FINAL

Record of Decision for Sediment – Operable Unit 2

U.S. ARMY NATICK SOLDIER SYSTEMS CENTER
NATICK, MASSACHUSETTS

Prepared for:

U.S. ARMY NATICK SOLDIER SYSTEMS CENTER
NATICK, MASSACHUSETTS

September 2009

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Prepared for:

U.S. ARMY NATICK SOLDIER SYSTEMS CENTER
Natick, Massachusetts

Prepared by:

ICF International
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September 2009

Project 095220.0.088
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ACRONYMS

ADL	Arthur D. Little, Inc.
ARAR	Applicable or Relevant and Appropriate Requirement
ARCS	Assessment and Remediation of Contaminated Sediments
Argonne	Argonne National Laboratory
ARIEM	Army Research Institute of Environmental Medicine
ATSDR	Agency for Toxic Substances and Disease Registry
AWQC	Ambient Water Quality Criteria
BSAF	Biota-Sediment Accumulation Factor
BWP	Bureau of Waste Practices
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
CHEE	Clean Harbors Environmental Engineering
CMR	Code of Massachusetts Regulations
CPF	Cancer Potency Factor
CSF	Cancer Slope Factor
CSM	Conceptual Site Model
CTE	Central Tendency Exposure
CWA	Clean Water Act
DASH	Diver Assisted Suction Harvester
DCR	Massachusetts Department of Conservation and Recreation
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethene
DDT	Dichlorodiphenyltrichloroethane
DOD	Department of Defense
ERA	Ecological Risk Assessment
EPH	Extractable Petroleum Hydrocarbon
ESD	Explanation of Significant Differences
FPGS	Former Proposed Gymnasium Site
FS	Feasibility Study
GPM	Gallons per minute
GPS	Global Positioning System
HHRA	Human Health Risk Assessment
HI	Hazard Index
HLA	Harding Lawson Associates
HP	Horsepower
HRGC	High Resolution Gas Chromatography
HRMS	High Resolution Mass Spectroscopy
HWMR	Hazardous Waste Management Regulations
ICF	ICF International
IRIS	Integrated Risk Information System
MACTEC	Mactec Engineering and Consulting, Inc.
MassDCR	Massachusetts Division of Conservation and Recreation
MassDEP	Massachusetts Department of Environmental Protection
MassDPH	Massachusetts Department of Public Health
MCP	Massachusetts Contingency Plan
mg/kg	milligrams per kilogram

MSO	Main Stormwater Outfall
MSWQS	Massachusetts Surface Water Quality Standards
NAAQS	National Ambient Air Quality Standards
NCP	National Contingency Plan
NERI	Northeast Research Institute
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NPV	Net Present Value
NRDA	Natural Resource Damage Assessment
NSSC	U.S. Army Natick Soldier Systems Center
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PAH	Polynuclear Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
POTW	Public-Owned Treatment Works
ppb	parts per billion
ppm	parts per million
PW	Present Worth
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
RAB	Restoration Advisory Board
RAM	Release Abatement Measure
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RfC	Reference Concentration
RfD	Reference Dose
RI	Remedial Investigation
RME	Reasonable Maximum Exposure
ROD	Record of Decision
SARA	Superfund Amendments and Authorization Act of 1986
SI	Site Investigation
SQT	Sediment Quality Triad
S/S	Solidification and Stabilization
SVOC	Semivolatile Organic Compounds
TCE	Trichloroethylene
TCLP	Toxicity Characteristic Leaching Procedure
TOC	Total Organic Carbon
TRV	Toxicity Reference Value
TPH	Total Petroleum Hydrocarbons
TSCA	Toxic Substances Control Act
USAEC	U.S. Army Environmental Command
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
US EPA	United States Environmental Protection Agency
USGS	U.S. Geological Survey
VOC	Volatile Organic Compounds
WQC	Water Quality Certification
WSW	Water Supply Wells

PART 1: DECLARATION

1.0 SITE NAME AND LOCATION

U.S. Army Natick Soldier Systems Center
Kansas Street
Natick, Massachusetts

Areas of Concern: Sediment along the Lake Cochituate shoreline of the U.S. Army Natick Soldier Systems Center at the T-25 Area, Building 2/45 Area, Boiler Plant Area, Building 22/36 Area, and Main Stormwater Outfall Area

The U.S. Army Natick Soldier Systems Center (NSSC, the "Site") in Natick, Massachusetts is an active Army installation that was placed on the National Priorities List (NPL) in May 1994. In 2006, a Federal Facility Agreement between the U.S. Department of the Army and the U.S. Environmental Protection Agency (US EPA) identified eight Areas of Concern and three Site Screening Areas at NSSC. This Record of Decision (ROD) applies to sediment along the NSSC shoreline, also known as Operable Unit 2 (OU-2). Based on the remedial investigations and the results of sediment risk assessments, the sediment areas have been divided into two areas. The first area is the NSSC shoreline outside of Pegan Cove from the T-25 Area outfall at NSSC's northern shoreline boundary south to the Building 2/45 Outfall. This shoreline area includes outfalls associated with four areas of concern, the T-25 Area, Building 2/45 Area, Boiler Plant Area, and Building 22/36 Area. The second sediment area is along the NSSC shoreline within Pegan Cove, and includes the Main Stormwater Outfall area of concern.

The U.S. Department of the Army is the lead agency for cleanup activities at NSSC. The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) ID number for the Site is MA1210020631.

2.0 STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial actions for sediment along the NSSC shoreline in the South Pond of Lake Cochituate for two sediment areas: 1) outside of Pegan Cove from the T-25 Area outfall to the Building 2/45 Area outfall, and (2) within Pegan Cove including the Main Stormwater Outfall.

These areas were chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 42 United States Code §9601 *et seq.*, as amended by the Superfund Amendments and Authorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 Code of Federal Regulations (CFR) Part 300, as amended.

The Selected Remedy for the first sediment area, outside of Pegan Cove, is No Action. The Selected Remedy for the second sediment area, within Pegan Cove, is Alternative 8 - Hot Spot Dredging, Geotextile Tube Dewatering, Off-Site Disposal, and Backfilling. These Selected Remedies are described in Section 3.0 (Description of the Selected Remedies) of this ROD. The Commander U.S. Army Environmental Command (USAEC) and the Director of the US EPA Region 1 (New England) Office of Site Remediation and Restoration have been delegated the authority to approve this ROD.

This decision was based on the Administrative Record, which has been developed in accordance with Section 113(k) of CERCLA, and is available for review at NSSC and the Morse Institute Library located in Natick, Massachusetts. The Administrative Record Index, located in Appendix A, identifies each of the items comprising the Administrative Record upon which the selection of the remedial action is based.

A letter of concurrence from the Massachusetts Department of Environmental Protection (MassDEP) is included in Appendix B.

MassDEP has reviewed this ROD and has indicated its support for the selected remedies. The Commonwealth of Massachusetts has reviewed the remedial investigations (RI), risk assessments, Feasibility Study (FS), and other reports associated with the sediment along the NSSC shoreline to determine if the selected remedies are in compliance with applicable or relevant and appropriate State environmental and facility citing laws and regulations.

2.1 ASSESSMENT OF THE SITE

A release of a hazardous substance occurred in the 1980s. A transformer leaked onto the ground and polychlorinated biphenyls (PCBs) were carried through the Main Stormwater Outfall (MSO) storm drain system into Pegan Cove of Lake Cochituate. The response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

3.0 DESCRIPTION OF THE SELECTED REMEDIES

The selected remedy for sediment at the NSSC shoreline areas that are outside of Pegan Cove is No Action. This No Action recommendation is based on comprehensive investigations and risk analyses indicating that there is no unacceptable human health or ecological risk associated with sediment in these areas. In this context, No Action means that no CERCLA remedial action will be taken with respect to sediment at the shoreline areas associated with the outfalls at the T-25, Building 22/36, Boiler Plant, and Building 2/45 areas.

The selected remedy for sediment at the NSSC shoreline within Pegan Cove is Alternative 8 - Hot Spot Dredging, Geotextile Tube Dewatering, Off-Site Disposal, and Backfilling. This recommendation is based on comprehensive investigations and risk analyses which indicate an unacceptable potential human health risk associated with fish ingestion in this area. Additionally, statistical analyses prepared by the Army and approved by the US EPA demonstrated that concentrations of PCBs in sediment at the Main Stormwater Outfall within Pegan Cove are statistically higher than at non-Army impacted reference locations.

Alternative 8 involves the removal of PCB-contaminated sediment, using hydraulic dredging techniques, from four hot spot areas within Pegan Cove to reduce the average PCB concentration within Pegan Cove to below the sediment cleanup goal of 1.0 milligrams per kilogram (mg/kg). The dredged areas will be backfilled with clean fill material, unless the post-remediation confirmatory sampling indicates that the residual concentrations, if any, already meet the average cleanup goal. Dredged sediment will be collected into geotextile tubes for dewatering and subsequently transported to an off-site disposal/treatment facility.

The selected remedy will include several principle components:

- Site Condition Evaluation
- Site Control Measures
- Silt Curtains
- Hydraulic Dredging
- Geotextile Tube Dewatering
- Odor Control
- Water Treatment
- Off-site Disposal
- Remedial Monitoring
- Site Restoration/Backfilling

The more detailed discussion of the components of the remedy is found in Section 15.1.8 (Alternative 8 – Hot Spot Hydraulic Dredging/Geotextile Tube Dewatering/ Off-Site Disposal/Backfilling) and Section 18.2.1 (Selected Remedies: Alternative 8 – Hot Spot Hydraulic Dredging/Geotextile Tube Dewatering/Off-Site Disposal/Backfilling).

4.0 STATUTORY DETERMINATIONS

No CERCLA remedial action is necessary for sediment at the NSSC shoreline outside of Pegan Cove, which includes the outfalls at the T-25, Building 2/45, Boiler Plant, and Building 22/36 areas.

A CERCLA remedial action is necessary for sediment at the NSSC shoreline within Pegan Cove, including the Main Stormwater Outfall.

The Selected Remedy for sediment at the NSSC shoreline within Pegan Cove is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, is cost-effective, and utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. The selected remedy abides by the mandates of CERCLA and the regulatory requirements of the NCP. This remedy also satisfies the statutory preference that the selected remedy should use a treatment process to permanently reduce the level of toxicity of contaminants at the site, the spread of the contaminants away from the site, or the amount of contamination at the site. The selected remedy is effective in reducing the toxicity (sediment containing elevated PCB concentrations are removed from the site and shipped to an off-site permitted landfill which would provide effective containment and isolation), reducing mobility (dredged sediment containing elevated PCB concentrations would be replaced with clean fill material, if deemed necessary based on post-dredging confirmatory sampling), and reducing volume (sediment containing elevated PCB concentrations in sediment would be removed from the site).

The Selected Remedy at the NSSC shoreline within Pegan Cove will result in no site-related hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure. Therefore, no statutory five-year review is required for the sediment at the NSSC shoreline within Pegan Cove by the NCP (40 CFR 300.430(f)(4)(ii)). However, a policy review may be conducted within five years of construction completion for the site to ensure that the remedy remains protective.

5.0 RECORD OF DECISION DATA CERTIFICATION CHECKLIST

The information provided in Table 5-1, which consists of key remedy selection data, is derived from the Decision Summary (Part II) of this ROD. Additional information can be found in the

Administrative Record that is maintained at NSSC and at the Morse Institute Library located at 14 East Central Street in Natick, Massachusetts. A list of documents contained in the Administrative Record for NSSC is included in Appendix A.

Table 5-1: Record of Decision Data Certification Checklist

Information	Location in Record of Decision
Chemicals of concern and their respective concentrations	Sections 11.3 and 11.4
Baseline risk represented by the chemicals of concern	Section 13
Cleanup levels established for chemicals of concern and the basis for these levels	Section 14
How source materials constituting principal threats will be addressed	Section 17
Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of ground water	Section 12
Potential land and ground water use that will be available at the site as a result of the selected remedy	Section 12
Estimated capital, annual operations and maintenance, and total present-value costs, discount rate, and the number of years over which the remedy cost estimates are projected	Table 18-2
Key factor(s) that led to selecting the remedy (i.e. describe how the Selected Remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision)	Section 19

6.0 AUTHORIZING SIGNATURE

This Record of Decision documents the selection of No Action for sediment along the NSSC shoreline outside of Pegan Cove and Alternative 8 (Hot Spot Dredging, Geotextile Tube Dewatering, Off-Site Disposal, and Backfilling) for sediment at the NSSC shoreline within Pegan Cove by the U.S. Department of the Army and the U.S. Environmental Protection Agency, with the concurrence of the Commonwealth of Massachusetts Department of Environmental Protection.

Concur and recommended for immediate implementation:

U.S. DEPARTMENT OF THE ARMY

By: Maria R. Gervais Date: 9/17/09

Maria R. Gervais
Colonel, U.S. Army
Commanding

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This Record of Decision documents the selection of No Action for sediment along the NSSC shoreline outside of Pegan Cove and Alternative 8 (Hot Spot Dredging, Geotextile Tube Dewatering, Off-Site Disposal, and Backfilling) for sediment at the NSSC shoreline within Pegan Cove by the U.S. Department of the Army and the U.S. Environmental Protection Agency, with the concurrence of the Commonwealth of Massachusetts Department of Environmental Protection.

Issuance of this ROD embodies the determination made by the Director of the Office of Site Remediation and Restoration, pursuant to the Toxic Substances Control Act, that the selected remedy will not pose unreasonable risk to human health or the environment pursuant to 40 CFR 761.61(c).

Concur and recommended for immediate implementation:

U.S. ENVIRONMENTAL PROTECTION AGENCY

By: _____ Date: 9-24-09

James T. Owens III, Director
Office of Site Remediation and Restoration
EPA New England

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PART 2: DECISION SUMMARY

7.0 SITE NAME, LOCATION, AND DESCRIPTION

U.S. Army Natick Soldier Systems Center
Kansas Street
Natick, Massachusetts

Areas of Concern: Sediment along the Natick Soldier Systems Center (NSSC) shoreline on Lake Cochituate, including outfalls at the T-25 Area, Building 2/45 Area, Boiler Plant Area, Building 22/36 Area, and Main Stormwater Outfall Area

NSSC is an active research and testing facility, owned and operated by the Federal government through the Department of the Army. NSSC is located approximately 17 miles west-southwest of Boston in the Town of Natick, Middlesex County, Massachusetts. NSSC has been a permanent Army installation since October 1954, and its mission includes research and development activities in food engineering, food science, clothing, equipment, and materials engineering, and aero-mechanical engineering. NSSC occupies a 74-acre area on a small peninsula extending from the eastern shoreline of the South Pond of Lake Cochituate (Figures 7-1 and 7-2).

The land surrounding NSSC includes residential, commercial/retail, and light industrial areas. The ground water beneath the Site is designated as a Zone II Wellhead Protection Area for the Town of Natick Springvale Municipal Water Supply Well Field (Springvale Well Field).

Lake Cochituate is located in the towns of Natick, Framingham, and Wayland, Massachusetts, approximately 16 miles west of Boston. Lake Cochituate is composed of five interconnected ponds (Fisk, South, Carling, Middle, and North) separated by several major roadways. The lake lies in the Sudbury River Basin and is a part of the Cochituate State Park. The flow of the ponds is from south to north. South Pond of Lake Cochituate is located in an urban-suburban setting in Natick, Massachusetts. The NSSC property is located on a peninsula in the South Pond. South Pond is 233 acres in area and approximately 69 feet at its deepest.

In the late 1990s and early 2000s all active outfalls at NSSC were retrofitted with new oil/water separators to improve stormwater quality and minimize future impacts to Lake Cochituate. The oil/water separators are routinely maintained and cleaned out, and any solids removed from the separators are properly disposed of off site. Therefore, the NSSC stormwater drainage system is no longer a continuing contaminant source to Lake Cochituate.

The following sections provide descriptions of the outfall areas along the NSSC shoreline that are part of this ROD. For a more complete description of the NSSC outfalls, please refer to Appendix B Section 9, of the *First Five-Year Review Report for U.S. Army Soldier Systems Center, Town of Natick, Middlesex County, Massachusetts* (ICF, 2007).

7.1 T-25 AREA

The T-25 Area, named because Building T-25 is located there, is a 15.6-acre rectangular area located in the northwestern portion of NSSC. The T-25 Area is a former gravel pit, which was filled with soil and construction debris prior to the development of the overall T-25 Area in the 1950s. Most of the T-25 Area is covered by buildings or asphalt. Many of the buildings are temporary. The largest open, uncovered portion of the T-25 Area is a small baseball field located in the northwest corner of the

site. The T-25 Area is bounded to the west, north, and east by residential properties; it is bounded to the south by the rest of the NSSC facility.

The T-25 Area outfall lies at the extreme southwest corner of the T-25 Area (see Figure 7-2). The outfall drains surface water runoff originating from the T-25 Area through an underground stormwater sewer system which was upgraded in 1999. Prior to the upgrade, surface water runoff discharged to the outfall through a culvert near Buildings 62 and 68. The outfall consists of an approximately 2-feet diameter pipe extending outwards from a concrete supporting wall abutting South Pond. An oil-water separator was installed between Buildings 14 and 20 in 1998 and a second one was installed between the ball field and Building 68 in 2004.

7.2 BUILDING 2/45 AREA

The Building 2/45 Outfall drains the parking area south of the two named buildings at NSSC into Lake Cochituate (see Figure 7-2). Building 2 is located in the south-central portion of NSSC along C Street and the terminus of Fourth Avenue and consists of a one-story reinforced concrete building with an elevated concrete slab floor. Building 2 was built in 1955 and houses a research facility, including a Climatic Chamber. Building 45 is located west and adjacent to Building 2 along C Street. A parking area and a short access road separate Building 45 and Building 2. Building 45 is bounded by a wooded area and Lake Cochituate to the west and a small parking area and the lake to the south. Building 45 was built in the early 1960s and houses NSSC's Department of Public Works. An oil-water separator was installed at the Building 2/45 Outfall in 1999.

7.3 BOILER PLANT AREA

The Boiler Plant (Building 19) is an approximately 2-acre area located on C Street in the southwestern portion of NSSC (see Figure 7-2). Building 19 is bordered to the north by C Street, to the east by Building 22, to the west by a parking area, and to the south by another parking area and the South Pond of Lake Cochituate. The terrain leading to the South Pond of Lake Cochituate (Boiler Point Cove) is a steep, vegetated incline where the Boiler Plant Outfall pipe drains into Boiler Plant Cove. An oil-water separator was installed in 2002.

7.4 BUILDING 22/36 AREA

Outfalls were historically located behind Building 36 and 16; these outfalls were abandoned in the late 1990s (and are also called the Historic Outfalls) and drainage was rerouted to an oil-water separator installed behind Building 36 in 1999. Buildings 22 and 36 are located in the southwestern portion of the facility east and north of the Boiler Plant (Building 19) and the intersection of C Street and First Avenue. The drainage area includes the portion of the site south of the T-25 Area outfall on the western side of the NSSC. The South Pond of Lake Cochituate borders the site to the south and west. The area is comprised of streets, parking areas, maintained grass areas, and un-maintained wooded areas abutting the lake.

7.5 MAIN STORMWATER OUTFALL AREA

The Main Stormwater Outfall (MSO) enters Lake Cochituate near the intersection of Turner (formerly C Street) and Greely Avenue (formerly Sixth Avenue), and is located northeast of Building 42 and southeast of Building 1. The outfall is constructed of 18-inch diameter PVC piping which terminates at a concrete bulkhead at the edge of the lake. Effluent discharges from the outfall over a 5-foot long concrete slab and into the lake. At times the concrete slab is below the lake's water level. The Main Stormwater Outfall receives stormwater runoff from much of the central and southern

portion of the NSSC property, which is comprised primarily of administration/office buildings, grassy areas, and parking lots. It also acts as the discharge point for the T-25 Area groundwater treatment system. An oil-water separator was installed at the MSO in the Summer/Fall of 1998, just north of Building 42. Other smaller outfalls at the Former Proposed Gymnasium site (FPGS), Army Research Institute of Environmental Medicine (ARIEM) Building, and the helipad which drain smaller localized parking areas and roofs of their associated building were all retrofitted with new oil/water separators in the late 1990s to improve stormwater quality and minimize impacts to the lake.

8.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

This section summarizes site history and activities for sediment at the U.S. Army NSSC shoreline on Lake Cochituate. Detailed chronologies for specific areas of concern along the NSSC shoreline are provided in Tables 8-1 through 8-5.

NSSC was added to the National Priorities List (NPL) under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Authorization Act of 1986 (SARA), in May 1994, to evaluate and implement response actions to clean up past releases of hazardous substances, pollutants, and contaminants. The CERCLIS ID number for the Site is MA1210020631. The NSSC shoreline and NSSC outfalls are considered subareas of the Site. Collectively, the sediment along the NSSC shoreline is known as Operable Unit 2 (OU-2)

A Federal Facility Agreement between the U.S. Department of the Army and the U.S. Environmental Protection Agency (US EPA) was signed in August 2006 to establish a procedural framework for ensuring that appropriate response actions are implemented at NSSC (US EPA, 2006). The U.S. Army is the lead agency responsible for environmental cleanup at this Site.

8.1 T-25 AREA

Prior to Army development in the 1950s, the T-25 Area was a gravel pit owned by the Town of Natick. Subsequently it was filled with soil and construction debris prior to development of the overall T-25 Area. Between 1970 and 1989, the T-25 Area was used to store bulk waste and drums of petroleum, solvents, antifreeze, trichlorofluoroethane, and pesticides. After 1989, the storage of bulk waste and drums was moved to indoor structures (Argonne, 1993). Past and present operations within the T-25 Area have included: quarrying; indoor and outdoor storage of bulk items, wastes, petroleum, solvents, antifreeze, pesticides, and Freon 113; warehouse operations (shipping and receiving); laboratory research, including the testing of petroleum, oil and lubricant pumping equipment, refrigeration units, and various types of fuel in engines; clothing and textile research; fire retardant research; drop-testing; waste incineration; and garage operations, including spray painting, vehicle maintenance, insect and rodent control, metal parts and brush cleaning, battery charging, silk screening, and rubber adhesive thinning. Future land use is expected to remain consistent with current use.

Table 8-1 describes the history of investigations associated with the T-25 Area and its outfall.

8.2 BUILDING 2/45 AREA

Building 2 houses the Doriot Climatic Chamber. Support spaces within Building 2 contain tropic and artic test control chambers. Trichloroethene (TCE) and Freon were used within closed systems at Building 2 for climatic control. TCE use was discontinued in the mid-1980s. Building 45 was built in the early 1960s and houses NSSC's Department of Public Works, the Parachute Prototype Shop, the

Biomechanics Laboratory, a computer laboratory, and offices and storage space in the basement (MACTEC, 2008b).

Table 8-2 describes the history of investigations associated with the Building 2/45 Area and its outfall.

Table 8-1: History of Investigations - T-25 Area Outfall

Date	Event
1996 and 1998	The Army completed a Phase I and Phase II RI (respectively) at the T-25 Area that included sampling and analysis of surface water and sediment at the T-25 Area Outfall and at 11 outfall and non-outfall reference locations across Lake Cochituate. Potential risks to human health and the environment were evaluated. A Tier I ecological risk assessment (ERA) was performed as part of the RI (ADL, 1996 and 1998b).
1997	An initial round of stormwater sampling was conducted at the T-25 Area outfall and off-site outfalls (ADL, 2002).
1997	The federal Agency for Toxic Substances and Disease Registry (ATSDR) (a division of the Centers for Disease Control) performed an independent public health assessment at NSSC, which included an evaluation of the potential human health risks from exposures during swimming, wading, or boating near the T-25 Area Outfall. The ATSDR study concluded that exposure was not likely to result in adverse health effects (RAB, 1997).
1997–present	Installed, operated, and maintained the T-25 Area ground water pump and treat system to contain and cleanup chlorinated solvent-contaminated ground water.
1998	Installed the T-25 Area oil-water separator between Buildings 14 and 20 and its associated piping (Site 1 OWS) (Fawkes, 2006).
1998-2001	Tier II ERA was performed to further evaluate potential ecological risks associated with the sediment at the T-25 Area Outfall. The Tier II ERA included: additional sediment/surface water sampling; benthic macro-invertebrate surveys; sediment toxicity testing; and wildlife foraging surveys (ADL, 2001b).
1999	A second round of stormwater sampling was conducted at the T-25 Area outfall and off-site outfalls (ADL, 2002).
1999	Time-critical removal action was completed to remove soil contaminated with pesticides and polynuclear aromatic hydrocarbons (PAHs) within the T-25 Area storage area (Weston, 1999).
2001 - 2004	Tier III ERA was performed and included extensive fish, benthic invertebrate, and sediment sampling across the major ponds of Lake Cochituate. Food chain modeling was performed to evaluate the potential risks to wildlife (benthos, fish, birds, and mammals) from NSSC-related sediment (ICF, 2004a).
2004	Fish fillet data collected during the Tier III ERA sampling program were used to assess the potential human health risks associated with the recreational consumption of representative native, non-stocked fish species (largemouth bass) caught from Lake Cochituate in the vicinity of NSSC. Major uncertainties inherent in the Tier III ERA were further analyzed (ICF, 2004c).
2004	Installed a second oil-water separator between the ball field and Building 68 that drains to the T-25 Area outfall (Fawkes, 2006).
2005	Angler survey conducted to determine if Lake Cochituate is currently used for subsistence fishing, and to provide a better understanding of local native fish ingestion rates, species consumption patterns, and fish preparation/cooking methods (ICF, 2006).
2009	Completed Final Feasibility Study to screen, develop, and evaluate remedial alternatives for the NSSC shoreline sediment (ICF, 2009a).
2009	Completed Proposed Plan to present remedial alternatives for the NSSC shoreline sediment to the public (ICF, 2009b).

Table 8-2: History of Investigations - Building 2/45 Area

Date	Event
1955	Construction of Building 2 (Climatic Chamber) completed. Three 1,000 gallon TCE tanks and four 2,000 gallon Freon tanks in crawlspace (Argonne, 1993).
Late 1960s	Building 45 constructed, including facility maintenance shops. Septic tank shown as "To Be Removed" on design drawings (Argonne, 1993).
1988	TCE use discontinued in Building 2. Dow Therm J used as heat transfer fluid (Argonne, 1993).
1989	Soil gas survey performed in the area outside of Building 2. Benzene, toluene, ethylbenzene, and xylene detected in vicinity of loading dock and southeast corner of Building 2. TCE detected in SE corner of Building 2; Freon and TCA detected in southwest corner of Building 2 (NERI, 1989, 1990).
1990	Transformer "T" removed from lower level of Building 45 (Argonne, 1993).
1991	Surface soil sampling performed at nine locations in the crawlspace of Building 2. Low levels of Freon, TCE, and acetone detected near Freon and former TCE tanks.
1991	DowTherm J release at Building 2.
1995	Containment liner installed beneath Building 2.
1997	Building 2 and 45 Area investigated as part of Water Supply Well (WSW) RI. TCE detected in ground water southwest of Building 2 and south of Building 45.
1999	Oil-water separator installed in Parking lot E.
1999	Surface water and sediment at four historic stormwater outfall locations (including the Building 2/45 outfall) were collected and an ecological screening analysis at each area was performed (ICF, 2002c).
2001	The WSW RI program completed in 1997 (Harding ESE, 2001f) included three areas: the WSW Site, the area around Buildings 2 and 45, and an off-post area located in Pegan Brook Park in the town of Natick. Surface water and sediment were only collected in off-site locations in the WSW site investigation (Pegan Brook, Rectangle Pond, Fisk Pond, North, Middle, and South Pond of Lake Cochituate [off-site locations]).
2002	The Historic Outfalls investigation of surface water and sediment at four historic stormwater outfalls (ICF, 2002c) included the Building 2 parking lot outfall. This investigation was performed to characterize the nature and extent of contamination in the surface water and sediment adjacent to each outfall, and to determine whether historical usage of these outfalls had adversely impacted the lake.
2003	Buildings 2 and 45 Site Investigation (SI) performed to further investigate TCE in ground water and potential discharge to South Pond.
2004	Final Work Plan for the Buildings 63, 2, and 45 SI (Harding ESE, 2004b).
2008	Final Site Investigation Report for Building 63, 2, and 45 (MACTEC, 2008b)
2009	Completed Final Feasibility Study to screen, develop, and evaluate remedial alternatives for the NSSC shoreline sediment (ICF, 2009a).
2009	Completed Proposed Plan to present remedial alternatives for the NSSC shoreline sediment to the public (ICF, 2009b).

8.3 BOILER PLANT AREA

The Boiler Plant (Building 19) remains in operation and is used to generate heat for NSSC buildings. From 1950 until 1982, the room in the southwestern corner of the basement of Building 19 was used as a pesticide storage and mixing area. A leach field was present to the south of Building 19, and Building 23 was a former pump house that was constructed to supply water to the boiler plant. The leach field, its associated contaminated soil, and Building 23 were removed in 2001. A former piggery was also located southwest of Building 19 and was used for housing and feeding pigs used at NSSC for research.

Table 8-3 describes the history of investigations associated with the Boiler Plant and its outfall.

Table 8-3: History of Investigations - Boiler Plant Area

Date	Event
1950s	Building 19 constructed (Argonne, 1993).
1956-1957	Floor drains rerouted to leach field (Argonne, 1993).
Mid 1980s	Drainage pipe rerouted to the sanitary sewer (Argonne, 1993).
April 1990	Clean Harbors removed four 12,500 gallon underground fuel oil tanks from the north side of the boiler house. Soil contamination was encountered beneath tanks #2 and #4. Between 1200 and 1500 cubic yards of contaminated soil were removed from the excavated area. This event prompted concerns about the possible migration of No. 6 fuel oil (CHEE, 1990).
July 1990	Clean Harbors Environmental Engineering (CHEE) performed a subsurface investigation to determine the extent of contamination down gradient of the tank removal. Five soil borings and supplemental soil samples were taken to characterize subsurface and surface soil. Results indicated no detectable levels of total petroleum hydrocarbons (TPH) and volatile organic compounds (VOCs). Thus, No. 6 fuel oil did not appear to have migrated northerly toward CHI-1 or beyond the Boiler House. CHEE recommended ground water monitoring and soil sampling.
December 1995	Installation of an oil-water separator designed to remove residual hydrocarbons from the wastewater from Building 19 floor drains was stalled when oil-stained soil was encountered. Soil samples indicated TPH of 3,100 mg/kg, above the Massachusetts Contingency Plan (MCP) Reportable Limit of 2500 mg/kg (Harding ESE, 2003).
Late 1995	Oil-water separator was installed in Building 19 (Harding ESE, 2003).
December 1995	NSSC files a Release Notification Form with the MassDEP in response to the above findings. MassDEP subsequently assigns the release RTN 3-13294.
1995	Phase I Initial SI conducted (Rizzo, 1996). The data collected were used to complete a Numerical Ranking System score sheet, ranking the site as a Tier II under the MCP.
1998 – 2000	Phase II SI collected and analyzed soil, ground water, surface water, and sediment in the Boiler Plant area. Phase II SI Report for Boiler Plant site (Harding ESE, 2003) concluded that contaminants of concern included mainly PCBs and extractable petroleum hydrocarbons (EPH), specifically polycyclic aromatic hydrocarbons (PAHs) in soil. EPH compounds were detected in sediment samples where run-off from the Boiler Plant area appeared to be entering the Lake.
April-July 2001	Release abatement measure (RAM) remediation contractor, Nobis Engineering, excavated approximately 1,077 tons of contaminated soil south of Building 19.
October 2001	RAM Completion Report (Harding ESE, 2001d) was submitted as required by the MCP. Contaminated soil at concentrations in excess of MCP S-1/GW-1 standards were removed, as confirmed by analysis of the remaining soil. Guard rails, pavement, Building T-23, and the leach field were removed. Site restoration activities (paving asphalt parking lot and re-vegetating) were completed.
2002	Installed an oil-water separator in the parking lot behind the Boiler Plant (Fawkes, 2006).
2003	Final Phase II Site Investigation Report was completed (Harding ESE, 2003).
2009	Completed Final Feasibility Study to screen, develop, and evaluate remedial alternatives for the NSSC shoreline sediment (ICF, 2009a).
2009	Completed Proposed Plan to present remedial alternatives for the NSSC shoreline sediment to the public (ICF, 2009b).

8.4 BUILDINGS 22/36 AREA

Building 22 was used from the 1950s to 1988 for the storage of chemical materials used in the Boiler Plant and for other NSSC activities (USATHAMA, 1980). The materials stored in Building 22 not related to boiler use were laboratory use quantities and included flammable, non-hazardous, and hazardous chemicals. Chemical storage in Building 22 was discontinued in 1988 and all chemicals removed from the building. Building 22 is currently used for storage of equipment and parts. Building 36 was constructed in the early 1960s as the "Heavy Equipment Lab and Office." The northern

portion of the building is used for food and packaging research and development and the southern portion consists of administrative offices (MACTEC, 2008a).

Table 8-4 describes the history of investigations associated with the Building 22/36 Area and its outfalls.

Table 8-4: History of Investigations - Building 22/36 Area

Date	Event
1999	Installation of oil-water separator for the Building 36 (#09) outfall (Fawkes, 2006).
2000	Draft Technical Memorandum, Building 22 (HLA, 2000).
2000	RI field program for the Buildings 22 and 36 areas began in October.
2001	Final Work Plan, Buildings 22 and 36 RI (Harding ESE, 2001a).
2001	Draft Work Plan Addendum, Buildings 22 and 36 RI, November (Harding ESE, 2001b).
2001	Draft Surface Water and Sediment Sampling Letter Work Plan, Buildings 22 and 36 RI (Harding ESE, 2001c).
2001	RI field program for the Buildings 22 and 36 areas completed.
2002	The Historic Outfalls investigation of surface water and sediment at four historic stormwater outfalls (ICF, 2002c) included the Building 36 and Building 16 historic outfalls. This investigation was performed to characterize the nature and extent of contamination in the surface water and sediment adjacent to each outfall, and to determine whether historical usage of these outfalls had adversely impacted the lake.
2004	Draft Additional Soil Sampling Letter Work Plan, Buildings 22 and 36 Remedial Investigation (Harding ESE, 2004a) outlining scope of the supplemental soil sampling effort, undertaken in response to requests by US EPA.
2005	Final RI Report Buildings 22 and 36 (Harding ESE, 2005).
2008	Final Buildings 22 and 36 Feasibility Study Report (MACTEC, 2008a).
2009	Completed Final Feasibility Study to screen, develop, and evaluate remedial alternatives for the NSSC shoreline sediment (ICF, 2009a).
2009	Completed Proposed Plan to present remedial alternatives for the NSSC shoreline sediment to the public (ICF, 2009b).

8.5 MAIN STORMWATER OUTFALL AREA

The MSO and its associated stormwater drainage system were originally constructed in 1954 for the collection and management of stormwater runoff and non-contact cooling waters at NSSC. Since 1997, it has also been the point of discharge for treated ground water effluent from the T-25 Area ground water remediation system. Currently the discharge from the ground water pump and treat system is first pumped to a holding tank for the fire suppression and irrigation systems, with overflow discharging at the MSO. The MSO currently receives stormwater runoff from much of the central and eastern portions of NSSC, which are comprised primarily of office buildings and parking lots. Runoff containing contaminants from parking lots, roofing, vehicular traffic, and other NSSC activities are considered potential sources of contamination to the MSO. In the mid-1980s, a PCB-containing transformer release occurred near Building 5. An oil-water separator was installed at the MSO in the Summer/Fall of 1998, just north of Building 42.

Table 8-5 describes the history of investigations associated with the MSO Area and its outfall.

Table 8-5: History of Investigations - MSO Area

Date	Event
1950s	Transformers containing Askarel (insulating fluids containing PCBs) were installed at NSSC (Argonne, 1993).
1954	Original MSO installed (Argonne, 1993).
Mid-1980s	Transformer H release near Building 5 (Argonne, 1993).
1990	Transformers containing Askarel were removed and replaced, The associated pads were washed/rinsed. Replaced Transformers G and H near Building 5 and found PCBs on the concrete pad and surrounding soil (Argonne, 1993).
1992	Transformers G and H pad was scarified and sealed and surrounding soil removed by ENPRO Services Inc. (Argonne, 1993).
1996	Arthur D. Little collected 20 sediment and 8 surface water samples at the MSO as part of the T-25 Area Phase II RI (ADL, 1998b).
1997	Harding Lawson Associates (HLA) collected one additional surface water sample (for water quality parameters only) adjacent to the outfall as part of the FPGS RI (HLA, 1999).
Summer/ Fall 1998	An oil-water separator was installed at the MSO immediately upstream of the point of discharge.
1999	The FPGS RI included a Human Health Risk Assessment (HHRA) and Tier I ERA for the MSO (Mactec, 2006).
1999	Presentation of the Tier II ERA Work Plan (ADL, 1998a) to the US EPA, MassDEP, and NSSC Restoration Advisory Board (RAB) on October 7, 1999.
2002	Tier II ERA at MSO was completed to evaluate potential ecological risks associated with the sediment. The Tier II ERA included: sediment/surface water sampling; benthic macro-invertebrate surveys; sediment toxicity testing; and wildlife foraging surveys (ICF, 2002a).
2002	Final Tier III ERA Work Plan completed (ICF, 2002b).
2001 - 2004	Tier III ERA was performed and included extensive fish, benthic invertebrate, and sediment sampling across the major ponds of Lake Cochituate. Food chain modeling was performed to evaluate the potential risks to wildlife (benthos, fish, birds, and mammals) from NSSC-related sediment (ICF, 2004a).
2004	Final Tier III ERA Report completed (ICF, 2004a).
2004	Fish fillet data collected during the Tier III ERA sampling program were used to assess the potential human health risks associated with the recreational consumption of representative native, non-stocked fish species (largemouth bass) caught from Lake Cochituate in the vicinity of NSSC and at non-site-impacted reference locations. Major uncertainties inherent in the Tier III ERA were further analyzed. Final Letter Work Plan, Additional HHRA and ERA Activities was prepared (ICF, 2004c).
2004	Draft Final Sediment Risk Management Technical Memorandum prepared (ICF, 2004b).
2005	Angler survey conducted to determine if Lake Cochituate is currently used for subsistence fishing, and to provide a better understanding of local native fish ingestion rates, species consumption patterns, and fish preparation/cooking methods (ICF, 2006).
2007	A fish and sediment sampling program was conducted that included the collection of additional fish tissue samples for the HHRA and collection of additional sediment samples to further characterize and delineate the extent of sediment PCB contamination associated with the MSO and at two reference locations (ICF, 2008).
2009	The Army completed a Sediment Feasibility Study (FS) which evaluated a range of cleanup alternatives designed to be protective of human health and the environment for the contaminated sediment along the NSSC shoreline near the MSO within Pegan Cove (ICF, 2009a).
2009	Completed Proposed Plan to present remedial alternatives for the NSSC shoreline sediment to the public (ICF, 2009b).

9.0 COMMUNITY PARTICIPATION

Notices of the availability of the Proposed Plan for sediment were published in the *MetroWest Daily News* on May 7, May 10, May 17, May 21, May 31, June 7, and June 14, 2009. Public informational meetings and hearings on the Proposed Plan were held at the Morse Institute Public Library in Natick on May 21, 2009, and again at the Natick Town Hall on June 10, 2009. A public comment period was held from May 18, 2009 to June 25, 2009. At the public meetings, the Army presented the Proposed Plan and answered questions from the public prior to providing opportunity for formal comments on the Proposed Plan. Comments received during the public comment period and the Army's responses are contained in the Responsiveness Summary (Section 21) that is a part of this ROD.

In addition, the community has been kept advised of investigative activities for the sediment through presentations by the Army at Restoration Advisory Board meetings held, following public notice, on an approximate quarterly basis throughout the year. The Restoration Advisory Board has been meeting since 1995.

The Proposed Plan and other documents were made available for public review in the Administrative Record that is maintained at NSSC and at the Morse Institute Library located at 14 East Central Street in Natick, Massachusetts. An index to the Administrative Record is provided in Appendix A.

10.0 SCOPE AND ROLE OF OPERABLE UNITS AND RESPONSE ACTION

In August 2006, the U.S. Department of the Army and the US EPA signed a Federal Facility Agreement, which identified eight Areas of Concern and three Site Screening Areas at NSSC (US EPA, 2006). These areas have been organized into separate OUs. Table 10-1 summarizes the different OUs at NSSC and their status.

This ROD selects the final remedy for sediment at the NSSC shoreline (OU-2). The remaining identified Areas of Concern and Site Screening Areas at the NSSC have been or are being addressed separately.

Table 10-1: Summary of Operable Units at NSSC

Operable Unit	ROD Signature Date	Remedy Selected	Status
OU-1	September 2001	Groundwater extraction and treatment	On-going
OU-2	Expected in September 2009	Sediment cleanup	N/A
OU-3	September 2007	No Further Action	Soil at the FPGS and Buildings 62 & 68 was previously subject to removal actions to allow for unrestricted use. Groundwater at the FPGS was no longer contaminated due to the soil removal. Ground water at the Buildings 62 & 68 is being cleaned up under OU-1
OU-4	September 2008	No Further Action	Soil at the Boiler Plant, T-25 Area, and Buildings 14 and Former Building 13 was previously subject to removal actions to allow for unrestricted use. Ground water is being cleaned up under OU-1

11.0 SITE CHARACTERISTICS

11.1 GENERAL SITE CHARACTERISTICS

Most surface drainage at the NSSC facility is controlled by the storm sewer system, which discharges to Lake Cochituate at two main locations (the T-25 Area outfall and the MSO) and at a number of other smaller outfalls. The T-25 Area outfall drains the entire northern end of the facility, while the MSO drains much of the central and southern portions of the NSSC property, which is comprised primarily of administration/office buildings, grassy areas, and parking lots. Other smaller active and historic outfalls at the FPGS, U.S. ARIEM Building, Buildings 2/45, the Boiler Plant, Building 36, and Building 16 drain the smaller localized parking areas and roofs of their associated buildings. Prior to the late 1990s and early 2000, runoff to the lake also occurred via sheetflow (over land) in other areas not controlled by the storm sewer system. Many of the outfalls and their associated storm drainage systems were constructed in the mid-1950s to early 1960s for the collection and management of stormwater runoff and non-contact cooling waters. In the late 1990s and early 2000 all active outfalls were retrofitted with new oil/water separators to improve stormwater quality and minimize future impacts to Lake Cochituate. The oil/water separators are routinely maintained and cleaned out, and any solids removed from the separators are properly disposed of off-site. Therefore, the NSSC stormwater drainage system is no longer a continuing contaminant source to Lake Cochituate.

The South Pond of Lake Cochituate has a mean depth of 19.8 feet and covers an area of 0.39 square miles (USGS, 2001). Water depths along the immediate shoreline of the NSSC facility range from 0 to 10 feet. The MSO discharges to an area of South Pond (Pegan Cove) where the depths range from 0 feet to a maximum depth of 10 feet, while the T-25 Area outfall discharges to an immediate area where the water depth progressively drops to a depth of up to 30 feet. Water depth continues to drop to a maximum depth of greater than 60 feet further out from the T-25 Area outfall.

