazard indices from exposure to PAHs in soil for a construction worker who may be performing building construction, excavation and/or other similar types of activities in Zones 1, 2 and 4 at the Site. The construction worker exposure scenario was evaluated for soil using PAHs because the soil contamination encountered at the Site primarily consisted of PAHs. These are the same contaminates found in Charles River Park (Zone 5). Revised risk-based soil cleanup-up goals were developed for the PAHs of concern based on the construction worker scenario. A final report dated 28 May 1997 was prepared detailing the results of this risk assessment work. The report was reviewed again in November 1999 (in the Draft Final FS Addendum Report for the Charles River Park Parcel, Foster Wheeler, 1999) for consistency with current risk assessment practice and found to be suitable for application to the soil at Charles River Park.

The risk assessment for the construction worker concluded that the PAH concentrations observed during the remedial activities exhibited an acceptable total cancer risk of less

than  $1 \times 10^{-5}$  and an acceptable hazard index less than 0.1. The revised PAH cleanup goals for the Site were presented in Section 3.3.4, Table 1-3 earlier in this 5-Year Review.

Relative to human health, toxicity data for contaminants of concern were reviewed to determine if any revisions have been made since the ESD was issued. Toxicity values for benzo[a]pyrene and dibenzo[a,h]anthracene were confirmed from the EPA IRIS Computerized Database of Hazardous Waste Toxicity Data Maintained by the EPA (U.S. EPA 2005), a peer-reviewed toxicity database. If toxicity values were not available from the IRIS (specifically dibenzo[a,h]anthracene), specific values were recommended by EPA Region I during development of the original risk assessment communications with WESTON. The TEF approach was used when evaluating toxicity data for PAHs during this 5-year review.

In order to reduce the risks to terrestrial ecological receptors from the contaminants of concern, ecologically-based clean-up levels were developed. Chemical-specific clean-up levels were calculated for the short-tailed shrew and the American robin based on a hazard index of 10 (*Feasibility Study Report (Outdoor) Army Materials Technology Laboratory, January 1996, WESTON*). A hazard index of 10 was established by EPA for this Site as an acceptable goal, since clean-up goals based on a hazard index of 1 yielded clean-up levels below background and analytical detection limits.

The results of the ecological risk assessment show that the concentrations of the PAHs at the Charles River Park do not pose a risk to ecological receptors. However, the results of the ecological risk assessment show that the concentrations of pesticides in Zone 4 and the Charles River Park (Zone 5) posed a risk to ecological receptors. HIs greater than 10 were estimated for the shrew based on concentrations of chlordane and DDT, and HIs greater than 10 were estimated for the robin based on concentrations of DDT, DDE, and endrin. Concentrations of DDE and chlordane also exceeded toxicity values for soil invertebrates. The results of the ecological risk assessment also showed a risk to the ecological receptors based on exposure to certain metals at the Site. The HIs for the

short-tailed shrew exceeded 10 for arsenic, chromium, lead, nickel and zinc. Concentrations of zinc and copper at the Site also exceeded toxicity values for soil invertebrates. The conclusion of the ecological risk assessment provided a clean-up goal of soil removal from areas of concern with contaminant levels measured above the statistical background values. To achieve this goal, soil was excavated to a depth of two feet (2 ft) and backfilled with clean imported fill materials. The ecological risk assessment is applicable to non-paved areas of the Charles River Park.

Significant changes to screening, ecological and toxicological values have not occurred. The ARARs have not changed for this remedy (see Appendix 7).

**Question C:** *Has any other information come to light that could call into question the protectiveness of the remedy?*

There is a concern that bank erosion is occurring along the Charles River adjacent to Charles River Park. During a 14 April 2005 Site Walk by the RAB members, there appeared to be areas of isolated erosion. These areas are where the Army was not required to do any remediation. While the integrity of the two foot soil coverage required by the ROD and ESD remains intact along the riverbanks, the Army may need to evaluate preventive measures to ensure long-term Site integrity.

#### **Technical Assessment Summary**

Based on the data reviewed and the Site information, the remedy is functioning as intended in the ROD. There have been no changes in ARARs, TBCs, screening levels, or toxicity criteria for the COPCs, and there have been no changes to the standardized risk assessment methodology that affect the protectiveness of the remedy. However, there is information that calls into question the effectiveness of the remedy.

### **3.8 ISSUES**

As mentioned in the answer to Question C, there is a concern that bank erosion may be occurring along the banks of the Charles River Park.

Additionally, during the 2004 annual inspection of the Charles River Park, several markers in Area M were hard to find due to runoff from an adjacent hill. For the 2005 annual inspection, the markers had pink flags placed near them and were surveyed using a Global Positioning System (GPS). DCR, in conjunction with the WYC, planned on building cinder block walls (about 2 blocks high) to prevent future coverage from runoff and make the markers more visible, which also increase public awareness.

### **3.9 RECOMMENDATIONS AND FOLLOWUP ACTIONS**

It is recommended that Annual IC Reports occur every year in accordance with the IC MOA and that five-year reviews continue. All areas that have any land use restrictions and still have some contamination that results in the prohibition of unrestricted use are the subject of future five-year reviews.

The Army needs to develop a proactive plan to ensure stability along the banks of the Charles River Park as well as continue to evaluate the riverbank for erosion during the IC inspections required by the MOA.

Finally, the cinder block walls proposed by DCR and WYC need to be put into place to ensure the markers within the Yacht Club area can be seen and located.

### **3.10 PROTECTIVENESS STATEMENT**

Based on the document review, data review and analysis, site inspection, and an assessment of the remedy protectiveness, the remedy and current institutional controls for the Charles River Park (OU-1, Zone 5) are considered protective of human health and the environment in the short term because there is no evidence that there is current exposure.

However, in order for the remedy to remain protective in the long term, the Army must stabilize the riverbank adjacent to Areas P and Q prior to the next five year review.

### **3.11NEXT REVEIW**

The next five-year review for AMTL, including the Charles River Park, should be performed within five years of the completion of this review. The completion date is the date on which EPA issues its letter to the U.S. Army either concurring with its findings or documenting reasons for non-concurrence.

## **4. OU2 – CHARLES RIVER**

### **4.1 SITE INTRODUCTION**

Refer to Section 1.1 for a description of the purpose of the five-year review.

### **4.2 SITE CHRONOLOGY**

The Charles River was identified as an OU because a number of storm drains from the AMTL property historically drained directly into the Charles River. Thus, the portion the river adjacent to the AMTL property was named as part of the Superfund site. (See Section 2.2 for more information regarding AMTL).

### **4.3 BACKGROUND**

#### **4.3.1 Physical Characteristics**

See Section 2.3.1.

#### **4.3.2 Land and Resource Use**

The Charles River is adjacent to the Charles River Park (see Section 3.3.2). It is used for recreational purposes that are water-related (boating, swimming, fishing, etc).

#### **4.3.3 History of Contamination**

The Charles River is adjacent to the Site, which could have contributed contaminants to the river via storm drainage, direct discharges, and erosion.

#### **4.3.4 Initial Response**

Site Investigation/Remedial Investigation (SI/RI) activities were performed between 1979 and 2005. In 1979, the Army completed a study to verify where storm water pipes were located at the facility, to collect samples and to identify potential sources of pollutants in the storm water. The study found that seven storm water pipes were present at the Site

that discharged either directly or through the storm water system and into the Charles River.

In 1994, 1998, and 2003 surface water and sediment samples were taken both upstream and downstream of the outfalls. The 2003 sampling event also included biological and toxicological studies of the river conditions. The Charles River was divided into four reaches for evaluation in the Baseline Ecological Risk Assessment (BERA). Chemicals detected in surface water at the Charles River OU were found at low concentrations that were either below human health based risk screening levels, consistent with upstream background conditions or indistinguishable from the urban background conditions of the Charles River. There are numerous existing and historical sources of pollutants to this urban riverine system.

Sediments was found to be contaminated by PAHs, inorganics, low levels of pesticides and PCBs, and extremely low levels of several radionuclides.

Potential human receptors included the people engaging in water-related activities along and on the river or eating fish caught from the river. These activities were considered for resident adults and children and park visitors. Based on the nature of contamination and anticipated activities, the exposure routes evaluated for this portion of the Charles River included:

- Ingestion and dermal contact with river water sediment;
- Ingestion of contaminated fish; and
- External exposure to radiation released from radionuclides in sediment.

Results of the Human Health Risk Assessment revealed that both cancer risk and non-cancer risk levels were within the acceptable thresholds specified in the NCP. The estimated excess chemical carcinogenic risks to adults were  $1 \times 10^{-10}$  for ingestion of surface water and  $2 \times 10^{-6}$  for ingestion of sediment. The excess carcinogenic risk from radionuclides ranged from  $5 \times 10^{-11}$  for ingestion of surface water to  $8 \times 10^{-10}$  for ingestion of fish. Chronic hazard index values for children ranged from 0.00003 for

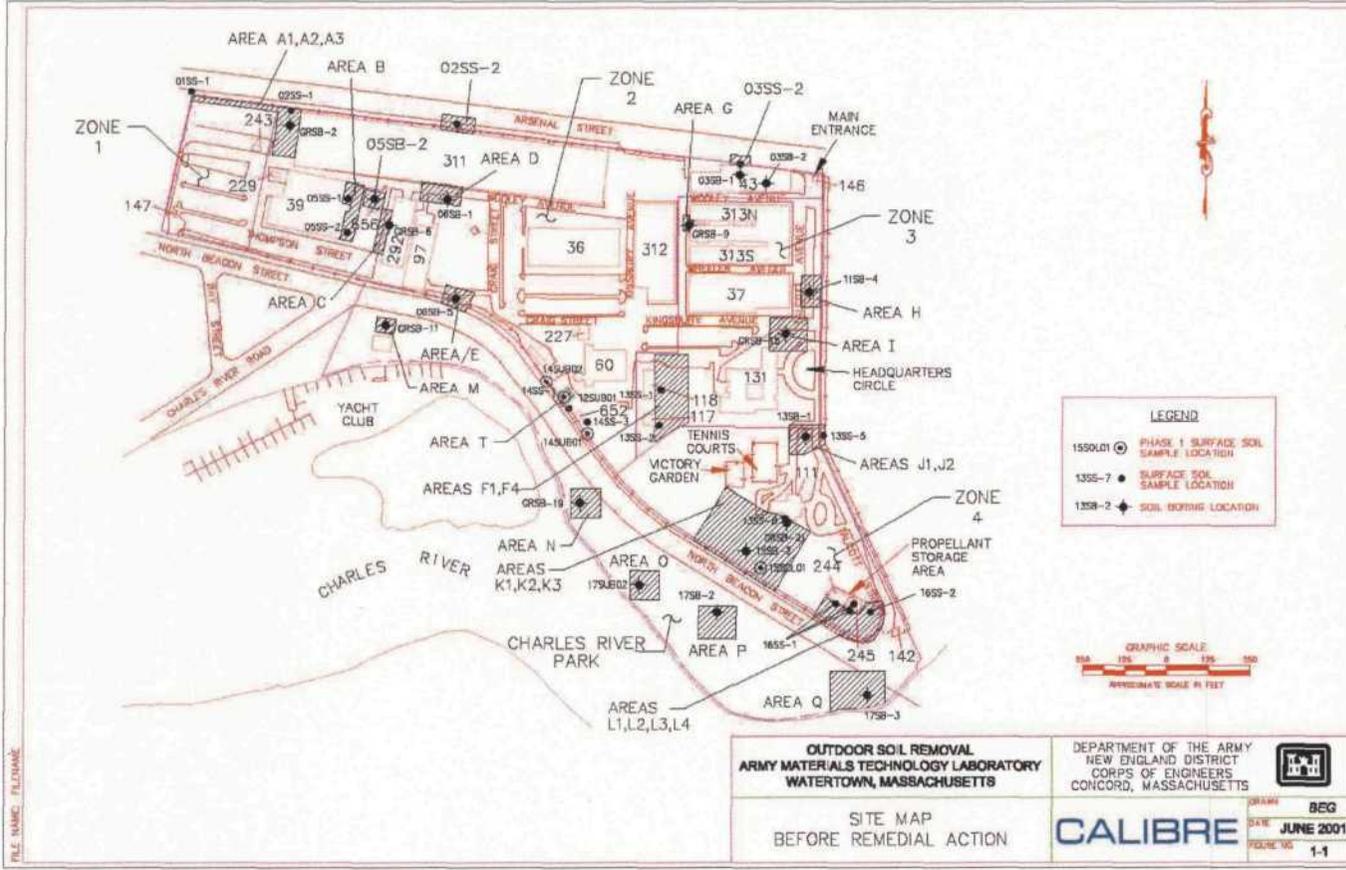
ingestion of surface water to 0.01 for ingestion of fish and for dermal exposure to sediment.