For approximately 50 years, runoff from parking lots, equipment storage areas, bulk chemical storage areas, areas with high vehicle traffic, and unpaved areas has contributed to the presence of PAHs, PCBs, pesticides, and metals in the sediment at each of the outfalls at NSSC.

One confirmed PCB release occurred at the NSSC facility during the mid-1980s, when there was a leak at transformer H, located on an outdoor pad immediately west of Building 5 (Argonne, 1993). The release resulted in PCB contamination of the concrete pad, soil within the fenced transformer area, and soil at least 8 feet outside of the fenced area. Soil concentrations up to 14,000 parts per million (ppm) were detected. The transformer pad was scarified and sealed, and the surrounding soil was removed in accordance with the Toxic Substances Control Act (TSCA) during the summer of 1992. Analyses of the pad and surrounding soil following the cleanup indicated that further investigation was not required (Argonne, 1993). This release of PCBs in the mid-1980s is believed to be the primary cause of the elevated PCB concentrations observed in sediment at the MSO. Storm drains in the area west of Building 5 drain to Lake Cochituate via the MSO. PCBs in the concrete and soil at transformer H likely migrated into the stormwater drainage system and into Lake Cochituate. In 1990, the facility performed a preventative maintenance program on all of its transformers that included removal, replacement with PCB-free units, refilling with PCB-free oil, and washing/rinsing transformer pads. In addition, all active storm drains drain through oil/water separators prior to discharge to the lake. Therefore, there are no continuing PCB sources at NSSC.

A conceptual site model (CSM) for contaminated sediment is presented in Figure 11-1, and identifies primary contaminant sources, release and transport mechanisms, exposure media, exposure routes, and potential receptors.

11.2 SEDIMENT CHARACTERISTICS

Key physical characteristics of NSSC sediment that have been observed and/or measured are discussed below, including texture, organic matter content, and water content.

The texture of the sediment encountered at NSSC varies from sand to finer-grained silts and clays. The texture of the sediment in Pegan Cove is generally silty clay. Nearshore sediment tends to consist of a larger percentage of sand, due to the winnowing of the finer-grained sediment from shallow water wave action. In deeper water (e.g., greater than 5 to 10 feet), sediment tends to consist of predominantly silts and clay.

The organic matter content in many of the sediments associated with NSSC, particularly those in Pegan Cove and deeper locations at the T-25 Area outfall, is high. The presence of organic carbon in the environment tends to promote the sorption of most organic materials/compounds. Surface sediment samples collected within Pegan Cove in 2007 (ICF, 2008a) had total organic carbon concentrations ranging from 11,000 to 380,000 mg/kg. Overall, total organic carbon concentrations appeared to increase with distance from the shore.

The water content in most of the sediments in Pegan Cove is also high. During field sampling of many of the sediments associated with NSSC, passive dewatering could not be accomplished during laboratory sample preparation. Centrifuging and freeze-drying of the sediment samples were necessary to meet moisture content requirements of the analytical methods.

11.3 SEDIMENT ANALYTICAL DATA

11.3.1 Pre-2007 Sediment Data

Prior to 2007, the Army collected and analyzed over 200 sediment samples from numerous NSSC and non-Army-impacted reference locations across Lake Cochituate (see Figure 7-2). A number of chemicals were found in both the NSSC-related and reference sediment, as summarized below.

Volatile Organic Compounds (VOCs): A limited number of VOCs were detected at very low concentrations in sediment. Some of the VOCs detected are recognized laboratory contaminants, and are not thought to be site-related.

Semivolatile Organic Compounds (SVOCs): SVOCs were detected in sediment at most of the NSSC and reference locations. The detected SVOCs were primarily in a class of chemicals called PAHs, which are both naturally occurring in the environment and related to human activity (such as burning of wood or fuel, and a major constituent of asphalt). The highest concentrations associated with NSSC were observed at the T-25 Area outfall and MSO, which are the two stormwater outfalls at NSSC that have drained large areas with high vehicular traffic (e.g., the Warehouse Area), as well as large areas of pavement, for approximately 50 years.

Pesticides: Pesticides were found in sediment at most of the NSSC and reference locations. The highest NSSC concentrations were observed at the T-25 Area outfall, and may have originated from the historic storage and application of pesticides for insect and pest control in the T-25 Area.

Pesticides detected in sediment at other Lake Cochituate locations are related to their wide-spread use for insect control throughout the watershed.

Inorganics: Inorganic chemicals (i.e., metals) were detected in sediment at NSSC, and are likely associated with bulk equipment storage and vehicular traffic. Similar concentrations of inorganics were detected at other locations on Lake Cochituate, and are likely associated with the highly developed nature of the area surrounding the lake or are naturally occurring.

Polychlorinated Biphenyls: Elevated concentrations of PCBs were detected in sediment, primarily at locations within Pegan Cove (including the MSO), as well as at some non-Army-impacted reference locations across Lake Cochituate. The PCBs found in the NSSC sediment are likely related to the transformer release that occurred in the mid-1980s near Building 5. PCBs released to the soil at the transformer during the leak likely migrated into the stormwater drainage system and into Lake Cochituate at the MSO. A summary of the total PCB concentrations detected in NSSC sediment prior to 2007 is provided in Table 11-1.

11.3.2 Sediment Data Collected in 2007

The purpose of the 2007 sediment and fish sampling program was to collect additional sediment samples to further characterize and delineate the extent of sediment PCB contamination in Pegan Cove associated with the MSO, along with additional fish samples to support the HHRA. As shown in Figure 7-2, surface sediment samples were collected throughout Pegan Cove and at two non-Army-impacted locations: an area in South Pond near the Route 135 culvert (Route 135 culvert) and Fisk Pond. Core samples (up to a depth of 32 inches) were also taken from the Pegan Cove area. Surface sediment total PCB and total organic carbon (TOC) results from 2007 are shown in Table 11-2, while core sediment PCB results are shown in Table 11-3.

Total PCB concentrations within the MSO/Pegan Cove area ranged from 0.15 to 4.1 mg/kg (average of 1.7 mg/kg), while concentrations ranged from 0.39 to 1.3 mg/kg (average of 0.96 mg/kg) at Fisk Pond and from 0.077 to 0.11 mg/kg (average of 0.10 mg/kg) at the Route 135 culvert. The highest total PCB concentrations occurred in the MSO/Pegan Cove area. Total PCB concentrations in sediment samples collected during the 2007 sampling event within the MSO/Pegan Cove area are similar to the pre-2007 samples which ranged from 0.058 to 7.4 mg/kg, with an average of 1.4 mg/kg (see Table 11-1). However, the 2007 data indicated that the extent of elevated PCB concentrations was broader than the previous data suggested. The 2007 data indicated that elevated total PCB concentrations extend across much of the Pegan Cove area, and are greatest along the NSSC shoreline, particularly at and to the south of the MSO outfall. Total PCB concentrations decrease to the east-northeast of the MSO and along the eastern shoreline of the cove.

The 2007 PCB sediment concentrations at Fisk Pond (Table 11-2: 0.39 to 1.3 mg/kg; average of 0.96 mg/kg) are similar to previous Fisk Pond samples, which ranged from non-detect to 1.9 mg/kg with an average of 0.30 mg/kg. The 2007 PCB sediment concentrations at the South Pond Route 135 culvert (0.077 to 0.11 mg/kg; average of 0.10 mg/kg) are generally similar to the pre-2007 results from other near shore South Pond reference sample locations in the area (such as Crescent Street, Possum Hollow Lane, and Pegan Brook Cove).

Table 11-1: Summary of Total PCB Sediment Concentrations: Pre-2007 Data

Sample Area	Average[1] (mg/kg)	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	# Detects/ # Samples[2]
South Pond NSSC Shoreline Locations				
FPGS	0.314	(ND)	3.1	1/11
MSO	1.401	0.058	7.37	36/36
ARIEM Building	1.597	0.097	3.8	5/5
Building 2 Parking Lot	0.065	0.027	0.164	11/11
Boiler Plant Cove	0.156	(ND)	0.55	4/9
Building 16	(ND)	(ND)	(ND)	0/2
Building 36	0.06	(ND)	0.046	1/3
T-25 Area	0.173	0.023	1.9	3/17
South Pond Reference Locations				
Lakewood Road	(ND)	(ND)	(ND)	0/2
Arcadia Road	(ND)	(ND)	(ND)	0/4
South Pond Reference Location Offshore	(ND)	(ND)	(ND)	0/1
Possum Hollow Lane	0.051	0.084	0.18	2/12
Crescent Street	0.06	0.0075	0.293	2/9
National Guard	(ND)	(ND)	(ND)	0/2
Pegan Brook Cove	0.099	0.040	0.177	6/9
Lake Street	(ND)	(ND)	(ND)	0/5
Upgradient of South Pond				
Pegan Brook	(ND)	(ND)	(ND)	0/6
Fisk Pond	0.301	(ND)	1.9	1/7
Little Roundy Pond	0.213	(ND)	1.1	1/6
Middle Pond Reference Locations				
Birch Road	1.117	0.075	4.28	3/4
Perry Road	(ND)	(ND)	(ND)	0/2
Middle Pond Reference Location Offshore	(ND)	(ND)	(ND)	0/1
North Pond Reference Locations				
North Pond Reference Location Offshore	(ND)	(ND)	(ND)	0/1
State Park	0.047	0.008	0.078	3/4
Lakeview Road	0.074	(ND)	0.190	3/4

Notes:
ND = Not detected
Total PCB concentrations are based on summation of homologs.
1. Averages calculated using 1/2 detection limit for non-detects.
2. Results exclude data not used in the risk assessments.

Table 11-2: Summary of Total PCB Surface Sediment Concentrations: 2007 Data

Area	Location	Total Organic Carbon (mg/kg)	Total PCBs (mg/kg)
MSO	SE-90	120,000	1.4
	SE-91	140,000	1.6
	SE-92	230,000	2.2
	SE-93	210,000	1.3
	SE-94	210,000	3.6
	SE-95	380,000	0.15/0.29 (duplicate)
	SE-96	140,000	1
	SE-97	300,000	1.4
	SE-98	130,000	0.56
	SE-99	120,000	0.51
	SE-100	200,000	1.7
	SE-101	190,000	0.72
	SE-102	120,000	0.46
	SE-103	180,000	2.4
	SE-104	180,000	1.2
	SE-105	140,000	2.2
	SE-106	230,000	0.52
	SE-107	150,000	2.1
	SE-108	230,000	0.95
	SE-109	180,000	2.2
	SE-110	200,000	2.6
	SE-111	190,000	2.5
	SE-112	130,000	2.5
	SE-113	150,000	4.1
	SE-114	200,000	1.5
	Average	**186,000**	**1.7**
Rt 135 Culvert	SE-115	240,000	0.11
	SE-116	120,000	0.077/0.054 (duplicate)
	SE-117	11,000	0.1
	Average	**139,250**	**0.1**
Fisk Pond	SE-118	110,000	0.39
	SE-119	100,000	1.3
	SE-120	140,000	1.2
	Average	**116,667**	**0.96**

Table 11-3: Summary of Total PCB Sediment Core Concentrations: 2007 Data

Location	Sample Depth (inches)	Total PCBs (mg/kg)	Co-located Ponar Sediment Sample PCBs (mg/kg)	
SE-121A	0 - 2	0.73	SE-90	1.15
SE-121B	14.9 - 16.9	8.9		
SE-121C	29.9 - 31.9	0.013		
SE-122A	0 - 2	2.2	SE-91	1.65
SE-122B	12.6 - 14.6	0.0027		
SE-122C	25.2 - 27.2	0.006		
SE-123A	0 - 2	1.9	SE-97	1.39
SE-123B	7.9 - 9.9	0.15		
SE-123C	15.7 - 17.7	0.0023		
SE-124A	0 - 2	0.95	SE-99	0.507
SE-124B	10.5 - 12.5	0.012		
SE-124C	21 - 23	0.00064		
SE-125A	0 - 2	1.1	SE-101	0.723
SE-125B	11.8 - 13.8	0.0013		
SE-125C	23.6 - 25.6	0.00072		
SE-126A	0 - 2	1.2/1.4 (dup)	SE-103	2.44
SE-126B	10.4 - 12.4	0.00089		
SE-126C	20.8 - 22.8	0.0003		
SE-127A	0 - 2	2.7	SE-112	2.48
SE-127B	8.8 - 10.8	ND		
SE-127C	17.7 - 19.7	0.00024		

11.3.3 Statistical Analysis of Sediment Data

The Army conducted a statistical analysis of all sediment total PCB data collected (including the pre-2007 and the 2007 data) in order to determine which areas of sediment contamination were of the most concern. The statistical procedures followed are described in Appendix E of the *Final Sediment Feasibility Study* (ICF, 2009a) and were reviewed and approved by US EPA. The Army concluded, and the US EPA concurred, that sediment PCB concentrations at the NSSC shoreline within Pegan Cove (MSO, ARIEM, and FPGS locations) were statistically higher than at the non-Army-impacted reference locations. For the sediment from NSSC shoreline locations outside of Pegan Cove (Boiler Plant, Buildings 2/45, Building 22/36, and T-25 Area outfall locations), statistical tests indicated that PCB concentrations at these sites were not greater than PCB concentrations at reference locations.

11.4 FISH DATA

11.4.1 Pre-2007 Fish Data

Fish, mussel, and sediment samples were collected during October 2001 in support of the Tier III ERA; the results are described in the *Final Tier III ERA Report* (ICF, 2004a). Table 11-4 summarizes

the pre-2007 fish tissue total PCB concentrations, as well as the length and weight of the each of the species collected.

Although additional fish species were observed, only those proposed in the *Final Tier III ERA Work Plan* (ICF, 2002c) were analyzed, and included largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), pumpkinseed (*Lepomis gibbosus*), and American eel (*Anguilla rostrata*). Several criteria were used to select these species from among those regularly caught in Lake Cochituate. The species selected for sampling in the Tier III ERA represented species that:

- Have localized home ranges, affecting how likely individuals of a species are to spend their entire lives consuming food from one location; for these species, the tissue concentration data would reflect exposure at a localized area and provide adequate site-specific information relative to the potential risk posed by site sediment;
- Are from several different trophic levels, and include higher level receptors and those with high lipid content, because organic chemicals bioaccumulate preferentially in tissue lipids;
- Are more likely to spend their time on or near sediment (demersal species), since direct exposure to or ingestion of sediment could then be an additional exposure route;
- Are abundant in the Lake; and
- Are used by local recreational anglers.

The species of fish caught by the Massachusetts Department of Public Health (MassDPH) in an earlier study (MassDPH, 1995) as well as those reported by Aneptek (1991) were reviewed, and it was determined that the selected species provided good coverage of potential site-specific ecological risks and could provide useful information for deriving incremental site-specific human health risk estimates.

All fish tissue samples were analyzed for pesticides, PCBs, and mercury. Tissue samples were analyzed for both PCB congeners and homologs. Total PCB values were calculated by summing the PCB homologs. At the request of US EPA, a subset of tissue samples was also analyzed for methyl mercury, PAHs, and metals. As discussed in the *Final Tier III ERA Work Plan* (ICF, 2002b), metal and PAH analyses were performed on fish at a subset of locations, including two NSSC outfalls (T-25 Area and MSO) and three reference locations (Possum Hollow, State Park, Crescent Street). Methyl mercury was analyzed in bluegill samples collected from the T-25 Area, MSO, Possum Hollow, and State Park locations. The additional methyl mercury analysis was performed to evaluate what fraction of total mercury was due to methyl mercury.

Chemical analyses were conducted on fillets (skin-on) and offal of the largemouth bass, and on the whole body of all other species. For largemouth bass, the whole body concentrations were reconstructed for use in the Tier III ERA.

Although fish were collected from both the NSSC shoreline and non-Army-impacted reference locations, it was noted that actual home ranges for the species collected may result in an overlap between these two areas.

Table 11-4: Summary of Total PCB Fish Concentrations: Pre-2007 Data

	PCB Min (µg/Kg)	PCB Max (µg/Kg)	PCB Average (µg/Kg)	Detection Frequency (# detects/ # samples	Length (cm)	Weight (g)	Samples Included
Bluegill Whole Body							
Site	80	830	350	26/26	4.8-18.5	14-130	FS-59, -60, -61, -62, -65
South Reference	110	682	240	14/14	7.8-18.5	24-110	FS-71, -72
Middle	30.4	330	110	10/10	11.5-18	24-106	FS-69, -70
North	25	82	55	10/10	10-16.5	22-90	FS-67, -68
Pegan	489	750	580	4/4	29-57	50-377	FS-73
Fisk	68.3	630	210	7/7	10-18	20-110	FS-74
Largemouth Bass Whole Body							
Site	348	5700	1500	16/16	22.5-45	74.5-1600	FS-59, -60, -62, -65 [no samples from -61]
South Reference	499	2200	1100	5/5	34-46	73.9-1450	FS-71, -72
Middle	420	480	450	3/3	24.5-50	195-1750	FS-70 [no samples from -69]
North	370	480	410	4/4	28-43.5	260-1200	FS-67, -68
Pegan	790	1060	930	5/5	32.5-43.5	73.4-1200	FS-73
Fisk	360	360	360	1/1	26.5	255	FS-74
Largemouth Bass Fillets>12 inches							
Site	460	2300	1000	6/6			FS-59, -60, -62 [no samples from -65]
South Reference	370	850	540	3/3			FS-71, -72
Largemouth Bass Fillets <12 inches							
Site	80	380	200	10/10			FS-59, -60, -62 and -65
South Reference	50	120	90	2/2			FS-71, -72
Pumpkinseed							
Site	250	1500	750	6/6	11.6-13	34-47	FS-59, -60, [no samples from -61, -62, -65]
South Reference	--	--	--	--	--	--	FS-71, -72 [no samples]
Middle	76	100	85	3/3	11-17.5	20-125	FS-69, -70
North	--	--	--	--	--	--	FS-67, -68 [no samples]
Pegan	500	780	690	3/3	9-13.2	16-50	FS-73
Fisk	--	--	--	--	--	--	FS-74 [no samples]
American eel							
Site	188	3100	1240	15/15	24-62.5	40-575	FS-59, -60, -62, -65
South	446	1400	880	4/4	31.5-56	47-238	FS-71, -72
Middle	270	940	590	7/7	40-60	114-610	FS-69, -70
North	220	560	340	6/6	52-65	287-480	FS-67, -68
Pegan	198	3000	1200	6/6	29-57	50-377	FS-73
Fisk	--	--	--	--	--	--	FS-74

Site Locations include: T-25 Area, MSO, Boiler Plan Cove, and FPGS;
South Reference Locations include: Possum Hollow Lane and Crescent Street
-- = fish not caught or analyzed at the location
Numbers are rounded.

The analytes detected in the pre-2007 fish and mussel samples were as follows:

- Mercury and methyl mercury were detected in fish samples from all NSSC and reference locations.
- PAHs were detected in all NSSC samples (only the fish collected from the T-25 Area and MSO locations were analyzed for PAHs). The same PAHs were detected in fish from the reference areas, with the exception of dibenzo(a,h)anthracene, which was not present in fish from any of the reference locations.
- PCBs were detected in all NSSC and reference samples (see Table 11-4).
- Fifteen of the 21 analyzed pesticides were detected in collected fish samples. Dichlorodiphenyldichloroethane (DDD), dichlorodiphenyldichloroethene (DDE), dichlorodiphenyltrichloroethane (DDT), alpha-chlordane, dieldrin, endrin aldehyde, gamma-chlordane, and heptachlor epoxide were detected in all measured samples at both the NSSC and reference site locations.
- Twenty metal analytes were detected in the NSSC samples. All but one of these metals (thallium) were also detected in fish from reference locations.

11.4.2 Fish Data Collected in 2007

The purpose of the 2007 fish and sediment sampling program was to collect additional fish tissue samples to support the fish ingestion HHRA and to collect additional sediment samples to further characterize and delineate the extent of sediment PCB contamination associated with the MSO. The sampling program was conducted in accordance with the regulator reviewed and approved *Final 2007 Fish/Sediment Sampling Work Plan* (ICF, 2007). Samples were collected from the MSO/Pegan Cove area and two non-Army-impacted locations which included an area in South Pond near the Route 135 culvert (Route 135 culvert) and Fisk Pond. Fish analytical results are shown in Tables 11-5 and 11-6. Fish samples were analyzed for PCB congeners and for percent lipids. Total PCB and homolog sums were calculated by addition of detected results for all congeners.

Three fish species (largemouth bass, bluegill, and yellow perch) were collected and analyzed during the 2007 sampling program. Bluegill and yellow perch were analyzed as whole body samples, and largemouth bass were filleted in the field with fillet (skin-on) and offal portions analyzed separately. Largemouth bass were retained for sampling only if they were greater than 12 inches long, the legal size limit for catching this species in Massachusetts. Table 11-5 lists total PCB concentrations and length and weight measurements for whole body bluegill and yellow perch samples. Table 11-6 lists total PCB concentrations for fillet and offal for largemouth bass.

Table 11-5: Summary of Total PCB Whole Fish Concentrations: 2007 Data

Bluegill Total PCB Concentrations – Whole Body

Location	PCB Min (mg/kg)	PCB Max (mg/kg)	PCB Average (mg/kg)	Detection Frequency (# detects/ # samples)	Length (cm)	Weight (g)	Percent Lipids (%)
MSO (FS-75)	0.38	0.93	0.58	5/5	14.0-18.5	70-130	0.130-2.22
Route 135 Culvert (FS-76)	0.14	0.38	0.25	5/5	17.1-19.5	90-135	0.112-2.77
Fisk Pond (FS-77)	0.12	0.20	0.16	5/5	13.3-17.5	45-90	0.0752-0.209

Yellow Perch Total PCB Concentrations – Whole Body

Location	PCB Min (mg/kg)	PCB Max (mg/kg)	PCB Average (mg/kg)	Detection Frequency (# detects/ # samples)	Length (cm)	Weight (g)	Percent Lipids (%)
MSO (FS-75)	0.33	4.7	2.3	5/5	13.8-26.5	50-165	0.107-0.630
Route 135 Culvert (FS-76)	0.60	1.6	1.1	5/5	21.0-26.0	90-155	0.138-1.06
Fisk Pond (FS-77)	0.24	0.62	0.46	5/5	19.7-25.5	75-175	0.163-0.513

Table 11-6: Summary of Total PCB Largemouth Bass Fillet and Offal Concentrations: 2007 Data

Location	Sample ID* (Whole Body)	Whole Body		Fillet			Offal		
		Length (cm)	Weight (g)	Weight (g)	Percent Lipids (%)	Total PCB (mg/kg)	Weight (g)	Percent Lipids (%)	Total PCB (mg/kg)
MSO (FS-75)	Average	34.0	472	144.1	0.0737	0.28	314.9	0.564	2.5
	Minimum	30.5	285	87.6	0.00480	0.043	185.6	0.133	0.24
	Maximum	39.9	785	241.7	0.167	1.0	528.5	1.49	7.6
Route 135 Culvert (FS-76)	Average	36.0	598	178.6	0.107	0.45	401.7	0.638	1.8
	Minimum	30.5	340	117.5	0.0121	0.054	213.1	0.00980	0.14
	Maximum	44.3	1010	228.5	0.466	2.8	758.0	4.09	6.3
Fisk Pond (FS-77)	Average	35.0	570	160.9	0.1520	0.025	395.1	1.34	0.33
	Minimum	32.0	380	119.5	0.0838	0.0094	249.7	0.639	0.14
	Maximum	41.0	885	251.7	0.183	0.036	630.0	1.74	0.46

12.0 CURRENT AND POTENTIAL FUTURE LAND USE

This section discusses current and potential future land use at NSSC and the surrounding shoreline areas.

NSSC is an active research and testing facility, owned and operated by the Federal government through the Department of the Army. NSSC has been a permanent Army installation since October 1954. Its mission includes research and development activities in food engineering, food science, clothing, equipment, materials engineering, and aero-mechanical engineering. The facility employs approximately 2,000 employees. The entire perimeter of NSSC, including the shoreline, is fenced and guarded; access is restricted and visitors must obtain a pass at the main gate. On the property, there is housing for approximately 100 military personnel. Under the current land use conditions, the only populations who occupy NSSC are NSSC employees (both military and civilian), some of whom are residents. Due to the high amount of activity at the facility during the work-day, and the secured nature of the installation, it is highly unlikely that people would gain unauthorized access to NSSC.

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

Future land use of NSSC is expected to remain the same as current land use. NSSC is currently operational and there are no plans or expectations that this will change in the future. The NSSC facility is not currently slated to close, and is expected to remain a permanent Army installation over the long term. If, in the future, the facility is closed and transferred to residential use, the standard Army base closure procedures would be followed. These procedures would include an environmental baseline study to determine potential environmental risks.

The NSSC shoreline is a secured area, and there is no public access. Lake Cochituate is a public access recreational lake under the jurisdiction of the Commonwealth of Massachusetts, Massachusetts Division of Conservation and Recreation (MassDCR).

13.0 SUMMARY OF SITE RISKS

This section discusses the human health and ecological risks evaluated for the NSSC shoreline. The Army, with input and oversight from US EPA and MassDEP, has conducted several ERAs and HHRAs to estimate the probability and magnitude of potential adverse effects from contaminants in sediment and fish associated with the NSSC shoreline. The CSM for contaminated sediment is presented in Figure 11-1.

Tiered ERAs were conducted at a number of outfalls along the NSSC shoreline. Tiered ERAs are used to focus the ERA on the receptors and contaminants of concern, and range from screening-level, in which site concentrations are compared to ecological benchmarks, to toxicity studies, in which sediment toxicity is tested using standardized laboratory tests, to sampling of benthos and fish. The ERAs also included site surveys to identify ecological receptors and the existence of any endangered species at or near the site. The ERA results indicated that the NSSC shoreline sediment poses negligible to minimal incremental risks to ecological receptors.

HHRAs evaluate exposures to site contaminants, based on the potential for an individual's exposure, and the associated potential health risks, based on the toxicity of chemical(s). The risk of harm to human health is evaluated by calculating incremental cancer and non-cancer risks associated with the estimated exposures to selected chemicals of concern, and comparing the estimated risks to US EPA's acceptable incremental risk limits. Potentially unacceptable human health risks were associated with ingestion of native fish that may take up contaminants, in particular PCBs, from sediment at the NSSC shoreline.

While the Army and US EPA disagree about the approach to calculating the fish ingestion risks, they do agree that the results indicate that there is an actionable site risk that requires the clean up of sediments associated with NSSC within Pegan Cove of Lake Cochituate. Appendix C provides a letter that documents the US EPA approach to calculating the fish ingestion risks and the results. The results of the fish ingestion HHRAs were used as the basis for taking action for the sediment at the NSSC shoreline.

The following sections summarize the ERAs and HHRAs conducted for NSSC sediment.

13.1 ECOLOGICAL RISK ASSESSMENTS

Tier I (screening-level or baseline) ERAs associated with sediment and surface water were performed at many of the shoreline areas at NSSC including: T-25 Area outfall, MSO, historic outfalls, Boiler Plant cove, FPGS, Little Roundy Pond, and Buildings 22/36. These Tier I ERAs laid much of the groundwork for the Tier II ERAs conducted at the two major NSSC stormwater outfalls (ADL, 2001b and ICF, 2002a), the Tier III ERA (ICF, 2004a), and additional ERA activities (ICF, 2004b). The Tier II and Tier III ERAs were conducted to further evaluate the potential risks to wildlife potentially using the site (benthos, fish, birds, and mammals) from exposure to the contaminated sediment. The Tier III ERA report (ICF, 2004a) provides a detailed discussion of the ERA results for each shoreline area mentioned above, while a summary of the most important findings is provided below.

Site surveys indicated no visible evidence of unusual ecological stress to the terrestrial, wetland, or aquatic habitats visited on-site or off-site adjacent to the NSSC property. Furthermore, no areas of visible contamination releases were found during the field inspections of the Lake Cochituate shoreline at NSSC (ADL, 1998b).

Tier I (screening-level) ERA: While there was no visible evidence that discharges from NSSC outfalls have caused adverse impacts to on-site or off-site ecological receptors, the screening-level (Tier I) ERAs at NSSC found that the sediment associated with the site might adversely impact the localized benthic and/or aquatic communities, particularly at the T-25 Area outfall (ADL, 1998b) and the MSO (Harding ESE, 2001e). Calculated screening-level sediment risks were driven primarily by PCBs and pesticides, and somewhat less by PAHs and metals. Most of the maximum concentrations of these contaminants were detected in localized areas adjacent to each outfall. In surface water, the estimated ecological risks were the same as or only slightly different from those at non-Army-impacted reference stormwater outfall locations.

Tier II ERAs: The results of the screening-level ERAs focused the Tier II ERA assessments on localized sediment habitats near the T-25 Area outfall (ADL, 2001) and the MSO (ICF, 2002a). The Tier II ERAs, which used a sediment quality triad (SQT) approach, were designed to document any acute or chronic sediment toxicity (i.e., the toxicity of sediment collected from the site as assessed in the laboratory using laboratory test species), to evaluate the impairment to the benthic community, and to evaluate the foraging habits of wildlife at the site. The Tier II ERAs identified

various degrees of benthic impairment, chronic toxicity, and acute toxicity, and confirmed that a complete food chain pathway existed. As a result of these studies, a Tier III ERA was planned to evaluate the biological significance of the benthic toxicity and impairment observed in the Tier II ERAs, and potential risks to higher level ecological receptors.

Tier III ERA: The Tier III ERA (ICF, 2004a) incorporated sediment locations along the entire NSSC shoreline and several reference locations. The scope included extensive fish and benthic invertebrate sampling, and food chain modeling, and used conservative effects and exposure assumptions. The Tier III ERA (ICF, 2004a) concluded that there is minimal potential residual risk to benthic (mussel) and avian receptors. For fish receptors (largemouth bass and American eel) and mammal receptors (mink and raccoon), low potential residual risks were calculated. Potential residual risk to a receptor is defined as the calculated risk to the receptor at the site locations minus the calculated risk at the reference locations.

Additional ERA Studies: The Tier III ERA used single, conservative estimates of exposure parameters and available toxicity reference values (TRVs), which were chosen to provide an environmentally conservative estimate of risk – effectively a "worst-case" scenario for each parameter. More accurate, site-specific exposure assumptions and TRVs were used in an additional ERA evaluation to assess the uncertainties inherent in the Tier III ERA. The additional ERA studies (ICF, 2004b) focused on those receptors for which the Tier III ERA found potential residual risk [i.e., mammals (mink and raccoon) and fish (largemouth bass and eel)], and on the chemicals identified as the key potential risk drivers, including PCBs, cadmium, zinc, and nickel. The analyses incorporated more realistic (less conservative) exposure assumptions into the risk characterization. In particular, the additional ERA studies focused on:

- Ecotoxicological benchmarks/toxicity reference values (TRVs),
- Site-use factors, and
- Diet fraction.

Using realistic effects and exposure assumptions, the additional ERA studies found a negligible to low magnitude of residual risk for the fish and mammal receptors. The only exception was for American eel (a species of fish) at one NSSC exposure unit (combined T-25 Area/Building 36/Boiler Plant Cove area), where residual risk estimates for nickel and zinc were slightly higher than acceptable levels. It is possible that this result overestimates residual risk because of the relatively small sample size for this species at that exposure unit. Residual risks for other fish collected from the same area were within acceptable levels (ICF, 2004b).

The additional ERA studies concluded that there are likely no population-level effects on species of birds or mammals that may forage at NSSC, and it is unlikely that actual fish receptors near the NSSC site would be at risk from exposure to the contaminated sediment. The results of the additional ERA provided further support for the conclusion that there are negligible to minimal risks to ecological receptors from NSSC-associated sediment.

13.2 HUMAN HEALTH RISK ASSESSMENTS

Several HHRAs were conducted in which the NSSC shoreline sediment was evaluated. The first sediment HHRA was conducted as part of the T-25 Area Phase II RI (ADL, 1998b); this was a baseline HHRA for the T-25 Area outfall which estimated risks associated with potential exposures to surface water and sediment for adults and children while swimming at the beach area to the south of the outfall, using conservative assumptions. Other HHRAs focused on potential exposures

while swimming at other NSSC outfall and shoreline locations. Subsequent HHRAs incorporated the fish ingestion exposure pathway. Using native species collected in 2007 (ICF, 2008), a revised, final fish ingestion HHRA was completed. The final HHRA for fish ingestion evaluated potential risks associated with PCBs detected in fish collected both at the NSSC shoreline and from non-Army-impacted reference locations.

HHRA consists of four steps: hazard identification; exposure assessment; toxicity assessment; and risk characterization.

13.2.1 Hazard Identification

Hazard identification includes the identification of chemicals of concern. Chemicals of concern in sediment and fish tissue were selected for inclusion in further steps of the HHRA, in order to focus the discussion of risk on those compounds that account for the greatest potential risks. Chemicals of concern were selected based on exceedances of relevant conservative screening criteria, comparison to site-specific background concentrations, or professional judgment.

13.2.1.1 Sediment

As discussed in Sections 8 and 11.3, the Army collected and analyzed hundreds of sediment samples from numerous NSSC and non-Army-impacted reference locations across Lake Cochituate since the early to mid 1990s. These samples were collected as part of various site investigation and remedial investigation programs at the NSSC site. A number of chemicals were found in both the NSSC-related and reference sediment. The principal chemicals of concern detected in sediment samples included: PCBs, pesticides, PAHs, and metals.

13.2.1.2 Fish

As discussed in Section 11.4, fish tissue data were collected from hundreds of fish samples in 2001 as part of the Tier III ERA (ICF, 2004a) in order to evaluate food chain risks for ecological receptors. Fish species collected and analyzed included largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), pumpkinseed (*Lepomis gibbosus*), and American eel (*Anguilla rostrata*). All fish tissue samples were analyzed for pesticides, PCBs, and mercury. A subset of tissue samples was also analyzed for methyl mercury, PAHs, and metals. Chemical analyses were conducted on both the fillet (skin-on) and offal of largemouth bass, and on the whole body of all other species. Based on a risk screening of the Tier III ERA fish tissue data against relevant human health risk criteria (ICF, 2004b) it was determined that PCBs were the principal chemical of concern in NSSC samples.

During a January 22, 2004 meeting between NSSC, US EPA, and MassDEP, US EPA requested a review of the largemouth bass fillet data collected during the Tier III ERA sampling program. US EPA risk assessors evaluated these data, and determined that a baseline HHRA would be required for the recreational fish ingestion pathway at NSSC, using largemouth bass fillet data only, with a focus on PCBs as the contaminant of the greatest potential concern. The initial HHRA for fish ingestion (ICF, 2004b) used legal-sized (greater than 12 inches) largemouth bass data from three site locations (MSO, T-25 Area outfall, and Boiler Plant Cove) combined and two South Pond reference locations (Possum Hollow Lane and Crescent Street) combined.

Additional largemouth bass fillet (skin-on) and offal data were collected in 2007 and analyzed for PCBs (ICF, 2008), with a focus on the more contaminated sediment areas of the NSSC shoreline within Pegan Cove and on two reference sites (Fisk Pond and Route 135 culvert on South Pond)

that had been identified as common angling locations. The fillet data were used in the revised, final fish ingestion HHRA. PCBs were detected in all largemouth bass samples from the NSCC and reference locations, as summarized in Table 13-1.

Table 13-1: Largemouth Bass Data 2007

		Fillet Total PCB (mg/kg)	Offal Total PCB (mg/kg)
NSSC Shoreline Location			
MSO	Average	0.28	2.5
(FS-75)	Minimum	0.043	0.24
(10 samples)	Maximum	1.0	7.6
Reference Locations			
Route 135 Culvert	Average	0.45	1.8
(FS-76)	Minimum	0.054	0.14
(10 samples)	Maximum	2.8	6.3
Fisk Pond	Average	0.025	0.33
(FS-77)	Minimum	0.0094	0.14
(4 samples)	Maximum	0.036	0.46

13.2.2 Exposure Assessment

The exposure assessment consisted of identification of potentially exposed populations and exposure pathways, and quantification of exposures.

NSSC is an operating US Army research laboratory with restricted public access. Access to the NSSC shoreline is restricted by fencing and security patrols occur on a regular basis. Lake Cochituate, however, is a public access lake managed by the MassDCR.

The populations potentially exposed and the potential exposure pathways along the NSSC shoreline are summarized in Table 13-2. Exposure pathways were identified by considering current and potential future site use, along with the contaminated media.

Table 13-2: Potentially Exposed Populations and Exposure Pathways

Potentially Exposed Populations	Potential Exposure Medium	Potential Exposure Pathways
Recreational swimming/wading at NSSC shoreline	Sediment and surface water	Ingestion and dermal contact
Recreational anglers at NSSC shoreline	Native fish species	Ingestion

Consistent with standard practice for Superfund site HHRAs, conservative exposure assumptions were used to estimate potential risks for the highest exposure that is reasonably expected to occur [the reasonable maximum exposure (RME)], as well as the average exposure [the central tendency exposure (CTE)]. Conservative assumptions, for example, included:

- For the swimming scenario, exposure was assumed to be 2 hours a day for 45 days a year exclusively at the areas adjacent to NSSC. Under current conditions, however, use of the NSSC shoreline area is prohibited, thus these assumptions are highly unlikely.
- For the RME fish ingestion scenario, it was assumed that under a future exposure scenario individuals catch and eat approximately two fish meals per month (16 grams per day).

It should also be noted that a MassDPH fish advisory is in effect for all of Lake Cochituate. The MassDPH fish consumption advisory at Lake Cochituate was issued in 1996. The Lake Cochituate fish consumption advisory[1] is as follows: 1) children younger than 12 years or age, pregnant women, women of childbearing age who may become pregnant and nursing mothers should not eat any fish from this water body, and 2) the general public should not consume any American eel from this water body. The advisory was issued primarily due to PCBs found in fish samples collected during a 1995 MassDPH study (MassDPH, 1995).

13.2.3 Toxicity Assessment

Toxicity assessment for the selected contaminants was accomplished using published US EPA toxicity values that provide quantitative estimates of the toxicity of chemicals and resultant toxic effects. The most current toxicity values located in the US EPA Integrated Risk Information System (IRIS) on-line database were used in the HHRAs.

For substances suspected to cause non-cancer chronic effects, a reference dose (RfD), or a reference concentration (RfC) for inhalation exposures, is developed by US EPA. In the HHRA, chronic RfDs were used as the toxicity values for non-cancer health effects. A chronic RfD is defined as an estimate (with uncertainty spanning an order of magnitude or greater) of a daily exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of deleterious effects during a lifetime. Chronic RfDs are based on published toxicity data, and are specifically developed to be protective for long-term exposure to a compound. Uncertainty factors have been incorporated into the RfDs to account for extrapolations from animal toxic effects data and to protect sensitive human subpopulations, such as children.

For carcinogenic effects, cancer slope factors (CSFs), quantitative risk estimates of carcinogenic potency derived by the US EPA, were used. CSFs relate the incremental lifetime probability of an individual developing cancer to the lifetime average exposure dose of a substance. The CSF is estimated using mathematical extrapolation models, most commonly the linearized multi-stage model, and is presented as the risk per mg/kg/day intake (i.e., mg dose carcinogen per Kg body weight per day). The US EPA's Weight-of-Evidence classification for carcinogenicity, based on an evaluation of the likelihood that the agent is a human carcinogen, was also cited for each contaminant of concern in the HHRA.

13.2.4 Risk Characterization

Non-cancer hazards are estimated using a hazard index (HI) approach, where the estimated average daily dose of a chemical is directly compared to the chronic RfD, which is a level below which adverse health effects are not expected. In general, for US EPA HHRAs, estimated non-cancer HIs are compared to a HI of 1. The CTE scenario uses average exposure parameters to estimate the "average" HI, while the RME scenario uses upper bound exposure parameters, to estimate the "upper bound" HI.

[1] The Fish Advisory is still in effect today for Lake Cochituate (http://db.state.ma.us/dph/fishadvisory/).

Cancer risks are estimated as a probability that a potentially exposed individual could get cancer as a result of the estimated site-related chemical exposure. Cancer risk estimates are compared to US EPA's acceptable risk range, which represents an increased (incremental) risk (or probability) of cancer for an individual potentially exposed to site contaminants. The incremental allowable cancer risk range is identified in the NCP (US EPA, 1990) as an increased probability of developing cancer of 1 in 1,000,000 to 1 in 10,000 over the course of a 70-year lifetime. Although the US EPA considers estimated incremental cancer risks from a site to be acceptable if they are in this range, an increased cancer risk of 1 in 10,000 is often used as the point of departure for undertaking remedial actions at a site.

Table 13-3 summarizes the risk characterization results from the NSSC shoreline investigations.

Table 13-3: Summary of HHRA Results

Medium	Potentially Exposed Populations	Exposure Routes Evaluated	Reasonable Maximum Exposure Adult (RME) Risk Results	
			Non-Cancer Hazard Index	Incremental Cancer Risk
Sediment	Recreational swimming or wading near NSSC outfalls	Ingestion of sediment; dermal contact with sediment	Below acceptable US EPA limits.	Below or within acceptable US EPA range
Fish	Recreational anglers catching and eating fish from the NSSC shoreline areas	Ingestion of native fish fillets (largemouth bass)	Above acceptable US EPA limits	Below or within acceptable US EPA range

Table 13-4 summarizes the HHRA results for the swimming/wading scenarios at the various outfall and shoreline locations at NSSC. The HHRAs concluded that the estimated human health risks for both non-cancer and cancer effects for exposure to surface water and sediment during swimming or wading near the T-25 Area outfall, MSO, Boiler Plant, Building 22/26, Building 2/45, and the FPGS were below or within the range considered acceptable by US EPA for both CTE and RME scenarios. In addition to the HHRAs conducted by the Army, an independent health assessment performed by the federal ATSDR in 1997 found that human health risks due to contact with surface water and sediment at the T-25 Area outfall were unlikely. The ATSDR also concurred with the MassDPH fish consumption advisory at Lake Cochituate issued in 1996 (RAB, 1997).

Table 13-4: Summary of HHRAs for Swimming or Wading Along the NSSC Shoreline

Location	Scenarios	Risk Assessment Method	Results
T-25 Area Outfall	Recreational swimming or wading – exposure to surface water and sediment	Baseline HHRA	Estimated risks below or within US EPA's acceptable incremental cancer risk range; non-cancer HI below 1.
MSO	Recreational swimming – exposure to surface water and sediment	Baseline HHRA	Surface water upper bound risks slightly exceed US EPA's acceptable levels; sediment risks within acceptable levels.
Boiler Plant Site	Recreational swimming – exposure to surface water and sediment	MCP Method 2 Risk Characterization	Risks less than one-tenth the MCP Cumulative Receptor Risk Limits (Cancer Risk Limit is 1×10^{-5}; Non-cancer Risk Limit is a HI of 1).
FPGS	Recreational swimming – exposure to surface water and sediment	Baseline HHRA	Estimated risks below or within US EPA's acceptable incremental cancer risk range; non-cancer HI below 1.
Buildings 22/36	Recreational swimming – exposure to surface water and sediment	Baseline HHRA	Estimated risks below or within US EPA's acceptable incremental cancer risk range; non-cancer HI below 1.
Buildings 2/45	Recreational swimming – exposure to ground water (1)	Baseline HHRA	Estimated risks below or within US EPA's acceptable incremental cancer risk range; non-cancer HI below 1.
Historic Outfalls – Bldgs 16 and 42 (ARIEM)	See note (2).	None	Not applicable.

Notes:

(1) Risk assessment for ground water beneath the Water Supply Wells Site and the area around Buildings 2 and 45 (HLA, 1999 and Harding ESE, 2005) concluded that there were no unacceptable risks associated with the recreational swimmer exposure to ground water that may discharge to surface water in the South Pond of Lake Cochituate (calculated without dilution in the surface water).'

(2) The potential human health risks associated with the surface water and sediment at the historic outfalls (ICF, 2002c) were not evaluated because the historic outfall sediment concentrations were generally one to three orders of magnitude less than those observed at the T-25 Area and MSO; at these locations, incremental human health risks associated with exposures to surface water and sediment were below or within the range considered acceptable by US EPA.

The initial 2004 fish ingestion HHRA (ICF, 2004b), using largemouth bass fillet data collected in the Tier III ERA, indicated that the non-cancer HIs at NSSC locations exceeded US EPA's acceptable level. Estimated incremental cancer risks were within US EPA's acceptable incremental cancer risk range using CTE assumptions, and slightly exceeded US EPA's risk range using RME assumptions.

The final HHRA for fish ingestion, using legal-sized largemouth bass fillet data collected in 2007, evaluated potential risks associated with PCBs detected in fish collected both at the NSSC shoreline in Pegan Cove and from reference locations.

The estimated incremental cancer risks (Table 13-5) for ingestion of legal-sized native fish fillets from the NSSC shoreline and from reference locations are within US EPA's acceptable incremental cancer risk limits.

Table 13-5: Final Fish Ingestion HHRA Incremental Cancer Risks

Estimated Cancer Risk	Site (1)		Reference (1)		US EPA Acceptable Incremental Cancer Risk Limits
	CTE	RME	CTE	RME	
Adult	4.9×10^{-7}	4.7×10^{-5}	5.8×10^{-7}	6.5×10^{-5}	$1x10^{-6}$ to $1x10^{-4}$
Child	1.6×10^{-7}	1.6×10^{-5}	1.9×10^{-7}	2.2×10^{-5}	$1x10^{-6}$ to $1x10^{-4}$

Note: (1) Using 2007 largemouth bass fillet data from the NSSC shoreline within Pegan Cove (Site) and 2007 largemouth bass data from Fisk Pond and Route 135 culvert (Reference).

However, the estimated RME non-cancer hazard indices (Table 13-6) associated with the potential ingestion of native fish caught near the NSSC shoreline within Pegan Cove are above the US EPA acceptable level, providing the basis for taking action in this ROD for the NSSC sediment within Pegan Cove.

The estimated RME reference hazard indices are greater than the NSSC hazard indices using legal-sized largemouth bass fillet data from the 2007 sampling program.

Table 13-6: Final Fish Ingestion HHRA Non-Cancer Hazard Indices

Estimated Non-Cancer Hazard Index	Site (1)		Reference (1)		US EPA Acceptable Non-Cancer Hazard Index
	CTE	RME	CTE	RME	
Adult	0.2	2.7	0.2	3.8	1
Child	0.1	0.9	0.1	1.3	1

Note: (1) Using 2007 largemouth bass fillet data from the NSSC shoreline within Pegan Cove (Site) and 2007 largemouth bass data from Fisk Pond and Route 135 culvert (Reference).

Because the assumptions used for the RME fish ingestion HHRA are conservative, they are likely to overestimate actual fish ingestion risks.

13.3 RISK ASSESSMENT SUMMARY AND CONCLUSIONS FOR THE SEDIMENT

The HHRAs conducted for sediment and surface water associated with the NSSC shoreline areas outside of Pegan Cove concluded that the estimated cancer and non-cancer risks for all potentially exposed populations were below or within the risk range considered acceptable by US EPA. The ERAs concluded that there were negligible to low ecological risks associated with sediment at the NSSC shoreline outside of Pegan Cove. No site-related hazardous substances, pollutants, or contaminants remain in sediment at the NSSC shoreline outside of Pegan Cove above levels that allow for unlimited use and unrestricted exposure.

The HHRA conducted for sediment and surface water associated with the Main Stormwater Outfall concluded that estimated cancer and non-cancer risks for all potentially exposed populations were below or within levels considered acceptable by US EPA. Risks were also evaluated for the potential ingestion of legal-sized (greater than 12 inches long) native fish species from the NSSC shoreline within Pegan Cove. The estimated incremental cancer risks for ingestion of native fish were below or within the range considered acceptable by the US EPA for all age groups. However, the estimated non-cancer hazard indices for ingestion of native fish from the NSSC shoreline

within Pegan Cove for the highest (or upper bound) estimated exposure exceeded US EPA's acceptable level. The ERAs concluded that there were negligible to low ecological risks associated with sediment at the NSSC shoreline within Pegan Cove.

While the Army and US EPA disagree about the approach to calculating the fish ingestion risks, they do agree that the results indicate that there is an actionable site risk that requires the cleanup of sediments associated with NSSC within Pegan Cove of Lake Cochituate. Appendix C provides a letter that documents the US EPA approach to calculating the fish ingestion risks and results.

13.4 BASIS FOR SEDIMENT REMEDIAL ACTION

The estimated non-cancer hazard indices associated with the potential ingestion of legal-sized native fish caught near the NSSC shoreline within Pegan Cove are above the US EPA acceptable hazard index of one (1) using RME assumptions. Since fish can take up PCBs from the sediment through the food chain, the estimated non-cancer risks provide the basis for taking action on the sediment within Pegan Cove.

The response action selected in this Record of Decision is necessary to protect public health or welfare or the environment from actual or threatened releases of pollutants or contaminants from the NSSC site which may present an imminent and substantial endangerment to public health or welfare.

14.0 REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are narrative statements that define the extent to which sites require risk management measures to meet the objective of protecting human health and the environment. The RAOs consider current site activity, future land use, and available reference data. For this site, the sediment cleanup goal is defined as the concentration of PCBs in sediment that is protective of humans that may catch and eat native fish from the NSSC shoreline. The RAOs and cleanup goal for the NSSC sediment are:

- ***Human Health***: Reduce the potential for sediment-associated human health risks due to PCBs in native fish caught near the NSSC shoreline currently and in the future by reducing average PCB concentrations in sediment within Pegan Cove to less than 1 mg/kg [1 part per million (ppm)].
- ***Environment:*** Based on ecological risk assessment results that show negligible to minimal ecological risks and/or ecological risks similar to reference, there are no remedial action objectives associated with ecological receptors.

The human-health based RAO will be attained by reducing the potential for human exposure at the NSSC shoreline by the removal of contaminants from areas of elevated PCB concentrations.

The sediment cleanup goal for total PCBs is established to reduce the potential for non-cancer risks, and to maintain the currently acceptable potential incremental cancer risks, for individuals who may consume native fish from the NSSC shoreline. The establishment of a sediment cleanup goal presumes that a reduction of PCBs in sediment at the NSSC shoreline will, over time, reduce the PCB concentrations in fish caught at the NSSC shoreline. This approach is based on the assumption that the contribution of sediment PCBs to the fish caught at the NSSC shoreline is not influenced by contributions of sediment PCBs to these fish from non-Army-related locations in other parts of Lake Cochituate.

The Army and US EPA have agreed that the 1 mg/kg average PCB concentration sediment cleanup goal will be used for risk management associated with the NSSC sediment operable unit. The basis for the selection of 1 mg/kg as the sediment cleanup goal is that it is consistent with the 2007 sediment PCB concentrations at the upgradient, non-Army-impacted Fisk Pond background location and it is at the low end of the range of calculated potential cleanup goals [as described in the FS (ICF, 2009a)] that are protective of individuals who may catch and eat native fish caught near the NSSC shoreline. The Army also believes that a 1 mg/kg sediment cleanup goal for the NSSC site is consistent with the goals selected at other PCB sites in New England.

The response action selected in this Record of Decision will reduce the volume and concentration of PCBs in sediment at the NSSC shoreline. However, it should be noted that this may not translate into a reduction of risk for individuals who may be catching and consuming native fish. Because PCBs have been detected in sediment at some non-Army-impacted locations on Lake Cochituate which may contribute to PCB concentrations in fish, any active remedy of NSSC shoreline sediment does not guarantee that an acceptable level of risk will be achieved for individuals who may catch and eat fish from the NSSC shoreline or other areas of Lake Cochituate either in the short-term or the long-term.

15.0 DESCRIPTION OF REMEDIAL ALTERNATIVES

A total of nine alternatives were developed for the sediment along the NSSC shoreline within Pegan Cove of Lake Cochituate. Alternative 8 describes the selected remedy presented in this ROD.

- Alternative 1 – No Action
- Alternative 2 – Limited Action/Institutional Controls
- Alternative 3 – Institutional Controls/Environmental Monitoring
- Alternative 4 – Clay Capping/Monitoring/Institutional Controls
- Alternative 5 – Composite Capping/Monitoring/Institutional Controls
- Alternative 6 – Sediment Stabilization/Mechanical Dredging/Off-Site Disposal
- Alternative 7 – Hydraulic Dredging/Geotextile Dewatering/Off-Site Disposal
- Alternative 8 – Hot Spot Hydraulic Dredging/Geotextile Dewatering/Off-Site Disposal
- Alternative 9 – Hydraulic Dredging/Mechanical Dewatering/Off-Site Disposal

15.1 DESCRIPTION OF ALTERNATIVES

15.1.1 Alternative 1 – No Action

The NCP requires that "No Action" be included among the general response actions evaluated in every Feasibility Study (40 CFR 300.430(e)(6)). The No Action alternative is evaluated based on the site conditions described in the baseline risk assessment and remedial investigation. No Action means that no response to contamination is made (although contaminants such as PCBs may naturally degrade over a long time period), activities previously initiated are abandoned, and no further active human intervention occurs to limit exposures at the site. A No Action alternative does not include any treatment, engineering controls, or institutional controls. There would be no capital or operation and maintenance (O&M) costs associated with this alternative. However, five-

year reviews would be required under CERCLA. The No Action response provides a baseline for comparison to the other remedial response actions.

15.1.2 Alternative 2 –Limited Action/Institutional Controls

Institutional controls are administrative or legal controls intended to reduce the potential for human exposure to contaminants of concern (i.e., PCBs) on a community and regional basis. Institutional controls must be protective and enforceable. Limited action/institutional controls would include maintenance of the current NSSC shoreline access restrictions (fenced and security-monitored shoreline) and signs prohibiting fishing from the NSSC shoreline. Additional signs would be produced in several languages that are commonly spoken in the area. This alternative would include continued U.S. Army fence line and shoreline security monitoring that is part of the routine base security program, and CERCLA-required five -year reviews. No monitoring data would be collected for this alternative or available for evaluation in the five-year reviews, so any remediation due to natural recovery would not be known.

In addition to the institutional controls prohibiting fishing from the NSSC shoreline, institutional controls would be implemented to reduce the potential for fish consumption from offshore portions of the lake and to minimize the potential disturbance of contaminated sediment. The geographic extent of the offshore institutional controls would be documented in a cooperative agreement between the Army and the appropriate Commonwealth of Massachusetts agencies. The offshore institutional controls could include a catch-and-release notice or an expansion of the current fish consumption advisory for Lake Cochituate. Institutional controls would also be implemented to ensure that the contaminated sediment is not disturbed over time. The following institutional controls would be required:

- Anchoring or other disturbance, temporary or permanent, would be prohibited in the contaminated sediment area. Anchoring restrictions would be communicated with signs onshore and possibly offshore.
- Docks, piers, or other temporary or permanent structures could not be constructed within the contaminated sediment area.
- Dredging would be prohibited within the contaminated sediment area.

Since the Commonwealth of Massachusetts has jurisdiction over the lake and the sediment in the lake, the Army would need to develop an enforceable cooperative agreement with the appropriate Commonwealth agencies to implement and enforce the offshore institutional controls. The agreement would need to specify which party is responsible for enforcing the offshore institutional controls. NSSC shoreline controls would be enforced by the Army, and controls over the lake would be enforced by the Commonwealth of Massachusetts. In order to ensure the long-term effectiveness of the NSSC shoreline and offshore institutional controls, the Army would need to provide annual certification that the institutional controls remain in place and that there were no violations of the institutional controls.

15.1.3 Alternative 3 –Institutional Controls/Environmental Monitoring

Alternative 3 (Institutional Controls/Environmental Monitoring) differs from Alternative 1 (No Action) and Alternative 2 (Limited Action/Institutional Controls) by the addition of baseline sampling and natural recovery monitoring, and the inclusion of a sediment cleanup level and an expected period for achieving that level.

Institutional Controls
The institutional controls would be the same as in Alternative 2.

Environmental Monitoring
Environmental monitoring would include a baseline sampling program which would include the collection and analysis of fish, sediment, and surface water samples from both site and background locations. This sampling program would serve as a baseline for evaluating the long-term effectiveness of natural recovery, and would also help to further characterize the PCB concentrations and horizontal and vertical extent of sediment contamination prior to implementation of this alternative.

Using the results of the baseline sampling and analysis program, the Army would develop and calibrate an appropriate model to predict natural recovery of PCBs in sediment and fish tissue over time. The sediment, fish tissue, and surface water data collected during the baseline sampling program (and prior events, if deemed necessary) would be used as input parameters to the model. The developed model would then be refined and calibrated using subsequent years of long-term monitoring data.

15.1.4 Alternative 4 –Clay Capping/Monitoring/Institutional Controls

Under Alternative 4, sediment would be covered or capped with clay composite material throughout the sediment cleanup goal area. Environmental monitoring would be performed both during and after installation of the cap. Institutional controls would be implemented to prevent damage to the cap, prohibit fishing from the NSSC shoreline, and to reduce the potential for fish consumption from offshore portions of the lake.

The principle components of Alternative 4 include:

- Site condition evaluation
- Engineered capping of sediment in selected target areas
- Monitoring
- Institutional controls
- Natural recovery

Site Condition Evaluation
A pre-remediation survey and baseline sampling program would be initiated throughout the remediation areas to provide general characteristics of the lake bottom and to further refine the horizontal and vertical extent of PCB contamination.

Engineered Capping of Sediment in Selected Target Area
Capping would require placing clay composite particles over the sediment exceeding the cleanup goal in two or more applied layers. The clay composite particles would be manufactured locally and transported by truck to a bulkhead location beside the lake. Using a conveyor, the material would be transferred to a shallow draft barge equipped with a mounted telescoping conveyor. The clay composite particles would be spread throughout the cleanup area with a barge mounted telescoping conveyor equipped with a global positioning system (GPS). The cap would be thick enough to physically isolate the contaminated sediment from the benthic environment and control potential flux of contaminants through the cap. Two lifts would be required to place the cap.

Monitoring
A pre-remediation monitoring program would be established to develop the extent of the remediation area and characterize the surface characteristics of the sediment. A remedial monitoring program would be established to document the geographic position of the cap placement, inspect the capping material, measure the extent and thickness of the cap, and monitor PCB and suspended solids levels in the water column within the vicinity of the capping operations. A post-remediation monitoring program would be established for long-term monitoring of the cap and natural recovery of sediment and fish. Monitoring and maintenance of the constructed cap is essential for long-term effectiveness. Long-term monitoring of natural recovery of lake sediment and fish would be the same as the environmental monitoring in Alternative 3.

Institutional Controls
Following the cap placement, institutional controls would be implemented to ensure that the constructed cap isolates the contaminated sediment long-term and remains protective over time. Institutional controls for the clay capping alternative would be the same as Alternative 2. In order to protect the integrity of the cap the following institutional controls would be required:

- Anchoring or other disturbance, temporary or permanent, would be prohibited within the footprint of the capped areas. Anchoring restrictions would be communicated with signs onshore and possibly offshore.
- Docks, piers, or other temporary or permanent structures could not be constructed within the footprint of the capped areas.
- Dredging would be prohibited within the site remediation boundaries.

Natural Recovery
Natural recovery of the sediment may occur over time through in-situ processes that include biodegradation, dispersion, dilution, sorption, volatilization, and chemical or biological stabilization, transformation, or destruction of contaminants. Natural recovery would be evaluated based on results of the long-term monitoring.

15.1.5 Alternative 5 –Composite Capping/Monitoring/Institutional Controls

Alternative 5 is similar to Alternative 4 except instead of using a clay composite material to cap the contaminated sediment, a geotextile is placed on top of the sediment and then covered with a layer of sand. The porous geotextile does not contribute to contaminant isolation, but serves to reduce the potential for mixing and displacement of the underlying sediment with the overlying sand. Geotextile can also add structural support during cap placement. The sand layer would serve to fulfill the three functions of a cap: physical isolation, stabilization/erosion protection, and chemical isolation. As with Alternative 4, environmental monitoring would be performed before, during, and after installation of the cap. Institutional controls would be implemented to prevent damage to the cap, prohibit fishing from the NSSC shoreline, and to reduce the potential for fish consumption from offshore portions of the lake.

The principle components of Alternative 5 include:

- Site condition evaluation
- Engineered capping of sediment in selected target areas
- Monitoring
- Institutional controls
- Natural recovery

Site Condition Evaluation
Site condition evaluations would be the same as in Alternative 4.

Engineered Capping of Sediment in Selected Target Areas
Capping would require placing the porous geotextile directly over the sediment exceeding the cleanup goal. The sand would be purchased locally and transported by truck to the site. Using a conveyor, the sand would be transferred to a shallow draft barge equipped with a mounted telescoping conveyor. The barge-mounted telescoping conveyor equipped with GPS would be used to spread the sand over the geotextile. Two lifts would be required to place the cap. The cap would be thick enough to physically isolate the contaminated sediment from the benthic environment and control potential flux of contaminants through the cap.

Monitoring
Monitoring programs would be the same as in Alternative 4.

Institutional Controls
Institutional controls would be the same as in Alternative 2 and Alternative 4.

Natural Recovery
Natural recovery would be evaluated the same as in Alternative 4.

15.1.6 Alternative 6 –Sediment Stabilization/Mechanical Dredging/Off-Site Disposal

Under Alternative 6, cofferdams would be installed within Pegan Cove in order to isolate the contaminated sediment removal areas. The isolated areas would be dewatered by pumping lake water from inside the cofferdam to outside the cofferdam into the lake for a period long enough to expose the sediment. Once the sediment was exposed, stabilizers such as Portland cement would be mixed into the sediment in place using earth moving equipment, and allowed to cure. Once the sediment was stabilized enough to be handled by earth moving equipment, the sediment would be placed into a hopper of a pug mill where additional reagents would be mixed in. The treated sediment would be stockpiled, allowed to cure, characterized for disposal, and shipped off-site for disposal/treatment. Once the contaminated sediments were removed, lake water would be returned to the removal areas and the cofferdams removed. The principle components of Alternative 6 include:

- Site Condition Evaluation
- Silt Curtains
- Cofferdam
- Cofferdam Dewatering
- Odor Control
- Treatability Study and Sediment Solidification/Stabilization (S/S)
- Dry Dredging
- Off-Site Disposal
- Remedial Monitoring
- Site Restoration
- Institutional Controls

Site Conditions Evaluation
In addition to pre-remediation surveys and baseline sampling, a preliminary subsurface geotechnical survey would be performed to provide general characteristics of the subsurface geology related to the cofferdam installations.

Silt Curtains
Prior to the installation of the cofferdam, silt curtains would be installed around the perimeter of the cofferdams in order to control or mitigate the settling of any fine grained suspended sediment particles solids in the water column. A primary silt curtain would be installed with a secondary curtain installed right behind it. Each silt curtain would extend from the shoreline around the perimeter of the cofferdams with the curtains extending the entire depth of the water and anchored at the bottom.

Cofferdams
Vertical interlocking sheet piles would be installed to create two temporary watertight enclosures within Pegan Cove. The structures generally consist of the interlocking sheet piles, bracing supports such as wales, struts, or tiebacks, and a bottom seal to seal out water. A design plan would be developed of the cofferdam which would be dependent on factors such as geologic subsurface conditions, depth of water, and groundwater infiltration rates. The cofferdam would be installed using an onshore or barge mounted crane which would drive each sheet pile into the bed of the lake with the use of a pneumatic hammer or vibratory pile driver.

Cofferdam Dewatering
In order to expose the sediment targeted for removal, each cofferdam cell would be dewatered. Initially large temporary pumps would be used with smaller automatic pumps being used as the water level drops and the possibility of sediment re-suspension increases. A system of well points could also be employed to depress the water table below the lake bottom. As the water level drops inside the cofferdam and the possibility of sediment re-suspension increases, discharged water may require some type of treatment and/or permitting. A dewatering plan would be included as part of the cofferdam design plans.

Odor Control
An odor monitoring program would be developed to monitor for and abate any nuisance odors to workers and the public. Odor problems could be diminished with the use of oxidizers such as potassium permanganate, sodium hypochlorite, or a microbial consortium which would convert hydrogen sulfide into odorless hydrogen sulfate.

Treatability Study and Sediment Solidification/Stabilization
A treatability study for the sediment solidification/stabilization (S/S) treatment process would be initiated to determine the appropriate type and ratio of stabilizer required to be added to the exposed sediment in order to improve the handling and physical characteristics of the sediment, decrease the surface area of the sediment mass across which loss of contaminants can occur, and reduce the solubility of hazardous constituents in the sediment. Inorganic reagents such as Portland cement, fly ash, lime, phosphates would be mixed with contaminated sediment to reduce the mobility of contaminants and improve the handling condition of the sediment.

Dry Dredging
S/S would be implemented by mixing the reagent into the sediment first with the use of earth moving equipment or a clam shell dredge. Sediment would then be placed into the hopper of a pug mill or continuous mixer, stockpiled, allowed to cure, characterized, and then shipped off-site for treatment or disposal.

Off-Site Disposal

Off-site disposal of the dredged sediment would follow the 1997 guidelines outlined in Policy # COMM-97-001, *Reuse and Disposal of Contaminated Soil at Massachusetts Landfills,* which supersedes the MassDEP Policy # Bureau of Waste Practices (BWP) BWP-94-037. Policy # COMM-97-001 maintains consistency with the 1995 MassDEP Policy # COMM-94-007, *Interim Policy for Sampling, Analysis, Handling, and Tracking Requirements for Dredged Sediment Reused or Disposed at Massachusetts Permitted Landfills.* Policy # COMM-97-001, in conjunction with 310 CMR (Code of Massachusetts Regulations) 30.000, provides information about the MassDEP requirements, standards, management practices and approvals for testing, tracking, transport, and reuse or disposal of contaminated soil at Massachusetts landfills. The dredging activities for South Pond are regulated under 314 CMR 9.04 and require a 401 Water Quality Certification (WQC) subject to the Criteria for Evaluation of Applications for the Discharge of Dredged or Fill Material.

Policy # COMM-97-001 allows proponents to perform one set of tests to satisfy the requirements for both the WQC and the BWP. If contaminants do not exceed the maximum allowable contaminant levels for sediment reuse at lined landfills as outlined in Table 1 of the MassDEP Policy # COMM-97-001, an applicant need not obtain individual BWP review and approval for sediment reuse at a lined landfill.

WQC applicants would be required to test for additional constituents if an applicant is proposing landfill reuse/disposal of sediment which include arsenic, PCBs, total petroleum hydrocarbons (TPHs), VOCs, and PAHs. Sediment which exceeds the contaminant limits outlined in Table 1 of the MassDEP Policy # COMM-97-001, if they are intended to be disposed of at lined or unlined landfills, would require BWP approval.

Sediment may be disposed of as hazardous or non-hazardous depending on certain criteria such as concentrations of PCBs, pesticides, PAHs, inorganics, VOCs, and pH, conductivity, corrosivity, ignitability, and reactivity.

Remedial Monitoring

Pre-Remediation Monitoring. Additional sediment data may be collected in determining remediation areas and sediment volumes with the purpose of minimizing the removal of clean sediment while at the same time optimizing the removal of PCB contaminated sediment.

Remediation Monitoring. A remedial monitoring program would be established to document PCB levels in the lake during remediation activities. The monitoring program would specifically address PCB and suspended solids levels in the water column within the vicinity of removal operations including any downstream impacts during activities such as cofferdam installation. Additionally, the program would include confirmatory sampling efforts wherein sediment samples would be collected after sediment removal to determine whether cleanup goals are being achieved. For any treated water discharged back to the lake created during the sediment dewatering process, water quality-based effluent limitations would be developed. Limits would be based on the Federal Clean Water Act, the Massachusetts Surface Water Discharge Permit Program, and 314 CMR 9.00.

TSCA 761 Subpart O (Sampling to Verify Completion of Self-Implementing Cleanup and On-Site Disposal of Bulk PCB Remediation Waste) would be used as guidance in developing the remediation monitoring program.

Post-Remediation Monitoring. Long-term monitoring after the dredging is completed would include sediment, surface water, and fish tissue sample collection and analyses to document PCB concentrations over time, both at NSSC shoreline locations and at reference locations. Sediment, water, and fish sampling and analysis would occur every year for the first 5 years and then once in the tenth year. A final Long-Term Monitoring Plan would be developed which would outline in detail the procedures for sampling of sediment, surface water, and fish. The Plan would also establish and describe the procedures for notification and further evaluation, if any exceedances of cleanup goals within the remedial area occur, and would specify the procedures for documentation and certification that the institutional controls are still in place. TSCA 761 Subparts N and O would be used as guidance in developing the Long-Term Monitoring program.

Site Restoration
After sediment is excavated, the cofferdam and silt curtains would be removed. If necessary, the sediment along the border of the remediation area would be re-graded and the banks of the shoreline would be reformed. Since the lake is shallow and the excavation would be only a foot deep, stability concerns are not expected to be an issue; therefore replacement material for the removed sediment would not be necessary.

Institutional Controls
Following sediment removal and site remediation, institutional controls would also be implemented to prohibit fishing from the NSSC shoreline and to reduce the potential for fish consumption from offshore portions of the lake. Institutional controls would be the same as those discussed in Alternative 2.

15.1.7 Alternative 7 –Hydraulic Dredging/Geotextile Tube Dewatering/Off-Site Disposal/Institutional Controls

Under Alternative 7, contaminated sediment would be pumped via a hydraulic dredge through a sediment slurry pipeline to onshore geotextile fabric tubes for dewatering. Once dewatered, the sediment would be shipped off-site to a licensed treatment or disposal facility. The principle components of Alternative 7 include:

- Site Condition Evaluation
- Silt Curtains
- Hydraulic Dredging
- Geotextile Tube Dewatering
- Odor Control
- Water Treatment
- Off-Site Disposal
- Remedial Monitoring
- Site Restoration
- Institutional Controls

Site Condition Evaluation
A pre-remediation acoustical survey and baseline sediment sampling would be initiated throughout the remediation area. The pre- and post-remediation acoustical survey would be employed to obtain bathymetric data and surface sediment characteristics within the remediation area. The pre-remediation acoustical survey would determine the lake bottom bathymetry and could be used to locate areas of debris. The post-remediation acoustical survey would determine the volume and depth of sediment removed. The baseline sediment sampling would include the collection and

analysis of additional sediment samples to further refine the horizontal and vertical extent of PCB contamination.

Silt Curtains

In order to control the settling of fine grained solids suspended in the water column during remedial activities, two silt curtains would be installed around the perimeter of the impacted sediment areas. One silt curtain would act as a primary containment with a second silt curtain installed right behind the first acting as a secondary containment. A silt curtain is designed to control the settling of fine grained solids suspended in water by providing a controlled area of containment. Contaminants are typically associated with the fine-grained suspended sediment particles where contamination can spread by desorption of the contaminants from the particles into the water column, or drifting of suspended sediment beyond the remediation area.

Hydraulic Dredging

Hydraulic dredges remove and transport dredged materials as a pumped sediment-water slurry. The sediment is dislodged by mechanical agitations using a cutterhead or auger which cut and loosen the sediment prior to it being pumped out. In very soft sediment, it may be possible to remove surface sediment by straight suction and/or by forcing the intake into the sediment without dislodgement. The loosened slurry is essentially then pumped into an intake pipe by the dredge and transported via pipelines to a dewatering facility located on shore. Part of the detailed dredging system design phase would include considerations for the type of hydraulic dredge used concerning swinging ladder or auger type. Typically, auger type hydraulic dredges are used when the lake bottom is flat.

All sediment removed by the hydraulic dredging system would be conveyed through the slurry pipeline to dewatering stations set up within open areas along the eastern shoreline of the NSSC facility. The dewatering stations would consist of a series of geotextile tubes in which the sediment slurry would be pumped into for dewatering. It is expected that the hydraulic dredging system would be fitted with state-of-the-art electronic positioning equipment so that the work is performed as efficiently and precisely as possible.

Geotextile Tube Dewatering

Geotextile tubes are fabricated from a woven polypropylene geo-textile containing heavy monofilament and fibrillated yarns. The tubes are designed to withstand pressures created when pumping material into them and have the hydraulic properties required to retain fine grained solids while allowing water to pass through them. Typically geotextile tubes are made of black geotextile that can act as a passive solar collector, assisting in the drying phase. The tubes work in conjunction with hydraulic dredging rigs where the sediment slurry would be pretreated either before being pumped into the tube, or pumped directly into the tube. Pretreatment would consist first of removing debris such as bark, vegetation, trash, rocks, and sand, if the sediment slurry has a large sand fraction. Secondly, a flocculent could be incorporated into the sediment slurry prior to being pumped into the tube, to assist in the dewatering process.

A treatability study for the dewatering of dredged sediment with geotextile tubes would be carried out to assess that the sediments can be effectively dewatered and whether flocculants or changes in the geotextile material composition (e.g., pore size) may be necessary to facilitate the dewatering process.

A designated dewatering area would be established on shore, which would be large enough to house several long geotextile tubes. Decant water from the geotextile tubes would be collected and treated on-site prior to discharging to the lake or a public owned treatment works (POTW).

Odor Control
Odor control would be managed in the same manner as Alternative 6.

Water Treatment
A typical water treatment plant used for dredging projects consists of a rapid mixing basin, flocculation chamber, settling basin, and mixed media filters to remove solids from the stream, and granular activated carbon filters to remove dissolved PCBs. Sizing a water treatment plant would be dependent on the decant discharge rate of the geotextile tube which is dependent on the hydraulic dredge pumping rate and the percent water in the sediment slurry. Typical sediment slurries produced from hydraulic dredging contain 10 to 30 percent solids by volume. If the dredged sediment slurry from South Pond contains 10 to 30 percent solids by volume, it is estimated that the volume of water to be treated could range from 140 to 180 gallons of water per in-situ cubic yard of sediment removed. Sediment containing 40 percent solids could require treating a volume of 120 gallons of water per cubic yard. Water treatment components such as filters and activated carbon, may require special handling and disposal if PCB concentrations in the decant water are higher than water quality-based effluent limitations, as would be determined during a remediation monitoring program. The limitations would be adequate enough to ensure attainment and maintenance of the water quality standards of the receiving waters as assigned by the discharge permit. Effluent limitations would consider such factors as the natural/ambient lake conditions, the existing discharges, and the protection of existing downstream uses. Limits would be based on the Federal Clean Water Act, the Massachusetts Surface Water Discharge Permit Program, and 314 CMR 9.00.

Off-Site Disposal
Off-site disposal of the dredged sediment would follow the same procedures and regulations as Alternative 6.

Remedial Monitoring
Remedial monitoring would be the same as in Alternative 6.

Site Restoration
After remedial activities were complete, the silt curtains would be removed and the sediment dewatering area would be cleaned. If necessary, the sediment along the border of the remediation area would be re-graded and the banks of the shoreline would be reformed. Since the lake is shallow and the excavation would be only a foot deep, stability concerns are not expected to be an issue; therefore replacement material for the removed sediment would not be necessary.

Institutional Controls
Following sediment removal and site remediation, institutional controls would also be implemented to prohibit fishing from the NSSC shoreline and to reduce the potential for fish consumption from offshore portions of the lake. Institutional controls would be the same as those discussed in Alternative 2.

15.1.8 Alternative 8 –Hot Spot Hydraulic Dredging/Geotextile Tube Dewatering/Off-Site Disposal/Backfilling

Alternative 8 would involve the removal of PCB-contaminated sediment, using hydraulic dredging techniques, from four hot spot areas within Pegan Cove to reduce the average PCB concentration within Pegan Cove to below the sediment cleanup goal of 1.0 mg/kg. The dredged areas would be

backfilled with clean fill material, unless post-remediation confirmatory sampling indicated that the residual concentrations, if any, already met the average cleanup goal. The four proposed separate areas for contaminated sediment removal are shown in Figure 15-1.

The principle components of Alternative 8 include:

- Site Condition Evaluation
- Site Control Measures
- Silt Curtains
- Hydraulic Dredging
- Geotextile Tube Dewatering
- Odor Control
- Water Treatment
- Off-Site Disposal
- Remedial Monitoring
- Site Restoration/Backfilling

A Remedial Process Flow Diagram of Alternative 8 is presented in Figure 15-2.

Site Condition Evaluation
A pre-remediation acoustical survey and baseline sediment sampling would be initiated throughout each hot spot remediation area. The acoustical survey would determine the lake bottom bathymetry, and the baseline sediment sampling would allow for further delineation/refinement of the hot spot locations slated for removal. A post-remediation acoustical survey would be performed to determine the volume and depth of sediment removed from each hot spot area.

Site Control Measures
Site control measures would be put in place prior to initiating any remedial action. The site control measures would include posting signs along the Army's security perimeter fence that would limit boating in the area of the dredging activities during the remedial action. Additionally, signage would be posted that would prohibit fishing from the NSSC shoreline within Pegan Cove. The signs would be constructed of metal and secured to the NSSC perimeter fence along the shoreline of Pegan Cove. The signs would include universal symbols indicating that fishing is prohibited, and contain warnings in different languages that are representative of the demographic populations that use Lake Cochituate. Once remedial activities were completed, the signs restricting boating would be removed and the signs prohibiting fishing would remain in place and be maintained by the Army. If requested, the Army would provide additional sign templates to appropriate state agencies, such as the MassDEP, MassDPH, and MassDCR.

Silt Curtains
Silt curtain installation would be the same as in Alternative 7, except that the silt curtains would be placed separately around each of the four hot spot dredging areas.

Hydraulic Dredging
Hydraulic dredging techniques would be the same as in Alternative 7, and would involve dredging four hot spot areas, including: three 6-inch dredge depth areas and one 12-inch dredge depth area in front of the Main Stormwater Outfall. An estimated total volume of 2,510 cubic yards of contaminated sediment will be removed using the hydraulic dredging technique. The four separate areas for contaminated sediment removal are shown in Figure 15-1.

Following the hot spot dredging and prior to removal of the primary or secondary silt curtain, and prior to backfill, post-dredging confirmatory sampling of the each dredged area would be conducted to verify that residual PCB concentrations, if any, would meet the average PCB cleanup goal.

Geotextile Tube Dewatering
Geotextile tube installation and use would be the same as in Alternative 7.

Odor Control
Odor control would be managed in the same manner as Alternative 6.

Water Treatment
Water treatment would be performed in the same manner as Alternative 7.

Off-Site Disposal
Off-site disposal of the dredged sediment would follow the same procedures and regulations as Alternative 6.

Remedial Monitoring
A remediation monitoring program would be established prior to initiating this alternative. Additional data would be collected to further characterize the extent of sediment contamination in each of the hot spot areas. The program would include surface water monitoring to ensure that suspended sediments do not migrate beyond the silt curtains. Decant water from the geotextile tube dewatering process would be tested and treated prior to discharge to the lake, if necessary. An air monitoring program would also be implemented near any sediment transfer facilities and remedial areas to verify the performance of measures designed to prevent or minimize impacts to workers and the community during remediation. As discussed above, post-dredging confirmatory sampling of the each dredged area would be conducted to verify that residual PCB concentrations, if any, would meet the average PCB cleanup goal.

There is no long-term monitoring associated with this alternative because the cleanup of Pegan Cove sediment will result in sediment concentrations consistent with Fisk Pond background concentrations.

Site Restoration/Backfilling
After sediment removal, the dredged hot spot areas would be backfilled with clean fill material, unless the post-remediation confirmatory sampling indicates that the residual concentrations, if any, already meet the average cleanup goal. Clean fill consisting of sand material would be brought on-site and backfilled into each sediment hot spot area to fill the voids produced from the dredging activities. Fill material would be blended to contain a specific total organic carbon content and be free of trash, woody debris, or other obstructions that may create nuisance during placement. Fill material would be slurried and placed in thin lifts within each sediment hot spot area using either a barge mounted diffuser pipe or a rotary turbo nozzle mounted to a barge where the slurry could be sprayed into the water surface.

After each hot spot removal area has been backfilled (if deemed necessary), silt curtains would be removed and the sediment dewatering area would be cleaned. If necessary, the sediment along the border of the remediation area would be re-graded and the banks of the shoreline would be reformed.

15.1.9 Alternative 9 –Hydraulic Dredging/Mechanical Dewatering/Off-Site Disposal/Institutional Controls

Under Alternative 9, contaminated sediment would be pumped via a hydraulic dredge to an onshore sediment slurry storage area where the sediment would be dewatered through the use of a mechanical dewatering device. Once dewatered, the sediment would be shipped off-site to a licensed treatment or disposal facility. The principle components of Alternative 9 include:

- Site Condition Evaluation
- Silt Curtains
- Hydraulic Dredging
- Mechanical Dewatering
- Odor control
- Water Treatment
- Off-Site Disposal
- Remedial Monitoring
- Site Restoration
- Institutional Controls

Site Condition Evaluation
The evaluation of site conditions would be the same as in Alternative 7.

Silt Curtains
Silt curtain installation would be the same as in Alternative 7.

Hydraulic Dredging
Hydraulic dredging techniques would be the same as in Alternative 7.

Mechanical Dewatering
Mechanical dewatering utilizes equipment to physically force water out of the sediment. Typical mechanical dewatering devices include belt presses and recessed plate filters. Both devices utilize the same principle of squeezing water out of sediment or sludge.

Belt presses are sized based on weight or volume of solids to be dewatered and are usually designed for excess capacity so that unanticipated incoming solids can be easily dewatered. Three primary stages of a belt press include a sand and oversize material zone, a conditioning zone, and a dewatering zone. The first operation, sand and oversize material removal, removes sand, trash, and oversized material such as rocks by first passing the sediment slurry over a screen to remove material usually over 20 millimeters (mm). Sand is then removed typically with a sand screw, sump, and conveyor. The sediment conditioning zone would occur with the addition of a dry or wet polymer to coagulate the sediment slurry. Instrumentation is often used to maintain optimal system performance. The conditioned sediment slurry is then introduced to either a belt filter press or recessed plate filter which physically force water out of the conditioned sediment. Typically, a belt filter press will produce a cake of approximately 40 to 50 percent solids by weight while a recessed plate filter press will produce a cake of approximately 50 to 65 percent solids by weight.

Staging for either a belt press or plate filters would have to include an area for dredged sediment slurry storage such as lined holding ponds, an area for a sediment slurry material screen, an area for polymer conditioning, an area for the belt or plate filter presses, an area for a water treatment

system to treat filtrate liquid, and an area for a filter cake storage area. Typically the polymer conditioning and belt or plate presses are housed in a temporary building. Odor inside the building can be problematic and often controlled with ventilation systems and chemicals such as potassium permanganate.

Bench scale testing would be performed with a manufacturer to determine performance data and the best design. Evaluation of equipment would consider capital and operating costs, including polymer, electricity, wash water, solids capture, ventilation and odor control, and further processing. The amount of silt and clay that must be dewatered in a day, the solids content of the slurry, and the time required to fill, empty, and prepare a filter press for the next fill cycle are all important in determining the number of filter presses required for a particular project.

Odor Control
Odor control would be managed in the same manner as Alternative 6.

Water Treatment
Water treatment of sediment filtrate liquid would be treated in the same manner as Alternative 7.

Off-Site Disposal
Off-site disposal of the dredged sediment would follow the same procedures and regulations as Alternative 6.

Remedial Monitoring
Remedial monitoring would be the same as in Alternative 6.

Site Restoration
After remedial activities were complete, the silt curtains would be removed, the mechanical dewatering system would be dismantled, and the sediment dewatering area would be cleaned and restored. If necessary, the sediment along the border of the remediation area would be re-graded and the banks of the shoreline would be reformed. Since the lake is shallow and the excavation would be only a foot deep, we do not anticipate any stability concerns; therefore replacement material for the removed sediment is not necessary.

Institutional Controls
Following sediment removal and site remediation, institutional controls would also be implemented to prohibit fishing from the NSSC shoreline and to reduce the potential for fish consumption from offshore portions of the lake. Institutional controls would be the same as those discussed in Alternative 2.

16.0 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

A comparative analysis of alternatives was conducted during the Feasibility Study (ICF, 2009a). In conformance with US EPA guidelines, the following nine criteria were evaluated in the analysis:

- Overall protection of human health and the environment
- Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)
- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, or volume through treatment
- Short-term effectiveness

- Implementability
- Cost
- State acceptance
- Community acceptance

A summary of the remedial alternatives and the criteria are presented in Table 16-1. An evaluation of each criterion for the alternatives is presented in Table 16-2.