The Weight of Evident (WOE) concluded that the potential for ecological risks contributed by the former AMTL facility were indistinguishable from the anthropogenic urban background conditions that characterize the Lower Charles River Basin. The WOE was derived from consideration of 1) the weight assigned to each measurement endpoint; 2) the magnitude of the response observed in each measurement endpoint; and 3) the summation of the degree of conflict/agreement among the outcomes of each measurement endpoint. There are elevated levels of many constituents (and a potential for ecological risk) present in all four reaches. The majority of these compounds are present at concentration consistent with upstream reference locations. In general, the potential for ecological risk to benthic invertebrates was found to be low to moderate, with an even lower potential risk to finfish and vertebrate wildlife, respectively.

#### 4.4 ACTIONS

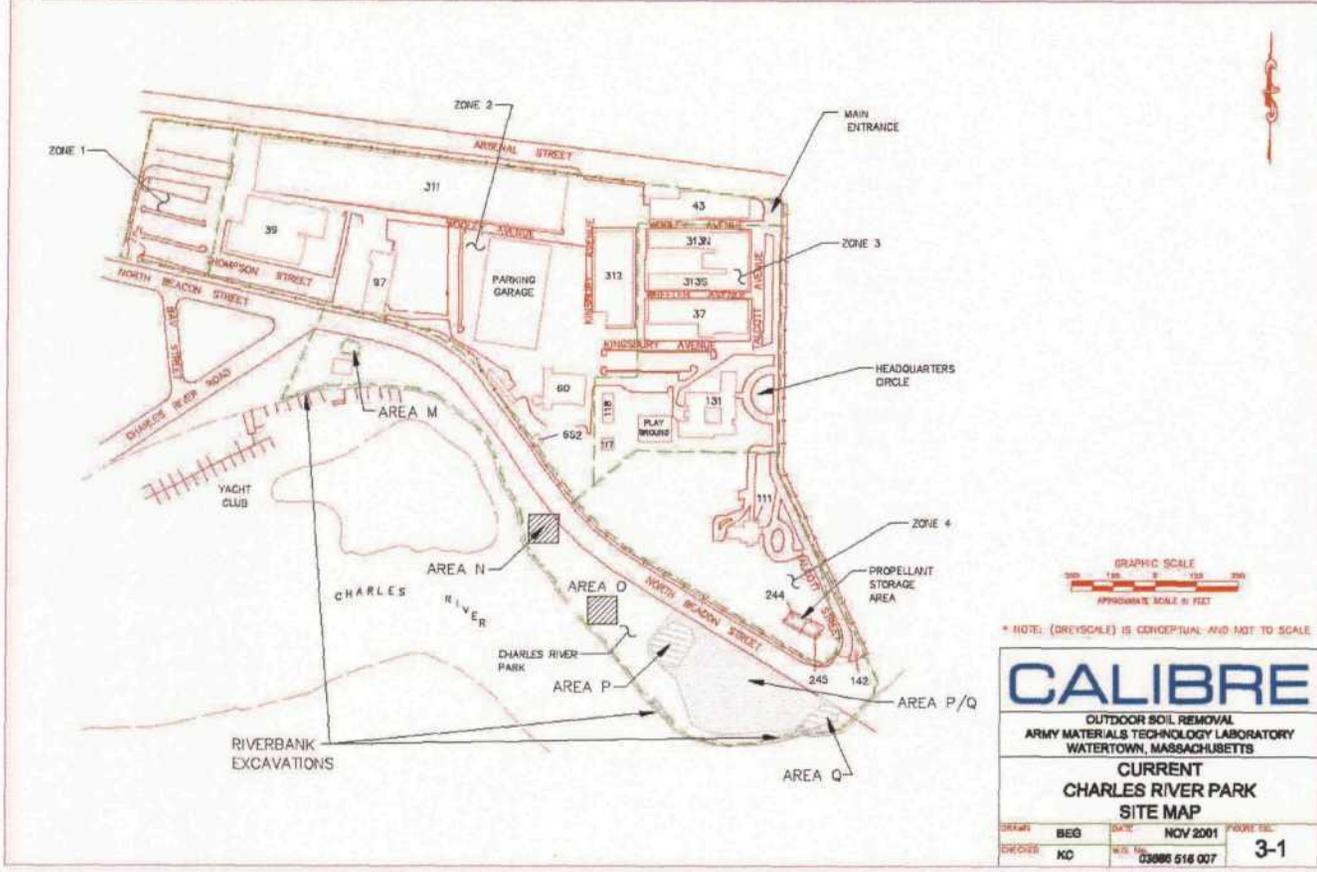
A NFA ROD was signed for this OU because of consistency of the AMTL Site conditions with urban background and the similar potential for ecological risks across sampling reaches.

APPENDIX 1  
AMTL and CHARLES RIVER PARK SITE MAPS  
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APPENDIX 1  
AMTL and CHARLES RIVER PARK SITE MAPS  
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**APPENDIX 2  
PUBLIC NOTICE**

**Page 1 of 1**

**The United States Army Announces the Initiation of the Five-Year Review of the Army Materials Technology Laboratory, Charles River Park and Charles River in Watertown, MA**

**Five-Year Review  
Watertown, MA  
July 15, 2005**

The U.S. Army is providing notice that they will be conducting the second Five-Year Review of the selected remedies that were implemented at the former Army Materials Technology Laboratory (AMTL) and associated Charles River Park (CRP). The purpose of the Five-Year Review is to determine if the remedies implemented at AMTL and Charles River Park are still protective of human health and the environment.

AMTL was divided into five zones based upon intended future reuse. Selected remedies for each zone were addressed by the level and type of contamination. All zones had either polynuclear aromatic hydrocarbons (PAH), metals (such as lead, nickel, or chromium) or pesticides (DDE or DDT). All cleanup goals were achieved. Additional institutional controls were implemented and remain today as part of the remedial actions.

During the Army's performance of the Five-Year Review of AMTL, CRP and the Charles River, the public is invited to provide any information regarding these sites that it deems relevant to the review process. **Public input will be accepted through October 31, 2005 and should be directed to the U.S. Army's point of contact listed below.**

The Five-Year is scheduled for completion on March 30, 2006. Upon completion, the report will be placed in the Information Repository, and another public notice will be issued to present findings of the review.

**Copies of the technical documents related to AMTL and the Charles River Park along with the rest of the Administrative Record file are available at the following information repository:**

Watertown Free Public Library  
Main Library  
30 Common Street  
Watertown, MA 02472  
(617) 972-6436

**Hours:**

Monday-Thursday: 9:00 am - 9:00 pm  
Friday: 9:00 am - 5:00 pm  
Saturday: 9:00 am - 5:00 pm (10 am - 2 pm mid-June - August)  
Sunday: 1:00 pm - 5:00 pm (closed May - October)

Parking for the library is in the Marshall Street Lot off of Mount Auburn Street.

**For further information or to submit written comments, please contact:**

Mr. Robert W. Davis  
Army Technical Manager  
U.S. Army Corps of Engineers - New England District  
Engineering/Planning Division  
696 Virginia Road  
Concord, MA 01742-2751  
(978) 318-8236  
Email: [Robert.W.Davis@usace.army.mil](mailto:Robert.W.Davis@usace.army.mil)

**APPENDIX 3  
TENANTS OF AMTL  
Page 1 of 2**

Property	Address	FI	Name	Sq. Ft.
60	1 Kingsbury	1	A123 Systems	10,993
311	311 Arsenal	4-W	Allen & Gerritsen, Inc.	24,347
311	311 Arsenal	4	Alzheimer's Assoc.	12,000
311	311 Arsenal	1	Assoc. in Dermatology	2,412
		2N,E		
311	311 Arsenal	3E	Athenahealth	112,616
97	400 N. Beacon	1	Athenahealth	21,000
131	400 Talcott	2	Babson-United, Inc.	18,600
			Babson-United, Inc.	
131	400 Talcott	2	(Local 509)	9,600
			Bacons Information	
311	311 Arsenal	1-NW	Systems	7,153
312	321 Arsenal	4	Boston Bread, L.L.C.	4,500
			Boston Sports Club	
311	311 Arsenal	1E	TSI Watertown, Inc.	57,926
				49,570
311	311 Arsenal	2&3	BR+APS&S	7,359
37	200 Talcott		Bright Horizons	42,950
			Burntsands, Inc.	
311	311 Arsenal	3-W	(m-Qube sub-tenant)	18,000
311	311 Arsenal	3	m-Qube	12,633
131	400 Talcott	GL	Bright Horizons	11,000
118	2 Kingsbury	2	Carlson Software, Inc.	2,579
313	100 Talcott	1	Communispace	9,000
313	100 Talcott	1N	Communispace	3,284
312	321 Arsenal	1st FI	Concours Group, Inc.	8,107
131	400 Talcott	3-Jan	Financial Fusion, Inc.	19,602
			Financial Fusion	
131	400 Talcott	1	(Mobile Mind)	4,224
			Financial Fusion	
131	400 Talcott	3	(On the Frontier)	4,200
			Financial Fusion	
131	400 Talcott	1	(St. Croix)	2,602
			Green Beacon	6,145
313	100 Talcott	2W	Solutions, LLC	3,754
313	100 Talcott	4	Harvard Film Archive	2,597
39	300 N. Beacon		HBSPC	93,688
39	300 N. Beacon		HBSPC	19,000
313	100 Talcott	1	HDS Architecture	3,588
313	100 Talcott	2E	Innosight LLC	4,047

**APPENDIX 3  
TENANTS OF AMTL  
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<b>Property</b>	<b>Address</b>	<b>Fl</b>	<b>Name</b>	<b>Sq. Ft.</b>
311	311 Arsenal	4	iProspect.com Inc.	24,000
117	3 Kingsbury	1	Management Office	1,680
311	311 Arsenal	2	McGarr	2,412
43	343 Arsenal	1	Molecular, Inc.	28,579
311	311 Arsenal	1-W	m-Qube	12,633
			Naked Fish	
43	343 Arsenal	2	Restaurants	6,466
312	321 Arsenal	2	Oxigene, Inc.	9,980
			Oxigene, Inc.	
312	321 Arsenal	2	(Snowbound)	9,980
311	311 Arsenal	1-W	Pharmetrics, Inc.	26,897
311	311 Arsenal	4E	Scholastic	11,464
313	100 Talcott	1	Scholastic	16,535
313	100 Talcott	2SW	Student Universe	18,099
118	2 Kingsbury	2	YPO	1,345
311	311 Arsenal	1-W	Vacant	8,375
312	321 Arsenal	2	Vacant	9,000
312	321 Arsenal		Watertown Art Center	10,000
118	2 Kingsbury	3	Watertown Eye Assoc.	1,104
312	321 Arsenal	2	Watertown Savings	2,858

APPENDIX 4  
AMTL ZONES' CHEMICAL OF CONCERNS & USES

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Zone	Site/Area	Samples	Contaminants	Cleanup Goals (mg/kg)	Cleanup Goals Achieved	Land Reuse Expectation	Land Reuse Current	Notes
1 and 2	A (Subareas A1, A2, A3)	Boring GRSB-2 Surface Soil 01SS-1 Surface Soil 02SS-1	Indeno (1,2,3-cd) pyrene Benzo(a)pyrene	3.0 2.0	Yes to ROD Cleanup Goals	Commercial <sup>2</sup>	Area is Commercial	Lot 1 under Grant, Commercial reuse
2	B (Subareas B1, B2)	Surface Soil 05SS-1 Surface Soil 05SS-2	Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Indeno (1,2,3-cd) pyrene	8.5 2.0 7.9 6.2 3.0	Yes to Construction worker risk based cleanup goals and ROD cleanup goals to a depth of 1 BGS	Commercial with deed restrictions <sup>3</sup>	Area is Zoned Commercial with deed restrictions; is currently a paved driveway	Lot 1 under Grant, was re-excavated by O'Neill
2	C	Boring GRSB-6	Benzo(a)pyrene	2.0	Yes to ROD Cleanup Goals	Commercial <sup>2</sup>	Commercial	Lot 1 under Grant
2	D	Boring 08SB-1	Indeno (1,2,3-cd) pyrene Benzo(a)pyrene	3.0 2.0	Yes to ROD Cleanup Goals	Commercial <sup>2</sup>	Commercial	Lot 1 under Grant
2	E	Boring 06SB-5	Indeno (1,2,3-cd) pyrene Benzo(a)pyrene	3.0 2.0	Yes to Construction worker risk based cleanup goals and ROD cleanup goals to a depth of 1 BGS	Commercial with deed restrictions <sup>3</sup>	Commercial with deed restrictions	Lot 1 under Grant, Grant violations have occurred at Area E
2	Metals Hot Spot Areas	Surface Soil 14SS-3 Subsurface Soil 14SUB01 Subsurface Soil 14SUB02	Chromium Nickel Nickel Zinc Chromium Nickel	Ecological Risk Reduction greater than 25%	Yes to ROD Cleanup Goals	Commercial <sup>2</sup>	Commercial	Lot 1 under Grant
2	Lead Hot Spots Areas	Surface Soil 02SS-2 Surface Soil 03SS-2 Boring 05SB-2	Lead Lead Lead	1,000 1,000 1,000	Yes to ROD Cleanup Goals	Commercial <sup>2</sup>	Commercial	Lot 1 under Grant

APPENDIX 4  
AMTL ZONES' CHEMICAL OF CONCERNS & USES

Page 2 of 4

Zone	Site/Area	Samples	Contaminants	Cleanup Goals (mg/kg)	Cleanup Goals Achieved	Land Reuse Expectation	Land Reuse Current	Notes
3	F (Subareas F1, F2)	Surface Soil 13SS-1	Indeno (1,2,3-cd) pyrene	3.0	Yes to ROD Cleanup Goals	Unrestricted	Commercial	Lot 1 under Grant
			Benzo(a)pyrene	2.0				
	Surface Soil 13SS-2	Chlorodane	1.4					
		DDE	0.1					
		DDT	0.2					
3	G	Boring GRSB-9	Indeno (1,2,3-cd) pyrene	3.0	Yes to Construction worker risk based cleanup goals and ROD cleanup goals to a depth of 1 BGS	Commercial with deed restrictions <sup>3</sup>	Area is Zoned Commercial with deed restrictions; is currently under asphalt paving	Lot 1 under Grant, out of compliance with Grant due to permanent reduction in grade
3	H	Boring 11SB-4	Benzo(a)pyrene	2.0	Yes to ROD Cleanup Goals	Unrestricted	Commercial	Lot 1 under Grant
			Dibenz(a,h)anthracene	0.27				
3	I	Boring GRSB-15	Benzo(a)anthracene	8.5	Yes to ROD Cleanup Goals	Unrestricted	Commercial	Lot 1 under Grant
			Benzo(a)pyrene	2.0				
			Benzo(b)fluoranthene	7.9				
			Benzo(k)fluoranthene	8.2				
			Chrysene	11.1				
			Indeno (1,2,3-cd) pyrene	3.0				
			Chlorodane	1.5				
			DDD	0.3				
			DDE	0.4				
			DDT	0.6				
		Dialdrin	0.1					
4	J (Subareas J1, J2)	Boring 13SB-1	Chlorodane	1.4	Yes to ROD Cleanup Goals	Open Space <sup>4</sup>	Open Space	Lot 2 under Grant
			DDE	0.14				
		Surface Soil 13SS-5	DDT	0.17				
			Aroclor 1280	1.0				

**APPENDIX 4  
AMTL ZONES' CHEMICAL OF CONCERNS & USES**

Page 3 of 4

Zone	Site/Area	Samples	Contaminants	Cleanup Goals (mg/kg)	Cleanup Goals Achieved	Land Reuse Expectation	Land Reuse Current	Notes
4	K (Subareas K1, K2, K3)	Boring GRSB-21 Surface Soil 13SS-8 Boring 15SB-2 Surface Soil 15SOL01	Chlorodane DDE DDT Arsenic Lead Nickel	1.4 0.14 0.17 16.9 291 33.8	Yes to ROD Cleanup Goals	Open Space <sup>4</sup>	Open Space	Lot 2 under Grant
4	L (Subareas L1, L2, L3, L4)	Surface Soil 16SS-1 Surface Soil 16SS-2	Chlorodane Chromium Nickel Zinc DDE DDT Aroclor 1280	1.4 26.8 33.8 157 0.14 0.17 1.0	Yes-L1, L2, L3 were cleaned up ROD cleanup goals. Area L4 was to construction worker risk based cleanup goals and ROD cleanup goals to 1' BGS	Open Space with deed restrictions <sup>5</sup>	Open Space with deed restrictions. L4 is partially under paving and landscape area	Lot 2 under Grant
2	T (Subareas T1, T2)	Surface Soil 14SS-1 12SUB01	Chlorodane DDT Nickel Zinc	Ecological Risk Reduction greater than 25%	Yes to ROD Cleanup Goals	Open Space <sup>4</sup>	Open Space	Lot 1 under Grant
5	M		Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Chrysene Dieldrin Lead	8.5 2.0 7.9 6.2 11.1 0.35 1000	Yes to ROD Cleanup Goals. Construction Worker values applied at depths >2' BGS	Open Space	Open Space/Yacht Club	Remediation field work is complete. Closeout report and implementation of institutional Controls pending.

**APPENDIX 4  
AMTL ZONES' CHEMICAL OF CONCERNS & USES**

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Zone	Site/Area	Samples	Contaminants	Cleanup Goals (mg/kg)	Cleanup Goals Achieved	Land Reuse Expectation	Land Reuse Current	Notes
5	N		Chlorodane	1.4	Yes to ROD Cleanup Goals	Open Space	Open Space	Remediation field work is complete. Closeout report and implementation of Institutional Controls pending.
			DDT	0.17				
5	O		Benzo(a)anthracene	8.5	Yes to ROD Cleanup Goals	Open Space	Open Space	Remediation field work is complete. Closeout report and implementation of Institutional Controls pending.
			Benzo(a)pyrene	2.0				
			Benzo(b)fluoranthene	7.9				
			Benzo(k)fluoranthene	6.2				
			Chrysene	11.1				
			Dibenz(a,h)anthracene	0.3				
			Indeno (1,2,3-cd) pyrene	3.0				
5	P		Benzo(a)pyrene	2.0	Yes to ROD Cleanup Goals, Construction Worker values applied at depths >2' BGS	Open Space	Open Space	Remediation field work is complete. Closeout report and implementation of Institutional Controls pending.
			Indeno (1,2,3-cd) pyrene	3.0				
5	Q		Benzo(a)pyrene	2.0	Yes to ROD Cleanup Goals, Construction Worker values applied at depths >2' BGS	Open Space	Open Space	Remediation field work is complete. Closeout report and implementation of Institutional Controls pending.
			Indeno (1,2,3-cd) pyrene	3.0				
			DDE	0.14				
			DDT	0.17				

<sup>1</sup> See Appendix 3 for current tenant status.

<sup>2</sup> See Attachment 1 for grant restriction for buildings and areas.

**APPENDIX 5**  
**LIST OF DOCUMENTS REVIEWED**  
**Page 1 of 3**

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Department of the Army, Institutional Control Memorandum of Agreement, Memorandum of Agreement Among the US Army, the US Environmental Protection Agency and the Massachusetts Department of Environmental Protection, Subject: The Charles River Park NPL Site Institutional Controls, 1998.

CPI Environmental Services, "Application for Sixth Amendment of the Grant of Environmental Restriction and Easement at the Former Army Materials Technology Laboratory, Watertown, Massachusetts", Prepared for Watertown Arsenal Development Corporation and the President and Fellow of Harvard University, November 2004.

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CPI Environmental Services, "Second Revised Response Action Outcome Statement, Former Army Materials Technology Laboratory, 395 Arsenal Street, Watertown, Massachusetts", Prepared for the President and Fellows of Harvard University and Watertown Arsenal Development Corporation, March 2005. The Second Amendment to the Activity and Use Limitation (AUL) for 3-17606 is included within this document.

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**APPENDIX 5**  
**LIST OF DOCUMENTS REVIEWED**  
**Page 2 of 3**

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ENSR, Real Estate Transfer Package, Army Materials Technology Laboratory, Watertown, Massachusetts, September 2005 (GRP)

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Kirkpatrick & Lockhart LLP Army Materials Technology Laboratory Institutional Control Checklist First Annual Report, August 2002 (Fourth)

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**LIST OF DOCUMENTS REVIEWED**  
**Page 3 of 3**

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**APPENDIX 6  
INTERVIEW RECORDS  
Page 1 of 2**

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> U.S. Army Materials Technology Laboratory, Watertown, Massachusetts		<b>EPA ID No.:</b> MAD213820939
<b>Subject:</b> Second Five-Year Review for OU12		<b>Time:</b> <b>Date:</b> 6/7/2005
<b>Type:</b> Telephone <input checked="" type="checkbox"/> Visit      Other		<b>Incoming</b> <input checked="" type="checkbox"/> <b>Outgoing</b>
<b>Location of Visit:</b> BEAL Offices, Watertown, MA		
<b>Contact Made By:</b>		
<b>Name:</b> Mark Brodowicz	<b>Title:</b> Project Manager	<b>Organization:</b> Calibre
<b>Individual Contacted:</b>		
<b>Name:</b> Rob Weikel	<b>Title:</b> Manager	<b>Organization:</b> The BEAL Companies
<b>Telephone No:</b> 617-918-7293 <b>Fax No:</b> --	<b>Street Address:</b> 3 Kingsbury Avenue <b>City, State, Zip:</b> Watertown, MA	
<b>Summary Of Conversation</b>		
<p>Mr. Weikel was interviewed because he is the contracted site manager for the owner of AMTL, Harvard University, which is where OU1 (Zones 1-4) and OU3 is located. Since he is present at AMTL during working hours Monday through Friday, he would have the opportunity to observe trespasser or other unexpected activity at OU1 and OU3. His input during the interview is summarized as follows:</p> <p><u>OU1</u></p> <ul style="list-style-type: none"> <li>• He has observed areas restricted to residential are in compliance (see Site Inspection Report for individual buildings).</li> <li>• He has observed no excavation, drilling or otherwise disturbance of the soils below building foundations or slabs (see Site Inspection Report for individual buildings).</li> <li>• He has only observed that the site is in compliance with the Soil Management Plan (see Site Inspection Report for individual buildings).</li> </ul> <p><u>OU3</u></p> <ul style="list-style-type: none"> <li>• He has observed no excavation, drilling or otherwise disturbance of the soils below building foundations or slabs (see Site Inspection Report for individual buildings).</li> <li>• He has only observed that the site is in compliance with the Soil Management Plan (see Site Inspection Report for individual buildings).</li> </ul> <p><u>General Comments</u></p> <ul style="list-style-type: none"> <li>• He has no concerns or suggestions OU1 or OU3.</li> </ul>		