Table 16-1: Comparative Evaluation of Remedial Alternatives

Criteria	Alternative 1 No Action	Alternative 2 Limited Action/Institutional Controls	Alternative 3 Institutional Controls/Environmental Monitoring	Alternative 4 Clay Capping/Monitoring/ Institutional Controls	Alternative 5 Composite Capping/Monitoring/ Institutional Controls	Alternative 6 Mechanical Dry Dredging/Sediment Stabilization/Offsite Disposal/ Institutional Controls	Alternative 7 Hydraulic Dredging/Geo-textile Tube Dewatering/Offsite Disposal/ Institutional Controls	Alternative 8 Hot Spot Hydraulic Dredging/Geo-textile Tube Dewatering/Offsite Disposal	Alternative 9 Hydraulic Dredging/Mechanical Dewatering/Offsite Disposal/ Institutional Controls
Overall protection of human health and the environment	PCB-impacted sediments will continue to pose an incremental risk, if individuals are catching and eating fish near the NSSC shoreline.	Institutional controls provide protection of human health by reducing human exposure to fish at and near the NSSC shoreline that may contain PCBs.	This alternative is protective of human health by reducing sediment PCB concentrations through natural recovery processes and implementing institutional controls to reduce exposure to fish at and near the NSSC shoreline that may contain PCBs.	This alternative is protective of human health by: isolating PCB-impacted sediments through capping; further reducing sediment PCB concentrations through natural recovery processes; and implementing institutional controls to reduce exposure to fish at and near the NSSC shoreline that may contain PCBs.	Same as Alternative 4.	This alternative is protective of human health by: stabilization, removal/dredging, and landfilling of PCB-impacted sediments; and implementing institutional controls to reduce exposure to fish at and near the NSSC shoreline that may contain PCBs.	This alternative is protective of human health by: removal and landfilling of PCB-impacted sediments; and implementing institutional controls to reduce exposure to fish at and near the NSSC shoreline that may contain PCBs.	This alternative is protective of human health by: removal of sediment in areas containing high PCB concentrations, landfilling of PCB-impacted sediments; and implementing site control measures during remedial activities. Site control measures, including signage, would be implemented to reduce exposure to fish at and near the NSSC shoreline that may contain PCBs.	Same as Alternative 7.
Compliance with ARARs	Does not comply with ARARs because there is no remedial action to clean up the PCBs in sediment.	Does not comply with ARARs because there is no remedial action to clean up the PCBs in sediment.	Meets or attains federal and state ARARs that apply to the site including chemical-, location-, and action-specific ARARs.	Meets or attains federal and state ARARs that apply to the site, including chemical-, location-, and action-specific ARARs.	Same as Alternative 4.	Meets or attains federal and state ARARs that apply to the site, including chemical-, location-, and action-specific ARARs.	Same as Alternative 6.	Same as Alternative 6.	Same as Alternative 6.
Long-term effectiveness and permanence	This alternative may have a low effectiveness at reducing risk in the long-term, based on the probable slow rate of natural recovery of PCBs in sediment. This alternative does not provide a permanent solution to addressing the increased risk to individuals fishing at the NSSC shoreline.	This alternative is effective in the long-term, provided that the institutional controls are adequately maintained and enforced over time. This alternative does not provide a permanent solution by removing or isolating the sediments containing PCBs.	MNR by itself is not effective in the long-term, however, this alternative is effective provided that the institutional controls are adequately maintained and enforced over time. This alternative does not provide a permanent solution by removing or isolating the sediments containing PCBs.	Possibly effective in the long-term at limiting the potential for exposure at the NSSC shoreline areas, with appropriate cap integrity monitoring and maintenance, and adequate maintenance and enforcement of institutional controls.[1]	Same as Alternative 4.	Possibly effective in the long-term at limiting the potential for exposure at NSSC shoreline areas through removal of PCB-impacted sediments, and adequate maintenance and enforcement of institutional controls.[1]	Same as Alternative 6.	Possibly effective in the long-term at limiting the potential for exposure at NSSC shoreline areas through removal of hot spot PCB-impacted sediments, and adequate maintenance of site control measures.[1]	Same as Alternative 6.
Reduction of toxicity, mobility, and volume through treatment	This alternative does not actively reduce the toxicity, mobility, or volume of PCBs in sediments at the NSSC shoreline, except through natural processes.	This alternative does not actively reduce the toxicity, mobility, or volume of PCBs in sediments at the NSSC shoreline, except through natural processes.	This alternative does not actively reduce the toxicity, mobility, or volume of PCBs in sediments at the NSSC shoreline, except through natural degradation processes. Relies on naturally occurring processes such as sediment deposition, dispersion, advection, and biotransformation processes to sequester, destroy, or dilute the PCBs in sediment.	The mobility of the PCBs in capped areas is reduced because the PCBs are sequestered under the constructed cap. However, there is no reduction in the toxicity or volume of the PCBs under the cap, except through natural processes.	Same as Alternative 4.	This alternative would reduce mobility and toxicity of PCB-impacted sediments through removal. Through institutional controls, this alternative would reduce potential human exposures to and risks from PCBs associated with the consumption of fish. This alternative does not destroy PCBs, however, permitted landfill disposal would provide effective containment and isolation of the PCBs.	Same as Alternative 6.	This alternative would reduce mobility and toxicity of PCB-impacted sediments through removal in areas along the NSSC shoreline containing elevated PCB concentrations. Through site control measures, this alternative would also reduce potential human exposures to and risks from PCBs associated with the consumption of fish. This alternative does not destroy PCBs, however, permitted landfill disposal would provide effective containment and isolation of the PCBs.	Same as Alternative 6.

Table 16-1: Comparative Evaluation of Remedial Alternatives

Criteria	Alternative 1: No Action	Alternative 2: Limited Action/Institutional Controls	Alternative 3: Institutional Controls/Environmental Monitoring	Alternative 4: Clay Capping/Monitoring/ Institutional Controls	Alternative 5: Composite Capping/Monitoring/ Institutional Controls	Alternative 6: Mechanical Dry Dredging/Sediment Stabilization/Offsite Disposal/ Institutional Controls	Alternative 7: Hydraulic Dredging/Geo-textile Tube Dewatering/Offsite Disposal/ Institutional Controls	Alternative 8: Hot Spot Hydraulic Dredging/Geo-textile Tube Dewatering/Offsite Disposal	Alternative 9: Hydraulic Dredging/Mechanical Dewatering/Offsite Disposal/ Institutional Controls
Short Term Effectiveness	This alternative is not associated with any potential short-term human exposures and risks, as there is no active remediation being undertaken.	This alternative does not affect public health or workers in the short-term.	This alternative would not affect the community in the short-term. The worker risk associated with the monitoring program is expected to be minimal.	Increased road and lake traffic during remedy implementation could affect the community. With proper safety practices, risks to workers is minimal. Potential environmental impacts from sediment resuspension would be addressed using water quality control measures such as silt curtains. Disturbance or alteration of aquatic habitats would be addressed by timing construction periods to avoid critical life-cycle periods.	Same as Alternative 4.	Increased road/lake traffic and potential air/noise issues during remedy implementation could affect the community. With proper safety practices, risks to workers is minimal. Potential environmental impacts from sediment resuspension and aqueous discharge from dewatering operations would be addressed using water quality control measures such as silt curtains and effluent treatment. Disturbance or alteration of aquatic habitats would be addressed by timing construction periods to avoid critical life-cycle periods.	Same as Alternative 6.	Same as Alternative 6.	Same as Alternative 6.
Implementability	Easily implementable.	Easily implementable, but would require cooperation between the Army and the State agencies responsible for fish advisories (MassDPH) and for Lake Cochituate (MassDCR). The Army would need to develop an enforceable cooperative agreement with the appropriate State agencies to implement and enforce the offshore ICs.	Monitoring program and institutional controls are easily implementable, but would require cooperation between the Army and the state agencies responsible for fish advisories (MassDPH) and for Lake Cochituate (MassDCR). The Army would need to develop an enforceable cooperative agreement with the appropriate State agencies to implement and enforce the offshore ICs.	Technically and administratively feasible – the required services and materials are readily available. Institutional controls would require cooperation between the Army and the State agencies responsible for fish advisories (MassDPH) and for Lake Cochituate (MassDCR). The Army would need to develop an enforceable cooperative agreement with the appropriate State agencies to implement and enforce the offshore ICs.	Same as Alternative 4.	Technically and administratively feasible – the required services and materials are readily available. However, dewatering could be challenging if high groundwater infiltration rates are encountered, stabilization could be difficult due to the physical characteristics of the sediment, and out-of-state landfilling may be required if sediment PCB concentrations are higher than anticipated or the physical characteristics of the dredged sediment do not allow for disposal at an in-state landfill. Institutional controls would require cooperation between the Army and the State agencies responsible for fish advisories (MassDPH) and for Lake Cochituate (MassDCR). The Army would need to develop an enforceable cooperative agreement with the appropriate State agencies to implement and enforce the offshore ICs.	Technically and administratively feasible – the required services and materials are readily available. However, out-of-state landfilling may be required if sediment PCB concentrations are higher than anticipated or the physical characteristics of the dredged sediment do not allow for disposal at an in-state landfill. Institutional controls would require cooperation between the Army and the State agencies responsible for fish advisories (MassDPH) and for Lake Cochituate (MassDCR). The Army would need to develop an enforceable cooperative agreement with the appropriate State agencies to implement and enforce the offshore ICs.	Technically and administratively feasible – the required services and materials are readily available. However, out-of-state landfilling may be required if sediment PCB concentrations are higher than anticipated or the physical characteristics of the dredged sediment do not allow for disposal at an in-state landfill. The Army could easily develop and maintain site control measures, including signs to reduce exposure to fish at and near the NSSC shoreline and to limit boating in the dredging areas. Additional signs would be provided to MassDEP, MassDPH, and/or MassDCR, if requested.	Technically and administratively feasible – the required services and materials are readily available. However, mechanical dewatering requires a relatively large area, can be mechanically complex, and can require extensive maintenance. Out-of-state landfilling may be also be required if sediment PCB concentrations are higher than anticipated or the physical characteristics of the dredged sediment do not allow for disposal at an in-state landfill. Institutional controls would require cooperation between the Army and the State agencies responsible for fish advisories (MassDPH) and for Lake Cochituate (MassDCR). The Army would need to develop an enforceable cooperative agreement with the appropriate State agencies to implement and enforce the offshore ICs.

Table 16-1: Comparative Evaluation of Remedial Alternatives

Criteria	Alternative 1 No Action	Alternative 2 Limited Action/Institutional Controls	Alternative 3 Institutional Controls/Environmental Monitoring	Alternative 4 Clay Capping/Monitoring/ Institutional Controls	Alternative 5 Composite Capping/Monitoring/ Institutional Controls	Alternative 6 Mechanical Dry Dredging/Sediment Stabilization/Offsite Disposal/ Institutional Controls	Alternative 7 Hydraulic Dredging/Geo-textile Tube Dewatering/Offsite Disposal/ Institutional Controls	Alternative 8 Hot Spot Hydraulic Dredging/Geo-textile Tube Dewatering/Offsite Disposal	Alternative 9 Hydraulic Dredging/Mechanical Dewatering/Offsite Disposal/ Institutional Controls
Cost (using contingency of 30% for capital costs)	Total NPV of costs is $193,000: No capital costs. Annual average O&M costs of about $10,000 for the CERCLA-required five-year reviews over a 30-year period; NPV of O&M costs is $193,000.	Total NPV of costs is $399,000: $165,000 in capital costs for public outreach and producing the initial signs prohibiting fishing along the NSSC shoreline. Annual average O&M costs of about $12,000 over a 30-year period, including the periodic cost of maintaining the signage and the five-year reviews; NPV of O&M costs is $234,000.	Total NPV of costs is $2.62 million: $983,000 in capital costs for developing an effective public outreach/education program, baseline survey, preparing the O&M plans, conducting natural recovery modeling analyses, and producing the signs prohibiting fishing along the NSSC shoreline. Annual average O&M costs of about $74,000 over a 30-year period, including the costs of monitoring, continued public outreach/education, and performing CERCLA-required five year reviews; NPV of O&M costs is $1.63 million.	Total NPV of costs is $10.3 million: $8.47 million in capital costs for design, pre-remedial survey, equipment mobilization/ demobilization, cap material and construction, monitoring during construction, oversight and administration, post construction survey, public outreach/education, preparation of the O&M plans, and production of the signs prohibiting fishing along the NSSC shoreline. Annual average O&M costs of about $82,000 over a 30-year period, including the monitoring costs and the periodic costs of the cap repair and five-year reviews; NPV of O&M costs is $1.83 million.	Total NPV of costs is $5.48 million: $3.65 million in capital costs for design, pre-remedial survey, equipment mobilization/demobilization, cap material and construction, monitoring during construction, oversight and administration, post construction survey, public outreach/education, preparation of the O&M plans, and production of the signs prohibiting fishing along the NSSC shoreline. Annual average O&M costs of about $82,000 over a 30-year period, including the monitoring costs and the periodic costs of the cap repair and five-year reviews; NPV of O&M costs is $1.83 million.	Total NPV of costs is $22.0 million: $21.0 million in capital costs for design, pre-remedial survey, equipment mobilization/demobilization, silt curtain and cofferdam construction, dewatering, odor control, sediment stabilization, dredging, water treatment, off-site sediment disposal, monitoring during construction, oversight and administration, public outreach/education, preparation of the O&M plans, and production of the signs prohibiting fishing along the NSSC shoreline. Annual average O&M costs of about $110,400 over a 10-year period, including the monitoring costs and the costs of the five-year reviews; NPV of O&M costs is $983,000.	Total NPV of costs is $18.8 million: $17.8 million in capital costs for design, pre-remedial survey, equipment mobilization/demobilization, silt curtain installation, dredging, odor control, geo-textile tube dewatering, water treatment, off-site sediment disposal, monitoring during construction, oversight and administration, public outreach/education, preparation of the O&M plans, and production of the signs prohibiting fishing along the NSSC shoreline. Annual average O&M costs of about $110,400 over a 10-year period, including the monitoring costs and the costs of the five-year reviews; NPV of O&M costs is $983,000.	Total NPV of costs is $4.12 million: $4.12 million in capital costs for design, pre-remedial survey, equipment mobilization/ demobilization, silt curtain installation, dredging, odor control, geo-textile tube dewatering, water treatment, off-site sediment disposal, monitoring during construction, confirmatory sediment sampling, backfilling, oversight and administration, public outreach/ education, and production of the signs prohibiting fishing along the NSSC shoreline. There are no annual O&M costs for this remedial option.	Total NPV of costs is $15.6 million: $14.6 million in capital costs for design, pre-remedial survey, equipment mobilization/demobilization, silt curtain installation, dredging, mechanical dewatering, water treatment, odor control, off-site sediment disposal, monitoring during construction, and oversight and administration, public outreach/education, preparation of the O&M plans, and production of the signs prohibiting fishing along the NSSC shoreline. Annual average O&M costs of about $110,400 over a 10-year period, including the monitoring costs and the costs of the five-year reviews; NPV of O&M costs is $983,000.

Notes:

1. These alternatives are "possibly" effective, as capping or removing the PCB-impacted sediments at the NSSC shoreline may or may not reduce the concentrations of PCBs in fish caught at these locations, based on the existence of PCB-impacted sediments in other non-NSSC-impacted locations on South Pond.

Table 16-2: Evaluation of Alternatives

Evaluation Criteria / Alternative	1 No Action	2 Limited Action/ Institutional Controls	3 Institutional Controls/ Environmental Monitoring	4 Clay Capping/ Monitoring/ Institutional Controls	5 Clay Capping/ Monitoring/ Institutional Controls	6 Mechanical Dredging/ Sediment Stabilization/ Off-Site Disposal/ Institutional Controls	7 Hydraulic Dredging/ Geotextile Tube Dewatering/ Off-Site Disposal/ Institutional Controls	8 Hot Spot Hydraulic Dredging/ Geotextile Tube Dewatering/ Off-Site Disposal/Backfilling	9 Hydraulic Dredging/ Mechanical Dewatering/Off-Site Disposal/ Institutional Controls
1. Overall Protection of Human Health and the Environment	○	●	●	●	●	●	●	●	●
2. Compliance with *ARARs*	○	○	●	●	●	●	●	●	●
3. Long-Term Effectiveness and Permanence	○	◖	◖	●	●	●	●	●	●
4. Reduction of Toxicity, Mobility, or Volume through Treatment	◖ *	◖ *	◖ *	◖	◖	●	●	●	●
5. Short-Term Effectiveness	●	●	●	●	●	◖	◖	◖	◖
6. Implementability	●	●	●	●	●	●	●	●	●
7. Capital Costs ($)	0	165,000	983,000	8,468,000	3,653,000	21,027,000	17,821,000	4,122,000	14,634,000
O&M Costs (PW) ($)	193,000	234,000	1,633,000	1,829,000	1,829,000	983,000	983,000	0	983,000
Total NPV ($)	193,000	399,000	2,616,000	10,297,000	5,482,000	22,010,000	18,804,000	4,122,000	15,617,000
8. State Acceptance [1]	●	○	○	○	○	○	○	●	○
9. Community Acceptance [2]	●	○	○	○	○	○	○	●	○

Notes:

- ● Meets or exceeds criteria
- ◖ Partially meets criteria
- ○ Does not meet criteria
- * Partially meets criteria due to natural reduction of chemical concentrations in sediment over time;
- PW Present Worth
- NPV Net Present Value
- 1 The Commonwealth of Massachusetts has expressed its support for Alternative 1 for the NSSC shoreline sediment outside of Pegan Cove and Alternative 8 for NSSC shoreline within Pegan Cove.
- 2 The town of Natick and some community representatives have generally supported the Selected Remedies, but have expressed concerns about certain components of Alternative 8. These concerns are presented and addressed in Part 3 (Responsiveness Summary) of this ROD.

17.0 PRINCIPAL THREAT WASTES

The NCP establishes an expectation that US EPA will use treatment to address the principle threats posed by a site wherever practical (NCP §300.430(a)(1)(iii)(A)). The principle threat concept is applied to characterization of source materials at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to ground water, surface water, or air, or act as a source for direct exposure. The principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur.

No principle threat wastes were detected in sediment located along the NSSC shoreline outside of Pegan Cove from the T-25 Area outfall to the Building 2/45 Area outfall, as site investigations and risk assessments have determined that there is no unacceptable human health or ecological risks associated with these sediments.

No principle threat wastes were detected in sediment located along the NSSC shoreline within Pegan Cove, including at the Main Stormwater Outfall. Site investigations and risk assessments have found an unacceptable human health risk associated with eating native fish caught along the NSSC shoreline in this area. Although PCBs are considered to be toxic, there were no principle threat wastes detected from surface water or sediment samples collected throughout Pegan Cove. PCBs adsorbed to fine grained sediment are not migrating as a contaminant source to groundwater, surface water, or air, and the current site usage of Pegan Cove is not expected to change in the near future. The selected remedy includes removal of sediment containing elevated PCB concentrations to be transported off-site to a disposal facility. The only treatment which may be employed during remedial actions is stabilizing the sediment for dewatering purposes.

18.0 SELECTED REMEDIES

As described, the sediment at the NSSC shoreline has been separated into two areas, based on the site investigations and the results of sediment risk assessments.

The first area is the NSSC shoreline outside of Pegan Cove from the T-25 Area outfall at NSSC's northern shoreline boundary south to the Building 2/45 Outfall. This shoreline area includes outfalls associated with four areas of concern, the T-25 Area, Building 2/45 Area, Boiler Plant Area, and Building 22/36 Area. No Action is selected for NSSC shoreline outside of Pegan Cove, as site investigations and risk assessments have determined that there is no unacceptable human health or ecological risk associated with the sediments.

The second sediment area is along the NSSC shoreline within Pegan Cove, and includes the Main Stormwater Outfall area of concern. For the sediment within Pegan Cove, based on the potential for human health risk associated with eating native fish caught along the NSSC shoreline within Pegan Cove, the planned remedy is Alternative 8 - Hot Spot Dredging, Geotextile Tube Dewatering, Off-Site Disposal, and Backfilling. Alternative 8 involves the removal of PCB-contaminated sediment, using hydraulic dredging techniques, from four hot spot areas within Pegan Cove to reduce the average PCB concentration within Pegan Cove to below the sediment cleanup goal of 1.0 mg/kg. The dredged areas will be backfilled with clean fill material, unless post-remediation confirmatory sampling indicates that the residual concentrations, if any, already meet the average cleanup goal.

18.1 SELECTED REMEDY FOR NSSC SHORELINE SEDIMENT OUTSIDE OF PEGAN COVE (T-25, BUILDING 2/45, BOILER PLANT, AND BUILDING 22/36)

The selected remedy for NSSC shoreline sediment outside of Pegan Cove is Alternative 1 - No Action. No Action means that no response to site contamination is made and that no monitoring is required.

Numerous environmental investigations and risk assessments have been conducted for the NSSC shoreline since the early 1990s. The Army has performed extensive sampling and analysis of sediment, surface water, mussels, and fish from the NSSC shoreline and across all the major ponds of Lake Cochituate. Sediment toxicity testing, invertebrate surveys of sediment-dwelling organisms, and wildlife surveys have also been conducted.

Using the data generated from the studies, comprehensive human health and ecological risk assessments have been completed to evaluate the potential risk to humans and the environment. The approaches and final reports for each site investigation and risk assessment were reviewed and approved by the US EPA and MassDEP. In addition, the federal ATSDR, a division of the U.S. Centers for Disease Control, performed an independent health assessment in 1997 for the sediment and surface water associated with the T-25 Area outfall of the NSSC shoreline.

Based on the results of the human health and ecological risk assessments, sediment associated with the NSSC shoreline outside of Pegan Cove has been determined to pose no unacceptable human health or ecological risk. The selected remedy for the NSSC shoreline sediment outside of Pegan Cove is No Action.

18.2 SELECTED REMEDY FOR SHORELINE SEDIMENT WITHIN PEGAN COVE

The selected remedy for NSSC shoreline sediment within Pegan Cove is Alternative 8 - Hot Spot Hydraulic Dredging, Geotextile Tube Dewatering, Off-Site Disposal, and Backfilling. This alternative was selected over the other alternatives because it is technically feasible, meets all Federal and State ARARs, is cost effective in comparison to the other dredging alternatives, and is expected to achieve long-term risk reduction through sediment removal and off-site disposal.

Although some sediment containing PCBs will remain on-site, the average sediment PCB concentration within Pegan Cove after hot spot dredging is performed will be less than the sediment cleanup goal of 1 mg/kg. Because the sediment removed from the hot spot areas will be disposed off-site, O&M activities and five-year reviews of the sediment remedy will not be required. The selected remedy will meet the objective of the RAO – to reduce the potential for sediment-associated human health risks due to PCBs in native fish caught near the NSSC shoreline currently and in the future by removing volumes of sediment-containing elevated PCB concentrations and backfilling those dredged areas with clean fill material. Site control measures including signs will be put in place prior to and during remedial activities to limit boating in the areas of the dredging operation and to restrict fishing from the NSSC shoreline.

Although the Army and US EPA do not expect any significant changes to this remedy, slight changes may occur during the remedial design. Any changes to the remedy described in this ROD would be documented using a technical memorandum in the Administrative Record, an Explanation of Significant Differences (ESD), or a ROD Amendment, as appropriate and consistent with the applicable regulations.

18.2.1 Alternative 8 - Hot Spot Dredging/Geotextile Tube Dewatering/Off-Site Disposal/Backfilling

Alternative 8 involves the removal of PCB-contaminated sediment, using hydraulic dredging techniques, from four hot spot areas within Pegan Cove to reduce the average PCB concentration within Pegan Cove to below the sediment cleanup goal of 1.0 mg/kg. The dredged areas will be backfilled with clean fill material, unless the post-remediation confirmatory sampling indicates that the residual concentrations, if any, already meet the average cleanup goal. Dredged sediment will be collected into geotextile tubes for dewatering and subsequently transported to an off-site disposal/treatment facility.

Four separate areas within Pegan Cove are designated as "hot spot" areas based on PCB concentrations in sediment from samples collected in 2007. Figure 15-1 illustrates the four hot spot areas which include: three 6-inch dredge depth areas and one 12-inch dredge depth area in front of the Main Stormwater Outfall. These areas were developed using the 2007 sediment sample PCB concentrations as input data for the contouring and mapping software Surfer® (version 8.05) and its default kriging method. In order to achieve an average PCB concentration below 1.0 mg/kg within Pegan Cove, the 2007 sediment sampling point locations and PCB concentrations were run through the kriging method in Surfer®. Kriging is an interpolation technique in which the surrounding measured values are weighted to derive a predicted value for an unmeasured value. In this case, the PCB concentrations for unmeasured values were interpolated. The dataset included an X, Y, and Z value (easting, northing, and PCB concentration) from each sampling point. A statistical report was generated in Surfer® which included a mean value for Z (a mean PCB concentration based on the dataset). By replacing certain Z values, or PCB concentrations, with ½ the detection limit of the clean fill (0.0025 mg/kg was used), and running the statistical report again, the mean Z value or concentration decreased. This process was repeated iteratively until the mean Z value was below the cleanup goal of 1.0 mg/kg. The Surfer® data was then incorporated into AutoCAD where sediment removal areas were drawn in and sediment removal volumes were calculated.

This alternative will include several principle components:

Site Condition Evaluation

A pre-remediation acoustical survey and baseline sediment sampling will be initiated throughout each hot spot remediation area. The acoustical survey will determine the lake bottom bathymetry. The pre-remediation acoustical survey will be used to determine the expected depth of the lake in the dredging areas and to locate areas of debris. The post-remediation acoustical survey will determine the volume and depth of sediment removed from each hot spot area. Baseline sampling will include the collection and analysis of additional sediment samples to further refine the extent of PCB contamination in each hot spot area. If the additional pre-cleanup sediment sampling data indicate elevated PCB concentrations, the Army will consider additional sediment removal if warranted.

Site Control Measures

Prior to initiating the selected remedy, site control measures will be put in place. The site control measures will include posting signs along the Army's security perimeter fence that will limit boating in the area of the dredging activities during the remedial action. Additionally, signage will be posted that will prohibit fishing from the NSSC shoreline within Pegan Cove. The signs will be constructed of metal and secured to the NSSC perimeter fence along the shoreline with Pegan Cove. The signs will include universal symbols indicating that fishing is prohibited, and contain

warnings in different languages that are representative of the demographic populations that use Lake Cochituate.

Once remedial activities are completed, the signs restricting boating will be removed and the signs prohibiting fishing will remain in place and be maintained by the Army. If requested, the Army will provide additional sign templates to appropriate state agencies, such as the MassDEP, MassDPH, and MassDCR.

Silt Curtains

Due to possible sediment re-suspension during dredging operations, two silt curtains will be installed around the perimeter of each sediment hot spot dredging area. The first (or interior) silt curtain will act as the primary containment, while a second (or exterior) silt curtain installed right behind the first will act as a secondary containment. The silt curtains will be designed to control the settling of fine grained solids suspended in water by providing a controlled area of containment. Silt curtains are flexible barriers that hang down from the water surface to the bottom of the lake and use a series of floats on the water surface, and a ballast chain or anchors along the bottom. The silt curtains will be made from filter fabrics or impervious polyethylene material such as coated nylon.

The silt curtains will be deployed with a small vessel and will be anchored to the shoreline, with the curtain extending the entire depth of the water, anchored to the bottom. The weighted bottom of the curtain will maintain contact with the bottom of the lake in order to keep sediment from flowing under the curtain. In order to do this, enough slack will be provided to allow the curtain to rise and fall, as the depth of the water body varies due to wave action, without breaking contact with the bottom of the water body. Since the depth of water within the dredging area is typically shallow (less than 10 feet) and there are no strong currents, a Type I silt curtain with a curtain depth between 8 and 24 feet should be appropriate and will be strung along the outside perimeter of each dredging area and weighted down to the bottom. An additional 10 to 20 percent of the straight line measurement will be added to each silt curtain to allow for easier installation and reduce any stress caused by high winds and waves.

As discussed further in the Remedial Monitoring section below, surface water monitoring (including turbidity and water transparency measurements - as determined by Secchi disks) will occur during dredging operations between the primary and secondary silt curtains as well as outside of the secondary silt curtain perimeter. This monitoring data will be used as a real-time indicator of the effectiveness of the silt curtains at preventing migration of sediment outside of the hot spot areas. The remedial design plans will establish specific monitoring techniques and frequencies, and contingency plans will be implemented in the event established monitoring limits are exceeded.

Hydraulic Dredging

Figure 15-1 illustrates the locations of the four hot spot dredging areas, which include: three 6-inch dredge depth areas and one 12-inch dredge depth area in front of the Main Stormwater Outfall. An estimated total volume of 2,510 cubic yards of contaminated sediment will be removed using the hydraulic dredging technique.

Hydraulic dredging removes and transports dredged materials as a pumped sediment-water slurry. The sediment is dislodged by mechanical agitations using a cutterhead or auger which cut and loosen the sediment prior to it being pumped out. In very soft sediment, such as the sediment within Pegan Cove, it may be possible to remove surface sediment by straight suction and/or by forcing the intake into the sediment without dislodgement.

The loosened slurry is then pumped into an intake pipe by the dredge and transported through high-density polyethylene pipelines to a dewatering facility located onshore. The slurry pipeline is configured in two principal sections with the first section floating immediately behind the dredge on a system of pontoons to enable the dredge to maneuver. The second pipeline sections will run above ground, along the shoreline to the sediment dewatering process station onshore. The sediment slurry pipeline could approach a maximum length of about 1,500 feet. The ultimate length of the pipeline will depend on the distance from the dredge to the location where the sediment slurry will be processed. The pipeline can be a single pipe or over packed with the transfer pipe inside a containment pipe to contain any potential leaks or breaks in the line.

Part of the remedial design phase will include considerations for the type of hydraulic dredge to be used, including a swinging ladder or auger type. Typically, auger type hydraulic dredges are used when the lake bottom is flat. Due to the shallow water conditions in Pegan Cove, a dredge with minimal draft will be required, especially within shallow areas along the shoreline.

All sediment removed by the hydraulic dredging system will be conveyed through the slurry pipeline to dewatering stations set up within open areas along the eastern shoreline of the NSSC facility. Due to the relatively short distance and minimal total dynamic head, it is expected that the sediment slurry will be transferred directly from the dredge pump to the onshore dewatering process station with no booster pumps required. To further control sediment re-suspension and improve overall productivity, modifications to the dredge such as the geometry of the cutterhead suction pipe, additions to the shroud, and improved operation of ladder mechanism from which the suction pipe is mounted may be made during operation. It is expected that the hydraulic dredging system will be fitted with state-of-the-art electronic positioning equipment so that the work is performed as efficiently and precisely as possible.

Typical hydraulic dredges have hull dimensions of up to 48 feet x 11 feet x 10 feet with a draft between 1.5 to 3 feet and 600 horsepower (HP) main pump and 200 HP auxiliary pumps. Dredges can be advance by alternatively raising and lowering spuds located at the rear of the dredge, or advance by mechanical self propulsion. Typical cutterhead suction and discharge diameters range from 8 to 12 inches in diameter with pumps capable of pumping up to 3500 gallons per minute (GPM) of water. Production rates for a typical auger dredge removing fine sand (0.1mm) are estimated between 90 cy per hour with an 8-inch diameter discharge to 200 cy per hour with a 10-inch diameter discharge. Production rates for typical cutterhead dredge with an 8-inch discharge diameter dredging highly organic sediment are estimated at up to 840 cy per day.

Debris which may interfere with production could consist of submerged dead tree branches along the shoreline, submerged aquatic vegetation, and/or boulders or cobbles on the bottom of the lake. If significant debris is encountered, the sediment-water slurry will be screened to remove the debris prior to pumping it into the geotextile tubes. In the event submerged aquatic vegetation, such as Eurasian Milfoil, become a nuisance to dredging operations by fouling a cutterhead or clogging transfer pumps, a device may be attached to the dredge in place of the cutterhead which chops the weeds into one to three inch pieces and pumps them to the shore using the dredge pump. Mechanical rakes may also be used which would rake up any aquatic weeds growing just above the lake floor. The installed double silt curtain will insure that any nuisance weed remnants do not migrate beyond the remediation area. Any debris or vegetation removed from the sediment-water slurry will be appropriately disposed of in a licensed off-site treatment/disposal facility.

Hydraulic dredging production rates will depend on the excavating and pumping characteristics of the sediment, the pumping capability of the dredge pump, cut volume of the dredged area, and the

length and hydraulic characteristics of the sediment slurry pipeline. Other factors will include the hours per day of operation, days per week of operation, and number of seasonal weeks.

Based on the estimated total volume of 2,510 cubic yards of sediment to be removed from the hot spot areas in Figure 15-1, a production rate of up to 840 cubic yards of sediment per day, a geotextile tube volume of 530 cy, an estimated dewatering period of 30 days, and a 15 day sediment offloading period, it is estimated to take approximately 50 days to dredge the impacted sediment into the geotextile tubes for dewatering and off-site disposal, not including mobilization time.

Following the hot spot dredging and prior to removal of the primary or secondary silt curtain, and prior to backfill, post-dredging confirmatory sampling of the each dredged area will be conducted to verify that residual PCB concentrations, if any, will meet the average PCB cleanup goal. The specifics of the confirmatory sampling will be further described in the remedial design plan.

Geotextile Tube Dewatering

Geotextile tubes are fabricated from a woven polypropylene geo-textile containing heavy monofilament and fibrillated yarns. The tubes are designed to withstand pressures created when pumping material into them and have the hydraulic properties required to retain fine grained solids while allowing water to pass through them. Typically geotextile tubes are made of black geotextile that can act as a passive solar collector, assisting in the drying phase.

The tubes work in conjunction with hydraulic dredging rigs where the sediment-water slurry will be pretreated either before being pumped into the tube, or pumped directly into the tube. Pretreatment will consist first of removing debris such as bark, vegetation, trash, rocks, and sand, if the sediment slurry has a large sand fraction. Secondly, a flocculent may be incorporated into the sediment slurry prior to being pumped into the tube, to assist in the dewatering process. The fabric size opening is typically larger then the grain size of the dredge material. Sediment retention inside the bag is created by a filter cake which forms on the inside of the fabric shell, creating the equivalent of a second filter where filtration efficiencies of over 98-percent are not uncommon with fine grained dredge material.

A designated dewatering area will be established onshore where a hydraulic dredge would pump sediment directly into the geotextile bag, unless pretreatment is first required. The dewatering area will be large enough to house several long geotextile tubes (up to 300 feet) having a circumference of up to 45 feet, with decant water treated on-site prior to discharge to the lake. A water containment system constructed around each tube will collect water for treatment prior to discharge. The water collection system will be lined with plastic, bermed to contain a volume of sediment in the event of a severe rupture in a tube, contain silt fencing for erosion control, contain a water collection system to collect decant water, and a water treatment system to treat decant water prior to discharge back to the lake.

A treatability study for the dewatering of dredged sediment with geotextile tubes will be carried out to assess that the sediments can be effectively dewatered and whether flocculants or changes in the geotextile material composition (e.g., pore size) may be necessary to facilitate the dewatering process.

Odor Control

Odor control measures will include the geotextile tubes used in the dewater process. Part of the retention process which occurs because of the physical properties of the geotextile fabric and the filter cake that forms on the inside of the fabric shell, creates a two stage filter which also aids in

retaining odors. If odors are determined to be a concern during initial operation of the remedial action, a microbial consortium may be added to the sediment slurry during the dredging process and filling of the geotextile tubes. The microbes feed on organic matter such as hydrogen sulfide and convert it into odorless hydrogen sulfate. Odor neutralizers or oxidizers such as sodium hypochlorite or potassium permanganate may also be added to the sediment slurry while the geotextile bags are being filled and/or sprayed over the geotextile bags especially when loading the dewatered sediment for off-site disposal.

Water Treatment

As discussed below in the Remediation Monitoring section, the contained decant water from the geotextile tube dewatering process will be tested prior to discharge into the lake. If the decant water contains contaminants that exceed applicable discharge criteria, it will be treated prior to discharge to the lake. The decant water may need to be treated for any of the contaminants above Ambient Water Quality Criteria (AWQC). The water treatment plant used for this dredging project will consist of a combination of a rapid mixing basin, flocculation chamber, settling basin, and mixed media filters to remove solids from the stream and/or granular activated carbon filters to remove dissolved PCBs. Water treatment components such as filters and activated carbon, may require special handling and disposal if PCB concentrations in the decant water are high. The treated effluent from the system would then be tested again to ensure it meets applicable discharge criteria. Treatability studies will determine if the decant water can be successfully treated on site or if it will need to be sent to the Army's treatment facility or to a POTW.

Typical sediment slurries produced from hydraulic dredging, contain 10 to 30 percent solids by volume. If the dredged sediment slurry from Pegan Cove contains 10 to 30 percent solids by volume, it is estimated that the volume of water that will require treatment could range from 140 to 180 gallons of water per in-situ cubic yard of sediment removed. Sediment containing 40 percent solids could require treating a volume of 120 gallons of water per cubic yard.

Off-Site Disposal

Following the dewatering of the dredged sediment, the geotextile bags will be cut open and the sediment will be loaded onto trucks and shipped to a licensed off-site disposal or treatment facility. All sediment removal and disposal will comply with applicable federal, state, and local regulations for the storage, handling, and disposal of all PCB wastes. Off-site disposal of the PCB-impacted sediment will be based on as found (in situ) PCB concentrations. However, additional sediment characterization will be performed after it has been dewatered, if required for acceptance to an off-site disposal/treatment facility. The type and number of characterization samples will be dependent on what the disposal/treatment facility requests. The characterization of sediment after dewatering compared to in-situ sampling for disposal characterization provides the advantage of being a more accurate characterization of the material to be disposed, does not diminish any environmental benefit or protection, and typically is significantly more cost effective.

Disposal of dredged sediment will follow the 1997 guidelines outlined in Policy # COMM-97-001, *Reuse and Disposal of Contaminated Soil at Massachusetts Landfills,* which supersedes the MassDEP Policy # Bureau of Waste Practices BWP-94-037. Policy # COMM-97-001 maintains consistency with the 1995 MassDEP Policy # COMM-94-007, *Interim Policy for Sampling, Analysis, Handling, and Tracking Requirements for Dredged Sediment Reused or Disposed at Massachusetts Permitted Landfills.* Policy # COMM-97-001, in conjunction with 310 CMR 30.000, provides information about the MassDEP requirements, standards, management practices and approvals for testing, tracking, transport, and reuse or disposal of contaminated soil at Massachusetts landfills. The dredging activities for Pegan Cove are regulated under 314 CMR 9.04

and require a 401 WQC subject to the Criteria for Evaluation of Applications for the Discharge of Dredged or Fill Material.

Policy # COMM-97-001 allows proponents to perform one set of tests to satisfy the requirements for both the WQC and the BWP. If contaminants do not exceed the maximum allowable contaminant levels for sediment reuse at lined landfills as outlined in Table 1 of the MassDEP Policy # COMM-97-001 (see Table 18-1), an applicant need not obtain individual BWP review and approval for sediment reuse at a lined landfill.

WQC applicants would be required to test for additional constituents if an applicant is proposing landfill reuse/disposal of sediments which include arsenic, PCBs, TPH, VOCs, and PAHs. Sediment which exceeds the contaminant limits outlined in Table 1 of the MassDEP Policy # COMM-97-001, if they are intended to be disposed of at lined or unlined landfills, would require BWP approval.

Sediment may be disposed of as hazardous or non-hazardous depending on certain criteria such as concentrations of PCBs, pesticides, PAHs, inorganics, VOCs, and pH, conductivity, corrosivity, ignitability, and reactivity.

Table 18-1: Maximum Allowable Contaminants for Sediment Reuse

CONTAMINANT [a]	Reuse Levels
Total Arsenic	40
Total Cadmium	80
Total Chromium	1,000
Total Lead	2,000
Total Mercury	10
Total Petroleum Hydrocarbons (TPH)	5,000
Total PCBs[b]	< 2
Total PAHs[c]	100
Total VOCs[d]	10
Listed or Characteristic Hazardous Waste (TCLP[e])	none

Notes:

a. Contaminant concentrations are in mg/kg, dry weight.

b. Total concentrations of PCBs listed in US EPA Method 8080 or Method 8082.

c. Total concentrations of PAHs listed in US EPA Method 8100.

d. Total concentrations of VOCs listed in US EPA Method 8240 or equivalent.

e. TCLP (toxicity characteristic leaching procedure) testing should be performed for metals or organic compounds when the total concentrations in the sediment are above the theoretical levels at which the TCLP criteria may be met or exceeded. For the above metals such levels (mg/kg) are: As > 100, Cd > 20, Cr > 100, Pb > 100, Hg > 4.

Source: MassDEP, Interim Policy #COMM-94-007, February 15, 1995

Remedial Monitoring

A pre-remediation monitoring program will be established prior to initiating the selected alternative. Estimates of the hot spot remediation areas and sediment volume are based on currently available data that describe the horizontal and vertical extent of PCB contamination. Given the anticipated magnitude of the sediment removal, additional data will be collected at a sufficient spatial resolution to minimize, to the extent possible, the removal of clean sediments, as well as to optimize the removal of PCB-contaminated sediments. TSCA 761 Subpart N (Cleanup Site

Characterization Sampling for PCB Remediation Waste) will be used as guidance in developing the pre-remediation monitoring program.

A monitoring program will also be established during the remedial activities to document lake water quality in the vicinity of each dredging area. This monitoring program will specifically address suspended solids levels in the water column within the vicinity of removal operations. It is important that these efforts begin prior to initiation of remedial operations to establish a baseline for subsequent comparisons during and after construction.

Real-time surface water monitoring (including turbidity and water transparency measurements - as determined by Secchi disks) will occur during dredging operations between the primary and secondary silt curtains as well as outside of the secondary silt curtain perimeter. This monitoring data will be used as a real-time indicator of the effectiveness of the silt curtains at preventing migration of sediment outside of the hot spot areas. The remedial design plans will establish specific monitoring techniques and frequencies, and contingency plans will be implemented in the event established monitoring limits are exceeded.

The monitoring program will also include testing the decant water from the geotextile tube dewatering process and effluent water discharged back to Lake Cochituate. This testing will be performed to ensure that water quality-based effluent limitations for particular contaminants are met. The effluent limitations will be adequate enough to ensure attainment and maintenance of the water quality standards of Lake Cochituate. Effluent limitations will consider such factors as the natural/ambient lake conditions, the existing discharges, and the protection of existing downstream uses. Limits will be based on the Federal Clean Water Act, the Massachusetts Surface Water Discharge Permit Program, and 314 CMR 9.00.

An air monitoring program will also be implemented near any sediment transfer facilities and remedial areas to verify the performance of measures designed to prevent or minimize impacts to workers and the community during remediation. Monitoring and engineering controls will be employed to minimize short-term effects due to material processing activities. Monitoring for nuisance odors will also be implemented which may require the monitoring of hydrogen sulfide, control of the source of potential odors, and ongoing follow up of any odor complaints.

TSCA 761 Subpart O (Sampling to Verify Completion of Self-Implementing Cleanup and On-Site Disposal of Bulk PCB Remediation Waste) will be used as guidance in developing the remediation monitoring program.

Site Restoration/Backfilling

After sediment removal, the dredged hot spot areas will be backfilled with clean fill material, unless the post-remediation confirmatory sampling indicates that the residual concentrations, if any, already meet the average cleanup goal. Clean fill consisting of sand material will be brought on-site and backfilled into each sediment hot spot area to fill the voids produced from the dredging activities. Fill material will be blended to contain a specific total organic carbon content and be free of trash, woody debris, or other obstructions that may create nuisance during placement. Fill material will be slurried and placed in thin lifts within each sediment hot spot area through either a barge mounted diffuser pipe or a rotary turbo nozzle mounted to a barge where the slurry could be sprayed into the water surface.

Results of the post-remediation confirmatory sampling from each dredged area will be used to determine whether backfill is required in a given dredged area. The specifics of confirmatory sampling and criteria for backfill based on sample results will be further described in the remedial

design plan.

After each hot spot removal area has been backfilled (if deemed necessary), silt curtains will be removed and the sediment dewatering area will be cleaned. If necessary, the sediment along the border of the remediation area will be re-graded and the banks of the shoreline will be reformed.

18.3 COST ESTIMATE FOR SELECTED REMEDIES

18.3.1 Cost Estimate Selected Remedy for NSSC Shoreline Sediment Outside of Pegan Cove (T-25, Building 2/45, Boiler Plant, and Building 22/36)

There is no cost associated with the selected remedy of No Action for sediment along the NSSC shoreline outside of Pegan Cove.

18.3.2 Cost Estimate Selected Remedy for NSSC Shoreline Sediment within Pegan Cove

The costs associated with the selected remedy for sediment along the NSSC shoreline within Pegan Cove are presented in Table 18-2. The values in the cost estimate summary table are based on best available information regarding the expected scope of the remedy. Slight changes are likely to occur in the costs for various work items as a result of new information and data collected during the remedial design. Major cost changes will be documented in the form of a technical memorandum in the Administrative Record file, an ESD, or an amendment to this ROD.