**APPENDIX 6  
INTERVIEW RECORDS  
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<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> U.S. Army Materials Technology Laboratory, Watertown, Massachusetts		<b>EPA ID No.:</b> MAD213820939
<b>Subject:</b> Second Five-Year Review for OU12		<b>Time:</b> <b>Date:</b> 6/7/2005
<b>Type:</b> Telephone <input checked="" type="checkbox"/> Visit      Other		<b>Incoming</b> <input checked="" type="checkbox"/> <b>Outgoing</b>
<b>Location of Visit:</b> Watertown Yacht Club, Watertown, MA		
<b>Contact Made By:</b>		
<b>Name:</b> Mark Brodowicz	<b>Title:</b> Project Manager	<b>Organization:</b> Calibre
<b>Individual Contacted:</b>		
<b>Name:</b> Scott Murphy	<b>Title:</b> Attorney	<b>Organization:</b> Massachusetts Department of Conservation and Recreation
<b>Telephone No:</b> 617-626-4929 <b>Fax No:</b> 617-626-1301	<b>Street Address:</b> 251 Causeway St., Ste. 700 <b>City, State, Zip:</b> Boston, MA	
<b>Summary Of Conversation</b>		
<p>Mr. Murphy was interviewed because he is the site manager for the owner of the Charles River Parcel, the Commonwealth of Massachusetts, Department of Conservation and Recreation, which is where OU1 (Zone 5) is located. He is periodically present at Charles River park during working hours Monday through Friday, he would have the opportunity to observe trespasser or other unexpected activity at OU1. His input during the interview is summarized as follows:</p> <p><u>OU1</u></p> <ul style="list-style-type: none"> <li>• He has observed restricted areas are in compliance (see Site Inspection Report for individual buildings/areas).</li> <li>• He has observed no excavation, drilling or otherwise disturbance of the soils below building foundations or slabs (see Site Inspection Report for individual buildings).</li> <li>• He has only observed that the site is in compliance with the Soil Management Plan (see Site Inspection Report for individual buildings).</li> <li>• He has observed the Department maintaining the Park as required.</li> </ul> <p><u>General Comments</u></p> <ul style="list-style-type: none"> <li>• He is concerned about the visibility of the markers. He will ensure that there are cinderblocks stationed around the markers to prevent runoff. He no other concerns about OU1.</li> </ul>		

**APPENDIX 7**  
**ARAR's TABLE**  
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Media	Requirement	Requirement Synopsis	Action To Be Taken To Attain Requirement	Status
<b>CHEMICAL-SPECIFIC</b>				
Soil	FEDERAL-EPA Risk Reference Doses (RfDs)	RfDs are dose levels developed based on the noncarcinogenic effects and are used to develop Hazard Indices. A Hazard Index of less than or equal to 1 is considered acceptable.	EPA RfDs have been used to characterize risks caused by exposure to contaminants in soil. Excavation and off-site disposal or reuse of contaminated soils will minimize risks.	TBC
Soil	FEDERAL-EPA Carcinogen Assessment Group Potency Factors	Potency Factors are developed by EPA from Health Effects Assessments or evaluation by the Carcinogenic Assessment Group and are used to develop excess cancer risks. A range of 10 <sup>-4</sup> to 10 <sup>-6</sup> is considered acceptable.	EPA Carcinogenic Potency Factors have been used to compute the individual incremental cancer risk resulting from exposure to site contamination in soil. Excavation and off-site disposal or reuse of contaminated soils will minimize risks.	TBC
Soil	FEDERAL-Guidance on Remedial Actions for Superfund Sites with PCB Contamination, OSWER Directive No. 9355.4-01 (8/90)	Describes the recommended approach for evaluating and remediating sites with PCB contamination.	This guidance has been used in establishing a cleanup goal for PCBs at the site. Excavation and off-site disposal or reuse of contaminated soils will attain the cleanup goals.	TBC
<b>LOCATION-SPECIFIC</b>				
Soil	FEDERAL-16 USC 470 et seq., National Historic Preservation Act and 7 CFR Part 650	Requires that action be taken to reserve historic properties. Planning action is required to minimize the harm to national historic landmarks.	MTL is a historic district and the Commander's Quarters is on the National Register of Historic Places. Army will consult with State Historic Office to ensure that actions that may cause structural damage to any building will be minimized.	Applicable
Soil	FEDERAL-16 USC 469A-1, Archaeological and Historic Preservation Act	Provides for the preservation of historical and archaeological artifacts that might be lost from alterations of the terrain. The Act requires data recovery and preservation activities be conducted if any project may cause irreparable loss or destruction to scientific, prehistoric, or archaeological data.	Actions involving intrusive work (e.g., excavation and construction) will require involvement of archaeologists and regulatory agencies if artifacts are found. Two known historic sites and one suspected prehistoric site are present at the MTL site	Applicable

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**ARAR's TABLE**  
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<b>Media</b>	<b>Requirement</b>	<b>Requirement Synopsis</b>	<b>Action To Be Taken To Attain Requirement</b>	<b>Status</b>
Soil	FEDERAL-Executive Order 11988 (Protection of Floodplains) 40 CFR 6, Appendix A	Requires that any action within a floodplain be conducted so as to avoid adverse effects, minimize harm, and restore natural and beneficial values.	Part of the River Park is a designated floodplain. Any excavation or other activities will be conducted to minimize harm and all areas disturbed will be restored.	Applicable
Soil	STATE-Massachusetts Historical Commission Regulations (950 CMR 70-71)	Establishes regulations to minimize or mitigate adverse effects to properties listed in the State Register of Historic Places. MTL is listed in the State Register. The regulations contain standards that protect the public's interest in preserving historic and archaeological properties as early as possible in the planning process of any project.	Requirements include notification to the Massachusetts Historical Commission (MHC). MHC will make a determination as to whether the actions planned will have an adverse impact. If so, the MHC and party responsible for the action will consult to determine ways to minimize adverse impacts.	Applicable
<b>ACTION-SPECIFIC</b>				
Soil, Hazardous Waste	FEDERAL-Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA Publication SW-846	This guidance document sets forth the methods for conducting TCLF testing.	The guidance will be used when testing soils at the site to determine whether they constitute hazardous waste. Any soils that are found to be hazardous will be disposed of in a licensed facility.	TBC
Soil, Hazardous Waste	STATE-310 CMR 30.300, Hazardous Waste Generator Requirements	Establishes requirements for generators of hazardous wastes.	Any generation of hazardous waste will comply with these requirements.	Applicable
Soil, Hazardous Waste	STATE-310 CMR 30.640, Waste Piles	Establishes requirements for waste piles containing hazardous waste.	Any piles of hazardous excavated soil will comply with these requirements	Relevant and Appropriate, Applicable for any soil classified as hazardous waste.

**APPENDIX 7**  
**ARAR's TABLE**  
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<b>Media</b>	<b>Requirement</b>	<b>Requirement Synopsis</b>	<b>Action To Be Taken To Attain Requirement</b>	<b>Status</b>
Soil, Hazardous Waste	STATE-310 CMR 30.680, Use and Management of Containers	Establishes requirements for the management of containers, such as drums, that would hold field-generated hazardous waste.	Any hazardous waste containers would comply with these requirements.	Relevant and Appropriate. Applicable for any soil classified as hazardous waste.
Soil	STATE-310 CMR 19, Solid Waste Management	Establishes requirements for the treatment, storage, and disposal of nonhazardous solid waste. Has additional rules for the management of Special Waste, which is defined as solid waste that is nonhazardous for which special management controls are necessary to protect adverse impacts.	Nonhazardous excavated soil or treatment residues will be handled in accordance with substantive requirements. If soils or residues meet the definition of Special Waste, management will be in compliance with these requirements.	Relevant and Appropriate
Air	FEDERAL-CAA 40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants (NESHAPs)	Sets air emission standards for 169 designated hazardous air pollutants (HAPs) from designated source activities.	Sampling at MTL has indicated the presence of several HAPs in soils. Since site remediation is a designated source category (but in this case is unlikely to be a major source), NESHAPs are relevant and appropriate and all remedial activities will be designed to meet Maximum Achievable Control Technology (MACT).	Relevant and Appropriate
Air	STATE-310 CMR 7, Air Pollution Control Regulations	Establishes requirements for attaining ambient air quality standards by setting emission limitations, design specifications, and permitting. Watertown is in an attainment area for lead, nitrous oxide, sulfur dioxide, and particulate matter, and is in a nonattainment area for ozone and carbon monoxide. Pertinent sections of the regulation include 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).	Remedial activities will be conducted so as to incorporate Reasonably Available Control Technology (RACT) for emissions of lead, nitrous oxide, sulfur dioxide, and particulate matter and to achieve Lowest Achievable Emission Rate (LAER) for VOCs and carbon monoxide.	Applicable (310 CMR 7.06, 7.09, and 7.10) Relevant and Appropriate (310 CMR 7.18)

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**ARAR's TABLE**  
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<b>Media</b>	<b>Requirement</b>	<b>Requirement Synopsis</b>	<b>Action To Be Taken To Attain Requirement</b>	<b>Status</b>
Air	STATE-DAQC Policy 90-001, Allowable Sound Emissions	This policy considers sound emissions to be in violation of 310 CMR 7.10 if the source increases the broadband sound level by more than 10 dB(A) above ambient, or produces a "pure tone" condition as measured at both the property line and at the nearest inhabited residence.	Remedial activities will be conducted so as not to exceed the policy's allowable noise levels.	TBC

**APPENDIX 8**  
**ACRONYMS**  
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<b>AEC</b>	Army Environmental Center
<b>AMTL</b>	U.S. Army Material Technology Laboratory
<b>ARAR</b>	Applicable or Relevant and Appropriate Requirements
<b>BERA</b>	Baseline Ecological Risk Assessment
<b>BGS</b>	Below Ground Surface
<b>BRAC</b>	Base Realignment and Closure
<b>BRACO</b>	Base Realignment and Closure Office
<b>CENAE</b>	U.S. Army Corp of Engineers New England District
<b>CERCLA</b>	Comprehensive Environmental Response Compensation and Liability Act
<b>COC</b>	Contaminants of Concern
<b>COPCs</b>	Contaminates of Potential Concern
<b>CRBCA</b>	Charles River Business Center Associates
<b>DCR</b>	Department of Conservation and Recreation
<b>DDD</b>	Dichloroethylidene
<b>DDE</b>	Dichlorodiphenyldichloroethene
<b>DDT</b>	Dichlorodiphenyltrichloroethane
<b>EPA</b>	Environmental Protection Agency
<b>ESD</b>	Explanation of Significant Differences
<b>FFA</b>	Federal Facilities Agreement
<b>FS</b>	Feasibility Study
<b>GPS</b>	Global Positioning System
<b>GSA</b>	General Services Administration
<b>Harvard</b>	Harvard College
<b>HI</b>	Hazard Indices
<b>IC</b>	Institutional Control
<b>IRIS</b>	Integrated Risk Information System
<b>kg</b>	Kilograms
<b>MASSDEP</b>	Massachusetts Department of Environmental Protection
<b>MCP</b>	Massachusetts Contingency Plan
<b>MDC</b>	Metropolitan District Commission
<b>mg</b>	Milligrams
<b>MOA</b>	Memorandum of Agreement
<b>NCP</b>	National Contingency Plan
<b>NFA</b>	No Further Action
<b>NPL</b>	National Priorities List
<b>OU</b>	Operable Unit
<b>PAHS</b>	Poly-Aromatic Hydrocarbons
<b>PAL</b>	Public Archaeology Laboratory, Inc.
<b>PCBs</b>	Polychlorinated Biphenyl.
<b>RAB</b>	Restoration Advisory Board
<b>RAO</b>	Remedial Action Objectives
<b>RCRA</b>	Resource Conservation Recovery Act

**APPENDIX 8**  
**ACRONYMS**  
**Page 2 of 2**

<b>RI</b>	Remedial Investigation
<b>ROD</b>	Record of Decision
<b>ROW</b>	Right-of-Way
<b>SARA</b>	Superfund Amendments and Reauthorization Act
<b>SI</b>	Site Investigation
<b>Site</b>	U.S. Army Material Technology Laboratory
<b>TBCs</b>	To-Be-Considereds
<b>TEF</b>	Toxicity Equivalency Factor
<b>TRC</b>	Technical Review Committee
<b>UCL</b>	Upper Confidence Limit
<b>WADC</b>	Watertown Arsenal Development Corporation
<b>WCC</b>	Watertown Conservation Commission
<b>WOE</b>	Weight of Evidence
<b>WYC</b>	Watertown Yacht Club

**ATTACHMENT 1  
SITE INSPECTIONS and SITE RESTRICTIONS**

**INSPECTION REPORT**

Army Materials Technology Laboratory – Five Year Review

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: 2 INSPECTOR: M. Brodowicz

**SUBJECT BUILDING/AREA:** #142, Guard Shack

No change since August 1999 First Annual Inspection.

No representatives of The Town of Watertown, owner of "Lot 2" of the AMTL portion of the subject site subject to the 1998 Grant of Environmental Restriction accompanied Mr. Brodowicz during the inspection of this date. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is knowledgeable relative to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant in 1998. Based on McPhail's knowledge of these issues, the inspection focused on pertinent issues since the 2004 inspection. With respect to the Lot 2 portion of the inspection, McPhail followed up our inspection with a telephone conversation with the Town of Watertown representative (Franklin Stearns).

**Specific Grant Restrictions**

No residential, daycare, or school uses were observed.

No transportation, disposal, or deposition of soils from within this parcel to areas outside of this parcel, unless in compliance with the Soil Management Protocol set forth in Paragraph 4 of the Grant were observed.

No excavation, drilling, or otherwise disturbing the soils under the building foundation and slabs was observed.

No drilling or other disturbance of the building foundations and slabs which would compromise their integrity in a manner that would or would likely result in human contact with the underlying soils was observed.

**General Conditions and Observations**

Building #142, the Guard Shack, was observed in a restored state during the inspection. According to WADC, no occupancy of this structure occurs. No evidence of hazardous substances in the building and area immediately surrounding the building impacting the general environment were observed. According to WADC, no disturbance of underlying soils has occurred during the inspection period.

**INSPECTION REPORT**

Army Materials Technology Laboratory – Five Year Review

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: 2 INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: "Area L4"

No representatives of The Town of Watertown, owner of "Lot 2" of the AMTL portion of the subject site subject to the 1998 Grant of Environmental Restriction accompanied Mr. Brodowicz during the Inspection of this date. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is knowledgeable relative to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant in 1998. Based on McPhail's knowledge of these issues, the inspection focused on pertinent issues since the 2004 inspection. With respect to the Lot 2 portion of the Inspection, McPhail followed up our inspection with a telephone conversation with the Town of Watertown representative (Franklin Stearns).

**Specific Grant Restrictions**

No residential, daycare, school (for children under 18 year of age), hotel, motel, community center (for children under 18 years of age), and/or recreational uses or activities uses were observed.

No reduction of the grade below the surface grade, as defined in subparagraph 2.C. of the Grant was observed.

No movement of soils, located at a depth of one (1) foot or more below the surface grade, as defined in subparagraph 2.C. of the Grant, above that depth, unless disposed of off-Site in compliance with the Soil Management Protocol set forth in Paragraph 4 of the Grant was observed.

**General Conditions and Observations**

Area "L4" has and remains within an "access" area to Lot #2. The area is principally beneath asphalt paving (access road) leading from the intersection of Beacon Street and Charles River Road, to the Lot #2 portion of the Site. A gate continues to limit access from the above noted public ways to the Site. Access from the rest of Lot #2 is not limited. Limited pavement and surface soils at the very edge of the pavement which were noted to have been disturbed (erosion) along the western side of the area, surrounding and possibly resulting in the eventual undermining of benchmark position L4-3, has been repaired and remains in good condition. According to WADC, no disturbance of underlying soils has occurred during the inspection period. Visual inspection revealed no evidence of soil disturbance in this area.

**INSPECTION REPORT**

Army Materials Technology Laboratory – Five Year Review

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: 2 INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: #244/245, Bunkers

No change since August 1999 First Annual Inspection.

No representatives of The Town of Watertown, owner of "Lot 2" of the AMTL portion of the subject site subject to the 1998 Grant of Environmental Restriction accompanied Mr. Brodowicz during the inspection of this date. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is knowledgeable relative to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant in 1998. Based on McPhail's knowledge of these issues, the inspection focused on pertinent issues since the 2004 inspection. With respect to the Lot 2 portion of the inspection, McPhail followed up our inspection with a telephone conversation with the Town of Watertown representative (Franklin Stearns).

**Specific Grant Restrictions**

No residential, daycare, or school uses were observed.

No transportation, disposal, or deposition of soils from within this parcel to areas outside of this parcel, unless in compliance with the Soil Management Protocol set forth in Paragraph 4 of the Grant were observed.

No excavation, drilling, or otherwise disturbing the soils under the building foundation and slabs was observed.

No drilling or other disturbance of the building foundations and slabs which would compromise their integrity in a manner that would or would likely result in human contact with the underlying soils was observed.

**General Conditions and Observations**

Buildings #144/245, Bunkers, were observed in original state during the inspection. The doors are securely locked. According to WADC in a later interview, the structures have not been open in the past year. No occupancy occurs. No evidence of hazardous substances in the building and the areas immediately surrounding the bunkers impacting the general environment were observed. According to WADC, no disturbance of underlying soils has occurred during the inspection period.

**INSPECTION REPORT**

Army Materials Technology Laboratory – Five Year Review

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: 2 INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: #111, Commander's Mansion

No change since August 1999 First Annual Inspection.

No representatives of The Town of Watertown, owner of "Lot 2" of the AMTL portion of the subject site subject to the 1998 Grant of Environmental Restriction accompanied Mr. Brodowicz during the inspection of this date. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is knowledgeable relative to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant in 1998. Based on McPhail's knowledge of these issues, the inspection focused on pertinent issues since the 2004 inspection. With respect to the Lot 2 portion of the inspection, McPhail followed up our inspection with a telephone conversation with the Town of Watertown representative (Franklin Stearns).

**Specific Grant Restrictions**

No residential, daycare, or school uses were observed.

No transportation, disposal, or deposition of soils from within this parcel to areas outside of this parcel, unless in compliance with the Soil Management Protocol set forth in Paragraph 4 of the Grant were observed.

No excavation, drilling, or otherwise disturbing the soils under the building foundation and slabs was observed.

No drilling or other disturbance of the building foundations and slabs which would compromise their integrity in a manner that would or would likely result in human contact with the underlying soils was observed.

**General Conditions and Observations**

Building #111, the Commander's Mansion, was observed in an restored state during the inspection. Interior surfaces (walls, ceilings, trim, and floors) have been refinished and/or replaced. The heating system is new. The Town of Watertown, which utilizes the property for social activities and historic tours, occupies the property. No evidence of hazardous substances in the building and area immediately surrounding the building impacting the general environment were observed. According to WADC, no disturbance of underlying soils has occurred during the inspection period.

**INSPECTION REPORT**

Army Materials Technology Laboratory – Five Year Review

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: 1 INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: #131, Former Arsenal Administrative Building

Rob Weikel of the Beal Companies, manager of Lot 2 for Harvard, and owner of the Arsenal property subject to the Grant of Environmental Restriction accompanied Mr. Brodowicz on this Inspection. Mr. Weikel is knowledgeable of site conditions and the day to day site use since Harvard's purchase of "Lot #1" of the AMTL portion of the subject site in 2001. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 inspection.

**Specific Grant Restrictions**

No excavation, drilling, or otherwise disturbing the soils under the building foundation and slabs (utility installations) are reported to have occurred since the last Annual Inspection. Restrictions to perforations of the slab have been lifted in the Amendments to the Grant.

No drilling or other disturbance of the building foundations and slabs which would compromise their integrity in a manner that would or would likely result in human contact with the underlying soils were reported or observed. Again, restrictions to contact with subslab/subfoundation soils have been removed under Grant Amendments.

**General Conditions and Observations**

Building #131, currently a former Army administrative building has been rehabilitated and continues to be utilized as an office use and daycare center (basement). According to Beal, the building was partially occupied/leased at the time of this inspection. Interior surfaces (walls, ceilings, trim, and floors) have or are being refinished and/or replaced. The heating system is new. The property occupancy is limited to commercial (office) and day care uses. Office and day care space has been completed in basement spaces of the building. No evidence of hazardous substances in the building and area immediately surrounding the building impacting the general environment were observed. An outside playground associated with the day care center is located immediately west of the building. According to Beal, no disturbance of underlying soils has occurred during the inspection period.

## INSPECTION REPORT

Army Materials Technology Laboratory – Five Year Report

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: 1 INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: #117, Former Base Housing

Other than a change in occupancy (former occupant, a Site Contractor, current occupant, Beal Property Management Personnel), no changes have occurred at this building since August 1999 First Annual Inspection.

Rob Weikel of the Beal Companies, manager of Lot 2 for Harvard, and owner of the Arsenal property subject to the Grant of Environmental Restriction accompanied Mr. Brodowicz on this Inspection. Mr. Weikel is knowledgeable of site conditions and the day to day site use since Harvard's purchase of "Lot #1" of the AMTL portion of the subject site in 2001. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 inspection.

### Specific Grant Restrictions

No excavation, drilling, or otherwise disturbing the soils under the building foundation and slabs was reported or observed.

No drilling or other disturbance of the building foundations and slabs which would compromise their integrity in a manner that would or would likely result in human contact with the underlying soils was observed.

### General Conditions and Observations

Building #117, former Army Base Housing, was observed in an restored state during the inspection. Interior surfaces (walls, ceilings, trim, and floors) have been refinished and/or replaced. The heating system is new. The property is occupied by Beal as office space at this time. No evidence of hazardous substances in the building and area immediately surrounding the building impacting the general environment were observed. As noted in past inspections, a limited amount of construction/maintenance-related materials (paint, cleaners) were noted as stored in the basement. According to Beal, no disturbance of underlying soils has occurred during the inspection period.

**INSPECTION REPORT**

Army Materials Technology Laboratory – Five Year Review

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: 1 INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: #118, Former Base Housing

Rob Weikel of the Beal Companies, manager of Lot 2 for Harvard, and owner of the Arsenal property subject to the Grant of Environmental Restriction accompanied Mr. Brodowicz on this inspection. Mr. Weikel is knowledgeable of site conditions and the day to day site use since Harvard's purchase of "Lot #1" of the AMTL portion of the subject site in 2001. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 inspection.

**Specific Grant Restrictions**

With the exception of sampling points during assessment of soils beneath the basement floor prior to the 1999 inspection, no excavation, drilling, or otherwise disturbing the soils under the building foundation and slabs was observed. As a result of this testing, soils beneath the building were found to comply with the ROD requirements, and access to these soils is no longer restricted.

No drilling or other disturbance of the building foundations and slabs which would compromise their integrity in a manner that would or would likely result in human contact with the underlying soils was observed.

**General Conditions and Observations**

Rehabilitation work on Building #118, former Army Base Housing, was observed as complete during the inspection. Interior surfaces (walls, ceilings, trim, and floors) have been de-leaded, refinished and/or replaced. The heating system is original, and contains asbestos materials (pipe wrap, insulation materials). The property has been occupied for office purposes. No evidence of hazardous substances in the building and area immediately surrounding the building impacting the general environment were observed. According to Beal, no disturbance of underlying soils has occurred during the inspection period.

**INSPECTION REPORT**

Army Materials Technology Laboratory – Five Year Review

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: 1 INSPECTOR: M. Brodowicz

**SUBJECT BUILDING/AREA:** #60, Former Power Plant Building

Rob Weikel of the Beal Companies, manager of Lot 2 for Harvard, and owner of the Arsenal property subject to the Grant of Environmental Restriction accompanied Mr. Brodowicz on this inspection. Mr. Weikel is knowledgeable of site conditions and the day to day site use since Harvard's purchase of "Lot #1" of the AMTL portion of the subject site in 2001. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 inspection.

**Specific Grant Restrictions**

No residential, daycare, school (for children under 18 year of age), hotel, motel, community center (for children under 18 years of age), and/or recreational uses or activities uses were observed.