Table 18-2: Selected Remedy – Cost Estimate Summary

	Item	Quantity	Unit	$/Unit	Direct Cost
Pre-Remedial/Baseline Study					
	Bathymetric Survey	1	ea.	$20,000.00	$20,000
	Sediment	54	ea.	$3,000.00	$162,000
	Water	16	ea.	$2,000.00	$32,000
	Pre-remedial Reporting	1	ea.	$20,000.00	$20,000
Permitting, Mobilization/Demobilization, Site Preparation, & Site Control Measures					
	Permits	1	LS	$5,000.00	$5,000
	Mobilization/Demobilization	1	LS	$400,000.00	$400,000
	Site Preparation	1	LS	$20,000.00	$20,000
	Site control measures (e.g., signs)	1	LS	$6,000.00	$6,000
Silt Curtain Installation					
	Silt Curtain	4,802	LF	$24.00	$115,236
	Silt Curtain Installation	16	day	$657.60	$10,522
	Water Monitoring	12	day	$1,600.00	$19,200
Hydraulic Dredging					
	Dredging	50	day	$10,000.00	$503,780
	Dewatering (incl. Geotextile Tubes & Flocculant)	50	day	$5,500.00	$277,079
	Odor Control	253,333	gal	$0.03	$6,333
	Confirmatory Sediment Sampling	40	ea.	$3,000.00	$120,000
	Water Monitoring/Silt Curtain Main. & Monitoring	50	day	$1,600.00	$80,605
	Bathymetric Survey after Dredging	1	ea.	$20,000.00	$20,000
Water treatment					
	Water Treatment	253,333	gal.	$0.50	$126,667
Off-Site Disposal					
	In State MA landfill	1,881	ton	$94.25	$177,284
	Loading	1,254	cy	$10.60	$13,292
	Crew Rate	15	day	$827.85	$12,418
Backfilling					
	Fill Material (sand/topsoil mixture)	2,508	cy	$43.70	$109,600
	Fill Pumping	2,508	cy	$97.50	$244,530
	Water Monitoring	7	day	$1,600.00	$11,200
Public Education					
	Public Education	1	LS	$80,000.00	$80,000
Site Restoration					
	Site Restoration	1	LS	$30,000.00	$30,000
	Site Closure Report	1	LS	$20,000.00	$20,000
Subtotal					
					$2,642,745
Contingency					
			30%		$792,824
Total Construction					
					$3,435,569
Design					
			10%		$343,557
Oversight & Management					
			10%		$343,557
		TOTAL ESTIMATED CAPITAL COST =			**$4,122,683**

19.0 STATUTORY DETERMINATIONS

The selected remedy for both the NSSC shoreline sediment outside of Pegan Cove and the NSSC shoreline sediment within Pegan Cove are consistent with CERCLA and, to the extent practicable, the NCP. The selected remedies for each of the sites have been determined to be protective of human health and the environment, to comply with federal and state requirements that are legally applicable or relevant and appropriate (ARARs), and to be cost-effective. The selected remedy for NSSC shoreline sediment within Pegan Cove also satisfies the statutory preference for treatment that permanently and significantly reduces the mobility, toxicity, or volume of hazardous substance as a principle element. The selected remedy for NSSC shoreline sediment within Pegan Cove is effective in reducing the toxicity (sediment containing elevated PCB concentrations are removed from the site and shipped to an off-site permitted landfill which would provide effective containment and isolation), reducing mobility (dredged sediment containing elevated PCB concentrations would be replaced with clean fill material), and reducing volume (sediment containing elevated PCB concentrations in sediment would be removed from the site). Additionally, the selected remedy for the NSSC shoreline sediment within Pegan Cove utilizes alternative treatment technologies to the maximum extent practicable.

19.1 NSSC SHORELINE SEDIMENT OUTSIDE OF PEGAN COVE (T-25, BUILDING 2/45, BOILER PLANT, AND BUILDING 22/36)

The selected remedy of No Action for the sediment along the NSSC shoreline outside of Pegan Cove is protective of human health and the environment and satisfies the requirements of Section 121 of CERCLA. This determination was based on field investigations, laboratory analyses, and an evaluation of potential human health and ecological risks. The selected remedy of No Action will attain all applicable or relevant and appropriate federal and state chemical-, location, and action-specific requirements (ARARs). The ARARs are provided in Table 19-1.

19.2 NSSC SHORELINE SEDIMENT WITHIN PEGAN COVE

The selected remedy of Alternative 8 - Hot Spot Hydraulic Dredging, Geotextile Tube Dewatering, Off-Site Disposal, and Backfilling for the NSSC shoreline sediment within Pegan Cove is protective of human health and the environment and satisfies the requirements of Section 121 of CERCLA. Alternative 8 provides the best balance of tradeoffs among the other alternatives with respect to the nine CERCLA criteria. This alternative was selected over the other alternatives because the Army expects it to satisfy the statutory requirements in CERCLA Section 121(b) to: 1) be protective of human health and the environment; 2) comply with all ARARs; 3) be cost-effective; and 4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies, to the maximum extent practicable.

19.2.1 Protection of Human Health and the Environment

The selected remedy for the NSSC shoreline sediment within Pegan Cove will protect human health and the environment through the removal of contaminated sediment from "hot spot" areas. This remedy will reduce the potential for sediment-associated human health risks due to PCBs in native fish caught near the NSSC shoreline currently and in the future by reducing the average PCB concentrations in sediment within Pegan Cove to less than the sediment cleanup goal of 1 mg/kg. In addition to hot spot dredging, site control measures will be implemented prior to and during the remedial action, including posting of signs limiting boating in the dredging areas and signs that prohibit fishing from and near the NSSC shoreline. As described in Section 14, there is no RAO

associated with ecological receptors or with the environment in general, as the ecological risk assessment results indicated negligible to minimal ecological risk associated with sediment.

19.2.2 Compliance with Applicable and Relevant and Appropriate Requirements

The selected remedy for the NSSC shoreline sediment within Pegan Cove will attain all applicable or relevant and appropriate federal and state chemical-, location-, and action-specific ARARs. The ARARs are provided in Table 19-2.

19.2.3 Cost Effectiveness

It is the Army's belief that the selected remedy for shoreline sediment within Pegan Cove is cost-effective - the remedy affords overall effectiveness proportional to its costs. This determination was accomplished by evaluating the overall effectiveness of those alternatives that satisfied the threshold criteria (i.e., were both protective of human health and the environment and ARAR compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment, and short term effectiveness). Overall effectiveness was then compared to costs to determine cost-effectiveness. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs and hence represent a reasonable value for the money to be spent.

For the shoreline sediment within Pegan Cove, Alternative 1 (No Action), Alternative 2 (Limited Action/Institutional Controls), and Alternative 3 (Institutional Controls/Environmental Monitoring) were considered to be cost-effective, but they would not result in the reduction of toxicity, mobility, or volume through treatment nor would they reduce long-term risks at the site within a reasonable amount of time. Alternative 4 (Clay Capping/Monitoring/Institutional Controls) and Alternative 5 (Composite Capping/Monitoring/Institutional Controls) were not considered cost-effective because capping does not satisfy the CERCLA statutory preference for treatment. Alternative 6 (Sediment Stabilization/Mechanical Dry Dredging/Off-Site Disposal/Institutional Controls) would reduce the toxicity, mobility, and volume through sediment stabilization, removal, and off-site disposal, however, the costs incurred for this alternative are the highest of all the alternatives and implementing this treatment technology could be difficult. Alternatives 7 (Hydraulic Dredging/Geotextile Tube Dewatering/Off-Site Disposal/Institutional Controls) and Alternative 9 (Hydraulic Dredging, Mechanical Dewatering/Off-Site Disposal/Institutional Controls) would both reduce the toxicity, mobility, and volume through contaminated sediment removal and off-site disposal, however, these technologies were not chosen due to the elevated costs associated with both alternatives, and the limited site space available for staging the sediment dewatering process which would extend the remediation period.

Table 19-1: NSSC Shoreline Sediment Outside Pegan Cove - Alternative 1 - Compliance with ARARs

Requirement/Guideline	Citation	Status	Requirement/Guideline Synopsis	Action to be Taken to Attain ARAR/TBC
CHEMICAL-SPECIFIC				
Federal Regulations				
Federal Food, Drug, and Cosmetic Act – Unavoidable Contaminants in Food for Human Consumption and Food-Packaging Material	21 CFR 109	Relevant and Appropriate	Establishes temporary tolerance limits for residues of PCBs in fish and shellfish (edible portion). The edible portion of fish excludes head, scales, viscera, and inedible bones.	Attainment of this ARAR cannot be evaluated because this alternative does not include long-term monitoring of fish tissue PCB concentrations.
Cancer Slope Factors (CSFs) Reference Doses (RfDs)	US EPA, Integrated Risk Information System	TBC	Values used to estimate potential cancer and non-cancer human health risks due to site-related exposures.	Considered in the calculation of site risks and cleanup levels.
TSCA Risk-Based Disposal	40 CFR 761.61(c)	Applicable	Establishes clean up and disposal options for PCB remediation waste, including PCB-impacted sediment. Includes requirement to apply in writing to the Regional Administrator for approval prior to beginning any sampling, clean up, or disposal activities.	There is no active remedial action associated with this alternative. No additional site characterization is planned as part of this alternative.
Other Guidance				
Assessment and Remediation of Contaminated Sediments (ARCS) Program; Sediment effect concentrations	US EPA, 1996	TBC	Provides sediment effect concentrations at three levels for the amphipod (*Hyallela azteca*) and the midge (*Chironomus riparius*).	Based on the low estimated incremental ecological risks, these TBC guidelines are not considered applicable.
LOCATION-SPECIFIC				
No location-specific ARARs apply to this alternative. This alternative does not discharge dredge or fill materials into Lake Cochituate; and does not destroy, physically alter, or modify wetlands or floodplains. No endangered, threatened, or special concern species are present; therefore related ARARs do not apply to this alternative.				
ACTION-SPECIFIC				
Other Guidance				
Guidance on Remedial Actions for Superfund Sites with PCB Contamination	US EPA, 1990a	TBC	Describes the recommended approach for evaluating and remediating Superfund sites with PCB contamination. To be used as a guide in the investigation and remedy selection process for PCB-impacted Superfund sites.	US EPA guidance has been considered in the development of the remedial alternatives for the site.

Table 19-2: NSSC Shoreline Sediment within Pegan Cove - Alternative 8 - Compliance with ARARS

Requirement/Guideline	Citation	Status	Requirement/Guideline Synopsis	Action to be Taken to Attain ARAR/TBC
CHEMICAL-SPECIFIC				
Federal Regulations				
Cancer slope factors	US EPA, Integrated Risk Information System	TBC	Guidance used to compute individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will meet this standard since potential carcinogenic risks caused by exposure to contaminants will be addressed by dredging of contaminated sediment and off-site disposal.
Reference Dose (RfD)	US EPA, Integrated Risk Information System	TBC	Guidance used to compute human health hazard resulting from exposure to non-carcinogens in site media	This alternative will meet this standard since potential non-carcinogenic hazards caused by exposure to contaminants will be addressed by dredging of contaminated sediment and off-site disposal.
Guidelines for Carcinogen Risk Assessment	EPA/630/p-03/001F March 2005	TBC	Guidance for assessing cancer risk	This alternative will meet this standard since potential carcinogenic risks caused by exposure to contaminants will be addressed by dredging of contaminated sediment and off-site disposal.
Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens	EPA/630/r-03/003F March 2005	TBC	Guidance for assessing cancer risks in children	This alternative will meet this standard since potential carcinogenic risks caused by exposure to contaminants will be addressed by dredging of contaminated sediment and off-site disposal.
LOCATION-SPECIFIC				
Federal Regulations				
Clean Water Act §404 Discharge of Dredged or Fill Material	33 CFR 320-330; 40 CFR 230	Applicable	Regulates the discharge of dredged or fill materials into waters of the U.S. Provides that no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the discharge that would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. Appropriate and practicable steps must be taken that will minimize the potential adverse impacts of the discharge of the dredged material on the aquatic ecosystem.	It has been determined that there is no practicable alternative having less adverse impact on the aquatic ecosystem than the dredging of contaminated sediment and backfilling alternative. Backfilling activities will comply with these provisions of the Clean Water Act (CWA). This alternative will not result in discharge of dredged materials.

Requirement/Guideline	Citation	Status	Requirement/Guideline Synopsis	Action to be Taken to Attain ARAR/TBC
Fish and Wildlife Coordination Act	16 USC § 661 *et seq.*	Applicable	Requires protection of fish and wildlife resources related to federal actions that control or modify water bodies.	The Army will consult with federal and state fish and wildlife personnel regarding the implementation of the remedy and the protection of fish and wildlife resources. This alternative will incorporate silt curtains to control the settling of fine grained solids suspended in water, thus minimizing the potential loss of fish and wildlife to the maximum extent possible. This alternative could result in a short-term loss of fish and benthic invertebrate resources as a result of the dredging of the remediated area; however, following completion of the remedial action, these resources are likely to recover over time. A remedial monitoring program would be established to monitor PCB and suspended solids levels in the water column before and during the remedial action. If water quality measurements exceed a specific threshold, a contingency plan, such as shutting down dredging operations and the installation of additional silt barriers, would be implemented.
Rivers and Harbors Act of 1899	33 CFR Part 320	Applicable	The Act makes it a misdemeanor to discharge refuse matter of any kind into the navigable waters of the United States without a permit; makes it a misdemeanor to excavate, fill, or alter the course, condition, or capacity of any port, harbor, channel, or other areas without a permit. Although many activities covered by the Rivers and Harbors Act are regulated under the Clean Water Act, the 1899 Act remains independent. Administered by the U.S. Army Corps of Engineers	Remedial activities will comply with the substantive environmental requirements of the Act.
State Regulations				
Massachusetts Wetlands Protection Act Regulations	310 CMR 10.00	Applicable	These regulations protect wetland resource areas subject to protection under MGL c. 131 § 40, as well as a 100-foot buffer zone, from physical alteration so their beneficial functions can be preserved. Specific wetland resource areas to be effected include: Land under Water, Bank, Bordering Vegetated Wetlands, and Land Subject to Flooding.	The remedial activities will meet all of the performance standards for each wetland resource area protected under these standards. Performance standards will be met by the use of silt curtains around the dredge and fill area and sediment and erosion control measures around shoreline components of the remedy.

Requirement/Guideline	Citation	Status	Requirement/Guideline Synopsis	Action to be Taken to Attain ARAR/TBC
Great Ponds; Jurisdiction of Director of Division of Fisheries and Wildlife	M.G.L. Ch 131, Sections 4 and 45	Applicable	Regulation of public use of Great Ponds. Section 4 allows for prescribing and enforcing standards for regulating fishing that will protect the public interest. Section 45 allows for restricting boating activity in prescribed areas of Great Ponds. Lake Cochituate is a state-regulated Great Pond.	Temporary site control measures, such as signage that limits fishing to catch and release only or restricts boating in areas of active remediation due to safety reasons, will meet these standards.
Public Waterfront Act and Waterways Regulations	M.G.L. Ch. 91, Section 19; 310 CMR 9.00	Applicable	Regulates activities in waterways and Great Ponds below the high water mark. Lake Cochituate is a state-regulated Great Pond.	Remedial measures taken will meet substantive environmental standards.
ACTION-SPECIFIC				
Surface Water - Federal Regulations				
Clean Water Act (CWA), Water Quality Criteria	40 CFR Parts 100 - 149	Applicable	Water quality criteria that may be promulgated by the state or by US EPA.	Water quality monitoring will be performed to ensure that contaminants are not entering the water column in concentrations greater than CWA water quality criteria.
Clean Water Act , National Recommended Water Quality Criteria	33 USC §1251 *et seq.*, 40 CFR 122.44	Relevant and Appropriate	National Recommended Water Quality Criteria for the protection of aquatic life and human health.	This dredging alternative will comply with the National Recommended Water Quality Criteria in the surface waters in South Pond of Lake Cochituate during and after completion of remedial activities, by monitoring lake water quality during and after the action, and the treatment (if necessary) of any water discharged back into Lake Cochituate as a result of dewatering activities.
Clean Water Act §402 National Pollutant Discharge Elimination System	40 CFR 122-125, 131	Applicable	These regulations contain discharge limitations, monitoring requirements, and best management practices for discharges into navigable waters.	This dredging alternative will comply with this regulation by monitoring the quality of and treating (if necessary) any water discharged back into Lake Cochituate as a result of dewatering activities.
Clean Water Act §403 General Pretreatment Regulations for Existing and New Sources of Pollution	40 CFR 403	Relevant and Appropriate	Establishes pretreatment standards for discharges to a POTW.	Wastes discharged to a POTW will meet pretreatment standards for the facility.

Requirement/Guideline	Citation	Status	Requirement/Guideline Synopsis	Action to be Taken to Attain ARAR/TBC
Surface Water - State Regulations				
Massachusetts Surface Water Quality Standards	314 CMR 4.00	Relevant and Appropriate	These standards designate the most sensitive uses for which the various waters of the Commonwealth shall be enhanced, maintained, or protected. Minimum water quality criteria required to sustain the designated uses are established.	This dredging alternative will comply with the State standards in the surface waters in South Pond of Lake Cochituate by monitoring lake water quality during the action, and the treatment (if necessary) of any water discharged back into Lake Cochituate as a result of dewatering activities.
Massachusetts Clean Water Act Water Quality Certification Regulations	314 CMR 9.06, 9.07	Applicable	For discharge of dredged or fill material, there must be no practicable alternative with less adverse impact on aquatic ecosystem; must take practicable steps to minimize adverse impacts on wetlands or land under water; must be no substantial adverse impact to physical, chemical, or biological integrity of surface waters.	This alternative will not result in discharge of dredged materials.
Massachusetts Surface Water Discharge Permit Program	314 CMR 3.00	Applicable	These regulations provide that discharges to waters of the Commonwealth shall not result in exceedances of MA Surface Water Quality Standards (MSWQS).	This alternative will not result in discharge of dredged materials.
Massachusetts Operation and Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Discharges	314 CMR 12	Relevant and Appropriate	Establishes pretreatment standards for discharges to a POTW (314 CMR 12.08-.09) and operation and maintenance standards for treatment works (314 CMR 12.03-.06).	Wastes discharged to the Army's wastewater treatment system or a POTW will meet pretreatment standards for the facility. The Army's wastewater pretreatment system, although not "treatment works", will meet relevant and appropriate operational standards including: not allowing waste to bypass the system, having an alarm system in place, and being maintained properly and safely with adequate tools, equipment, parts, personnel, etc. Sampling and analysis will be conducted according to the facility requirements.
Surface Water – Other Guidance				
Management plan for Eurasian milfoil	MADCR, 2006; MADCR, 2002	TBC	Lake Cochituate's latest vegetation survey identifies Eurasian milfoil in all ponds except one. Preliminary management plans are provided.	In the short term, this dredging alternative will reduce the growth of Eurasian milfoil in the remediated areas. Silt curtains will be used to prevent the spread of Eurasian milfoil during remedial activities. Growth of Eurasian milfoil within the dredged areas after remedial activities are completed is possible if lake-wide milfoil mitigation efforts are not successful.

Requirement/Guideline	Citation	Status	Requirement/Guideline Synopsis	Action to be Taken to Attain ARAR/TBC
Sediment - Federal Regulations				
RCRA Hazardous Waste Regulations	40 CFR 260-264, 268	Applicable	Establishes requirements for the identification and listing of hazardous waste; provides standards applicable to generators of hazardous waste, transporters of hazardous waste, and owners and operators of hazardous waste treatment, storage, and disposal facilities; identifies hazardous wastes that are restricted from land disposal.	Because Massachusetts has been authorized to run the Resource Conservation and Recovery Act (RCRA) base program, hazardous materials will be managed according to the Massachusetts Hazardous Waste Management Regulations requirements listed below.
TSCA Risk-Based Disposal	40 CFR 761.61(c)	Applicable	Establishes clean up and disposal options for PCB remediation waste, including PCB-impacted sediments. Includes requirement to apply in writing to the Director, EPA Region 1 Office of Site Remediation and Restoration for approval prior to beginning any sampling, clean up, or disposal activities.	Risk-based standards will be used to develop cleanup standards and in handling and managing PCB contaminated sediments. Disposal of dredged sediments will be based on as found (*in situ*) PCB concentrations.
TSCA Storage Requirements	40 CFR 761.65(a)–(c)	Applicable	Establishes PCB-remediation waste storage requirements.	The requirements concerning the storage of PCB remediation waste will be complied with.
TSCA Decontamination Requirements	40 CFR 761.79	Applicable	Establishes decontamination standards and procedures for removing PCBs, which are regulated for disposal, from water, organic liquids, non-porous surfaces (including scrap metal from disassembled electrical equipment), concrete, and non-porous surfaces covered with a porous surface, such as paint or coating on metal.	These requirements will be met when decontaminating equipment, debris and the temporary dewatering facility.
TSCA Sampling Requirements	40 CFR 761 Subparts N & O	Relevant and Appropriate	Establishes requirements for site characterization sampling for PCB remediation waste (Subpart N).	Additional site characterization is planned. Subpart N will be used as guidance for characterization sampling.
Sediment - State Regulations				
Massachusetts Hazardous Waste Management Regulations (HWMR) Hazardous Waste Determination [1]	310 CMR 30.100	Applicable	The federal RCRA program has been delegated to the Commonwealth of Massachusetts. These regulations establish the requirements for determining whether wastes are hazardous. .	Removed sediment would be analyzed to determine whether the waste should be classified as hazardous or non-hazardous. Based on current data, the sediment is not expected to be characterized as hazardous.
Massachusetts HWMR Requirements for Generators of Hazardous Wastes [1]	310 CMR 30.300, 30.340	Applicable	These regulations contain requirements for generators of hazardous waste. The regulations apply to generators of sampling waste and also apply to the accumulation of waste prior to off-site disposal.	Removed sediment would be analyzed to determine whether the waste should be classified as hazardous or non-hazardous, in order to comply with the regulations regarding accumulation of waste prior to off-site disposal. Based on current data, the sediment is not expected to be characterized as hazardous.

Requirement/Guideline	Citation	Status	Requirement/Guideline Synopsis	Action to be Taken to Attain ARAR/TBC
Massachusetts HWMR General standards for hazardous waste facilities	310 CMR 30.500	Applicable	General facility requirements for waste analysis, security measures, inspections, and training requirements	The remedial action will be conducted in accordance with this requirement. All workers will be properly trained. If dredged sediment is considered hazardous waste, it will be stabilized and disposed of off-site.
Massachusetts HWMR Special requirements for wastewater treatment units	310 CMR 30.605	Relevant and Appropriate	Standards for wastewater treatment units for the treatment of hazardous waste	If as part of this remedial action, it is necessary to treat water contaminated with hazardous wastes prior to discharge to surface waters the standards of these regulations will be met.
Massachusetts HWMR Containers	310 CMR 30.680	Applicable	Establishes requirements for management of containers such as drums that would hold field-generated hazardous wastes.	Any hazardous waste containers used for holding contaminated soil/sediment, water, or other waste will comply with these requirements.
Massachusetts HWMR Management, storage, and treatment in tanks	310 CMR 30.690	Applicable	These standards specify requirements for tank systems used to store or treat hazardous waste. Provides specifications for design and installation of tank systems. Requires secondary containment, leak detection systems, and inspections. Identifies general operating requirements, and closure and post-closure care.	Design and installation requirements will be followed if tanks are used to store or treat hazardous wastes generated as part of this remedy. Specifications will include secondary containment, if necessary.
Massachusetts HWMR Supplemental requirements for hazardous waste management facilities	310 CMR 8.03	Relevant and Appropriate	This regulation outlines the additional requirements that must be satisfied in order for a RCRA facility to comply with the National Pollutant Discharge Elimination System (NPDES) regulation.	Any water treatment facilities used as part of this remedy to treat hazardous waste will meet these regulations through a monitoring program and engineering controls, if necessary.
Sediment - Other Guidance				
Contaminated Sediment Remediation Guidance for Hazardous Waste Sites	USEPA, 2005	TBC	Provides technical and policy guidance for making risk management decisions for contaminated sediment sites. Primarily intended for federal and state project managers considering remedial response actions or non-time-critical removal actions under CERCLA.	EPA guidance has been considered in the development of the remedial alternatives for the site.
Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites	USEPA, 2002	TBC	Presents 11 risk management principles that remedial project managers, on-scene coordinators, and RCRA corrective action project managers should carefully consider when planning and conducting site investigations and selecting and implementing a response.	EPA guidance has been considered in the development of the remedial alternatives for the site.

Requirement/Guideline	Citation	Status	Requirement/Guideline Synopsis	Action to be Taken to Attain ARAR/TBC
USEPA's Contaminated Sediment Management Strategy	USEPA, 1998	TBC	Establishes four goals to manage the problem of contaminated sediment, and describes actions the Agency intends to take to accomplish those goals.	EPA guidance has been considered in the development of the remedial alternatives for the site.
Guidance on Remedial Actions for Superfund Sites with PCB Contamination	USEPA, 1990a	TBC	Describes the recommended approach for evaluating and remediating Superfund sites with PCB contamination. To be used as a guide in the investigation and remedy selection process for PCB-impacted Superfund sites.	EPA guidance has been considered in the development of the remedial alternatives for the site.
Massachusetts Erosion and Sediment Control Guidance		TBC	Standards for preventing erosion and sedimentation.	Remedial actions will be managed to control erosion and sedimentation.
Fish - State Regulations				
Fishing Restrictions, Catch and Release	321 CMR 4.01(2)(a)	Applicable	Sets restrictions on freshwater fishing to catch and release only. Designates catch and release waters in the Commonwealth.	These enforceable catch and release restrictions will be incorporated into the site control measures until the completion of the remedial action due to safety reasons.
Public Health Fish Consumption Advisory - Lake Cochituate	http://db.state.ma.us/dph/fishadvisory/].	TBC	Health advisory due to PCBs in the lake's fish. The general population should not eat American Eel from the Lake and sensitive populations should not eat any fish species.	The health advisory will be considered, to the extent practicable, if site control measures that pertain to consumption of fish are implemented.
Air- Federal Regulations				
Clean Air Act – National Emissions Standards for Hazardous Air Pollutants	40 CFR 63	Applicable	Regulates air emissions from area, stationary, and mobile sources; authorizes the US EPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and the environment.	Will be complied with during any remedial activity involving excavation.
Air- State Regulations				
Massachusetts Ambient Air Quality Standards	310 CMR 6.00	Applicable	Sets primary and secondary standards for emissions of certain contaminants, including particulate matter.	Remedial activities, including dredging and processing of sediment, will be implemented in accordance with these rules. No air emissions from remedial activities will cause ambient air quality standards to be exceeded. Dust standards will be complied with during excavation of materials at the Site.

Requirement/Guideline	Citation	Status	Requirement/Guideline Synopsis	Action to be Taken to Attain ARAR/TBC
Massachusetts Air Pollution Control Regulations	310 CMR 7.00	Applicable	These regulations set emission limits necessary to attain ambient air quality standards	Remedial activities, including dredging and processing of sediment, will be managed to meet the standards for visible emissions (310 CMR 7.06), dust, odor and demolition (310 CMR 7.09), and noise (310 CMR 7.10.

Notes:

1. These provisions are carried out in conjunction with the 1997 guidelines outlined in the MADEP Policy #COMM-97-001, *Reuse and Disposal of Contaminated Soil at Massachusetts Landfills*, which supersedes the MADEP Policy # Bureau of Waste Practices BWP-94-037. Policy #COMM-97-001 maintains consistency with the 1995 Policy #COMM-94-007, *Interim Policy for Sampling, Analysis, Handling and Tracking Requirements for Dredged Sediment Reused or Disposed at Massachusetts Permitted Landfills*. as described in Section 6.3.6.1, subsection entitled "Off-Site Disposal."

19.2.4 Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Possible

The selected remedy represents the best balance of trade-offs among the alternatives with respect to the evaluation criteria. The selected remedy represents the maximum extent to which permanence and treatment can be practically utilized at this site.

Long-Term Effectiveness and Permanence. The long-term effectiveness and permanence of the selected remedy (Alternative 8) was not rated the highest at reducing risk. Alternatives 6, 7, and 9 were rated higher for long-term effectiveness and permanence because each alternative involves removing a greater volume of PCB impacted sediment. The remaining alternatives (Alternatives 1, 2, 3, 4, and 5) were rated lower than the selected remedy for long-term effectiveness and permanence because each would leave the PCB-impacted sediment in place.

Reduction of Toxicity, Mobility, or Volume. The selected remedy is effective in reducing the toxicity (sediment containing elevated PCB concentrations are removed from the site and shipped to an off-site permitted landfill which would provide effective containment and isolation), reducing mobility (dredged sediment containing elevated PCB concentrations would be replaced with clean fill material), and reducing volume (sediment containing elevated PCB concentrations in sediment would be removed from the site). Alternatives 6, 7 and 9 would be more effective at reducing toxicity as the selected remedy because a greater volume of PCB impacted sediment would be removed. These alternatives also take longer to implement and have a much greater capital cost.

Short-Term Effectiveness. The potential occupational risks to workers from the physical hazards associated with remedial activities for the selected remedy should be short-term and easily managed by following Occupational Safety and Health Administration (OSHA) health and safety procedures, wearing proper personal protection equipment, and following a site-specific health and safety plan. Protection of the community from exposure to noise and odors will be managed through actions implemented as a result of the monitoring programs.

The execution of the selected remedy could also result in short-term environmental impacts associated with re-suspension of sediment containing PCBs in the water column and the disturbance of aquatic habitats. Direct impacts to aquatic habitats may include habitat loss, benthic and pelagic organism mortality or displacement, and impacts due to elevated suspended sediment concentrations in water. Although considered to be minimal, impacts of re-suspension of sediment containing PCBs in the water column will be mitigated with the use of silt curtains and monitoring.

Alternatives 4, 5, 6, 7, and 9 all possess potential occupational risks to workers from the physical hazards associated with remedial activities which would be easily managed by following OSHA health and safety procedures, site-specific health and safety procedures, and protecting the public through proper monitoring programs. Alternatives 6 and 9 pose the highest potential occupational risks to workers and the public due to the volume of exposed dredged or excavated sediment which would be produced.

Implementability. The selected remedy is technically feasible and has been implemented successfully at other contaminated sediment sites. Dewatering of dredged sediment through geotextile fabric tubes is a common technique for dewatering sediment and is easily used in conjunction with hydraulic dredging. Treatment design for decant water from the sediment dewatering process will be dependant on treatability studies but commercial available technologies exist. Disposal facilities for dewatered dredged sediment exist either in-state or out-of-state.

Alternative 4 and 5 are also technically feasible and have been implemented at other contaminated sediment sites. However, since the area is also a water skiing slalom course the public and state opinion of these capping alternatives would make them difficult to implement as described. Alternatives 6 and 7 are also technically feasible and have been implemented at other contaminated sediment sites; however construction difficulties may arise due to the limited space available on-site for staging the dewatering process. Alternatives 6, 7, and 9 could take years to complete due to the amount of time required to dewater the sediment, the limited number of geotextile fabric bags that will fit on-site at once, and the winter months when no work can be performed. Alternative 9 is also technically feasible but there are uncertainties with the amount of space required for the dewatering process.

Cost. The selected remedy has the lowest total costs ($4.12 million) out of all the active remediation alternatives and no associated O&M costs. Alternatives 4 and 5 have total costs of $10.3 million and $5.5 million, respectively, with O&M costs averaging $82,000 per year for 30 years. Alternatives 6, 7, and 9 had total costs of $22.0 million, $18.8 million, and $15.6 million, respectively, with annual O&M costs averaging $110,000 per year for 10 years.

State Support/Agency Acceptance. The State of Massachusetts has expressed its support of Alternative 8. A copy of the Declaration of State Concurrence letter is included in Appendix B.

Community Acceptance. The community has been involved with the comprehensive investigations and risk analyses associated with the sediment along the NSSC shoreline through regular newsletters, environmental open houses, and the Restoration Advisory Board which has been meeting since 1995. The newsletters, open houses, and Restoration Advisory Board have allowed the community easy access to the remediation process, kept the community informed and given them the opportunity to make recommendations which affect the community.

In general, the selected remedy was favorably commented on at the public meetings and hearings held on May 21, 2009 and June 10, 2009. Written comments were also favorable, but some members of the public have expressed concerns about various components of the selected remedy. These concerns are presented and have been addressed as Part 3 - Responsiveness Summary of this ROD.

19.2.5 Preference for Treatment as a Principle Element

CERCLA contains a statutory preference that the selected remedy should use a treatment process to permanently reduce the level of toxicity of contaminants at the site, the spread of the contaminants away from the site, or the amount of contamination at the site. The selected remedy is effective in reducing the toxicity (sediment containing elevated PCB concentrations are removed from the site and shipped to an off-site permitted landfill which would provide effective containment and isolation), reducing mobility (dredged sediment containing elevated PCB concentrations would be replaced with clean fill material), and reducing volume (sediment containing elevated PCB concentrations in sediment would be removed from the site).

19.2.6 Five-Year Review Requirements

The CERCLA process establishes five-year reviews to ensure that the remedy in place continues to provide adequate protection of human health and the environment. The Selected Remedy at the NSSC shoreline within Pegan Cove will result in no site-related hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure. Therefore, no statutory five-year review is required for the sediment at the NSSC

shoreline within Pegan Cove by the NCP (40 Code of Federal Regulations 300.430(f)(4)(ii)). However, a policy review may be conducted within five years of construction completion for the site to ensure that the remedy remains protective.

20.0 DOCUMENTATION OF SIGNIFICANT CHANGES FROM PREFERRED ALTERNATIVES OF PROPOSED PLAN

The Army released a Proposed Plan for remedial action for sediment at the NSSC shoreline on May 18, 2009. The Proposed Plan identified No Action as the Preferred Alternative for the NSSC shoreline sediment outside of Pegan Cove (including the T-25, Building 2/45, Boiler Plant, and Building 22/36 areas of concern), and Alternative 8 (Hot Spot Hydraulic Dredging, Geotextile Tube Dewatering, Off-Site Disposal, and Backfilling) for NSSC shoreline sediment within Pegan Cove. During the public comment period, the Army received several comments which are presented and addressed in Part 3 – Responsiveness Summary of this ROD.

Based on the comments received, the Army has made a change to the selected remedy for NSSC shoreline sediment within Pegan Cove (Alternative 8). The change includes the addition of post-dredging confirmatory sediment sampling in each of the hot spot areas. Following the hot spot dredging and prior to removal of the primary or secondary silt curtain, and prior to backfill, post-dredging confirmatory sampling of the each dredged area will be conducted to verify that residual PCB concentrations, if any, will meet the average PCB cleanup goal. The specifics of the confirmatory sampling will be further described in the remedial design plan.

PART 3: RESPONSIVENESS SUMMARY

21.0 RESPONSIVENESS SUMMARY

This Responsiveness Summary has been prepared to meet the requirements of Sections 113(k)(2)(B)(iv) and 117(b) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), which requires response to "... significant comments, criticisms, and new data submitted in written or oral presentations" on a Proposed Plan for remedial action. The purpose of this Responsiveness Summary is to document the Army's responses to questions and comments expressed during the public comment period by the public, potentially responsible parties, and governmental bodies in written and oral comments regarding the Proposed Plan for sediment at the U.S. Army Natick Soldier Systems Center, Natick, Massachusetts.

This Responsiveness Summary is organized into the following sections:

- **Overview of the Selected Remedies.** This section briefly outlines the basis for the Army's selected remedy.
- **Background on Community Involvement.** This section provides a brief history of community involvement and Army initiatives to inform the community of site activities.
- **Summary of Comments Received During the Public Comment Period and Army Responses.** This section provides Army responses to verbal and written comments received from the public. Transcripts of the May 21, 2009 and June 10, 2009 public hearings are included as Appendix D to this Record of Decision.

21.1 OVERVIEW OF THE SELECTED REMEDIES

The selected remedy for sediment at the NSSC shoreline areas that are outside of Pegan Cove, including the outfalls at the T-25, Building 2/45, Boiler Plant, and Building 22/36 areas, is No Action. This No Action recommendation is based on comprehensive investigations and risk analyses indicating that there is no unacceptable human health or ecological risk associated with sediment in these areas, and that concentrations of PCBs in these sediments are similar to reference locations. In this context, No Action means that no CERCLA remedial action will be taken with respect to sediment at the shoreline areas associated with the outfalls at the T-25, Building 2/45, the Boiler Plant, and Building 22/36 areas.

The selected remedy for sediment at the NSSC shoreline within Pegan Cove is Hot Spot Hydraulic Dredging, Geotextile Tube Dewatering, Off-Site Disposal, and Backfilling (Alternative 8). This recommendation is based on comprehensive investigations and risk analyses which indicate an unacceptable potential human health risk associated with fish ingestion in this area, as well as statistical analysis presented by the Army and approved by the US EPA in the Final Feasibility Study (ICF, 2009a). This analysis showed that concentrations of PCBs in sediment at the NSSC shoreline within Pegan Cove are statistically higher than at reference locations, while concentrations of PCBs in the sediment from NSSC shoreline locations outside of Pegan Cove are similar to reference locations.

21.2 BACKGROUND ON COMMUNITY INVOLVEMENT

Notice of the availability of the Proposed Plan for sediment was published in the *MetroWest Daily News* on May 7, May 10, May 17, May 21, May 31, June 7, and June 14, 2009. Public informational meetings and hearings on the Proposed Plan were held at the Morse Institute Public Library in Natick on May 21, 2009, and again at the Natick Town Hall on June 10, 2009. At the public meetings, the Army presented the Proposed Plan and answered questions from the public prior to providing opportunity for formal comments on the Proposed Plan. The Army accepted formal verbal or written comments from the public during both public hearings. A public comment period was also held from May 18, 2009 to June 25, 2009 to accept public comments on the Proposed Plan and on other documents released to the public.

A transcript of the public hearings are appended (Appendix D) to this Record of Decision. Comments received during the public comment period and the Army's responses are provided in Section 21.3.

In addition, the community has been kept advised of investigative activities for the sediment through presentations by the Army at Restoration Advisory Board meetings held, following public notice, on an approximate quarterly basis throughout the year. The Restoration Advisory Board has been meeting since 1995.

All supporting documentation for the decision regarding the sediment at NSSC is contained in the Administrative Record for review. The Administrative Record is a collection of all the documents considered by the Army in choosing the plan of action for the sediment at NSSC. The Administrative Record is available for public review at NSSC and at the Morse Institute Library located at 14 East Central Street in Natick, Massachusetts. An index to the Administrative Record is provided as Appendix A of this Record of Decision.

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

The Army received verbal comments from numerous people during the public hearings on May 21st and June 10th, 2009. Numerous written comments were also received during the public comment period. The following subsections summarize all comments and the Army's responses.

21.3.1 Comments Received at the Public Meeting on May 21, 2009 and Army Responses

1. Public hearing (05/21/09) comment from A. Richard Miller, a member of the Restoration Advisory Board

Comment No. 1:

A. Richard Miller, Dick Miller, 61 Lake Shore Road in Natick. I am a member of the Restoration Advisory Board for this program, have been since its founding. The primary reason is I have also been a member of the Cochituate State Park Advisory Committee since its founding and before that I was Executive Director of what some of you may remember as The Lake Cochituate Watershed Association. I have a long history here, 1968 and after.

First of all, I want to go on record tonight and at the next hearing. I am hopeful that my comments may start some other comments so I'm glad I was able to go early. I have two items that I want to flag. One of them is just these hearings and this process itself right now at this stage in the clean up. The second one is what I see as a major shortfall in what was presented as the range of what could be done. I'll fill them, but those are the two things I want to address.

On the hearing, the Restoration Advisory Board got formal notice of this meeting and of its meeting two nights before last Thursday afternoon, late afternoon I think. So there's been less than a week of get ready time. We have, last year, discussed some pieces in this.

I found out Wednesday night at a different meeting that it would be coming up. It's much too fast. In fact, it fell on a night that was even more terrible than it is because the Conservation Commission was having a Lake Cochituate hearing tonight. They're not having it, they're not having it for the reason above. People aren't here tonight because the Natick Town Meeting is running tonight. So we've had bad conflicts. Without contacting the local members there was no input towards that collision of dates. I hope we'll have more turnout at the next meeting. I'm grateful that on Tuesday night there was an agreement that we should have a second meeting over here. That wasn't a given and I appreciate that. You will too if there's more people from Town and more Town organizations, etc.

So that's item one, we just need to do better on the coordination. We have a group to do that. It has to be done in an appropriate way.

Response No. 1:

Comment noted. At the request of various community members, a second public hearing was held and the public comment period was extended from June 16, 2009 until June 25, 2009.

2. Public hearing (05/21/09) comment from A. Richard Miller, a member of the Restoration Advisory Board

Comment No. 2:

The second topic is the bigger one in terms of the background and the foreground. Ever since these hearings began I've had a very simple position. It might be too simple, it might not work, but it's very simple: Don't use Lake Cochituate, a major recreational lake in eastern Mass., as a receptacle for dumping. We've been meeting all these years on this process because it was used as a receptacle for dumping. You don't have to decide who to blame and how much, but we're discussing how much of it to leave as a receptacle for dumping. That's what we're talking about when we say how many parts per million, which areas, in which areas will we leave the junk in the lake and in which areas will we take it out of. When we talk about one part per million we're coming fairly close to, at least a few years ago and I think still, is close to the detectable limit. The same measuring equipment can't measure way down beneath that level. That doesn't mean it's good or it's bad, it just means that it may not be practical this year to do a lot more detailed evaluation. But there are several reasons that we might worry in the future here if we don't.

One of them is that we have learned over the years that we had a bad limit. As we measure better, both in terms of what people suffer from and in terms of how we measure what's in the environment, we learned that we should change the limits. We've done that quite often, it's been going on in the last month and it will be going on in the next 20 years. So yes, we have to pick some limits and draw some lines on what we do. Lake Cochituate is a rather special place to decide

that we can leave it in because it's a handy receptacle as long as we stay within that guideline. I don't think that's the way to go.

In addition to that there's another reason we shouldn't do it and it came up in 2002. When the Eurasian Water Milfoil started growing in Lake Cochituate, and it was discovered in May of 2002, it was entirely within Pegan Cove, right there. The proper approach with Eurasian Water Milfoil was, my God, this stuff spreads like crazy, get it out fast before it gets everywhere else. It is everywhere else. It's not thick in North Pond yet, but it's thick in all of South Pond and most of Middle Pond. Let's say it's thick and thin in a few spots on North Pond. We did it all wrong.

This was upstream of everything else, and yet we couldn't go in and hand pull those plants because everyone is afraid of this toxic sediment. Everyone said, "Whatever you do, don't disturb the bottom fill, muck it up, pull it loose." We now have a lake full of a problem.

Did the Army start the problem? Quite possibly they did. Why did it show up next to their boat launching ramp and not next to the State's boat launching ramp to begin with? Quite possibly they did. I don't know. You don't know. They don't know. We won't know. But it's more likely than not, just by looking at how far you have to take a boat without the Milfoil coming off it to get it to the far end of the lake. But from the near end of the lake it's pretty easy to do.

In any case, the very fact that it was there prevented an early clean up. Now there's a big bill attached. I don't think you saw any mention of that problem in this presentation. I didn't either. I think we should. The range from no clean up to thorough clean up should include that giant headache that the lake is facing now.