No transportation, disposal, or deposition of soils from within this parcel to areas outside of this parcel, unless in compliance with the Soil Management Protocol set forth in Paragraph 4 of the Grant were observed.

No excavation, drilling, or otherwise disturbing the soils under the building foundation and slabs was observed. Special concrete coatings on portions of the slab where past PCB abatement occurred remain in place.

No drilling or other disturbance of the building foundations and slabs which would compromise their integrity in a manner that would or would likely result in human contact with the underlying soils was observed.

**General Conditions and Observations**

For the first time since the 1999 First Annual Inspection, Building #60, renovations of the former Power Plant Building have completed, and the building is one hundred percent occupied for commercial purposes. The building is occupied by a battery research business at the time of our inspection. No evidence of hazardous substances in the area immediately surrounding the building impacting the general environment was observed. We were unable to access the building on the date of our inspection.

Based on our interview, Beal understands that during final renovations for occupancy, no drilling, cutting, or other perforation of the existing concrete floors was conducted during the recent renovation. This includes the area of the building where PCB-impacted concrete (a former floor-level slab) has been capped with concrete.

**INSPECTION REPORT**

**SUBJECT BUILDING/AREA:** #60, Former Power Plant Building

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No additional excavation has reportedly occurred in this area since August 2000. Based on observations made during the 2001 inspection, landscaping and paving activities did not appear to have impacted soils @ 12.0' BSG at the AUL area.

An Activity and Use Limitation (AUL) Instrument as defined in the Massachusetts Contingency Plan (310 CMR 40.0000); to institutionalize restrictions to soils in the area of Building 60 was modified in 1999. The initial AUL filing for this building identified an area surrounding the smokestack at the power plant, and was prepared to restrict access to all soils (surface to infinite depth). The 1999 modification allowed access to soils without restriction for the first 4.0' below surface grade (BSG) in this same area. As documented in previous annual inspection reports, contaminated soils remain in this area @ 12' BSG.

**INSPECTION REPORT**

Army Materials Technology Laboratory – Five Year Review

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: 1 INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: #652, Former Pump House

No change since August 1999 First Annual Inspection.

Rob Weikel of the Beal Companies, manager of Lot 2 for Harvard, and owner of the Arsenal property subject to the Grant of Environmental Restriction accompanied Mr. Brodowicz on this inspection. Mr. Weikel is knowledgeable of site conditions and the day to day site use since Harvard's purchase of "Lot #1" of the AMTL portion of the subject site in 2001. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 inspection.

**Specific Grant Restrictions**

No residential, daycare, school (for children under 18 year of age), hotel, motel, community center (for children under 18 years of age), and/or recreational uses or activities uses were observed.

No transportation, disposal, or deposition of soils from within this parcel to areas outside of this parcel, unless in compliance with the Soil Management Protocol set forth in Paragraph 4 of the Grant were observed.

No excavation, drilling, or otherwise disturbing the soils under the building foundation and slabs was observed.

No drilling or other disturbance of the building foundations and slabs which would compromise their integrity in a manner that would or would likely result in human contact with the underlying soils was observed.

**General Conditions and Observations**

Building #652, a former Pump House (water), was observed in an unrestored and secured state during the inspection. No occupancy occurs. No evidence of hazardous substances in the building and area immediately surrounding the building impacting the general environment were observed. Equipment once contained within the structure has been removed. According to Beal, no disturbance of underlying soils has occurred during the inspection period.

**INSPECTION REPORT**

Army Materials Technology Laboratory – Five Year Report

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: 1 INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: "Area E"

Rob Weikel of the Beal Companies, manager of Lot 2 for Harvard, and owner of the Arsenal property subject to the Grant of Environmental Restriction accompanied Mr. Brodowicz on this inspection. Mr. Weikel is knowledgeable of site conditions and the day to day site use since Harvard's purchase of "Lot #1" of the AMTL portion of the subject site in 2001. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 inspection.

**Specific Grant Restrictions**

No residential, daycare, school (for children under 18 year of age), hotel, motel, community center (for children under 18 years of age), and/or recreational uses or activities uses were observed.

McPhail observed no readily apparent reduction of the grade below the surface grade, as defined in subparagraph 2.C. of the Grant was observed. No apparent movement of soils, located at a depth of one (1) foot or more below the surface grade, as defined in subparagraph 2.C. of the Grant, above that depth, unless disposed of off-Site in compliance with the Soil Management Protocol set forth in Paragraph 4 of the Grant was observed.

**General Conditions and Observations**

Numerous changes and subsequent activity including communications between relevant entities have occurred with respect to Area E, and have been documented in past Inspection Reports. In the current inspection period, no changes to grade were observed.

According to relevant documentation, "Area E", a soil excavation exclusion area was the site of extensive landscaping and soil disturbance activities between 1999 and 2000. The area remains unchanged since the 2001 inspection, as a grassy open space with rock wall and gravel walk way elements. Also noted in 2001, lighting was installed and existing walls were repaired to reduce the effects of erosion on protective soil cover.

Changes in this area with respect to area grade, benchmark construction, and benchmark location have been documented in the Seventh Amendment to the Grant.

The 2005 inspection of benchmarks documented no apparent disturbance to the monuments.

## INSPECTION REPORT

Army Materials Technology Laboratory – Seventh Annual Report

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: 1 INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: #97, Former Research Building

Rob Weikel of the Beal Companies, manager of Lot 2 for Harvard, and owner of the Arsenal property subject to the Grant of Environmental Restriction accompanied Mr. Brodowicz on this inspection. Mr. Weikel is knowledgeable of site conditions and the day to day site use since Harvard's purchase of "Lot #1" of the AMTL portion of the subject site in 2001. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 inspection.

### Specific Grant Restrictions

No residential, daycare, school (for children under 18 year of age), hotel, motel, community center (for children under 18 years of age), and/or recreational uses or activities uses were observed.

No transportation, disposal, or deposition of soils from within this parcel to areas outside of this parcel, unless in compliance with the Soil Management Protocol set forth in Paragraph 4 of the Grant were observed.

Excavation, drilling, or otherwise disturbing the soils under the building foundation and slabs are allowed in this building as a "permitted activity" with notice to MASSDEP. This work must be completed within a 6-month time frame, as allowed based on certain assumptions in the risk characterization of the AMTL portion of the subject site. A copy of correspondence associated with this special exemption and notice is attached to the First Annual Report for reference purposes. All other restrictions of the Grant apply.

No drilling or other disturbance of the building foundations and slabs which would compromise their integrity in a manner that would or would likely result in human contact with the underlying soils was observed.

### General Conditions and Observations

Renovation of Building #97 for commercial (offices) purposes, a former Research Building was in the process of being completed at the time of the 2005 inspection. During the current inspection, workers were noted in this building. Evidence of perforation of the slab was noted, in isolated areas. According to Beal, the contractor(s) involved with renovation of this building were sufficiently aware of the 6-month restriction relative to subslab soil exposure, and complete their work accordingly. The floor was opened on May 5, 2005 and closed (concrete patch) on June 1, 2005. The building was yet to be occupied at the time of the inspection. No evidence of hazardous substances in the building and area immediately surrounding the building impacting the general environment were observed.

Excavation, drilling, or otherwise disturbing the soils under the building foundation and slabs were also observed in 1999. According to the owners at the time (the developer), this work was completed within the 6-month time frame allowed.

**INSPECTION REPORT**

Army Materials Technology Laboratory – Five Year Review

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: 1 INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: "Area B"

No change since August 2002 Second Annual Inspection.

Rob Weikel of the Beal Companies, manager of Lot 2 for Harvard, and owner of the Arsenal property subject to the Grant of Environmental Restriction accompanied Mr. Brodowicz on this inspection. Mr. Weikel is knowledgeable of site conditions and the day to day site use since Harvard's purchase of "Lot #1" of the AMTL portion of the subject site in 2001. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 inspection.

**Specific Grant Restrictions**

No residential, daycare, school (for children under 18 year of age), hotel, motel, community center (for children under 18 years of age), and/or recreational uses or activities uses were observed.

No reduction of the grade below the surface grade, as defined in subparagraph 2.C. of the Grant was observed. No movement of soils, located at a depth of one (1) foot or more below the surface grade, as defined in subparagraph 2.C. of the Grant, above that depth, was observed. Work as documented in previous Inspection Reports was completed in accordance to an Amendment to the Grant.

**General Conditions and Observations**

"Area B", an excavation exclusion area, has not been significantly altered via excavation and re-grading since the August 2000 inspection. Work conducted in 1998/99 was performed under a Grant Amendment. Soils generated as a result of work were managed under the Soil Management Plan in Paragraph 4 of the Grant, under a MASSDEP Material Shipping Record or "MSR".

Currently, "Area B" consists of a small area of contaminated soils located behind and adjacent to a concrete retaining wall, in the loading dock area of Building #39. Restrictions, which applied to the original Area B area, now apply to this relatively smaller area. Area B is paved, and is utilized as the loading dock approach area and sidewalk area for Building #39. The Fourth Amendment to the Grant relative to this work was filed on 3 August 2000.

As discussed in the 2002 Annual Review, MASSDEP, CRBCA, and the Army discussed replacement of two scraped benchmarks, which were observed to remain largely intact and in place. These benchmarks have been replaced with similar markers, set flush with respect to surrounding concrete and asphalt pavement. The elevation of these replacement marks has been established. The Seventh Amendment documented these changes in elevation and construction of these benchmarks.

The 2005 inspection of benchmarks documented no apparent disturbance to the monuments.

**INSPECTION REPORT**

Army Materials Technology Laboratory – Five Year Report

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: 1 INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: #39, Harvard Publishing Building

No change since August 2000 Second Annual Inspection.

Rob Weikel of the Beal Companies, manager of Lot 2 for Harvard, and owner of the Arsenal property subject to the Grant of Environmental Restriction accompanied Mr. Brodowicz on this inspection. Mr. Weikel is knowledgeable of site conditions and the day to day site use since Harvard's purchase of "Lot #1" of the AMTL portion of the subject site in 2001. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 inspection.

**Specific Grant Restrictions**

No residential, daycare, school (for children under 18 year of age), hotel, motel, community center (for children under 18 years of age), and/or recreational uses or activities uses were observed.

No excavation, drilling, or otherwise disturbing the soils under the building foundation and slabs (utility installations) was observed at the time of the inspection. According to the LSP-of-Record for the AMTL portion of the subject site (Hoskins), soil disturbance did occur and was completed in 1999. Restrictions to perforations of the slab were lifted in an Amendment to the Grant at that time, based on additional risk assessment.

**General Conditions and Observations**

Building #39, a former Army research building has been rehabilitated for office use (Harvard Publishing). As noted in previous inspection reports, construction is complete. Interior surfaces (walls, ceilings, trim, and floors) have been refinished and/or replaced. The heating system is new. No evidence of hazardous substances in the building and area immediately surrounding the building impacting the general environment were observed. The building is occupied for commercial purposes. According to Beal, no disturbance of underlying soils has occurred during the inspection period.

**INSPECTION REPORT**

Army Materials Technology Laboratory – Five Year Report

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: 1 INSPECTOR: M. Brodowicz

**SUBJECT BUILDING/AREA:** #311, Former Milling Shed Building

No change since July 2001 Third Annual Inspection.

Rob Weikel of the Beal Companies, manager of Lot 2 for Harvard, and owner of the Arsenal property subject to the Grant of Environmental Restriction accompanied Mr. Brodowicz on this inspection. Mr. Weikel is knowledgeable of site conditions and the day to day site use since Harvard's purchase of "Lot #1" of the AMTL portion of the subject site in 2001. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 inspection.

**Specific Grant Restrictions**

No transportation, disposal, or deposition of soils from within this parcel to areas outside of this parcel, unless in compliance with the Soil Management Protocol set forth in Paragraph 4 of the Grant were observed.

Restrictions regarding excavation, drilling, or otherwise disturbing the soils under the building foundation and slabs were removed in an earlier Grant Amendment.

No drilling or other disturbance of the building foundations and slabs which would compromise their integrity in a manner that would or would likely result in human contact with the underlying soils was observed. Again, all soil contact restrictions with respect to commercial redevelopment of this building area were removed in an earlier Grant Amendment.

**General Conditions and Observations**

Building #311, the former Milling Shed Building has been documented as being rehabilitated for future commercial use (office space) in previous reports. The building was occupied for commercial purposes at the time of the inspection. According to Beal, the building is partially leased/occupied. A health club is currently renovating space on the first floor of the eastern end of the building.

As noted in previous inspection reports, the concrete slab had been perforated in several locations for the purpose of utility and structural installations in the building and building area in 1999. These perforations were conducted at a time when certain restrictions to access to soils underlying the building were specified in the Grant. These perforations were not observed in later annual inspections. According to previous owners (CRBCA), perforations were been filled and sealed over.

**INSPECTION REPORT**

**SUBJECT BUILDING/AREA:** #311, Former Milling Shed Building

Page 2

At this time, all commercial use restrictions have been removed from future use of Building #311. A "First Amendment to the Activity and Use Limitation" for Release Tracking Number 3-17606 was recorded in August 2004. The Second Amendment to the AUL is also known as the Seventh Amendment to the Grant of Environmental Restriction and Easement and Grant Integration, the overall document governing future use of the MTL property. The Sixth Amendment to the Grant was accepted by regulators in May 2005.

Based on the Sixth Amendment, all references to Building 311 will be removed from future Annual Inspection Reports.

**INSPECTION REPORT**

Army Materials Technology Laboratory – Five Year Review

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: 1 INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: #312, Former Research Building

Rob Weikel of the Beal Companies, manager of Lot 2 for Harvard, and owner of the Arsenal property subject to the Grant of Environmental Restriction accompanied Mr. Brodowicz on this Inspection. Mr. Weikel is knowledgeable of site conditions and the day to day site use since Harvard's purchase of "Lot #1" of the AMTL portion of the subject site in 2001. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 inspection.

**Specific Grant Restrictions**

No transportation, disposal, or deposition of soils from within this parcel to areas outside of this parcel, unless in compliance with the Soil Management Protocol set forth in Paragraph 4 of the Grant were observed.

Excavation, drilling, or otherwise disturbing the soils under the building foundation and slabs are allowed in this building as a "permitted activity" with notice to MASSDEP. This work must be completed within a 6-month time frame, as allowed based on certain assumptions in the risk characterization of the AMTL portion of the subject site. A copy of correspondence associated with this special exemption and notice is attached to the First Annual Report for reference purposes. All other restrictions of the Grant apply.

**General Conditions and Observations**

At the time of the 2005 Annual Inspection, Building #312, a former Research Building (firing range, crane bay) was in the process of the final stages of renovation for commercial and/ other uses. In addition to the commercial uses observed in previous Inspection Reports (bank, restaurant), the crane bay has been redeveloped as the Arsenal Center for the Arts, a public recreational space.

Harvard and WADC have prepared and submitted the Second Amendment to the Activity and Use Limitation (AUL) and Second Revised Response Action Outcome Statement for RTN # 3-17606 pertaining to the Building # 312 renovation. RTN # 3-17606 was assigned to response actions at the AMTL portion of the subject site as they pertain to exposures in building interiors, and the reasonably foreseeable occupancy of those buildings.

According to the Second Revised RAO, following risk assessment, there are no longer use restrictions on the interior space within this building. The amended AUL does require that certain building components remain encapsulated. Collectively, the Second Revised RAO and the amended AUL memorialize response actions (de-leading of surfaces and encapsulation) and subsequent re-assessment of risk associated with exposures at Building 312. The filing of these Amendments has allowed the Arsenal Center for the Arts to be developed in Building 312. Re-development of this building was largely complete

**INSPECTION REPORT**

SUBJECT BUILDING/AREA: #312, Former Research Building

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at the time of McPhail's inspection. During the inspection it was observed that the encapsulation was intact and being respected.

During the year under inspection the WADC and Harvard filed with DEP an Application for 7th Amendment to the Grant (dated April 5, 2005) to propose to remove from the Commercial ReUse Area Building 312 and the Plaza Area between Building 312 and Arsenal Street. At the time of this inspection DEP and EPA are in the process of providing comments to WADC on this Grant Amendment Application. Until such time as this or some other Grant Amendment affecting Building 312 and the Plaza Area is accepted, the Restricted Uses and Activities contained in Section 2.A. of the Grant remain in effect. During this inspection, no prohibited uses or activities were observed.

During the current inspection, no drilling or other disturbance of the building foundations and slabs which *would compromise their integrity in a manner that would or would likely result in human contact with the underlying soils* was observed. According to Beal, no disturbance of underlying soils has occurred during the inspection period.

**INSPECTION REPORT**

Army Materials Technology Laboratory – Five Year Review

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: 1 INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: #313-C, Former Arsenal Building

No significant change since August 2000 Second Annual Inspection.

Rob Weikel of the Beal Companies, manager of Lot 2 for Harvard, and owner of the Arsenal property subject to the Grant of Environmental Restriction accompanied Mr. Brodowicz on this inspection. Mr. Weikel is knowledgeable of site conditions and the day to day site use since Harvard's purchase of "Lot #1" of the AMTL portion of the subject site in 2001. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 inspection.

**Specific Grant Restrictions**

Excavation, drilling, or otherwise disturbing the soils under the building foundation and slabs (utility installations) were observed in 1999, but are completed at this time. Restrictions to perforations of the slab were lifted in the Amendments to the Grant, for western areas of the building. Restrictions remain for an area in the building's eastern end, where PCB contamination in subslab soils remains.

Drilling or other disturbance of the building foundations and slabs which would compromise their integrity in a manner that would or would likely result in human contact with the underlying soils was observed in the building's western half. Again, restrictions to contact with subslab/subfoundation soils have been removed under Grant Amendments for this area only.

**General Conditions and Observations**

As noted in previous inspection reports, Building #313-C (central wing), a former Arsenal Building has been rehabilitated for office use. The building is currently occupied. No evidence of hazardous substances in the building and area immediately surrounding the building impacting the general environment were observed.

As noted above, via soil testing results, Amendment's to the Grant lifted restrictions to soil access for western portions of this building. The western portion of the building has been razed. During 1999/2000, this area was landscaped. Soil access restrictions remain for the area of the current building footprint.

During inspection of the PCB restriction area, no evidence of disturbance of the slab was noted. Interior floor surfaces (carpet/tile) were intact. According to Beal, no disturbance of underlying soils has occurred during the inspection period.

## INSPECTION REPORT

Army Materials Technology Laboratory – Five Year Review

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: 1 INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: #313-S, Former Arsenal Building

No significant change since August 2000 Second Annual Inspection.

Rob Weikel of the Beal Companies, manager of Lot 2 for Harvard, and owner of the Arsenal property subject to the Grant of Environmental Restriction accompanied Mr. Brodowicz on this Inspection. Mr. Weikel is knowledgeable of site conditions and the day to day site use since Harvard's purchase of "Lot #1" of the AMTL portion of the subject site in 2001. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 inspection.

### Specific Grant Restrictions

No excavation, drilling, or otherwise disturbing the soils under the building foundation and slabs (utility installations) was observed. Restrictions to perforations of the slab remain for this building, due to the presence of PCBs in soils beneath the slab. A "conditional exception" was granted during the 1999/2000 period, for the installation of a footing. CRBCA reported in 2000 that no PCB-contaminated material was generated as a result of this work.

### General Conditions and Observations

Building #313-S (south wing), a former Arsenal Building has been rehabilitated for office use. As noted in previous inspection reports, construction is observed to be complete. The building is currently occupied. No evidence of hazardous substances in the building and area immediately surrounding the building impacting the general environment were observed. Inspection of the Conditional Exception area revealed an intact concrete slab, and no evidence of perforation or exposure to underlying soils.

No drilling or other disturbance of the building foundations and slabs which would compromise their integrity in a manner that would or would likely result in human contact with the underlying soils was observed. According to Beal, no disturbance of underlying soils has occurred during the inspection period.

## INSPECTION REPORT

Army Materials Technology Laboratory – Five Year Review

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: 1 INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: "Area G"

No significant change since July 2001 Third Annual Inspection.

Rob Weikel of the Beal Companies, manager of Lot 2 for Harvard, and owner of the Arsenal property subject to the Grant of Environmental Restriction accompanied Mr. Brodowicz on this inspection. Mr. Weikel is knowledgeable of site conditions and the day to day site use since Harvard's purchase of "Lot #1" of the AMTL portion of the subject site in 2001. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 inspection.

### Specific Grant Restrictions

No residential, daycare, school (for children under 18 year of age), hotel, motel, community center (for children under 18 years of age), and/or recreational uses or activities uses were observed.

No reduction of the grade below the surface grade, as defined in subparagraph 2.C. of the Grant, or movement of soils, located at a depth of one (1) foot or more below the surface grade, as defined in subparagraph 2.C. of the Grant, above that depth, unless disposed of off-Site in compliance with the Soil Management Protocol set forth in Paragraph 4 of the Grant is permitted.

### General Conditions and Observations

"Area G", an excavation exclusion area, had been substantially or significantly disturbed (fill placement raised pre-existing grade) in 1999. The area had been utilized as an access point for equipment, labor, and material associated with demolition/renovation work being conducted on nearby buildings (313-C specifically). Other than the temporary placement of clean demolition debris as a temporary construction "ramp" to facilitate work on Building #313-C during this period, no alteration to the area was observed or reported.

At the time of the August 2000 inspection, Area G appeared to have been restored to essentially its previous grade and landscaping/sidewalk/pavement have been installed in the area. Subsequent grade verification by Dunn-McKenzie in February 2001 however, documented lower grades in the area of two benchmarks, than those documented as status quo in 1999. CRBCA reported during interviews for the 2001 Third Annual report that MASSDEP was currently evaluating the need to submit an Amendment to the Grant documenting the change (lower) in elevation of benchmarks in this area. As discussed in the Third Annual Review report, an evaluation of existing conditions by the LSP of record suggested that risk and soil management goals of the Grant are intact. Nonetheless, regulators have determined that activities at Excavation Area "G" have violated the Grant. An assessment of the nature of these activities and the current conditions in the area by the LSP of Record (Hoskins) suggests that no new significant risks are

**INSPECTION REPORT**

**SUBJECT BUILDING/AREA:** "Area G"

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present. The Sixth Amendment documented the changes in elevation of the area and benchmarks, construction of these benchmarks, and ensures annual inspection guidelines to ensure benchmark integrity.

For the current Inspection Report period, no reduction of the grade below the surface grade, as defined in subparagraph 2.C. of the Grant was observed. No movement of soils, located at a depth of one (1) foot or more below the surface grade, as defined in subparagraph 2.C. of the Grant, above that depth, unless disposed of off-Site in compliance with the Soil Management Protocol set forth in Paragraph 4 of the Grant was observed. An inspection of benchmarks documented no apparent disturbance to the monuments. According to Beal, no disturbance of pavement or soils has occurred during the inspection period.

**INSPECTION REPORT**

Army Materials Technology Laboratory – Seventh Annual Report

DATE: 6/2/05 WEATHER: 70F, Sun  
LOT#: 1 INSPECTOR: M. Brodowicz

**SUBJECT BUILDING/AREA:** #37, Former Arsenal Building

No significant change since August 2000 Second Annual Inspection.

Rob Weikel of the Beal Companies, manager of Lot 2 for Harvard, and owner of the Arsenal property subject to the Grant of Environmental Restriction accompanied Mr. Brodowicz on this inspection. Mr. Weikel is knowledgeable of site conditions and the day to day site use since Harvard's purchase of "Lot #1" of the AMTL portion of the subject site in 2001. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 inspection.

**Specific Grant Restrictions**

Excavation, drilling, or otherwise disturbing the soils under the building foundation and slabs (utility installations) observed in 1999 no longer exist. Restrictions to perforations of the slab were lifted in the Amendments to the Grant, as a result of soil testing.