When I first brought this up it was many years ago. We realized it was an obstacle. More recently we knew what the limits were of where the toxic sediment was and how thick it was in each spot. It has taken years to decide where we could and where we couldn't say it was okay to leave the sediment in and perhaps disturb it now and again. What happens when you put anchors in there and you pull the anchor loose, etc. It hasn't been well managed and that's not entirely the Army's fault. Mass. DCR runs the lake management, but it came from Pegan Cove.

I think we can argue what percent of responsibility and liability the Army should have for cleaning this up. To sweep it under the carpet, under the sediment, and say that it isn't an issue is just totally wrong. That's my comment.

My request is to assign it as an issue to focus on as well as these other issues, to go through the records, to actually substantiate what I remember well that we did discuss it often and from early on, and to start quantifying what portion of the restoration fees for that problem should be included because it resulted from this problem. Thank you.

Response No. 2:

Surface drainage at the NSSC facility is controlled by the storm sewer system, which discharges to Lake Cochituate at two main locations (the T-25 Area stormwater outfall and the MSO) and at a number of other smaller outfalls. Discharge to Lake Cochituate through the NSSC stormwater system is a permitted discharge and meets all requirements, as imposed by State and Federal regulations. In the late 1990s, the Army retrofitted all active outfalls with new oil/water separators, to improve stormwater quality and minimize future impacts to Lake Cochituate. The oil/water separators are routinely maintained and cleaned out, and any solids removed from the separators are properly disposed of off-site. Therefore, the NSSC stormwater drainage system is no longer a

continuing contaminant source to Lake Cochituate. Thus, although the source of the sediment PCBs is suspected to be a transformer leak that occurred in the 1980s, there are no current sources for PCBs to the Lake from the NSSC facility. It should also be noted that there are numerous other permitted and non-permitted discharges from non-Army related outfalls located across the South, Middle, and North Ponds of Lake Cochituate. The Army understands the comment's concern that Lake Cochituate is being used as a "receptacle for dumping." Unfortunately, by the very nature of the highly developed watershed that Lake Cochituate is a part of, contaminants have been discharging to the lake for many years from various anthropogenic sources.

Eurasian milfoil occurs in Lake Cochituate, and is, unfortunately, a common invasive species in many other water bodies throughout Massachusetts. The Army's cleanup proposal for contaminated sediment is provided as a CERCLA remedial action. The purpose of a CERCLA remedial action is to directly address the releases of CERCLA hazardous substances caused by the responsible party. In the case of the NSSC sediment, that principal CERCLA hazardous substance is PCBs. Eurasian milfoil is not a regulated contaminant under CERCLA, therefore it is not addressed under the NSSC Superfund-related investigation or cleanup activities. Since Lake Cochituate is managed by the Massachusetts Department of Conservation and Recreation (MassDCR), any actions related to managing milfoil would be under the jurisdiction of the MassDCR. Since the Army is not addressing Eurasian milfoil in its CERCLA remedial action, it does not hold an opinion regarding whether or not to use chemicals in addressing lake weeds.

Based on a thorough review of all RAB minutes since 2001, the Army never stated that the milfoil should not be pulled loose due to contaminated sediment along the NSSC shoreline, nor has the Army hindered the process of addressing the milfoil issue. While the Army has identified confirmed areas along the NSSC shoreline that have sediment contamination, it was not the Army's place to tell anyone whether they can or can not pull milfoil from these areas. In fact, the human health risk assessments concluded that potential contact with the contaminated sediment near NSSC for individuals swimming and wading in the lake did not pose an unacceptable risk. The RAB minutes between 2002 and 2007 (including January 19, 2006; April 20, 2006; and November 30, 2006) do document concerns among some RAB members that the SolarBee circulator systems could cause re-suspension of contaminated sediment.

The Army is not responsible for causing the growth of Eurasian milfoil in Pegan Cove. Beginning in September 2001 (almost 10 months prior to the first observance of milfoil by the MassDCR), the NSSC boat ramp was permanently closed (including a locked fence and gate) due to homeland security issues. The more plausible hypothesis is that milfoil has proliferated in Pegan Cove because it tends to grow best in shallow water (8 to 10 feet deep) with an organic and nutrient-rich sediment substrate, both of which exist in Pegan Cove. Additionally, Pegan Cove is heavily used for water skiing; therefore there is frequent high speed motor boat activity (and resulting turbulence) in this part of the lake that has likely resulted in spreading of the milfoil. Since very few milfoil mitigation efforts have been performed by MassDCR in the Pegan Cove since 2002, the milfoil has been allowed to spread.

As part of the proposed remedial action, the Army proposes certain measures to ensure that the milfoil will not be further spread during sediment remediation activities. A double-layered silt curtain will be put in place around all dredging areas to retain any sediment that might be suspended in the water column. The silt curtains will also retain any aquatic vegetation, such as milfoil, that may be agitated during the cleanup action. Any plant matter that is removed from the dredged material prior to its placement in the geotextile tubes will be disposed of properly off-site, depending on its properties, either as regular waste or hazardous waste.

3. Public hearing (05/21/09) comment from Kannan Vembu, a member of the Restoration Advisory Board

Comment No. 3:

Kannan Vembu, 9 Stonebridge Circle, Natick. I'm also a member of the RAB. I have a comment regarding the concern that I have on the chosen cleanup option. I don't see any institutional control or any follow-up action after the work is done. In this process you're going to start probably in the hot zone and there's a chance that's where you have the silt curtain around so that it might spread around. I don't know what the settling rate is of those sediments or how long it would take before it spreads, at least some of the concentration, to the rest of the area covered under the silt curtain outside of the hot zone.

I wish some concern or some action is taken to make sure that there is one ppm average for whatever period of time. You know, you want it so that it is actually one ppm in the final analysis. So there's a time that needs to be included for monitoring the sediments that may have spread from the hot zone through the operation and without taking a lot of time to settle in the rest of the areas.

Response No. 3:

Potential sediment re-suspension was a significant concern that the Army considered when evaluating various remedial alternatives for sediment within Pegan Cove, especially given the fine-grained nature of the sediment. In fact, one of the key reasons hydraulic dredging is proposed as the preferred remedy is that it minimizes sediment re-suspension. Hydraulic dredging technologies (*e.g.*, cutterhead, portable hydraulic, plain suction) have a sediment re-suspension rate much less than mechanical dredges. Some models like the Mud Cat™ SP-810 and Mud Cat™ MC-2000 are designed to generate little or no turbidity when dredging. Hydraulic dredging works like a vacuum where the sediment is either loosened with a cutterhead and transported by a suction pump to a treatment facility (geotextile bag), or simply sucked up through a pipe with a suction pump. Reducing sediment re-suspension will be a key factor in choosing the specific hydraulic dredging technology to be used.

One of the key components of the proposed remedy will be to prevent the migration of sediment from within the hot spot areas (or areas of elevated PCB contamination) to areas outside of the hot spots. To prevent this, a primary silt curtain will be installed around the perimeter of each hot spot dredging area. Silt curtains do not allow water to pass through them, are anchored to the lake bottom, and are held up with floats on the water surface. A secondary silt curtain will also be installed around the primary silt curtain with an approximate 2- to 3-foot gap between the two curtains. The hydraulic dredge will remove all sediment (to the proposed 6- or 12-inch depth) within and right up to the boundaries of the primary silt curtain. Real-time surface water monitoring (including turbidity and water transparency measurements - as determined by Secchi disks) will occur during dredging operations between the primary and secondary silt curtains as well as outside of the secondary silt curtain perimeter. This monitoring data will be used as a real-time indicator of the effectiveness of the silt curtains at preventing migration of sediment outside of the hot spot areas. The remedial design plans will establish specific monitoring techniques and frequencies, and contingency plans will be implemented in the event established monitoring limits are exceeded.

A pre-cleanup survey will be initiated throughout the remediation areas, and will include further refinement of the horizontal and vertical extent of PCB contamination. This new data will allow refinement of the current "hot spot" locations slated for removal, in order to ensure that the cleanup

goal of an average PCB concentration of 1 ppm across Pegan Cove will be met. The available site data and the results of the sediment concentration contour modeling (using accepted modeling techniques reviewed and approved by US EPA) indicate that removal of the "hot spot" areas and backfilling with clean fill will result in an average PCB concentration below 1 ppm across Pegan Cove. Following excavation and prior to removal of the primary or secondary silt curtain, and prior to backfill, post excavation confirmatory sampling of the dredged area will be conducted to verify that residual concentrations, if any, will meet the average cleanup goal. The specifics of sampling will be further described in the remedial design plan.

4. Public hearing (05/21/09) comment from Marco Kaltofen, co-chair of the Restoration Advisory Board

Comment No. 4:

Hello, my name is Marco Kaltofen and I'm the Community Co-chair of the Natick Soldier Systems Center Restoration Advisory Board. I wanted to thank the staff at the Soldier Systems Center for putting this proposed plan together. I wanted to express my appreciation for the work that they've done to protect the health and safety of the community and the lake users and the environment and also that of the employees at the Soldier Systems Center. Thank you.

Response No. 4:

Comment noted.

21.3.2 Comments Received at the Public Meeting on June 10, 2009 and Army Responses

1. Public hearing (06/10/09) comment from A. Richard Miller, a member of the Restoration Advisory Board

Comment No. 1:

My name is A. Richard Miller, Dick Miller. I live at 61 Lakeshore Road in Natick and on Lake Cochituate. I have been a member of this group's Restoration Advisory Board since its inception and I have been active on this question before there was a Restoration Advisory Board.

I have three different issues I want to address. I'm glad to be speaking early because perhaps it will get some other people thinking about some of these issues in time for comments now or in the follow-up.

First, I would like to point out that I became Executive Director of the Lake Cochituate Watershed Association in 1968. As I started finding out what everyone had to tell me about a very busy and complex Lake Cochituate, a lot of questions pointed towards what's on the Natick Laboratories. When I went to find out more, I was essentially relegated to the public relations arm rather than the environmental arm on base and I found out that not only wasn't I allowed free access to information, but neither were the State agency people. That changed within two years. In 1970 the Federal Clean Water Act was passed and suddenly EPA and the State agency people and I got a better level of access. But of course, the damage had been done by then. We had been working many, many years talking about how to clean up the pre-existing damage.

First of all, I want to say I'm glad for all the changes. I have been working with people who have been working with me for many years. The change is phenomenal, but we're left with old problems and still with half baked ways to address those problem in some respects, in other respects we're

much more scientific and committed than we were before. Having given that quick introduction to why I know a little more from way back when, I would like to zoom up to the present.

I have two documents in my hand. One is the 19-pager that you can pick up on the front table and it's also available on-line. The second one is from an operation slightly preceding this one, the Nyanza Chemical Cleanup that many of you know about in nearby Ashland, Mass. A similar process, but details are quite different.

On this particular plan, 19 pages include a lot of information and I think it's very well presented, but they missed some information. I want to address three items that I think are pretty much totally missing from the presentation. You can check me for size afterwards to see whether you agree or not.

Item Number 1. This clean up has a Restoration Advisory Board, I'm one of its members and I'm one that attends regularly and has for many, many years. The particular hearing tonight is a hearing that wouldn't have happened because its one public hearing for these things and it was on May 21st which was a night for Natick Town Meeting. The Natick town officials weren't here, I think I was the sole exception. I have been chair of four or five Natick Boards, but not currently, and I didn't represent Natick at the meeting. Neither did anyone else.

Mass. DCR operates Lake Cochituate as Cochituate State Park. It wasn't here at the meeting. A lot of you were not here at the meeting. I'm grateful to EPA and to the Army and to everyone else for pushing for this unusual re-run of that meeting because tonight we have a better chance to compare notes with each other to see what each other is thinking and to put in better comments for processing and perhaps for adoption. I hope we never see that problem again. Simply, the Restoration Advisory Board was omitted from the planning for the meeting. Half of us could have pointed out the problem. I did one week in advance, but the steamroller was already rolling pretty hard by then.

You'll notice this report is dated May 18th. I don't think anyone saw it before May 18th. Actually, I think most people saw it a little after. This is basically what was triggering a 30-day comment period which is a standard amount of time to comment, but we didn't have a standard release, we didn't have a standard meeting, we didn't have a standard comparing of concepts. I would like to ask for a 30-day comment period beginning tonight. If you don't want to do that, consider what you think about a six-day comment period and make us a far, far better offer than that, please. I think people did get a good presentation and I think they would like to see what they want to say about it. That's my experience with 30-day comment periods, they start with some pooling of information.

That's my comments on the Restoration Advisory Board and public participation aspect. That was my Item 1 of 3. I don't think it's covered in this. In fact, it's sort of ignored in this because we're left with a six-day comment period and that's not discussed either.

Response No. 1:

Comment noted. At the request of various community members, a second public hearing was held and the public comment period was extended from June 16, 2009 until June 25, 2009.

2. Public hearing (06/10/09) comment from A. Richard Miller, a member of the Restoration Advisory Board

Comment No. 2:

Item 2. We talked about how we're doing a very good job here. We looked at a range from no removal whatsoever to a maximum of all the removal. We didn't throw darts, it was more careful than that. We basically fought back and forth with logic, numbers we had, the concerns we had, to find a trade-off point. The Army's offer for a trade-off point is to remove everything where it's one part per million or more of PCB and to leave the rest. Now, I phrase this decision a little differently. I've been working on Lake Cochituate for a lot of years and during all that time I've said, "Don't use Lake Cochituate as your receptacle." It's about that simple. The Army is proposing to leave Lake Cochituate as a receptacle for the part it doesn't find cost effective to remove. That part is the part that is less than one part per million.

I told you I had a second report with me. My answer, a Superfund site analogous to this in every way except that the government is not the property owner, a company rather than a government agency put the material in. Other than that it's a similar process. They're removing everything up to one part per million.

They're doing this way out in the woods away from buildings, way up high away from the ground that other activities nearby are on, way upstream from any significant body of water for fishing, swimming or anything else, and they're finding it appropriate to clean to a level that we feel is worth shooting for, or what this proposal feels is worth shooting for, in a major recreational lake in eastern Massachusetts.

I see an immense difference between the two places. I see no difference between the level of effort. Except for one, their's is up on ground where it's dry and ours is in the water. We're not caring about that any more either for that reason. I think they're very disproportionate if you ignore the one part per million and look at the context in which it's being removed. I would like to see that we don't continue to use the lake as the receptacle for the lower levels.

Now, somebody pointed out a little earlier that we don't clean much lower than that. There's a reason for that, too. We don't do good measurements, we don't know how to measure really carefully. I'm just saying scrape it deeper, scrape it further to the sides, take it out. It will do some help for some other purposes as well. It's in a major recreational lake in eastern Massachusetts and I don't think that's the same as up on a hill back in the woods in Ashland and it's not affecting a local or a major regional body of water. So my second part is simply don't use the lake as a receptacle. Do a more thorough cleaning job.

Jill pointed out in questioning two areas that were hot spots enough to remove and the area between them with no obvious reason other than a rather quirky relationship between extrapolation on a mathematical model and real life. There's no reason not to clean up between them and there's no reason not to clean out further to the sides as well. But that's what you get when you rely on a mathematical model instead of what to me is common sense in this particular place. I think that's it.

Oh, one thing. Why bother to clean out more? That's right, why indeed. Because cancers have not gone away. Cancers started growing at the inception of World War II and have kept climbing. More recently cancers have been reaching down to lower and lower age groups. If we thought for a minute that all these numbers on which chemical was and was not dangerous were truly accurate as opposed to very good mathematical models attempting to model real things that we don't yet

understand, then cancers would be diminishing rapidly. They would be almost gone by now. Because all the chemicals come with a label that says it's okay for a one part per million level that says take it to there and we'll be okay. Without going into how it got to be a lie, it patently isn't the truth or the cancers would be going away.

Very simply, these are chemicals that are suspect. Chemicals, unlike we, are not innocent until proven guilty. The mathematical modeling that we're relying upon has not closed the circle and they since are still far too high, the cancer incident rate. We know there's a gap. Why rely on the mathematical model when you know there's a gap. Don't use the lake as a receptacle.

Response No. 2:

The clean up at the Nyanza Superfund site in Ashland, MA is not analogous or relevant to the NSSC site. The contaminant of concern that was remediated at Nyanza was mercury. The contaminant of concern in sediment at NSSC is PCBs. Additionally, the clean up performed at Nyanza addressed wetlands and drainageways, whereas the proposed clean up at NSSC is lake sediments. Therefore, drawing comparisons between the cleanup goals for different contaminants and different environmental settings is not relevant.

Based on the different methodologies presented in the FS, a sediment cleanup goal of an average PCB concentration of 1 ppm across Pegan Cove was selected by the Army, and has been agreed to by the US EPA and MassDEP. This cleanup goal is protective of human health and the environment, and also consistent with non-site-impacted background concentrations (Fisk Pond). As part of the pre-cleanup survey that will be initiated prior to dredging, additional sediment samples will be collected from the proposed hot spot areas. The new data will allow for further delineation/refinement of the current "hot spot" locations slated for removal, in order to ensure that the cleanup goal of an average PCB concentration of 1 ppm across Pegan Cove will be met. The currently proposed hot spot dredging areas were developed using the 2007 sediment sample PCB concentrations as input data used in the contouring software Surfer® (version 8.05) in order to achieve an average post-dredging PCB concentration within Pegan Cove of below 1.0 mg/kg (ppm). The contouring process used the default kriging method, and was reviewed and approved by US EPA. Based on the results of the contouring, removal of contaminated sediment from the four proposed hot spot areas will achieve an average PCB concentration within Pegan Cove of less than 1 mg/kg (ppm). If the additional pre-cleanup sediment sampling data indicate elevated PCB concentrations, the Army will consider additional sediment removal if warranted.

The human health risk assessments conducted for theoretical exposure to sediment and fish near the NSSC shoreline were performed in accordance with US EPA guidance using conservative assumptions and with oversight by the US EPA, Mass DEP, and the RAB. The results of the fish ingestion risk assessment determined that there is an unacceptable potential non-cancer risk for individuals who might ingest native fish caught from the NSSC shoreline. The estimated cancer risk was within U.S.EPA acceptable ranges.

3. Public hearing (06/10/09) comment from A. Richard Miller, a member of the Restoration Advisory Board

Comment No. 3:

My third point and final point. In this range, we have only looked at a range between nothing and everything and picked a point partway down from the everything. The range only addressed one half of what clean ups are about. The other half of what cleanups are about is paying or otherwise

mitigating ancillary damages caused by the material that was in the way. What other damages were incurred?

Back to the 19-page report for tonight. There's no mention whatsoever of the other very popular topic of this week on Lake Cochituate, Eurasian Water Milfoil and other infestations of aquatic weeds in the lake which began in 2002 in Pegan Cove adjacent to that boat launching ramp and no other boat launching ramp. You heard tonight that that ramp has been used by citizens and community members as well.

Let me put that in context. It was not. It was used by anyone in the Army who could get a pass through to use it, a retired veteran, people who had an Army way into the pond, but it was not used by the community in general. The only time that changed, and I'm glad it did, the Army has done many nice things for the community and they did one after there was a major infestation of Eurasian Water Milfoil. It spread so wide that the Middle Pond boat launching ramp was netted away from the South Pond water ski area, people were allowed to get their boats into South Pound through the Army's ramp. It was only because the Milfoil had spread and nets were in the way for boats getting there without using the Army's ramp. That's the history of how other boats got there. Until 2002 the boats that were coming near Pegan Cove were coming through that ramp. The boats that were getting to that Pegan Cove area from the main launching area had two-and-a-half ponds to race through to get there. Any Milfoil that they carried in from another pond would have been washed off almost surely long, long, long before it got to Pegan Cove. So the fact that 11 to 14 acres of Milfoil showed up first in Pegan Cove is, in my opinion, an almost sure sign that it came in from that launching ramp from U.S. Army Natick Labs.

That's doesn't make U.S. Army Natick Labs guilty of having schemed to have put it in in any sense. In terms of a degree of liability for it happening, to me anything else is much, much more far fetched than that way of introducing the Milfoil. It would have shown up somewhere else sooner otherwise.

It might have shown up there, I believe, at the end of May 2002. We have several experts on those dates in the audience from DCR. When it showed up we all knew that a net was going to be put across the south end of Pegan Cove within two weeks to catch the floating fragments of Milfoil before they could infest the rest of the lake. Pegan Cove is upstream from the whole chain of ponds that make up Lake Cochituate. It was all vulnerable. Getting the net up was important. It didn't happen at all that summer. It happened September 16th.

Now, there's a lot of people who might accept some blame for that, but that's the time during which the Milfoil spread. On September 16th when it was time to put up the net it didn't go at Pegan Cove because the Milfoil was spread way beyond. It went between South Pond and Middle Pond and that's why boats had to be launched into South Pond from the Army's ramp. They couldn't get there any other way.

Very simply, the result of not catching the Milfoil in time has resulted in a huge bill and a huge continuing headache for the rest of the lake. This is complicated by several factors. Natick didn't particularly want to drink the herbicide chemicals in it's drinking water which comes from wells adjacent to South Pond. A lot of people argued a lot of different directions, but when it came to pulling those weeds, the non-chemical approach, from Pegan Cove which is less then ten feet deep, an easy place to contain it and remove it compared to anything that came later, it turned out to be unfeasible.

I can assure you that I brought it up on a fairly regular basis at the very beginning and several times per year ever since. We've had major concerns at those Restoration Advisory Board meetings without about releasing the toxic sediment. Not that it was not an issue, but that the problem was an issue. This was one of the contributing factors, and not the only one, as to why there wasn't an early and effective control of the Milfoil.

What difference does it make and who cares? My favorite questions. Kids know them, parents tend to ignore them. If you can answer them it's often worth doing. What difference does it make? Well, we were told within the month by the Army that there was no way to go beyond the range of no removal to full removal. There was no vehicle for talking about restoration beyond removal even if damage was done while it was there. It has been there a long time and during that critical period. That's not true. There are a number of vehicles for restoration for ancillary damage or for mitigation.

In this Nyanza chemical operation for clean up, half of the project, like most of these projects, goes beyond the removal. There's $3.9 million of this money that's going to groups to do something right in exchange for all that's been done wrong. In terms of doing things right, Lake Cochituate has an interest and I've had an interest and therefore I knew about the whole project. What I didn't know a lot about was the mechanism by which that $3.9 million magically appeared. It does affect CERCLA sites as well as Superfund sites.

The particular vehicle is called the U.S. Natural Resource Damage and Restoration Assessment Program. There's an arm of it operating in Massachusetts and I am formally requesting that the Army, the EPA, all the parties concerned, cooperate and coordinate that group to find a fair and equitable assessment for how much this damage from this project can be turned into control of the Milfoil that is now infesting the entire lake.

We have some good projects, but the State nor the local residence have the kind of money it now costs now that we don't have 11 to 14 acres to wrestle with.

So I would very much like those questions addressed and answered. I have asked already that the Army simply gather all the comments from all those earlier minutes from all those earlier meetings to see how many times this question was brought up and to make those discussions available because it's not as simple as this picture and all those issues have disappeared from the 19-page presentation that you've heard. It may be the difference of getting our lake back to a clear lake, the one we remember from before these problems hit. Thank you very much.

Response No. 3:

Eurasian milfoil occurs in Lake Cochituate, and is, unfortunately, a common invasive species in many other water bodies throughout Massachusetts. The Army's cleanup proposal for contaminated sediment addresses a CERCLA remedial action. The purpose of a CERCLA remedial action is to address releases of CERCLA hazardous substances caused by the responsible party. In the case of the NSSC sediment, that principal CERCLA hazardous substance is PCBs. Eurasian milfoil is not a regulated contaminant under CERCLA, therefore it is not addressed under the NSSC Superfund-related investigation or cleanup activities. Since Lake Cochituate is managed by the Massachusetts Department of Conservation and Recreation (MassDCR), any actions related to managing milfoil would be under the jurisdiction of the MassDCR. Since the Army is not addressing Eurasian milfoil in its CERCLA remedial action, it does not hold an opinion regarding whether or not to use chemicals in addressing lake weeds.

Based on a thorough review of all RAB minutes since 2001, the Army never stated that the milfoil should not be pulled loose due to contaminated sediment along the NSSC shoreline, nor has the Army hindered the process of addressing the milfoil issue. While the Army has identified confirmed areas along the NSSC shoreline that have sediment contamination, it was not the Army's place to tell anyone whether they can or can not pull milfoil from these areas. In fact, the human health risk assessments concluded that potential contact with the contaminated sediment near NSSC for individuals swimming and wading in the lake did not pose an unacceptable risk. The RAB minutes between 2002 and 2007 (including January 19, 2006; April 20, 2006; and November 30, 2006) do document concerns among some RAB members that the SolarBee circulator systems could cause re-suspension of contaminated sediment.

The Army is not responsible for causing the growth of Eurasian milfoil in Pegan Cove. Beginning in September 2001 (almost 10 months prior to the first observance of milfoil by the MassDCR), the NSSC boat ramp was permanently closed (including a locked fence and gate) due to homeland security issues. The more plausible hypothesis is that milfoil has proliferated in Pegan Cove because it tends to grow best in shallow water (8 to 10 feet deep) with an organic and nutrient-rich sediment substrate, both of which exist in Pegan Cove. Additionally, Pegan Cove is heavily used for water skiing and therefore there is frequent high speed motor boat activity (and resulting turbulence) in this part of the lake that has likely resulted in spreading of the milfoil. Since very few milfoil mitigation efforts have been performed by MassDCR in the Pegan Cove since 2002, the milfoil has been allowed to spread.

As part of the proposed remedial action, the Army proposes certain measures to ensure that the milfoil will not be further spread during sediment remediation activities. A double-layered silt curtain will be put in place around all dredging areas to retain any sediment that might be suspended in the water column. The silt curtains will also retain any aquatic vegetation, such as milfoil, that may be agitated during the cleanup action. Any plant matter that is removed from the dredged material prior to its placement in the geotextile tubes will be disposed of properly off-site, depending on its properties, either as regular waste or hazardous waste.

4. Public hearing (06/10/09) comment from Carole Berkowitz, Chair of Protect Our Water Resources

Comment No. 4:

My name is Carole Berkowitz. I live at 9 Crescent Street, Natick, Mass. That's right across from Natick Labs on South Pond. I represent -- well, I'm the Chair of a group called Protect Our Water Resources. It's a group of Natick citizens only, 200 plus citizens who are very concerned about the drinking water in particular and about the whole lake.

What I want to say is that we're at a point where there are other citizens who very much want to use herbicides to deal with the problem of aquatic weeds. We had one such episode in 2006 with the use of fluoridone. Fortunately, our three Natick boards, the Board of Health, the Natick Conservation Commission and our Selectmen voted against the fluoridone because the Board of Health hired an independent consultant along with the backing of the Mass. DCR. This particular consultant studied a lot of the materials that you people put together or had researched, and with that information made the decision not to put fluoridone, a whole lake treatment, into South Pond. Now in 2009 we're facing two other entries of chemicals, one on North Pond and that's a troclopyr and then in Middle Pond it's diquat dibromide.

What I want to emphasize here is this continued pressure to use chemicals. Instead, we want to use this DASH, the Diver Assisted Suction Harvester. As we all know, it's not easy to get money for this particular non-chemical device. We've been now working with Wayland. I'm doing that now, applying for a grant. The Natick Conservation Commission, they applied for a grant, they gave a DCR matching partnership grant, they gave $17,000 to the grant. Our particular grant was not accepted and the chemical application was accepted. People from Wayland and Framingham applied for the same partnership grant and the chemicals were accepted. The grant for the DASH was not accepted even though Natick came forth with $17,000, their particular part of the grant.

So here we are. We still don't want to see chemicals used. On top of what we're hearing tonight, I hope people begin to realize that there are a lot of uncertainties with these chemicals. To think of adding more on top of what we already have and potentially, the way the water flows, those chemicals could get into our drinking water.

We know that there is evidence on both sides of the issue and we're very sensitive to that. We know that the aquatic weeds are a problem, but it's the way that you deal with the problem that becomes important to us.

I would like to say that I want to also support Dick Miller's suggestion that we look at restoration funds as well and look at every possible opportunity to find the money so that we can use a DASH in Lake Cochituate. Thank you very much.

Response No. 4:

Eurasian milfoil occurs in Lake Cochituate, and is, unfortunately, a common invasive species in many other water bodies throughout Massachusetts. The Army's cleanup proposal for contaminated sediment addresses a CERCLA remedial action. The purpose of a CERCLA remedial action is to address releases of CERCLA hazardous substances caused by the responsible party. In the case of the NSSC sediment, that principal CERCLA hazardous substance is PCBs. Eurasian milfoil is not a regulated contaminant under CERCLA, therefore it is not addressed under the NSSC Superfund-related investigation or cleanup activities. Since Lake Cochituate is managed by the Massachusetts Department of Conservation and Recreation (MassDCR), any actions related to managing milfoil would be under the jurisdiction of the MassDCR. Since the Army is not addressing Eurasian milfoil in its CERCLA remedial action, it does not hold an opinion regarding whether or not to use chemicals in addressing lake weeds.

5. Public hearing (06/10/09) comment from Jim Straub, Lakes and Ponds Program Coordinator for the Department of Conservation and Recreation

Comment No. 5:

My name is Jim Straub. I'm the Lakes and Ponds Program Coordinator for the Department of Conservation and Recreation. I'll keep my comments to the program that we're talking about tonight.

The one question I had was, in your proposal you planned on backfilling the areas that you suction harvested. My question is: Do you have a valid reason for that and, if possible, can that not be done? My second question is: If there are restrictions put on Pegan Cove, which we talked about possible no wake zones and things like that, does the Army have a plan or an idea of how that will be enforced? Those are the two comments that I would like addressed please. Thank you. Oh, my address is 251 Causeway Street, Boston, Mass.

Response No. 5:

The preferred remedy currently includes backfilling each dredged hot spot area with a clean sand material to fill the voids produced from the dredging activities. Backfilling will also provide the added assurance that in the event there are residual PCB concentrations remaining at the bottom of each hot spot removal area, these residual PCBs will be covered, thereby minimizing their exposure to aquatic biota. Backfilling of the hot spot removal areas may, however, be eliminated if it is determined that it is not reasonably effective in further reducing the potential for sediment-associated human health risks due to PCBs in fish caught near the NSSC shoreline currently and in the future. Results of post excavation confirmatory sampling of the dredged area (conducted following excavation and prior to removal of the primary or secondary silt curtain, and prior to backfill) may be used to determine whether backfill is required in a given dredged area. The specifics of sampling and criteria for backfill based on sample results will be further described in the remedial design plan.

As part of the preferred remedy, site control measures will include posting signs that limit boating in the area of the dredging activities during the remedial action, and prohibit fishing from the NSSC shoreline within Pegan Cove. The signs prohibiting fishing will be constructed of metal and secured to the NSSC perimeter fence along the shoreline within Pegan Cove. The Army will enforce the fishing prohibition control measure along the NSSC shoreline. Since the Commonwealth of Massachusetts has jurisdiction over the lake and the sediment in the lake, the Army would need to develop an enforceable cooperative agreement with the appropriate Commonwealth agencies (e.g., MassDCR) to implement the restrictions that apply to the offshore areas, including the control measure that limits boating in the area of the remedial action. The agreement would need to specify which party is responsible for enforcing the offshore control measures.

6. Public hearing (06/10/09) comment from Bob Bois, Natick Board of Selectman and Natick Conservation Commission

Comment No. 6:

I'm Bob Bois with the Town of Natick. I'm actually representing the Board of Selectmen and the Natick Conservation Commission this evening. Both would like to submit comments, we have written comments and I have sent them along to you, Jim, I believe.

From the Board of Selectmen's point of view I just want to summarize them. The removal and backfilling of the contaminated sediments should comply with the performance standards set in both the Wetlands Protections Act and the Town's wetland bylaws. The Board of Selectmen graciously offered to the Natick Conservation Commission to work with you guys on getting that done and we're there to help out.

Response No. 6:

As described in the Proposed Plan, the preferred remedy will comply with all chemical, location, and action-specific Applicable and Relevant and Appropriate Requirements (ARARs). These ARARs will include the performance standards set forth in the Massachusetts Wetlands Protection Act, the Town of Natick Wetland Bylaw, as well numerous other ARARs. The ARARs for the preferred remedy are presented in the Final Feasibility Study and will be included in the signed Record of Decision.

Following the submittal of the Record of Decision, the Army will prepare a remedial design plan, which will establish the specific performance standards required by the various ARARs and how each will be attained during implementation of the remedial action. Copies of the draft remedial design plan will be provided to the town of Natick for review prior to the implementation of the remedy.

7. Public hearing (06/10/09) comment from Bob Bois, Natick Board of Selectman and Natick Conservation Commission

Comment No. 7:

Further, the second point that the Board made was that further field work to define the sediment removal areas needs to be completed as part of pre-construction before you do the removal and also as post construction to know that you've got enough contaminated material. What I saw this evening suggests that you'll be doing that.

Response No. 7:

A pre-cleanup survey will be initiated throughout the remediation areas, and will include further refinement of the horizontal and vertical extent of PCB contamination in the sediment. This new data will allow refinement of the current "hot spot" locations slated for removal, in order to ensure that the cleanup goal of an average PCB concentration of 1 ppm across Pegan Cove will be met.

The proposed remedy for the NSSC shoreline sediment is based on currently available sediment PCB data, as well as the additional data which will be collected during the pre-cleanup survey described above. It should be noted that the cleanup goal is an average PCB concentration of 1 ppm across Pegan Cove. The available site data and the results of the sediment concentration contour modeling (using accepted modeling techniques reviewed and approved by US EPA) indicate that removal of the proposed "hot spot" areas and backfilling with clean fill will result in an average PCB concentration below 1 ppm across Pegan Cove. Following excavation and prior to removal of the primary or secondary silt curtain, and prior to backfill, post-excavation confirmatory sampling of the dredged area will be conducted to verify that residual concentrations, if any, will meet the average cleanup goal. The specifics of sampling will be further described in the remedial design plan.

8. Public hearing (06/10/09) comment from Bob Bois, Natick Board of Selectman and Natick Conservation Commission

Comment No. 8:

The third point, special care should be given to monitor all discharges resulting from the proposed project to assure that the water quality of the lake is not further impacted. It's encouraging tonight, through your example, that you showed that indeed that was the case. It will be interesting to find out what standards, what discharge standards you're going to use here.

Response No. 8:

Cleanup monitoring under the preferred remedy includes monitoring the treated discharge water from sediment dewatering operations, and monitoring the lake water conditions for sediment re-suspension and transport beyond the remediated hot zones. The treated water from sediment

dewatering operations will be monitored to ensure that it meets applicable criteria prior to discharging it back to the lake. The treatment and monitoring of the discharge water will ensure that it does not adversely impact the lake. The remedial design plans will establish specific monitoring techniques and frequencies, and contingency plans will be implemented in the event established monitoring limits are exceeded.

9. Public hearing (06/10/09) comment from Bob Bois, Natick Board of Selectman and Natick Conservation Commission

Comment No. 9:

The fourth item, the long-term effectiveness of the performance of the proposed project should include ongoing fish sampling, particularly the native stuff. The purpose of the future fish sampling should be to monitor the anticipated reduction of contaminated concentrations found in the lake, native fish, in hopes of removing the current ban. If all goes well, the high PCB levels in fish should decrease and the ban should no longer be needed in the future.

Finally, the Board would like to see multilingual signage to prohibit the eating of native fish caught in the lake. They should be posted in various locations.

The Board does thank you for your hard effort and for the Proposed Plan and it fully supports the action.

Response No. 9:

There are currently elevated concentrations of PCBs in sediment at other upstream and non-Army-impacted locations within Lake Cochituate, as shown by the lake-wide sampling performed since the mid 1990s. While the removal of the most contaminated sediment adjacent to the NSSC shoreline will result in a post-dredging average sediment PCB concentration of less than 1 ppm within Pegan Cove, it may or may not result, over time, in an ultimate reduction in the PCB concentrations in fish caught from Pegan Cove. This is because fish caught within Pegan Cove and elsewhere around Lake Cochituate may take up PCBs from these other non-Army-impacted areas that contain PCBs in the sediment. Therefore, the Army does not propose any post-remediation fish monitoring as part of the preferred remedy since the results from such sampling could not be definitively attributed to the Army's implemented sediment remedy. To ensure the remediation has met its cleanup goals, following excavation and prior to removal of the primary or secondary silt curtain, and prior to backfill, post excavation confirmatory sampling of the dredged area will be conducted to verify that residual concentrations, if any, will meet the average clean up goal. The specifics of sampling will be further described in the remedial design plan.

As part of the preferred remedy, site control measures will be implemented prior to initiating any remedial activity, and will include posting signs that prohibit fishing from the NSSC shoreline within Pegan Cove. The signs prohibiting fishing will be constructed of metal and secured to the NSSC perimeter fence along the shoreline within Pegan Cove. The signs will include universal symbols indicating that fishing is prohibited, and contain warnings in different languages that are representative of the demographic populations that use Lake Cochituate. The signs prohibiting fishing will remain in place after completion of the remedial action and will be maintained by the Army. If requested, the Army will provide additional sign templates to appropriate state agencies, such as the MassDEP, MassDPH, and MassDCR.

10. Public hearing (06/10/09) comment from Bob Bois, Natick Board of Selectman and Natick Conservation Commission

Comment No. 10:

The Natick Conservation Commission, at its last meeting, voted unanimously actually to ask the Army and I believe the NRD, Natural Resource Damage, and the Trustee for the State to pursue federal funding for the possible removing of the invasive plants in South Pond of Lake Cochituate as a natural damage claim under the State NRD of Trustee Authority. That vote, as I mentioned earlier, was unanimous and we'd like to have that added to the assessment. Thank you.

Response No. 10:

Comment noted. Although the Army considers the effect of a CERCLA remedy on the potential injury to natural resources, the process of assessing any natural resource damages is separate from the selection of an appropriate remedy under CERCLA. Any claim for recovery of potential natural resource damages must be initiated by the appropriate trustee(s) under the applicable federal law after remedy selection. In addition, the decision regarding appropriate projects to restore the injured natural resource must be made by the trustee(s).

11. Public hearing (06/10/09) comment from Marco Kaltofen, Co-Chair Restoration Advisory Board

Comment No. 11:

Hello, my name is Marco Kaltofen. I'm a Natick resident, I live at 5 Water Street. I have also been the Community Co-Chair of the Restoration Advisory Board which is a community based and also regulator and U.S. Army organization that has volunteers to help review the Superfund clean up at the Labs in the past 14 years, 13 years. Since 1995, so about 14 years.

One of our priorities has always been to deal with a serious health problem, and that is the PCB contaminated fish continue to be eaten at the lake despite the overarching bans by the Commonwealth on that fish consumption. So any activity that is going to reduce the amount of fish that are being be consumed, especially by sensitive people like children or people that might eat more than the average amount of fish taken from the lake, is a good thing.

As the Community Co-Chair I am very supportive of the action that the Army is taking. I'm very appreciative of the work that's been done by the Army in producing this plan. I think overall it's a good one. I made some written comments about a few tweaks, some of them were repeated by the Town through their representative, particularly in signage that continues to warn people about not taking fish even after the remediation is complete.

Jill, I know you brought up something that bothered me and that was the continuity between two separate hot spots, that they be treated as one single continuous unit. I think several people have bought up the issue of monitoring after the remediation, particularly for looking at the quality of the fish that remain when the job is done. Five years from now, assuming we sign this Record of Decision on this particular clean up, we'll have to come back and review how we've all done. After the clean up, fish and environmental survey, I think it's going to be very important to do that.

Lastly, I really did want to thank the people who took the time to come and make comments tonight.

Response No. 11:

As part of the pre-cleanup survey that will be initiated prior to dredging, additional sediment samples will be collected from the proposed hot spot areas, including the two southernmost areas. The new data will allow for further delineation/refinement of the current "hot spot" locations slated for removal, in order to ensure that the cleanup goal of an average PCB concentration of 1 ppm across Pegan Cove will be met. The currently proposed hot spot dredging areas were developed using the 2007 sediment sample PCB concentrations as input data used in the contouring software Surfer® (version 8.05) in order to achieve an average post-dredging PCB concentration within Pegan Cove of below 1.0 mg/kg (ppm). The contouring process used the default kriging method, and was reviewed and approved by US EPA. Based on the results of the contouring, removal of contaminated sediment from the four proposed hot spot areas will achieve an average PCB concentration within Pegan Cove of less than 1.0 mg/kg. If the additional pre-cleanup sediment sampling data associated with the two southernmost hot spot areas indicate elevated PCB concentrations, the Army will consider additional sediment removal if warranted. Combining the two southernmost areas into a single continuous locus of sediment to be removed would result in an increase in volume of approximately 16 percent or an additional 400 cubic yards.

There are currently elevated concentrations of PCBs in sediment at other upstream and non-Army-impacted locations within Lake Cochituate, as shown by the lake-wide sampling performed since the mid 1990s. While the removal of the most contaminated sediment adjacent to the NSSC shoreline will result in a post-dredging average sediment concentration of less than 1 ppm within Pegan Cove, it may or may not result, over time, in an ultimate reduction in the PCB concentrations in fish caught from Pegan Cove. This is because fish caught within Pegan Cove and elsewhere around Lake Cochituate may take up PCBs from these other non-Army-impacted areas that contain PCBs in the sediment. Therefore, the Army does not propose any post-remediation fish tissue monitoring as part of the preferred remedy since the results from such sampling could not be definitively attributed to the Army's implemented sediment remedy. To ensure the remediation has met its cleanup goals, following excavation and prior to removal of the primary or secondary silt curtain, and prior to backfill, post excavation confirmatory sampling of the dredged area will be conducted to verify that residual concentrations, if any, will meet the average clean up goal. The specifics of sampling will be further described in the remedial design plan.

12. Public hearing (06/10/09) comment from Michael Lowery, a member of the Wayland Surface Water Quality Committee

Comment No. 12:

I'm Michael Lowery, 120 Lake Shore Drive in Wayland. Wayland has the North Pond of Lake Cochituate. I am a member of the Town body called the Wayland Surface Water Quality Committee. I work in partnership with some of these gentlemen and ladies to help keep the lake as a whole in good condition.

Because your effort has not really -- it's been principally in Natick. Our towns have only recently come to understand the import of these hearings and for that reason I would like to support Mr. Miller's request and ask that the public comment period be extended so that my committee can better consider some of the issues that were raised tonight that are new to us. Thank you.

Response No. 12:

At the request of various community members, the public comment period was extended from June 16, 2009 until June 25, 2009.

21.3.3 Comments Received in Writing During the Public Comment Period

1. Written comment from Marco Kaltofen, PE, co-chair of the Restoration Advisory Board, letter dated 05/21/09

Comment No. 1:

The two southernmost areas for which dredging is planned in Pegan Cove should be combined into a single continuous locus of sediment to be removed. As a practical matter these two areas are quite close, and combining them can facilitate dredging by reducing the number of dredge cyclings required. The added volume of sediment collected appears to be less than 10 percent of the estimated total volume. This sediment is likely to be very similar in quality to sediment already targeted for removal. The overall chance for successful achievement of the proposed cleanup level of 1 PPM will improve by removal of sediment in this area between the two existing removal zones.

Response No. 1:

As part of the pre-cleanup survey that will be initiated prior to dredging, additional sediment samples will be collected from the proposed hot spot areas, including the two southernmost areas. The new data will allow for further delineation/refinement of the current "hot spot" locations slated for removal, in order to ensure that the cleanup goal of an average PCB concentration of 1 ppm across Pegan Cove will be met. The currently proposed hot spot dredging areas were developed using the 2007 sediment sample PCB concentrations as input data used in the contouring software Surfer® (version 8.05) in order to achieve an average post-dredging PCB concentration within Pegan Cove of below 1.0 mg/kg (ppm). The contouring process used the default kriging method, and was reviewed and approved by US EPA. Based on the results of the contouring, removal of contaminated sediment from the four proposed hot spot areas will achieve an average PCB concentration within Pegan Cove of less than 1.0 mg/kg. If the additional pre-cleanup sediment sampling data associated with the two southernmost hot spot areas indicate elevated PCB concentrations, the Army will consider additional sediment removal if warranted. Combining the two southernmost areas into a single continuous locus of sediment to be removed would result in an increase in volume of approximately 16 percent or an additional 400 cubic yards.

2. Written comment from Marco Kaltofen, PE, co-chair of the Restoration Advisory Board, letter dated 05/21/09

Comment No. 2:

Institutional controls, (specifically including permanent signage), to prohibit fishing along the entirety of the Natick SSC shoreline should be created, along with signage visible to boaters on the lake. The incremental cost is minimal, and O & M costs are negligible. It is not material that similar controls exist based on site security issues. Added notification to the public via a shoreline fishing ban decreases the risk that Lake Cochituate fish will be consumed by members of the public, which furthers the goals of the overall risk reduction plan. The 1997 ATSDR evaluation has already targeted areas outside of Pegan Cove as a sources of added incremental health risks, particularly to minors. Understanding that the risks are below regulated levels, nevertheless, a

posted Natick SSC fishing ban reinforces the existing ban on fish-taking by the Commonwealth of Massachusetts. This existing ban is routinely ignored, resulting in needless PCB exposures to members of the public.

Response No. 2:

As part of the preferred remedy (Alternative 8), site control measures will be implemented prior to initiating any remedial activity. The site control measures will include posting signs that limit boating in the area of the dredging activities during the remedial action, and prohibit fishing from the NSSC shoreline within Pegan Cove. The signs prohibiting fishing will be constructed of metal and secured to the NSSC perimeter fence along the shoreline within Pegan Cove. The signs will include universal symbols indicating that fishing is prohibited, and contain warnings in different languages that are representative of the demographic populations that use Lake Cochituate.

Once remedial activities are completed, the signs restricting boating will be removed and the signs prohibiting fishing will remain in place and be maintained by the Army. If requested, the Army will provide additional sign templates to appropriate state agencies, such as the MassDEP, MassDPH, and MassDCR.

3. Written comment from Marco Kaltofen, PE, co-chair of the Restoration Advisory Board, letter dated 05/21/09

Comment No. 3:

An important part of site closure, prior to the 5 year review phase, is to monitor the PCB levels in Pegan Cove fish, particularly for American eels and large mouth bass. The completion of remedial activities should not be certified without an analysis of PCBs in Pegan Cove fish, taken a scientifically reasonable period after the remedial activities are otherwise complete. This data will also assist those making the determination regarding the continuing efficacy of this proposed plan at the first 5 year review, by providing baseline post-remedial data. This baseline data will be an irreplaceable resource for evaluating the proposed plan's effectiveness. For example, should it be documented that PCB levels in fish declined after remediation, then any future increases are more likely to be due to PCB sources not controlled by the Natick SSC. This kind of data could not be obtained retrospectively, should the Natick SSC fail to conduct a follow up fish study.

Response No. 3:

There are currently elevated concentrations of PCBs in sediment at other upstream and non-Army-impacted locations within Lake Cochituate, as shown by the lake-wide sampling performed since the mid 1990s. While the removal of the most contaminated sediment adjacent to the NSSC shoreline will result in a post-dredging average sediment concentration of less than 1 ppm within Pegan Cove, it may or may not result, over time, in an ultimate reduction in the PCB concentrations in fish caught from Pegan Cove. This is because fish caught within Pegan Cove and elsewhere around Lake Cochituate may take up PCBs from these other non-Army-impacted areas that contain PCBs in the sediment. Therefore, the Army does not propose any post-remediation fish tissue monitoring as part of the preferred remedy since the results from such sampling could not be definitively attributed to the Army's implemented sediment remedy. To ensure the remediation has met its cleanup goals, following excavation and prior to removal of the primary or secondary silt curtain, and prior to backfill, post excavation confirmatory sampling of the dredged area will be conducted to verify that residual concentrations, if any, will meet the average clean up goal. The specifics of sampling will be further described in the remedial design plan.

4. Written comment from Kannan Vembu, PhD., a member of the Restoration Advisory Board, email dated 05/26/09

Comment No. 4:

It was stated that under "Site Risks - Human Health" - "Risks exceeded US EPA's acceptable range for eating native fish caught from non-SSC locations". However, in selecting the "Sediment Cleanup Goal", one of the rationale for selecting an average PCB concentration of 1 part per million given was - "Similar to existing sediment PCB concentrations at the upgradient non-SSC-impacted Fisk Pond locations".

Comment - If the non-SSC locations exceeded EPA's acceptable range, using sediment PCB concentration in non-SSC locations as one of the rationale to select 1 PPM cleanup goal seems to be a disconnect and further explanation may be required.

Response No. 4:

There are currently PCBs in sediment at other upstream non-Army-impacted lake locations, including the Fisk Pond background location. These sediment PCBs have resulted in risks that exceed US EPA's acceptable range for eating native fish caught from non-Army-impacted locations. While the selected cleanup goal of 1 ppm is similar to existing sediment PCB concentrations at the upgradient non-NSSC-impacted Fisk Pond location, it was selected based primarily on calculations that indicate that it is protective of human health, as described in Section 3.2 of the Final Feasibility Study (March 5, 2009) and excerpted below:

> A numerical remedial goal for total PCBs in sediment at the NSSC shoreline is established to reduce the potential for non-cancer risks possibly associated with ingestion of fish caught from the NSSC shoreline, and to maintain the potential incremental cancer risk for individuals who may consume native fish from the NSSC shoreline at levels below concern. The establishment of a remedial goal for sediment presumes that a reduction of PCBs in sediment at the NSSC shoreline will, over time, reduce the PCB concentrations in fish caught at the NSSC shoreline. This approach is based on the assumption that the contribution of PCBs to the fish caught at the NSSC shoreline is not influenced by contributions of PCBs from sediment to these fish from reference (non-site-related) locations in the South Pond of Lake Cochituate.

Based on the different methodologies presented in the FS, a range of protective sediment cleanup goals was derived, from 0.13 ppm to 4 ppm. The lowest cleanup goal calculated, 0.13 mg/kg total PCBs in sediment, is likely to be technically impracticable to attain from an engineering perspective, and is also lower than concentrations of PCBs found in non-site-impacted background locations. Under CERCLA, the selected cleanup goal must be protective of human health and the environment, but should also be consistent with non-site-impacted background concentrations. The selected sediment cleanup goal of 1 ppm is consistent with these criteria, and has been agreed to by the US EPA and MassDEP.

5. Written comment from Kannan Vembu, PhD., a member of the Restoration Advisory Board - email dated 05/26/09

Comment No. 5:

In selecting Alternative 8 as the preferred method for clean up, the disturbance caused during dredging may disburse higher concentration sediments beyond the hot zone to within the boundaries of the silt curtains and over a period of time the sediments may settle outside the remediated hot zone. However, there is no O&M costs or institutional control indicated in this alternative (compared to Alternatives 4, 5, 6, 7, and 9). It is not clear what is meant by "Cleanup Monitoring" under this alternative.

Comment - Further explanation with data may be required to ensure the public that the selected alternative is permanently safe or propose means to ensure safety through monitoring and explaining how and where it will be done and over what period of time.

Response No. 5:

Cleanup monitoring under Alternative 8 refers to monitoring procedures that will be implemented during the remedial activities. This includes monitoring the treated discharge water from sediment dewatering operations, monitoring the lake water conditions for sediment re-suspension and transport beyond the remediated hot zones, and air monitoring to ensure that potential air and odor impacts to workers, facility staff, and the community are minimized. The remedial design plans will establish specific monitoring techniques and frequencies, and contingency plans will be implemented in the event established monitoring limits are exceeded.

Potential sediment re-suspension was a significant concern that the Army considered when evaluating various remedial alternatives. One of the key reasons hydraulic dredging is proposed as the preferred remedy is that it minimizes sediment re-suspension. One of the key components of the proposed remedy will be to prevent the migration of sediment from within the hot spot areas (or areas of elevated PCB contamination) to areas outside of the hot spots. To prevent this, a primary silt curtain will be installed around the perimeter of each hot spot dredging area. A secondary silt curtain will also be installed around the primary silt curtain with an approximate 2- to 3-foot gap between the two curtains. The hydraulic dredge will remove all sediment (to the proposed 6- or 12-inch depth) within and right up to the boundaries of the primary silt curtain. Real-time lake water monitoring will occur during dredging operations between the primary and secondary silt curtains, as well as outside of the secondary silt curtain perimeter. This monitoring data will be used as a real-time indicator of the effectiveness of the silt curtains at preventing migration of sediment outside of the hot spot areas.

Following excavation and prior to removal of the primary or secondary silt curtain, and prior to backfill, post-excavation confirmatory sampling of the dredged area will be conducted to verify that residual concentrations, if any, will meet the average cleanup goal. The specifics of sampling will be further described in the remedial design plan.

6. Written comment from Robert E. Hickman, PE, Natick, MA resident – email dated 05/23/09

Comment No. 6:

What steps will be taken during the hydraulic sediment removal to minimize increased contaminates in the lake water as a result of the dredging?

Response No. 6:

Potential sediment re-suspension was a significant concern that the Army considered when evaluating various remedial alternatives. One of the key reasons hydraulic dredging is proposed as the preferred remedy is that it minimizes sediment re-suspension. One of the key components of the proposed remedy will be to prevent the migration of sediment from within the hot spot areas (or areas of elevated PCB contamination) to areas outside of the hot spots. To prevent this, a primary silt curtain will be installed around the perimeter of each hot spot dredging area. A secondary silt curtain will also be installed around the primary silt curtain with an approximate 2- to 3-foot gap between the two curtains. Real-time lake water monitoring will occur during dredging operations between the primary and secondary silt curtains, as well as outside of the secondary silt curtain perimeter. This monitoring data will be used as a real-time indicator of the effectiveness of the silt curtains at preventing migration of sediment outside of the hot spot areas.

The treated water from sediment dewatering operations will also be monitored to ensure that it meets applicable criteria prior to discharging it back to the lake. The treatment and monitoring of the water will ensure that it does not adversely impact the lake. The remedial design plans will establish specific monitoring techniques and frequencies, and contingency plans will be implemented in the event established monitoring limits are exceeded.

7. Written comment from Robert E. Hickman, PE, Natick, MA resident – email dated 05/23/09

Comment No. 7:

On page 14 there is a section titled "Water Treatment" in which the proposed treatment is described. This is very important to ensure that the filtrate does not contain any contaminates before it is returned to the lake. However, on page 16, there is no provision for O&M Costs that will be required for the water treatment. This inconsistency leaves me concerned that water treatment will not be provided. Please clarify this matter before initiating the work.

Response No. 7:

The cost for water treatment in the preferred remedy (Alternative 8) is incorporated into the Capital Costs of the alternative, which is shown on page 16 of the Proposed Plan. The Final Feasibility Study (March 5, 2009) presents a more detailed description of the water treatment that will be provided as part of the sediment dewatering process and its associated costs.

8. Written comment from Robert E. Hickman, PE, Natick, MA resident – email dated 05/23/09

Comment No. 8:

What provisions will be made for monitoring the lake water and sediments after the work in complete. I recently read that the former Natick Paperboard business has some PCB contamination on its property and that drainage from that site enters Lake Cochituate.

Response No. 8:

The proposed remedy for the NSSC shoreline sediment is based on currently available sediment data, as well as additional data which will be collected during the pre-cleanup survey. Following excavation and prior to removal of the primary or secondary silt curtain, and prior to backfill, post-excavation confirmatory sampling of the dredged area will be conducted to verify that residual concentrations, if any, will meet the average cleanup goal. The specifics of sampling will be further described in the remedial design plan.

The former Natick Paperboard site, which does have confirmed PCB contamination and a drainage system that enters Lake Cochituate in Pegan Cove, is currently being addressed under the Massachusetts Contingency Plan (MCP) program overseen by the MassDEP. There are currently elevated concentrations of PCBs in sediment at other non-Army-impacted locations within Lake Cochituate, as shown by the lake-wide sampling performed since the mid 1990s. These non-Army-impacted locations would be addressed by the appropriate regulatory agencies under separate actions.

9. Written comment from Robert E. Hickman, PE, Natick, MA resident – email dated 05/23/09

Comment No. 9:

Why is there a need to backfill the areas where 6-12 inches of sediment is removed? This seems unnecessary and would reduce the project cost if eliminated.

Response No. 9:

The preferred remedy currently includes backfilling each dredged hot spot area with a clean sand material to fill the voids produced from the dredging activities. Backfilling will also provide the added assurance that in the event there are residual PCB concentrations remaining at the bottom of each hot spot removal area, these residual PCBs will be covered, thereby minimizing their exposure to aquatic biota.

Results of post-excavation confirmatory sampling of the dredged area (conducted following excavation and prior to removal of the primary or secondary silt curtain, and prior to backfill) may be used to determine whether backfill is required in a given dredged area. The specifics of sampling and criteria for backfill based on sample results will be further described in the remedial design plan.

10. Written comment from Steve and Laurie Strout, Natick, MA residents, email dated 05/31/09

Comment No. 10:

As daily users of the lake we are in strong support of any and all actions anyone chooses to undertake concerning the clean up and water quality of this important body of water. We support the EPA's and Army's plan to dredge and will also support any and all efforts to remove invasive plants or other concerns the lake may have.

Response No. 10:

Comment noted.

11. Written comment from Lawrence Scult, Wayland, MA resident, email dated 05/27/09

Comment No. 11:

I am writing with respect to the proposed clean up at the US Army Natick SSC. As you may be aware, the Pegan Cove area is used extensively by water-skiers during the summer months because of its calm water. If it all possible, it would be much appreciated if the dredging could occur after the season is over (end of September).

Response No. 11:

The exact timing of the proposed sediment cleanup is not yet known, and will depend largely on available Department of Defense funding. However, it is anticipated that dredging operations would begin shortly after the ice melt in Pegan Cove or during early spring, and could take a few months to complete. Activities will be scheduled to avoid periods of fish spawning, per guidance provided by the U.S. Fish and Wildlife Service. The Army will coordinate all remedial activities very closely with MassDCR and Cochituate State Park to insure that appropriate signs are posted informing water skiers and lake users of the remedial activities, and appropriate safety measures are implemented.

12. Written comment from John Ciccariello, Chair, Board of Selectmen, Natick, MA, letter dated 06/02/09

Comment No. 12:

The removal and backfilling of contaminated sediments should comply with the performance standards set in both the state Wetland Protection Act and Natick Wetland Bylaw. The Natick Conservation Commission is committed to working with the Army to develop detailed plans and specifications for the Proposed Project that are protective of the entire Lake Cochituate environment and its many uses

Response No. 12:

As described in the Proposed Plan, the preferred remedy will comply with all chemical, location, and action-specific Applicable and Relevant and Appropriate Requirements (ARARs). These ARARs will include the performance standards set forth in the Massachusetts Wetlands Protection Act, the Town of Natick Wetland Bylaw, as well numerous other ARARs. The ARARs for the

preferred remedy are presented in the Final Feasibility Study and will be included in the signed Record of Decision.

Following the submittal of the Record of Decision, the Army will prepare a remedial design plan, which will establish the specific performance standards required by the various ARARs and how each will be attained during implementation of the remedial action. Copies of the draft remedial design plan will be provided to the town of Natick for review prior to the implementation of the remedy.

13. Written comment from John Ciccariello, Chair, Board of Selectmen, Natick, MA, letter dated 06/02/09

Comment No. 13:

Further field work to define the sediment removal areas needs to be completed as part of the preconstruction work for the Proposed Project. Post removal sediment sampling should also be completed to assure that the removal action level (1 part per million of Polychlorinated Biphenyls) is met in the removal areas.

Response No. 13:

A pre-cleanup survey will be initiated throughout the remediation areas, and will include further refinement of the horizontal and vertical extent of PCB contamination in the sediment. This new data will allow refinement of the current "hot spot" locations slated for removal, in order to ensure that the cleanup goal of an average PCB concentration of 1 ppm across Pegan Cove will be met.

The proposed remedy for the NSSC shoreline sediment is based on currently available sediment PCB data, as well as the additional data which will be collected during the pre-cleanup survey described above. It should be noted that the cleanup goal is an average PCB concentration of 1 ppm across Pegan Cove. The available site data and the results of the sediment concentration contour modeling (using accepted modeling techniques reviewed and approved by US EPA) indicate that removal of the proposed "hot spot" areas and backfilling with clean fill will result in an average PCB concentration below 1 ppm across Pegan Cove. Following excavation and prior to removal of the primary or secondary silt curtain, and prior to backfill, post-excavation confirmatory sampling of the dredged area will be conducted to verify that residual concentrations, if any, will meet the average cleanup goal. The specifics of sampling will be further described in the remedial design plan.

14. Written comment from John Ciccariello, Chair, Board of Selectmen, Natick, MA, letter dated 06/02/09

Comment No. 14:

Special care should be given to monitor all discharges resulting from the Proposed Project to assure that water quality of the Lake is not further impacted.

Response No. 14:

Cleanup monitoring under the preferred remedy includes monitoring the treated discharge water from sediment dewatering operations, and monitoring the lake water conditions for sediment re-suspension and transport beyond the remediated hot zones. The treated water from sediment dewatering operations will be monitored to ensure that it meets applicable criteria prior to

discharging it back to the lake. The treatment and monitoring of the discharge water will ensure that it does not adversely impact the lake. The remedial design plans will establish specific monitoring techniques and frequencies, and contingency plans will be implemented in the event established monitoring limits are exceeded.

15. Written comment from John Ciccariello, Chair, Board of Selectmen, Natick, MA, letter dated 06/02/09

Comment No. 15:

The long-term effectiveness and performance of the Proposed Project should include ongoing fish sampling, particularly the American eels and large mouth bass. The purpose of the future fish sampling should be to monitor the anticipated reduction of contaminant concentrations found in the Lake's native fish population in the hope of some day removing the currently necessary health ban on eating native fish caught in the Lake.

Response No. 15:

There are currently elevated concentrations of PCBs in sediment at other upstream and non-Army-impacted locations within Lake Cochituate, as shown by the lake-wide sampling performed since the mid 1990s. While the removal of the most contaminated sediment adjacent to the NSSC shoreline will result in a post-dredging average sediment PCB concentration of less than 1 ppm within Pegan Cove, it may or may not result, over time, in an ultimate reduction in the PCB concentrations in fish caught from Pegan Cove. This is because fish caught within Pegan Cove and elsewhere around Lake Cochituate may take up PCBs from these other non-Army-impacted areas that contain PCBs in the sediment. Therefore, the Army does not propose any post-remediation fish monitoring as part of the preferred remedy since the results from such sampling could not be definitively attributed to the Army's implemented sediment remedy. To ensure the remediation has met its cleanup goals, following excavation and prior to removal of the primary or secondary silt curtain, and prior to backfill, post excavation confirmatory sampling of the dredged area will be conducted to verify that residual concentrations, if any, will meet the average clean up goal. The specifics of sampling will be further described in the remedial design plan.

16. Written comment from John Ciccariello, Chair, Board of Selectmen, Natick, MA, letter dated 06/02/09

Comment No. 16:

Permanent multi-lingual signage to prohibit the eating of native fish caught in the Lake should be posted until the native fish are safe for people to eat.

Response No. 16:

Currently there are signs posted around Lake Cochituate (including at NSSC) regarding the Fish Consumption Advisory issued by the Massachusetts Department of Public Health (MassDPH) in 1996 for all of Lake Cochituate. These MassDPH signs are in English only. The advisory specifies that: 1) children younger than 12 years of age, pregnant women, women of childbearing age who may become pregnant, and nursing mothers should not eat any fish from this water body, and 2) the general public should not consume any American eel from this water body. The Army does not have jurisdiction over the design of the advisory signs posted by MADPH.

As part of the preferred remedy (Alternative 8), site control measures will be implemented prior to initiating any remedial activity, and will include posting signs that prohibit fishing from the NSSC shoreline within Pegan Cove. The signs prohibiting fishing will be constructed of metal and secured to the NSSC perimeter fence along the shoreline within Pegan Cove. The signs will include universal symbols indicating that fishing is prohibited, and contain warnings in different languages that are representative of the demographic populations that use Lake Cochituate. The signs prohibiting fishing will remain in place after completion of the remedial action and will be maintained by the Army. If requested, the Army will provide additional sign templates to appropriate state agencies, such as the MassDEP, MassDPH, and MassDCR.

17. Written comment from Bob Bois, Environmental Compliance Officer, Town of Natick – email dated 06/10/09

Comment No. 17:

Matt Gardner, chair of the Natick Conservation Commission, motioned the Commission support the pursuit of federal funding for the possible removal of invasive plants in South Pond of Lake Cochituate as a natural resource damage claim to the State NRD trustee, George Bain so moved, Evan Pagliuca seconded, all in favor 7-0.

Response No. 17:

Comment noted. Although the Army considers the effect of a CERCLA remedy on the potential injury to natural resources, the process of assessing any natural resource damages is separate from the selection of an appropriate remedy under CERCLA. Any claim for recovery of potential natural resource damages must be initiated by the appropriate trustee(s) under the applicable federal law after remedy selection. In addition, the decision regarding appropriate projects to restore the injured natural resource must be made by the trustee(s).

18. Written comments from James. M. White Jr., RS/REHS, Director of Public Health, Natick Board of Health - letter dated 06/10/09

Comment No. 18:

The Natick Board of Health would like to take this opportunity to submit the following comments regarding the Proposed Plan to dredge contaminated sediment within Pegan Cove on Lake Cochituate in the Town of Natick:

1. The option chosen for the sediment removal was the only option that did not include any post removal monitoring of the Polychlorinated Biphenyls (PCBs). Post removal sampling should be included in the parameters of the removal action plan to assure that the safe levels of no greater than 1 part per million of PCBs are met.

2. The Department has reviewed the letter sent to you dated May 26, 2009 by the Natick Board of Selectmen and Robert Bois, Conservation Agent. Their comments reflect the same concerns as those of the Board of Health. The Board of Health would like to go on record as endorsing their comments and is looking forward to see how these concerns are addressed.

The efforts that the U.S. Army Natick Soldier System Center is putting forth to restore the conditions and quality of Pegan Cove and Lake Cochituate are appreciated, as are your efforts to keep both the Town of Natick Departments and residents informed of your intentions. If you have

any questions regarding this letter or the Board of Health can assist you in any way feel free to contact James White at 508-647-6460.

Response No. 18:

1. A pre-cleanup survey will be initiated throughout the remediation areas, and will include further refinement of the horizontal and vertical extent of PCB contamination in the sediment. This new data will allow refinement of the current "hot spot" locations slated for removal, in order to ensure that the cleanup goal of an average PCB concentration of 1 ppm across Pegan Cove will be met.

   The proposed remedy for the NSSC shoreline sediment is based on currently available sediment PCB data, as well as the additional data which will be collected during the pre-cleanup survey described above. The available site data and the results of the sediment concentration contour modeling (using accepted modeling techniques reviewed and approved by US EPA) indicate that removal of the proposed "hot spot" areas and backfilling with clean fill will result in an average PCB concentration below 1 ppm across Pegan Cove. Following excavation and prior to removal of the primary or secondary silt curtain, and prior to backfill, post excavation confirmatory sampling of the dredged area will be conducted to verify that residual concentrations, if any, will meet the average cleanup goal. The specifics of sampling will be further described in the remedial design plan.

2. The Army's response to the Natick Board of Selectman and Robert Bois comments may be found above as Responses to Comment No.'s 12, 13, 14, 15, 16, and 17.

19. Written comment from Harlee Strauss, Ph. D., a member of the Restoration Advisory Board - email dated 06/12/09

Comment No. 19:

I support the Army's plan to dredge the Pegan Cove area to decrease the average concentrations of PCBs in the sediments. However, I believe that the Army should conduct confirmation/verification activities to ensure that the projected risk reduction is achieved. The recent (2007) National Research Council report: Sediment Dredging at Superfund Megasites: Assessing the Effectiveness gives several recommendations along this line. These include:

- EPA should ensure that monitoring is conducted at all contaminated sediment megasites to evaluate remedy effectiveness. Monitoring data should be made available to the public in a form that makes it possible to verify evaluations of remedial efficacy independently.
- Pre-remediation baseline monitoring methods and strategies should be developed to allow statistically valid comparisons with post-remediation monitoring datasets. The ultimate goal is to assemble a consistent, long term dataset that can be used in evaluations. Monitoring should be initiated during the design of the remedy to help establish a pre-remedial time trend.

Although the Natick labs site is not a megasite, the cleanup should be consistent with these recommendations.

Below are three non-mutually exclusive alternatives for post-remediation monitoring; there are likely others as well.

- Post-remediation sediment sampling within a predetermined area that includes the (hopefully former) hot spots and extends beyond the area where the second silt curtains were installed. This would tell you whether or not the cleanup goal of 1 ppm average PCB concentration in sediment was achieved which is, after all, the specific remediation goal.
- Fish sampling as part of the 5 year review. Since fish consumption was the health risk identified that triggered the remediation, it is important to ensure that the risk was, in fact, reduced. I think five years should be enough time for the reduction to percolate through the food web.
- Rapid field techniques such as biota monitoring with, for example, benthic invertebrates as indicators as to whether or not there is a reduction in food-web transfer of contaminants. This would require both pre and post remediation data from the areas to be dredged.

One or more of these options for post-remediation monitoring should be conducted to confirm the efficacy of the remedy.

Response No. 19:

A pre-cleanup survey will be initiated throughout the remediation areas, and will include further refinement of the horizontal and vertical extent of PCB contamination in the sediment. This new data will allow refinement of the current "hot spot" locations slated for removal, in order to ensure that the cleanup goal of an average PCB concentration of 1 ppm across Pegan Cove will be met. The proposed remedy for the NSSC shoreline sediment is based on currently available sediment PCB data, as well as the additional data which will be collected during the pre-cleanup survey described above. The available site data and the results of the sediment concentration contour modeling (using accepted modeling techniques reviewed and approved by US EPA) indicate that removal of the proposed "hot spot" areas and backfilling with clean fill will result in an average PCB concentration below 1 ppm across Pegan Cove. Following excavation and prior to removal of the primary or secondary silt curtain, and prior to backfill, post-excavation confirmatory sampling of the dredged area will be conducted to verify that residual concentrations, if any, will meet the average cleanup goal. The specifics of sampling will be further described in the remedial design plan.

There are currently elevated concentrations of PCBs in sediment at other upstream and non-Army-impacted locations within Lake Cochituate, as shown by the lake-wide sampling performed since the mid 1990s. While the removal of the most contaminated sediment adjacent to the NSSC shoreline will result in a post-dredging average sediment concentration of less than 1 ppm within Pegan Cove, it may or may not result, over time, in an ultimate reduction in the PCB concentrations in fish caught from Pegan Cove. This is because fish caught within Pegan Cove and elsewhere around Lake Cochituate may take up PCBs from these other non-Army-impacted areas that contain PCBs in the sediment. Therefore, the Army does not propose any post-remediation fish tissue monitoring as part of the preferred remedy since the results from such sampling could not be definitively attributed to the Army's implemented sediment remedy.

Biota sampling is not proposed for the proposed remedy. Biota sampling was conducted as part of the ecological risk assessments (ERAs) performed on the sediment along the NSSC shoreline. Tier II ERAs identified various degrees of benthic impairment, chronic toxicity, and acute toxicity, and confirmed that a complete food chain pathway existed. The Tier III ERA evaluated the biological significance of the benthic toxicity and impairment observed in the Tier II ERAs, as well as potential risks to higher level ecological receptors. The Tier III ERA included extensive fish and benthic invertebrate sampling, and food chain modeling, and used conservative effects and

exposure assumptions. The Tier III ERA concluded that there is negligible to minimal potential residual risk to benthic receptors. Therefore, it is not likely that additional benthic invertebrate monitoring would be a useful indicator of the success of the implemented remedy.

20. Written comments from Carole Berkowitz, Resident, 9 Crescent Street, Natick, MA; Chair, Protect Our Water Resources - email dated 06/18/09

Comment No. 20:

I wish to have included in the public comment record the following:

1. That the government test the Springvale Wells, Lake Cochituate, South Pond for PCB contamination every six months up to two years after the completed dredging process.

2. That the government remove the sediment between the identified hot spots.

Response No. 20:

1. U.S. Army testing of the Springvale Wells, Lake Cochituate, and South Pond after the dredging is completed is not proposed as part of the preferred remedy. The proposed remedy for the NSSC shoreline sediment is based on currently available sediment PCB data, as well as the additional data which will be collected during the pre-cleanup survey. Following excavation and prior to removal of the primary or secondary silt curtain, and prior to backfill, post-excavation confirmatory sampling of the dredged area will be conducted to verify that residual concentrations, if any, will meet the average cleanup goal. The specifics of sampling will be further described in the remedial design plan.

   Migration of contamination outside the dredged area will be controlled by a double silt curtain. One of the key components of the proposed remedy will be to prevent the migration of sediment from within the hot spot areas (or areas of elevated PCB contamination) to areas outside of the hot spots. To prevent this, a primary silt curtain will be installed around the perimeter of each hot spot dredging area. Silt curtains do not allow water to pass through them, are anchored to the lake bottom, and are held up with floats on the water surface. A secondary silt curtain will also be installed around the primary silt curtain with an approximate 2- to 3-foot gap between the two curtains. Real-time surface water monitoring (including turbidity and water transparency measurements - as determined by Secchi disks) will occur during dredging operations between the primary and secondary silt curtains as well as outside of the secondary silt curtain perimeter. This monitoring data will be used as a real-time indicator of the effectiveness of the silt curtains at preventing migration of sediment outside of the hot spot areas. The remedial design plans will establish specific monitoring techniques and frequencies, and contingency plans will be implemented in the event established monitoring limits are exceeded.

   The Town of Natick is required by law to routinely test the Springvale Wells. Additionally, there are currently elevated concentrations of PCBs in sediment at other upstream and non-Army-impacted locations within Lake Cochituate, as shown by the lake-wide sampling performed since the mid 1990s. While the removal of the most contaminated sediment adjacent to the NSSC shoreline will result in a post-dredging average sediment concentration of less than 1 ppm within Pegan Cove, it may or may not result, over time, in an ultimate reduction in the PCB concentrations in fish caught from Pegan Cove. This is because fish caught within Pegan Cove and elsewhere around Lake Cochituate may take up PCBs from

these other non-Army-impacted areas that contain PCBs in the sediment. Therefore, the Army does not propose any post-remediation fish tissue monitoring as part of the preferred remedy since the results from such sampling could not be definitively attributed to the Army's implemented sediment remedy.

2. As part of the pre-cleanup survey that will be initiated prior to dredging, additional sediment samples will be collected from the proposed hot spot areas. The new data will allow for further delineation/refinement of the current "hot spot" locations slated for removal, in order to ensure that the cleanup goal of an average PCB concentration of 1 ppm across Pegan Cove will be met. The currently proposed hot spot dredging areas were developed using the 2007 sediment sample PCB concentrations as input data used in the contouring software Surfer® (version 8.05) in order to achieve an average post-dredging PCB concentration within Pegan Cove of below 1.0 mg/kg (ppm). The contouring process used the default kriging method, and was reviewed and approved by US EPA. Based on the results of the contouring, removal of contaminated sediment from the four proposed hot spot areas will achieve an average PCB concentration within Pegan Cove of less than 1.0 mg/kg. If the additional pre-cleanup sediment sampling data associated with the two southernmost hot spot areas indicate elevated PCB concentrations, the Army will consider additional sediment removal if warranted.

21. Written comments from Carole Berkowitz, Resident, 9 Crescent Street, Natick, MA; Chair, Protect Our Water Resources - email dated 06/18/09

Comment No. 21:

I wish to have included in the public comments the following:

1. That the government consider testing the Springvale wells for PCB contamination every six months for up to two years after the completion of the dredging process.
2. That the government consider removing the sediment between the identified hot spots.

Response No. 21:

1. U.S. Army testing of the Springvale Wells, Lake Cochituate, and South Pond after the dredging is completed is not proposed as part of the preferred remedy. The proposed remedy for the NSSC shoreline sediment is based on currently available sediment PCB data, as well as the additional data which will be collected during the pre-cleanup survey. Following excavation and prior to removal of the primary or secondary silt curtain, and prior to backfill, post excavation confirmatory sampling of the dredged area will be conducted to verify that residual concentrations, if any, will meet the average cleanup goal. The specifics of sampling will be further described in the remedial design plan.

   Migration of contamination outside the dredged area will be controlled by a double silt curtain. One of the key components of the proposed remedy will be to prevent the migration of sediment from within the hot spot areas (or areas of elevated PCB contamination) to areas outside of the hot spots. To prevent this, a primary silt curtain will be installed around the perimeter of each hot spot dredging area. Silt curtains do not allow water to pass through them, are anchored to the lake bottom, and are held up with floats on the water surface. A secondary silt curtain will also be installed around the primary silt curtain with an approximate 2- to 3-foot gap between the two curtains. Real-time surface water monitoring (including turbidity and water transparency measurements - as determined by Secchi disks) will occur during dredging operations between the primary and secondary silt curtains as

well as outside of the secondary silt curtain perimeter. This monitoring data will be used as a real-time indicator of the effectiveness of the silt curtains at preventing migration of sediment outside of the hot spot areas. The remedial design plans will establish specific monitoring techniques and frequencies, and contingency plans will be implemented in the event established monitoring limits are exceeded.

The Town of Natick is required by law to routinely test the Springvale Wells. Additionally, there are currently elevated concentrations of PCBs in sediment at other upstream and non-Army-impacted locations within Lake Cochituate, as shown by the lake-wide sampling performed since the mid 1990s. While the removal of the most contaminated sediment adjacent to the NSSC shoreline will result in a post-dredging average sediment concentration of less than 1 ppm within Pegan Cove, it may or may not result, over time, in an ultimate reduction in the PCB concentrations in fish caught from Pegan Cove. This is because fish caught within Pegan Cove and elsewhere around Lake Cochituate may take up PCBs from these other non-Army-impacted areas that contain PCBs in the sediment. Therefore, the Army does not propose any post-remediation fish tissue monitoring as part of the preferred remedy since the results from such sampling could not be definitively attributed to the Army's implemented sediment remedy.

2. As part of the pre-cleanup survey that will be initiated prior to dredging, additional sediment samples will be collected from the proposed hot spot areas. The new data will allow for further delineation/refinement of the current "hot spot" locations slated for removal, in order to ensure that the cleanup goal of an average PCB concentration of 1 ppm across Pegan Cove will be met. The currently proposed hot spot dredging areas were developed using the 2007 sediment sample PCB concentrations as input data used in the contouring software Surfer® (version 8.05) in order to achieve an average post-dredging PCB concentration within Pegan Cove of below 1.0 mg/kg (ppm). The contouring process used the default kriging method, and was reviewed and approved by US EPA. Based on the results of the contouring, removal of contaminated sediment from the four proposed hot spot areas will achieve an average PCB concentration within Pegan Cove of less than 1.0 mg/kg. If the additional pre-cleanup sediment sampling data associated with the two southernmost hot spot areas indicate elevated PCB concentrations, the Army will consider additional sediment removal if warranted.

22. Written comments from Peter Hawtrey, Resident, South Pond, Lake Cochituate, Natick, MA - email dated 06/18/09

Comment No. 22:

I wish to have included in the public comment record the following:

1. That the government test the Springvale Wells, Lake Cochituate, South Pond for PCB contamination every six months up to two years after the completed dredging process.
2. That the government remove the sediment between the identified hot spots

Response No. 22:

1. U.S. Army testing of the Springvale Wells, Lake Cochituate, and South Pond after the dredging is completed is not proposed as part of the preferred remedy. The proposed remedy for the NSSC shoreline sediment is based on currently available sediment PCB data, as well as the additional data which will be collected during the pre-cleanup survey. Following excavation and prior to removal of the primary or secondary silt curtain, and prior to backfill,

post-excavation confirmatory sampling of the dredged area will be conducted to verify that residual concentrations, if any, will meet the average cleanup goal. The specifics of sampling will be further described in the remedial design plan.

Migration of contamination outside the dredged area will be controlled by a double silt curtain. One of the key components of the proposed remedy will be to prevent the migration of sediment from within the hot spot areas (or areas of elevated PCB contamination) to areas outside of the hot spots. To prevent this, a primary silt curtain will be installed around the perimeter of each hot spot dredging area. Silt curtains do not allow water to pass through them, are anchored to the lake bottom, and are held up with floats on the water surface. A secondary silt curtain will also be installed around the primary silt curtain with an approximate 2- to 3-foot gap between the two curtains. Real-time surface water monitoring (including turbidity and water transparency measurements - as determined by Secchi disks) will occur during dredging operations between the primary and secondary silt curtains as well as outside of the secondary silt curtain perimeter. This monitoring data will be used as a real-time indicator of the effectiveness of the silt curtains at preventing migration of sediment outside of the hot spot areas. The remedial design plans will establish specific monitoring techniques and frequencies, and contingency plans will be implemented in the event established monitoring limits are exceeded.

The Town of Natick is required by law to routinely test the Springvale Wells. Additionally, there are currently elevated concentrations of PCBs in sediment at other upstream and non-Army-impacted locations within Lake Cochituate, as shown by the lake-wide sampling performed since the mid 1990s. While the removal of the most contaminated sediment adjacent to the NSSC shoreline will result in a post-dredging average sediment concentration of less than 1 ppm within Pegan Cove, it may or may not result, over time, in an ultimate reduction in the PCB concentrations in fish caught from Pegan Cove. This is because fish caught within Pegan Cove and elsewhere around Lake Cochituate may take up PCBs from these other non-Army-impacted areas that contain PCBs in the sediment. Therefore, the Army does not propose any post-remediation fish tissue monitoring as part of the preferred remedy since the results from such sampling could not be definitively attributed to the Army's implemented sediment remedy.

2. As part of the pre-cleanup survey that will be initiated prior to dredging, additional sediment samples will be collected from the proposed hot spot areas. The new data will allow for further delineation/refinement of the current "hot spot" locations slated for removal, in order to ensure that the cleanup goal of an average PCB concentration of 1 ppm across Pegan Cove will be met. The currently proposed hot spot dredging areas were developed using the 2007 sediment sample PCB concentrations as input data used in the contouring software Surfer® (version 8.05) in order to achieve an average post-dredging PCB concentration within Pegan Cove of below 1.0 mg/kg (ppm). The contouring process used the default kriging method, and was reviewed and approved by US EPA. Based on the results of the contouring, removal of contaminated sediment from the four proposed hot spot areas will achieve an average PCB concentration within Pegan Cove of less than 1.0 mg/kg. If the additional pre-cleanup sediment sampling data associated with the two southernmost hot spot areas indicate elevated PCB concentrations, the Army will consider additional sediment removal if warranted.

23. Written comments from Dick Miller, Member, Natick Soldier System Center Restoration Advisory Board - email dated 06/24/09

Comment No. 23:

I appreciate this opportunity to comment in writing on the U.S. Natick Soldier Systems Center's Proposed Plan for Toxic Sediment Removal from Lake Cochituate.
(http://www.epa.gov/region1/superfund/sites/natticklab/448238.pdf)

My personal comments are based on my background as a physicist and engineer, my 41 years of volunteer environmental activism including past Chair of the Natick Conservation Commission, Executive Director of the Lake Cochituate Watershed Association, member of the Cochituate State Park Advisory Committee since its founding, Chair of the Natick Cancer Study Task Force, continuous membership on this facility's Restoration Advisory Board (RAB) since its founding, participation in dozens of workshops including several national-level ones for Department of Defense (DOD) clean-ups, and more.

As I stated orally, I have three main comment topics, as follows.

1. PUBLIC PARTICIPATION PROCESS:
In scheduling the public meeting without including the Restoration Advisory Board, the public participation process was evaded at considerable cost - no official Town or Mass. DCR participation, and few others who could attend on that night. From now on, include your RAB! I thank the EPA, Army and other RAB members who corrected that with a second public hearing (quite unusual). I'm also glad that the 6-day period (after the good hearing) that the Army offered for written response was extended to about half of the usual 30 days.

2. EXTENT OF CLEAN-UP:
The Army proposes to leave toxic sediment in our lake, and even in shallow water, if it isn't toxic to the level of 1 part per million. That is no more clean-up than is done at, for example, the Nyanza Chemical superfund site in Ashland, Mass. But the Nyanza clean-up area is dry ground, high over the water table, and far away from houses, wells, ponds or popular river stretches or other public recreation areas.

Why no better at Lake Cochituate, in Cochituate State Park? This is *in* the water, *in the major recreational lake in eastern Massachusetts!* The general answer is that they don't measure better, so they don't clean better. Plus, we are told, the current risk estimates indicate that this level is adequate.

Unfortunately, the current risk estimates don't make sense. Our average national cancer incidence rates - and the higher rates here - have risen over the decades since 1940. Lower age levels are impacted even more. If chemical risk estimates were correct, we would not have as much cancer as, in fact, we do. We don't sufficiently understand the problem - yet propose to use our lake as a receptacle for a considerable remainder of the Army's past pollution, based upon the fallacious assumptions that we inherit. That is illogical, and justifies sediment removal from a wider area. You put it in; take it out!

Surely it is cost-effective to include the additional sediment removal during this clean-up operation, rather than in a future year. And meanwhile, doing so would reduce health risks we cannot yet quantify; that's the Precautionary Principle.
(http://millermicro.com/PrecPrin.html)

3. DAMAGE MITIGATION:
The Army proposal does not consider any damage mitigation beyond the removal of its toxic

sediment, and has failed to document years of RAB concern about disturbing its toxic sediment to uproot invasive weeds. (Eurasian water milfoil, a highly invasive weed that first appeared in Pegan Cove in 2002, has since spread downstream to the entire chain of ponds, and will be very expensive to control while protecting the Town of Natick's adjacent drinking water wells from exposure to more questionable chemicals.) In fact, at the May 2009 meeting of the Cochituate State Park Advisory Committee, the Army stated that no such mitigation recourse exists. But it does - including the U.S. Natural Resource Damage & Restoration Assessment Program.

A key paragraph on the US NRD web site states:

"Natural resource injuries may occur at sites as a result of releases of hazardous substances or oil. Trustees use NRDAs to assess injury to natural resources held in the public trust. This is an initial step toward restoring injured resources and services and toward compensating the public for their loss." (http://www.epa.gov/superfund/programs/nrd/primer.htm)

I formally request that the Army and RAB members actively cooperate in a full report and pursuit of these restoration options (not limited to NRD), concerning the Army sediment's partial cause for the spread of invasive weeds in Lake Cochituate.