**General Conditions and Observations**

Building #37, a former Arsenal Building has been rehabilitated for office use. As discussed in previous inspection reports, construction appeared to be essentially complete by the 2000 inspection. The building is currently occupied. No evidence of hazardous substances in the building and area immediately surrounding the building impacting the general environment were observed.

No drilling or other disturbance of the building foundations and slabs which would compromise their integrity in a manner that would or would likely result in human contact with the underlying soils was observed. Based on the current status, a report for Building #37 will no longer appear as part of the Annual Review.

## INSPECTION REPORT

Army Materials Technology Laboratory – Five Year Review

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: Charles River Park Parcel INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: Charles River Park Open Area

No significant change since the 2004 Annual Inspection.

Scott Murphy, representing the Massachusetts Department of Conservation and Recreation, successor to the Metropolitan District Commission (MDC) and the current owner of the River Parcel, and Bob Davis, a representative of the Army as a specialist with regards to restoration of the Charles River Park Parcel accompanied Mr. Brodowicz on this inspection. These individuals have provided knowledge relative to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grants in 1998 and 2004. Mr. Alving, the contractor for WADC from McPhail and Associates, also was present during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 Annual Inspection.

### Specific Grant Restrictions

No residential, daycare, or school activities, except those activities incidental to recreational park activities are to occur.

No reduction in grade, as defined in subparagraph 2.G is permitted.

No excavation, drilling or otherwise disturbing the soils located two (2) feet or more below surface grade, as defined in subparagraph 2.G., infra is permitted.

All benchmarks installed on the Park Parcel are to be maintained in accordance with the provisions of the Grant. The benchmarks are to remain visible and accessible.

### General Conditions and Observations

The Charles River Park Open Area appears as it did in the 2004 Annual Inspection. The open park area appears to have been used for passive, non-intensive purposes. No evidence of excavation or other soil disturbances was observed.

On the Charles River Park Open Area, according to DCR and USACE personnel, no residential, daycare, or school activities, except those activities incidental to recreational park activities, no reduction in grade, as defined in subparagraph 2.G, and finally, no excavation, drilling or otherwise disturbing the soils located two (2) feet or more below surface grade, as defined in subparagraph 2.G., infra have occurred during the 2005 Annual Inspection period.

All benchmarks were observed to be maintained in accordance with the provisions of the Grant. The benchmarks were visible and accessible. DCR is currently in the process of improving the accessibility and visibility of benchmarks. GPS coordinates for each benchmark will be established, which will be utilized to locate benchmarks in grassy, overgrown, and ground litter areas during future inspections.

**INSPECTION REPORT**

Army Materials Technology Laboratory – Five Year Review

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: Charles River Park Parcel INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: Charles River Park Wooded Area

No significant change since the 2004 Annual Inspection.

Scott Murphy, representing the Massachusetts Department of Conservation and Recreation, successor to the Metropolitan District Commission (MDC) and the current owner of the River Parcel, and Bob Davis, a representative of the Army as a specialist with regards to restoration of the Charles River Park Parcel accompanied Mr. Brodowicz on this inspection. These individuals have provided knowledge relative to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grants in 1998 and 2004. Mr. Alving, the contractor for WADC from McPhail and Associates, also was present during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 Annual Inspection.

**Specific Grant Restrictions**

No residential, daycare, or school activities, except those activities incidental to recreational park activities are permitted.

**General Conditions and Observations**

The Charles River Park Wooded Area appears as it did in the 2004 Annual Inspection. The wooded area appears to have been used for passive, non-intensive purposes. No evidence of unpermitted use was evident during the course of our inspection.

On the Charles River Park Wooded Area, according to DCR and USACE personnel, no residential, daycare, or school activities, except those activities incidental to recreational park activities have occurred for the 2005 Annual Inspection period.

**INSPECTION REPORT**

Army Materials Technology Laboratory – Five Year Review

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: Charles River Park Parcel INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: Watertown Yacht Club Open Area

No significant change since the 2004 Annual Inspection.

Scott Murphy, representing the Massachusetts Department of Conservation and Recreation, successor to the Metropolitan District Commission (MDC) and the current owner of the River Parcel, and Bob Davis, a representative of the Army as a specialist with regards to restoration of the Charles River Park Parcel accompanied Mr. Brodowicz on this inspection. These individuals have provided knowledge relative to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grants in 1998 and 2004. Mr. Alving, the contractor for WADC from McPhail and Associates, also was present during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 Annual Inspection.

**Specific Grant Restrictions**

No residential, daycare, or school activities, except those activities incidental to recreational park activities are permitted.

No reduction in grade, as defined in subparagraph 2.G is permitted.

No permits are to be obtained for construction or maintenance purposes, which involved soil disturbance or excavation.

No excavation, drilling or otherwise disturbing the soils located two (2) feet or more below surface grade, as defined in subparagraph 2.G., infra. is permitted.

With respect to existing structures, no residential, daycare, or school activities, except those activities incidental to recreational park activities are permitted. No disturbance of building foundations and slabs in a manner which would likely result in human contact with underlying soils is permitted. Finally, no excavation, drilling or otherwise disturbing of the soil underlying the building foundations and slabs is permitted.

All benchmarks installed on the Park Parcel are to be maintained in accordance with the provisions of the Grant. The benchmarks are to remain visible and accessible.

**General Conditions and Observations**

The Watertown Yacht Club Open Area appears as it did in the 2004 Annual Inspection. The area appears to have been used for passive, non-intensive purposes. No evidence of un-permitted use or soil disturbance was evident during the course of our inspection.

**INSPECTION REPORT**

SUBJECT BUILDING/AREA: Watertown Yacht Club Open Area

Page 2

According to DCR, USACE, and the WYC representative, no residential, daycare, or school activities, except those activities incidental to recreational park activities have occurred for the 2005 Annual Inspection period. According to the WYC representative, no activities which resulted in reduction in grade, floor perforations, or the disturbance of soils on the WYC Open Area have occurred during the 2005 Annual Inspection period.

With respect to structures, according to WYC personnel, no residential, daycare, or school activities, except those activities incidental to recreational park activities have occurred during the inspection period. No disturbance of building foundations and slabs in a manner which would likely result in human contact with underlying soils has occurred as of the date of the inspection. Finally, no excavation, drilling or otherwise disturbing of the soil underlying the building foundations and slabs has occurred.

Generally, benchmarks were accessible and visible. DCR is currently in the process of improving the accessibility and visibility of benchmarks. GPS coordinates for each benchmark will be established, which will be utilized to locate benchmarks in grassy, overgrown, and ground litter areas during future inspections. Additionally, on the WYC Open Space Area, off-set stakes will be installed adjacent to benchmarks, and measurements will be recorded for future reference.

**INSPECTION REPORT**

Army Materials Technology Laboratory – Seventh Annual Report

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: Charles River Park Parcel INSPECTOR: M. Brodowicz

**SUBJECT BUILDING/AREA:** North Beacon Street Wooded Area

No significant change since the 2004 Annual Inspection.

Scott Murphy, representing the Massachusetts Department of Conservation and Recreation, successor to the Metropolitan District Commission (MDC) and the current owner of the River Parcel, and Bob Davis, a representative of the Army as a specialist with regards to restoration of the Charles River Park Parcel accompanied Mr. Brodowicz on this inspection. These individuals have provided knowledge relative to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grants in 1998 and 2004. Mr. Alving, the contractor for WADC from McPhail and Associates, also was present during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 Annual Inspection.

**Specific Grant Restrictions**

No residential, daycare, or school activities, except those activities incidental to recreational park activities are permitted.

**General Conditions and Observations**

The North Beacon Street Wooded Area appears as it did in the 2004 Annual Inspection, No evidence of unpermitted use was evident during the course of our inspection.

According to DCR, USACE, and Watertown DPW personnel, no residential, daycare, or school activities, except those activities incidental to recreational park activities have occurred for the 2005 Annual Inspection period.

**INSPECTION REPORT**

Army Materials Technology Laboratory – Seventh Annual Report

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: Charles River Park Parcel INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: North Beacon Street Area

No significant change since the 2004 Annual Inspection.

Scott Murphy, representing the Massachusetts Department of Conservation and Recreation, successor to the Metropolitan District Commission (MDC) and the current owner of the River Parcel, and Bob Davis, a representative of the Army as a specialist with regards to restoration of the Charles River Park Parcel accompanied Mr. Brodowicz on this inspection. These individuals have provided knowledge relative to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grants in 1998 and 2004. Mr. Alving, the contractor for WADC from McPhail and Associates, also was present during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 Annual Inspection.

**Specific Grant Restrictions**

No residential, daycare, or school activities, except those activities incidental to recreational park activities are permitted.

No disturbance of the roadway or sidewalk pavement which would compromise their integrity which could result in human contact with the underlying soils is permitted.

No excavation, drilling or otherwise disturbing the soil underlying the roadway or sidewalks.

**General Conditions and Observations**

The North Beacon Street Area appears as it did in the 2004 Annual Inspection, No evidence of unpermitted use was evident during the course of our inspection.

According to DCR, USACE, and Watertown DPW personnel, no residential, daycare, or school activities, except those activities incidental to recreational park activities have occurred for the 2005 Annual Inspection period. No disturbance of the roadway or sidewalk pavement which would compromise their integrity which could result in human contact with the underlying soils have occurred.

## INSPECTION REPORT

Army Materials Technology Laboratory – Seventh Annual Report

DATE: 6/7/05 WEATHER: 70F, Sun  
LOT#: 1 INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: Commercial Reuse Area

Rob Weikel of the Beal Companies, manager of Lot 1 for Harvard, and owner of the Arsenal property subject to the Grant of Environmental Restriction accompanied Mr. Brodowicz on this inspection. Mr. Weikel is knowledgeable of site conditions and the day to day site use since Harvard's purchase of "Lot #1" of the AMTL portion of the subject site in 2001. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is generally knowledgeable of matters pertaining to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant of Environmental Restriction and Easement for the AMTL portion of the subject site in 1998. Based on McPhail's knowledge of these issues through the inspection/interview process, and the information provided by these individuals, to the extent that they have knowledge, the inspection focused on pertinent issues since the 2004 inspection.

### Specific Grant Restrictions

No residential, daycare, school (for children under 18 year of age), hotel, motel, community center (for children under 18 years of age), and/or recreational uses or activities uses were observed.

No transportation, disposal, or deposition of soils from within this parcel to areas outside of this parcel, unless in compliance with the Soil Management Protocol set forth in Paragraph 4 of the Grant were observed.

### General Conditions and Observations

According to WADC, no disturbance of underlying soils has occurred during the inspection period. Visual inspection revealed no evidence of soil disturbance in this area.

**INSPECTION REPORT**

Army Materials Technology Laboratory – Seventh Annual Report

DATE: 6/7/05

WEATHER: 70F, Sun

LOT#: 2

INSPECTOR: M. Brodowicz

SUBJECT BUILDING/AREA: Lot 2

No representatives of The Town of Watertown, owner of "Lot 2" of the AMTL portion of the subject site subject to the 1998 Grant of Environmental Restriction accompanied Mr. Brodowicz during the inspection of this date. Mr. Alving, the contractor for WADC from McPhail and Associates, accompanied Mr. Brodowicz during the inspection. Mr. Alving is knowledgeable relative to Site History, Past and Present Use, and Response Actions which have occurred prior to and subsequent to the implementation of the Grant in 1998. Based on McPhail's knowledge of these issues, the inspection focused on pertinent issues since the 2004 inspection. With respect to the Lot 2 portion of the inspection, McPhail followed up our inspection with a telephone conversation with the Town of Watertown representative (Franklin Stearns).

**Specific Grant Restrictions**

No residential, daycare, school (for children under 18 year of age), hotel, motel, community center (for children under 18 years of age), and/or recreational uses or activities uses were observed.

No transportation, disposal, or deposition of soils from within this parcel to areas outside of this parcel, unless in compliance with the Soil Management Protocol set forth in Paragraph 4 of the Grant were observed.

**General Conditions and Observations**

According to WADC, no disturbance of underlying soils has occurred during the inspection period. Visual inspection revealed no evidence of soil disturbance in this area.