Response No. 23:

1. PUBLIC PARTICIPATION PROCESS: Comment noted. At the request of various community members, a second public hearing was held and the public comment period was extended from June 16, 2009 until June 25, 2009.

2. EXTENT OF CLEANUP: The cleanup at the Nyanza Superfund site in Ashland, MA is not relevant to the NSSC site. The contaminant of concern that was remediated at Nyanza was mercury. The contaminant of concern in sediment at NSSC is PCBs. Additionally, the cleanup performed at Nyanza addressed wetlands and drainageways, whereas the proposed cleanup at NSSC is lake sediments. Therefore, drawing comparisons between the cleanup goals for different contaminants and different environmental settings is not relevant.

The human health risk assessments conducted for theoretical exposure to sediment and fish near the NSSC shoreline were performed in accordance with US EPA guidance using conservative assumptions and with oversight by the US EPA, Mass DEP, and the RAB. The results of the fish ingestion risk assessment determined that there is an unacceptable potential non-cancer risk for individuals who might ingest native fish caught from the NSSC shoreline. The estimated cancer risk was within U.S.EPA acceptable ranges.

Based on the different methodologies presented in the FS, a sediment cleanup goal of an average PCB concentration of 1 ppm across Pegan Cove was selected by the Army, and has been agreed to by the US EPA and MassDEP. This cleanup goal is protective of human health and the environment, and also consistent with non-site-impacted background concentrations.

As part of the pre-cleanup survey that will be initiated prior to dredging, additional sediment samples will be collected from the proposed hot spot areas. The new data will allow for further delineation/refinement of the current "hot spot" locations slated for removal, in order to ensure that the cleanup goal of an average PCB concentration of 1 ppm across Pegan Cove will be met. The currently proposed hot spot dredging areas were developed using the 2007 sediment sample PCB concentrations as input data used in the contouring software Surfer® (version 8.05) in order to

achieve an average post-dredging PCB concentration within Pegan Cove of below 1.0 mg/kg (ppm). The contouring process used the default kriging method, and was reviewed and approved by US EPA. Based on the results of the contouring, removal of contaminated sediment from the four proposed hot spot areas will achieve an average PCB concentration within Pegan Cove of less than 1.0 mg/kg. If the additional pre-cleanup sediment sampling data indicate elevated PCB concentrations, the Army will consider additional sediment removal if warranted.

3. DAMAGE MITIGATION: The Army's cleanup proposal for contaminated sediment addresses a CERCLA remedial action. The purpose of a CERCLA remedial action is to address releases of CERCLA hazardous substances caused by the responsible party. In the case of the NSSC sediment, that principal CERCLA hazardous substance is PCBs. Eurasian milfoil is not a regulated contaminant under CERCLA, therefore it is not addressed under the NSSC Superfund-related investigation or cleanup activities. Since Lake Cochituate is managed by the Massachusetts Department of Conservation and Recreation (MassDCR), any actions related to managing milfoil would be under the jurisdiction of the MassDCR. Although the Army considers the effect of a CERCLA remedy on the potential injury to natural resources, the process of assessing any natural resource damages is separate from the selection of an appropriate remedy under CERCLA. Any claim for recovery of potential natural resource damages must be initiated by the appropriate trustee(s) under the applicable federal law after remedy selection. In addition, the decision regarding appropriate projects to restore the injured natural resource must be made by the trustee(s).

24. Written comments from Wayland Surface Water Quality Committee – via email letter dated 06/25/09 (email from Michael Lowery)

Comment No. 24:

The North Pond of Lake Cochituate is partly in the Town of Wayland. Our Committee is appointed by the Wayland Board of Selectmen to preserve and protect the surface waters of Wayland, including Lake Cochituate.

A member of our committee has attended your most recent public meeting regarding the sediment removal process, and we have read the PROPOSED PLAN document furnished at that meeting.

We have the following comments:

- The spot treatment methodology selected has as its goal the reduction in contaminant levels within Pegan Cove to the same level they are at in the other sampled locations in Lake Cochituate. Unless there are pre-contamination water samples to establish baseline contaminant levels, the Army should assume that the present levels in other areas of the lake may be the result of the original contamination; and should seek lower end levels of contaminants in all locations in Pegan Cove.

- During the meeting, a question was raised about whether there would be post-remediation sampling to confirm that The Army's goals had been reached. The response was no. We don't believe this is satisfactory and ask that the Army consider post-remediation contaminant sampling to confirm it has attained its goals.

- In addition to remediation of sediments, we believe the Army may be responsible to provide restoration funds under the Natural Resources Damages Assessment process to

compensate for the past and future costs of controlling Eurasian Water Milfoil, and loss of use of public facilities.

This species was first detected in Lake Cochituate near the boat ramp in Pegan Cove which the Army allowed veterans and occasionally others to use. The waters of Lake Cochituate flow from South to North, so it is reasonable that the Army's boat ramp may be a source of the pioneer milfoil infestation.

At about the same time, the Army discovered the PCB contamination and was justifiably concerned no activities to control the milfoil be undertaken in the area. However wise this policy, the Eurasian Water Milfoil spread to infest Pegan Cove, then South Pond, then Middle Pond, and most recently North Pond.

The Towns of Natick, Framingham, and Wayland as well as the Massachusetts Department of Conservation and Recreation have incurred significant costs to remove milfoil, and lost use of public facilities. Additional and continuing significant milfoil control costs are anticipated.

Certainly the spread of milfoil in Lake Cochituate is not entirely the Army's responsibility – but there is a national and state process that can be performed to assess the degree to which the Army's contamination and its recommendations not to control milfoil spread were responsible for milfoils infestation of large parts of Lake Cochituate.

We therefore request that the Army participate and cooperate in the U.S. Natural Resource Damage & Restoration Assessment Program. To determine the extent of its responsibility to offset the past and future costs of Eurasian Milfoil Control programs in Lake Cochituate.

Thank you for the opportunity to provide public comment.

Response No. 24:

- Based on the different methodologies presented in the FS, a sediment cleanup goal of an average PCB concentration of 1 ppm across Pegan Cove was selected by the Army, and has been agreed to by the US EPA and MassDEP. This cleanup goal is protective of human health and the environment, and also consistent with non-site-impacted background concentrations.

  A pre-cleanup survey will be initiated throughout the remediation areas, and will include further refinement of the horizontal and vertical extent of PCB contamination in the sediment. This new data will allow refinement of the current "hot spot" locations slated for removal, in order to ensure that the cleanup goal of an average PCB concentration of 1 ppm across Pegan Cove will be met. If the additional pre-cleanup sediment sampling data indicate elevated PCB concentrations, the Army will consider additional sediment removal if warranted.

  The proposed remedy for the NSSC shoreline sediment is based on currently available sediment PCB data, as well as the additional data which will be collected during the pre-cleanup survey described above. The available site data and the results of the sediment concentration contour modeling (using accepted modeling techniques reviewed and approved by US EPA) indicate that removal of the proposed "hot spot" areas and backfilling with clean fill will result in an average PCB concentration below 1 ppm across Pegan Cove. Following excavation and prior to removal of the primary or secondary silt curtain, and prior to backfill, post excavation confirmatory sampling of the dredged area will be conducted to verify that

residual concentrations, if any, will meet the average cleanup goal. The specifics of sampling will be further described in the remedial design plan.

- The Army's cleanup proposal for contaminated sediment addresses a CERCLA remedial action. The purpose of a CERCLA remedial action is to address releases of CERCLA hazardous substances caused by the responsible party. In the case of the NSSC sediment, that principal CERCLA hazardous substance is PCBs. Eurasian milfoil is not a regulated contaminant under CERCLA, therefore it is not addressed under the NSSC Superfund-related investigation or cleanup activities. Since Lake Cochituate is managed by the Massachusetts Department of Conservation and Recreation (MassDCR), any actions related to managing milfoil would be under the jurisdiction of the MassDCR. Although the Army considers the effect of a CERCLA remedy on the potential injury to natural resources, the process of assessing any natural resource damages is separate from the selection of an appropriate remedy under CERCLA. Any claim for recovery of potential natural resource damages must be initiated -- if at all -- by the appropriate trustee(s) under the applicable federal law after remedy selection. In addition, even assuming recovery of natural resource damages, the decision regarding appropriate projects to restore the injured natural resource must be made by the trustee(s). Thus, any discussion regarding such projects is premature.

  Based on a thorough review of all RAB minutes since 2001, the Army never stated that the milfoil should not be pulled loose due to contaminated sediment along the NSSC shoreline, nor has the Army hindered the process of addressing the milfoil issue. Additionally, the Army did not issue "recommendations not to control milfoil spread," as the comment states. While the Army has identified confirmed areas along the NSSC shoreline that have sediment contamination, it was not the Army's place to tell anyone whether they can or can not pull milfoil from these areas. In fact, the results of the human health risk assessments concluded that contact with contaminated sediment by individuals swimming and wading in the lake did not pose an unacceptable risk. The RAB minutes between 2002 and 2007 (including January 19, 2006; April 20, 2006; and November 30, 2006) do document concerns among some RAB members that the SolarBee circulator systems could cause re-suspension of contaminated sediment.

  The Army is not responsible for causing the growth of Eurasian milfoil in Pegan Cove. Beginning in September 2001 (almost 10 months prior to the first observance of milfoil by the MassDCR), the NSSC boat ramp was permanently closed (including a locked fence and gate) due to homeland security issues. The more plausible hypothesis is that milfoil has proliferated in Pegan Cove because Eurasian milfoil tends to grow best in shallow water (8 to 10 feet deep) with an organic and nutrient-rich sediment substrate, both of which exist in Pegan Cove. Additionally, Pegan Cove is heavily used for water skiing and therefore there is frequent high speed motor boat activity (and resulting turbulence) in this part of the lake that has likely resulted in spreading of the milfoil. Since very few milfoil mitigation efforts have been performed by MassDCR in the Pegan Cove since 2002, the milfoil has been allowed to spread.

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FIGURES

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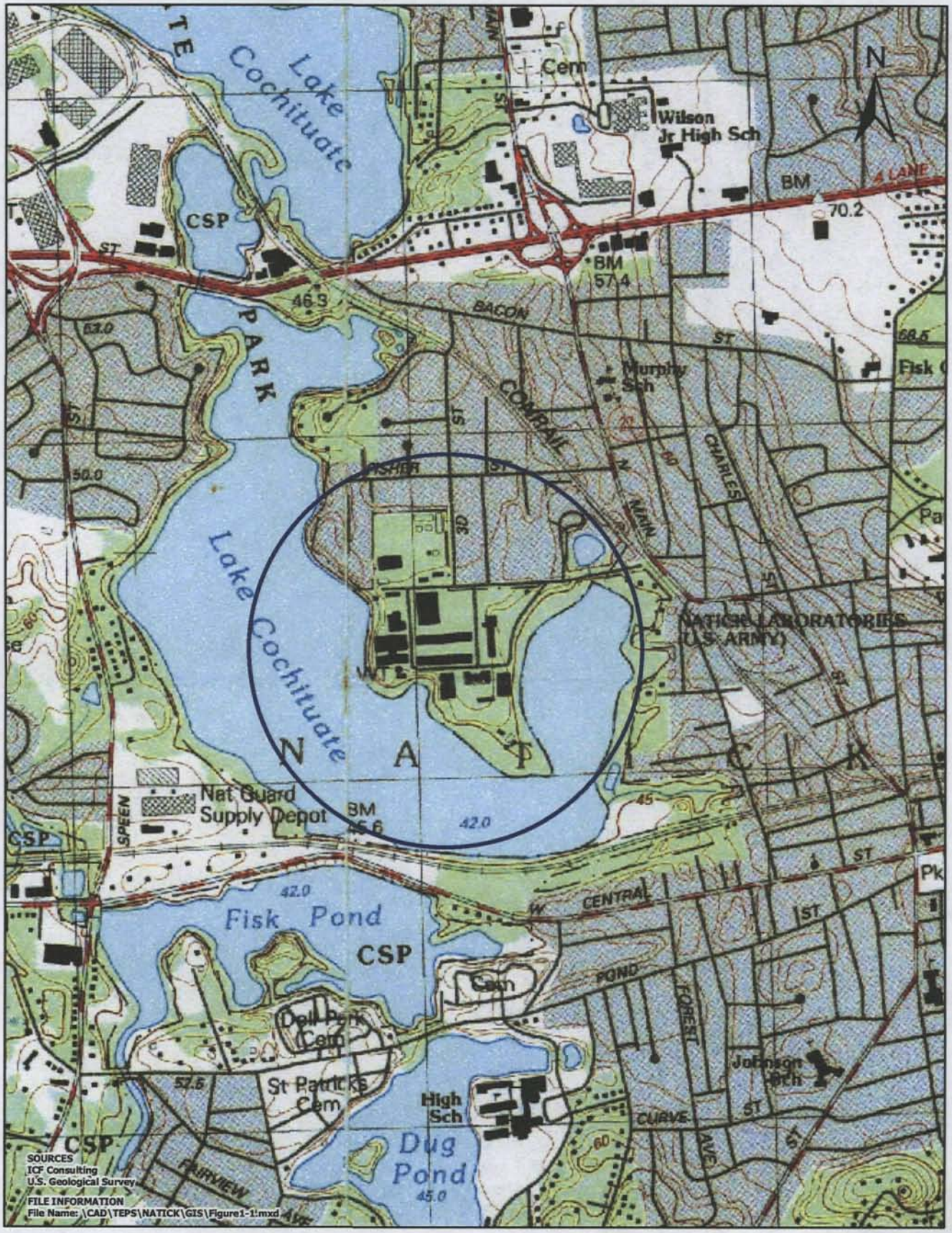


ICF INTERNATIONAL

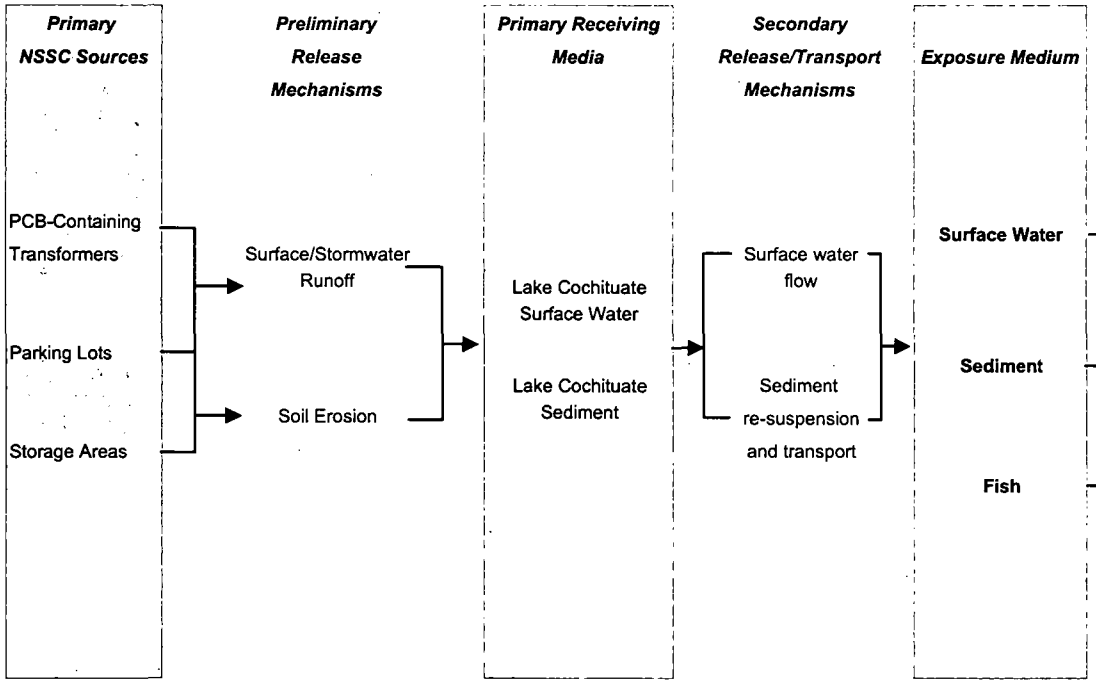
Feet
0 625 1,250 1,875 2,500

Meters
0 250 500 750 1,000

FIGURE 7-1
U.S. ARMY
SOLDIER SYSTEMS CENTER
SITE LOCATION MAP

Figure 7-2
U.S. Army NSSC Shoreline Sample Location Map

Figure 11-1: Conceptual Site Model for Contaminated Sediment

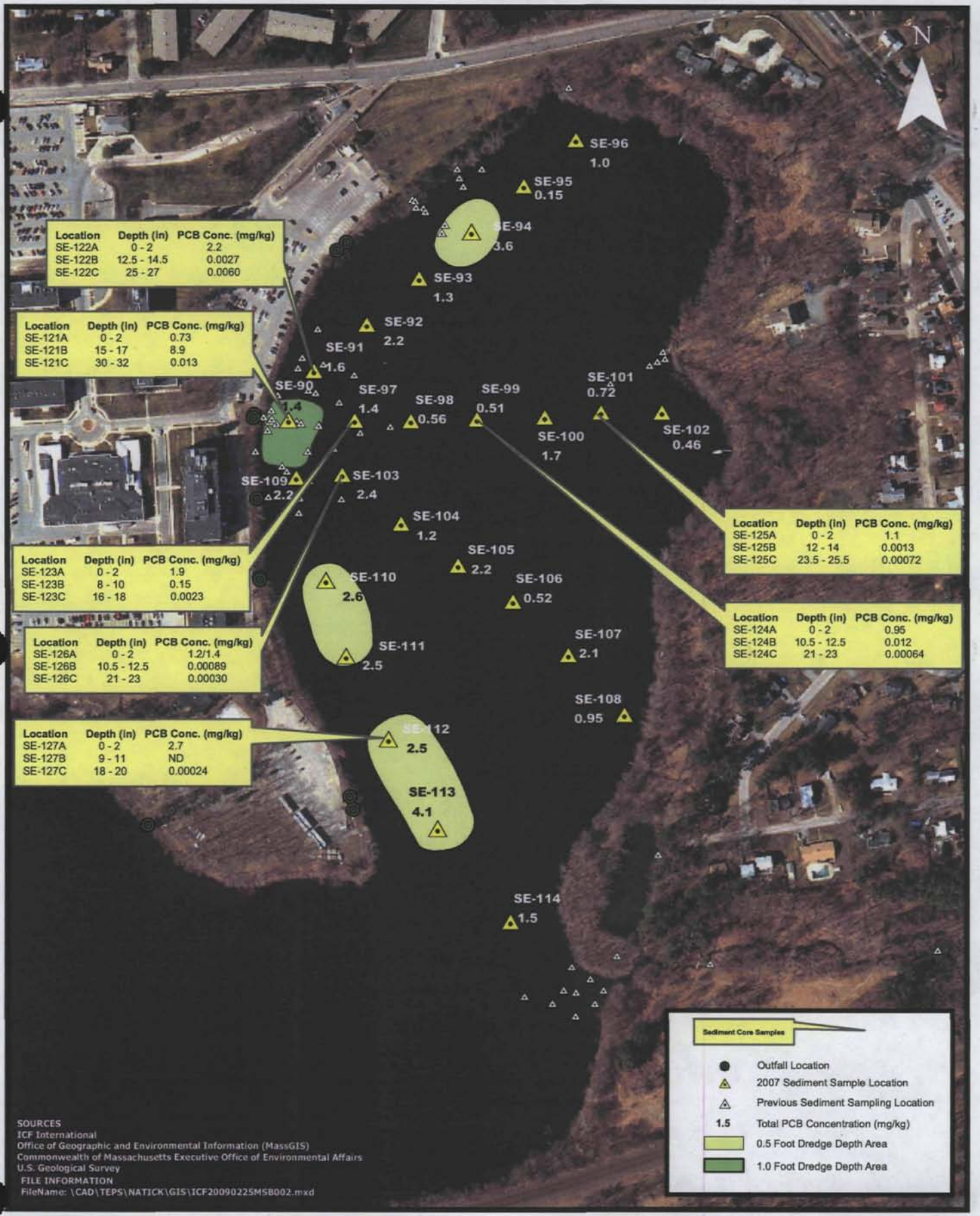


Potential Receptors

Exposure Route	Human: NSSC Site Personnel & Visitors	Human: Off-Site Residents	Biota: Terrestrial	Biota: Aquatic
Surface Water				
Ingestion	•	•		•
Dermal Contact	•	•		•
Sediment				
Ingestion	•	•		•
Dermal Contact	•	•		•
Fish				
Ingestion	•	•		•

Notes:

- Indicates potential exposure pathway.



ICF INTERNATIONAL

Feet

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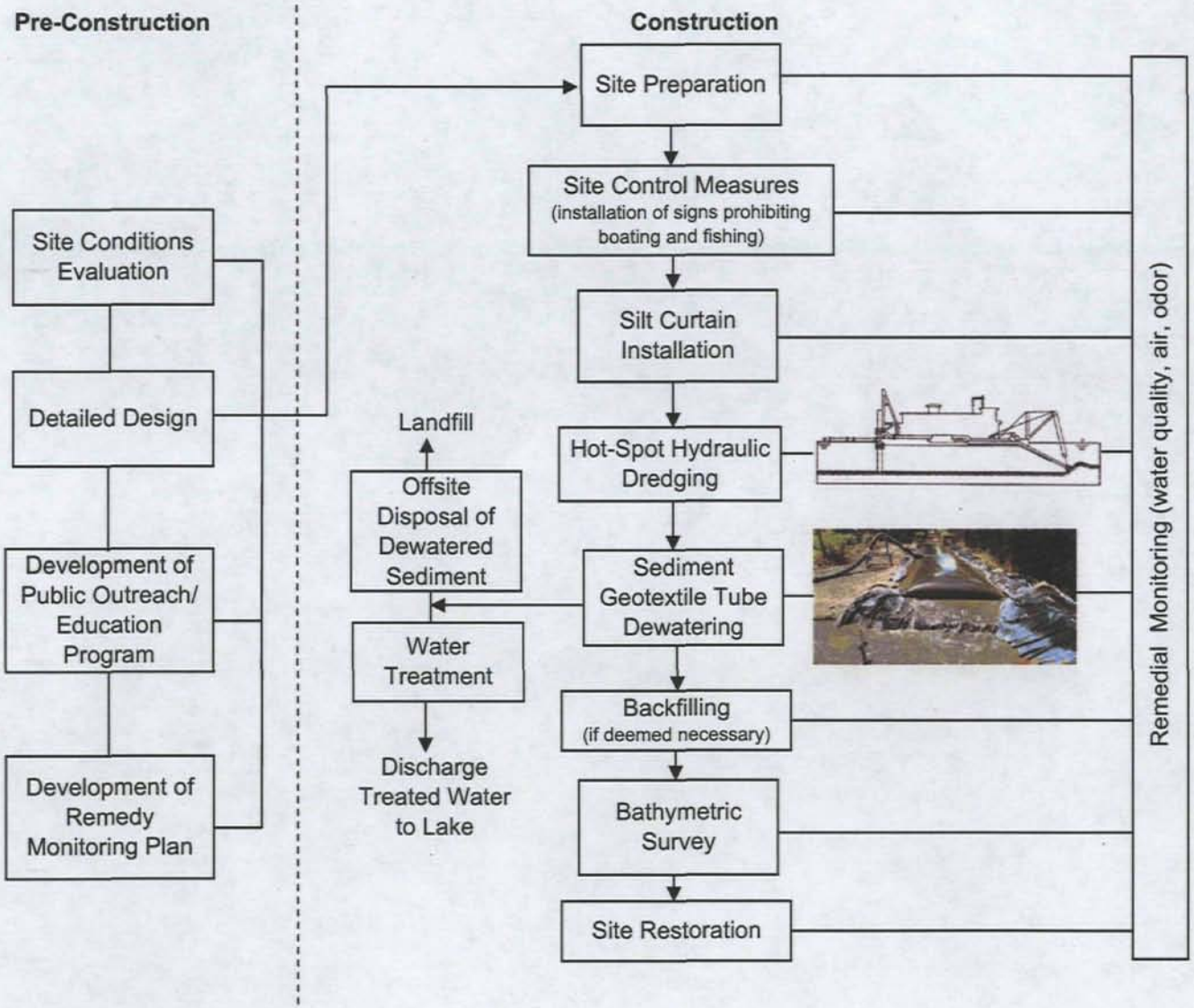
Figure 15-1
Total PCB Hot Spot Sediment Removal Cleanup Goal Areas
Soldier Systems Center
Natick, Massachusetts

Figure 15-2: Remedial Process Flow Diagram - Alternative 8



APPENDIX A

ADMINISTRATIVE RECORD INDEX

IN

FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
WK Plan	1	Arthur D. Little Draft Plan for T-25	12/4/92	
Newspaper	2	Media Advisory	12/28/92	
WK Plan	3	Arthur D. Little Work Plan Scope of Work		
WK Plan	4	Draft Final WK Plan - THAMA	3/12/93	Superseded by 209
WK Plan	5	Draft Final QA Project Plan for T-25 - THAMA	3/17/93	
Correspond	6	Review of Draft WK Plan for T-25	3/17/93	
Corresp.	7	Draft Letter Report of HRS Score for NRDEC	5/3/93	
Corresp.	8	Public Affairs Announcement from EPA to Natick	5/7/93	
Newspaper	9	Tab: "Army Labs may make Superfund List"	5/93	
Corresp.	10	Agenda & Summary of 9th Technical Review (TRC)	5/5/93	
Fed. Reg.	11	Federal Register - Proposed Rules	5/10/93	
Newspaper	12	"EPA targets" & "2 MA Sites Cited as Hazards"	5/11/93	
Newspaper	13	"EPA may speed up Army Labs Clean-up"	5/12/93	
Corresp.	14	EPA Proposed listing of NPL Candidates	5/18/93	
Analytical	15	Environmental Sampling Technology (EST)	5/19/93	
Analytical	16	Water Quality Field Sampling Data Sheet	5/23/93	
Analytical	17	Revet Labs - Chain of Custody	5/93	
Analytical	18	Revet Labs - Chain of Custody	5/93	
Contacts	19	Irene Kessel - Natick Resident	5/26/93	
Contacts	20	Board of Selectmen - Moree Fleming	5/27/93	

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Correspond	21	Review of Final Haz. Ranking System - EPA	5/10/93	
Correspond	22	Request for Natick to process Purge water	6/2/93	
Correspond	23	Final Haz. Ranking System Package from THAMA	6/7/93	
Corresp.	24	Comments to Haz. Ranking System - Natick	6/8/93	
Analytical	25	Revet Lab Results	6/11/93	
Corresp.	26	Submission of Final Letter Report of HRS - ETA	6/21/93	
Corresp.	27	Receipt of Haz. Ranking Binders - Natick Lib.	6/22/93	
	28	Final Haz. Ranking System from EPA	6/24/93	
Contacts	29	Roger Wade - Dir., Board of Health	6/25/93	
Corresp.	30	Briefing given by Kim Wauters @ Natick	5/18/93	
Newspaper	31	EPA wants to add 4 more NE sites to Superfund	6/23/93	
Newspaper	32	Mistakes made by the Lake - Tab	6/30/93	
Correspondence	33	from Environmental Coalition of Natick	7/6/93	
Corresp.	34	Natick Installation Restoration Program Mtg Agenda	7/28/93	
Corresp.	35	Sampling of Natick Population - Survey	7/29/93	
WK Plan	36	US Army Corps Engineers - Final Community Relations	7/29/93	
News Release	37	PAO - News Release, Neighborhood Advisory	8/20/93	
Contacts	38	WKOK - Gene Molter & Middlesex News	8/27/93	
Correspond	39	Letter to mrs. Coverly - Natick Library	9/10/93	
Correspond	40	Letter to Roger Wade - Natick Board of Health	9/10/93	

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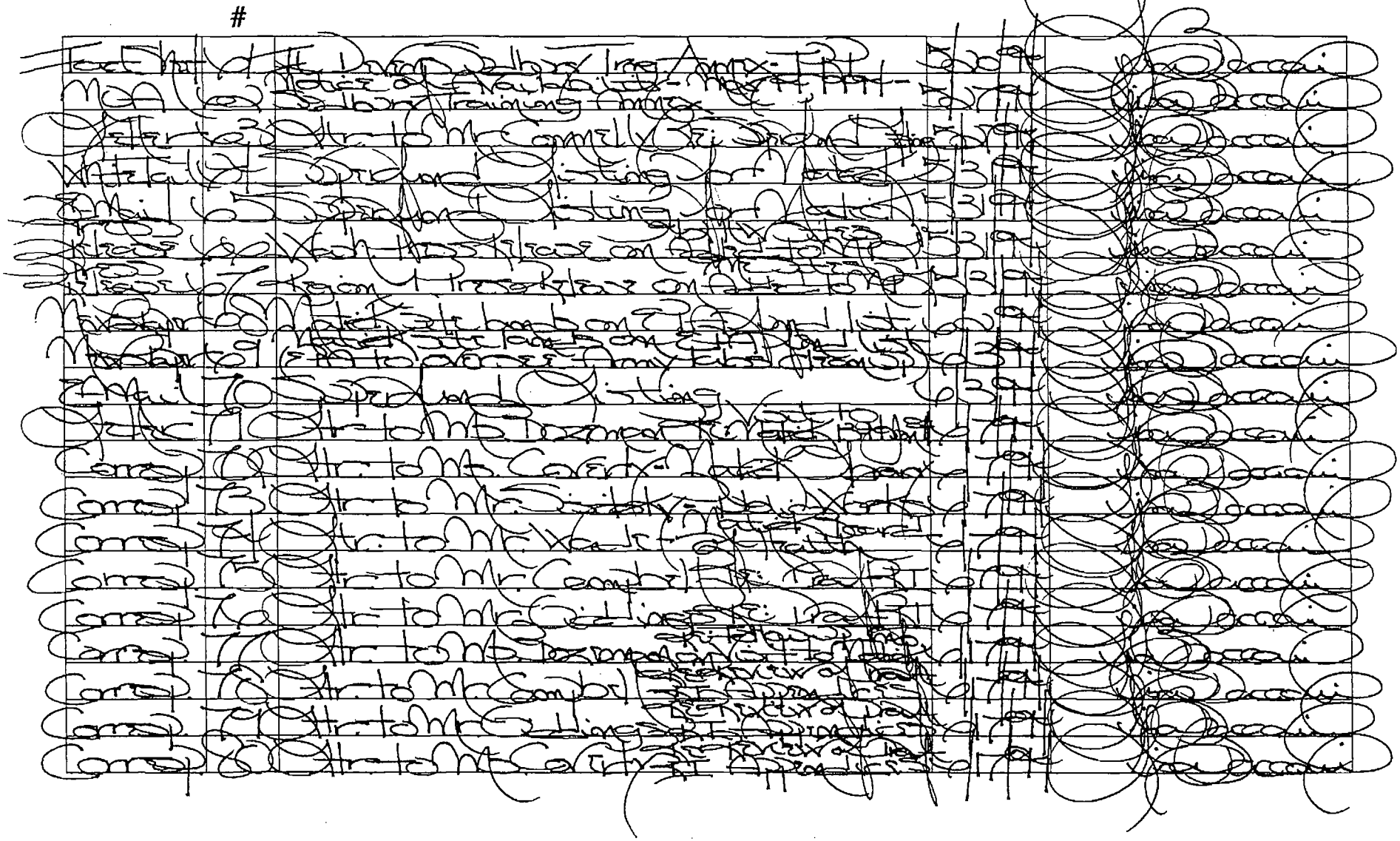
FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Newspaper	41	Middlesex News - Natick's contaminated wells	9/13/93	Sharon Currie
Corresp	42	To: David LaPusata - DEP, Woburn - Purge H2O	9/20/93	Sharon Currie
Corresp.	43	To: David Tordoff / Don Grant, EPA Re: NPDES Permit	9/20/93	Sharon Currie
CORRESP	44	Examples of Notice of Availability	12/13/93	John Manning
Newspaper	45	Middlesex News - EPA to Make Decision on Nlabs Site	1/13/93	Patty Carrigan
Corresp	46	DEP Permit to Process Purge water	1/10/93	[illegible]
Corresp	47	" " " Do Pump Test & Process Pump Water	1/10/93	[illegible]
Corresp	48	EPA. Permit Exclusion for Purgewater & Pumpwater	1/10/93	[illegible]
[illegible]	49	[illegible]	[illegible]	[illegible]
[illegible]	50	[illegible]	[illegible]	[illegible]
Corresp	51	Ltr to Mr [illegible] - DEP	[illegible]	[illegible]
Corresp	52	Ltr to Ms Anderson - EPA	[illegible]	[illegible]
Corresp	53	Ltr to Ms Anderson - EPA	[illegible]	[illegible]
[illegible]	54	[illegible]	[illegible]	[illegible]
[illegible]	55	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Memo	[illegible]	[illegible]	[illegible]	[illegible]
Memo	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]			[illegible]	[illegible]

IN

FILE	FILE #	DESCRIPTION	DATE	SIGNATURE



IN

FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Report	86	Photogeologic Analysis	9/12/94	
Report	87	Historical Photo Analysis	9/12/94	
Photo's	88	Photogeologic Analysis	9/12/94	
Photo	89	Historical Photo Analysis	9/12/94	
Newspaper	97	Toxic Paradise / Can mustard gas & eagles co-exist	2 Dec 94	C. Fitzgerald
Correspondence	98	Mr. Marco Kaltofen - Reply	2 Dec 94	C. Fitzgerald
Correspondence	99	National Priorities List Site	5 Dec 94	C. Fitzgerald
Corresp	100	Employee Open House Comments/Surveys	1 Apr 95	

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Newspaper	101	News: Labs holding env open houses	4/10/95	[illegible]
Newspaper	102	News: Public Announcement for open house	4/11/95	[illegible]
Corresp	103	Ltr from Cody State Park Advisory Committee	4/11/95	[illegible]
Corresp	104	EPA notification of TAG grant [illegible]	4/11/95	[illegible]
Newspaper	105	TAB: Natick Labs open up to residents	4/19/95	[illegible]
Newspaper	106	TAB: On the contamination trail	4/27/95	[illegible]
Corresp	107	Ltr to Mr Carr-Resident of Natick	5/5/95	[illegible]
Corresp	108	Ltr to C. Murphy-Resident of Natick	5/11/95	[illegible]
Corresp	109	Ltr to Mr Gross-Resident of Natick	5/11/95	[illegible]
Corresp	110	Ltr to Mr Bowden-Resident of Natick	5/[illegible]/95	[illegible]
Corresp	111	Ltr to Ms Moore-Resident of Natick	5/[illegible]/95	[illegible]
Corresp	112	Ltr to Mr Mackey-Resident of Natick	5/[illegible]/95	[illegible]
Corresp	113	Ltr to Mr + Mrs Williams III-Resident	5/[illegible]/95	[illegible]
Corresp	114	Ltr to Dr [illegible]-Resident of Natick	5/[illegible]/95	[illegible]
Corresp	115	Community Selection Panel	5/30/95	[illegible]
Corresp	116	Ltr to Ms. [illegible] Re: RAB Volunteer	5/30/95	[illegible]
Corresp	117	Ltr to Potential RAB Members	5/30/95	[illegible]
Corresp	118	Community Interest Survey Form	5/30/95	[illegible]
Corresp	119	Volunteers for RAB as of 15 May 95	5/30/95	[illegible]
Corresp	120	E-mail from Larry Cole-Resident	5/30/95	[illegible]

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Corresp	121	Ltr. to Mrs. Gordon - Resident of Natick	5/31/95	
Corresp	122	Ltr. to Ms. Rikleen - Resident of Natick	5/31/95	
Corresp	123	E-mail from Marco Haltofer - Resident	5/31/95	
Corresp	124	Ltr. to Ms. Dwight - Resident of Natick	5/31/95	
Corresp	125	Ltr. to Mr. Howard - Resident of Natick	5/31/95	
Corresp	126	Ltr. to Mr. Bell - Resident of Natick	5/31/95	
Corresp	127	Ltr. to Mr. + Mrs. Van Speybroeck - Residents	5/31/95	
Corresp	128	Ltr. to Mr. Ty Ko - Resident of Natick	5/31/95	
Corresp	129	Ltr. to Spiegel's - Residents of Natick	5/31/95	
Corresp	130	E-mail Response to Mr. Cole from DPW	6/2/95	
Corresp	131	Ltr. to Dr. Roskey - Resident of Natick	6/5/95	
Corresp	132	Ltr. to Mr. Zyskowski - Resident of Natick	6/5/95	
Corresp	133	Ltr. to Mr. + Mrs. Fitzgerald - Residents of Natick	6/6/95	
Corresp	134	Community Interest Survey Forms Returned	6/20/95	
Corresp	135	Response Cards Returned	6/20/95	
Corresp	136	Resident Surveys	6/20/95	
Corresp	137	Ltr. to Mr. Janson Re: Pump Test	7/5/95	
Corresp	138	Ltrs. to Selected RAB Members	7/6/95	
Corresp	139	Ltrs. to Non-Selected RAB Candidates	7/6/95	
Corresp	140	Ltrs. to RAB Members announcing the 1st RAB Meeting	7/20/95	

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Corresp.	141	Ltr. from Mr. Jarson Re: Pump Test	7/24/95	
Corresp.	142	E-Mail Response to Ms. Brink from ESO	7/31/95	
Corresp.	143	Ltr. to RAB Members Forwarding Package for First RAB Meeting	8/9/95	
Corresp.	144	Ltr. to Non-RAB Members Announcing First RAB Meeting	8/9/95	
Corresp.	145	SSCOM's Employee RAB Members	8/11/95	
Corresp.	146	Media Advisory on 1st RAB Meeting	8/16/95	
Corresp.	147	First RAB Sign-In Sheet	8/17/95	
Corresp.	148	Conflict of Interest Statements from RAB Members	8/17/95	
Newspaper	149	News: Groundwater testing comes up empty at Natick Labs site	8/17/95	
Newspaper	150	News: So far, tests haven't found source of spill at Natick Labs	8/18/95	
Newspaper	151	News: Correction to News Articles 149+150	8/21/95	
Newspaper	152	Tab: Board begins Natick Labs Cleanup Process	8/23/95	
Newspaper	153	News: A forgotten bit of the future.	8/24/95	
Corresp.	154	Agreement Statements from RAB Members	8/31/95	

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Corresp.	155	Ltr to RAB Members Forwarding Package for Second RAB Meeting	9/16/95	[signature]
Corresp	156	Media Advisory on 2nd RAB Meeting	9/18/95	[signature]
Corresp.	157	2nd RAB Meeting Handouts	9/22/95	[signature]
Corresp (Superseded 5/7/99)	158	Phase II Remedial Investigation Health and Safety Plan	10/11/95	[signature]
Corresp	159	Media Advisory on 3rd RAB Meeting	10/18/95	[signature]
Corresp	160	Water Well Surveys	10/31/95	[signature]
Corresp	161	Ltr to RAB Members Forwarding Package for Fourth RAB Meeting	11/6/95	[signature]
Newspaper	162	News: Legal Notice - RAB Meeting	11/13/95	[signature]
Newspaper ~~Corresp~~	163	News: Meeting on Lake Cochituate Cleanup Jan 10	4/5/96	[signature]
Corresp	164	Media Advisory on 4th RAB Meeting	4/5/96	[signature]
Corresp	165	Ltr to Mr Hast Forwarding Response To His Questions	4/5/96	[signature]
Corresp	166	Ltr to Ms Linda Sussman Re: Middlesex News Article	4/[illegible]/96	[signature]
Corresp.	167	E-mail from Mr Miller - Subj: Natick RAB Comments	4/[illegible]/96	[signature]

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Newspaper	168	News: Legal Notice - RAB Mtg - 1/31/96	1/18/96	[signature]
Corresp	169	Media Advisory on 4th RAB Mtg.	1/22/96	[signature]
Newspaper	170	Tab: Legal Notice - DEP - Bureau of Waste Site Cleanup Proposed Significant Decision & Statement of Basis	1/31/96	[signature]
Newspaper	171	Tab: Natick Labs cleanup discussed	2/2/96	[signature]
Newspaper	172	News: State studies cancer rate	2/2/96	[signature]
Corresp.	173	Ltr to Ms. Flynn Re: Env. Concerns	2/6/96	[signature]
Corresp.	174	4th RAB Sign-In Sheet + Public Questions	2/9/96	[signature]
Corresp	175	Response to MT's Request for Sample Collection	2/12/96	[signature]
Corresp	176	Ltr from Mr. Keele Re: Treatability Study Work Plan, T-25 Area at the U.S. Army SSCOM	2/15/96	[signature]
Corresp	177	Media Advisory on 5th RAB Mtg.	2/22/96	[signature]
Corresp.	178	5th RAB Sign-In Sheet, Agenda, + Handout	2/23/96	[signature]
Newspaper	179	News: Legal Notice - RAB Mtg - 3/14/96	2/22/96	[signature]
Newspaper	180	Tab: Source Spots - State targets three as possible contaminators	3/6/96	[signature]
Corresp.	181	Ltr to Mr. Keele Re: Draft Phase II Comment + Response to EPA Comments + Draft Community Relations Plan for SSCOM	3/11/96	[signature]

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Corresp	182	Media Advisory on Sixth RAB Mtg	3/15/96	
Newspaper	183	News: Continued Natick Labs Cleanup Takes Shape	3/19/96	
Corresp	184	Media Advisory on 2nd Env. Open House	5/2/96	
Corresp	185	Ltr. from Blasland, Bouck & Lee, Inc. Re: Discharge of Water from the Proposed Groundwater Decontamination + Cleanup System into Lake Cochituate Residential Swimming Area	5/7/96	
Newspaper	186	Natick Bulletin: Labs Celebrate Earth Day	5/7/96	
Newspaper	187	Natick Bulletin: Action Starting in Labs Cleanup	5/17/96	
Newspaper	188	Cancer Study Still Under Wraps: NB	5/17/96	
Corresp	189	Media Advisory on Seventh RAB Mtg.	5/28/96	
Corresp	190	Ltr. to RAB Members, EPA + MDEP Re: Review of Ground Water Model for SECOM	5/30/96	
Corresp	191	Ltr to RAB Members Re: May RAB Mtg Minutes + Draft Agenda for June RAB Mtg.	6/14/96	

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Newspaper	192	News: Legal Notice - RAB Mtg - 6/27/96	6/19/96	[illegible]
Corresp.	193	Ltr to Mr. Fitzgerald Re: Response to Comments on the Draft Treatability Study Work Plan - Oct 95	6/26/96	[illegible]
Corresp.	194	Media Advisory on Eighth RAB Meeting	6/27/96	[illegible]
Corresp.	195	8th RAB Sign In Sheet	6/28/96	[illegible]
Corresp.	196	Ltr to Mr. McHugh from Mr. Keefe, EPA Re: Draft Community Relation Plan - Revision 4	6/28/96	[illegible]
Corresp.	197	Ltr to Mr. McHugh from Mr. Keefe, EPA Re: Draft Stepped Rate Aquifer Test Design - March 1995	6/28/96	[illegible]
Corresp.	198	Ltr to Mr. Campbell (MADEP) and Mr. Keefe EPA Re: Draft Action Memorandum Sewer [illegible]	7/3/96	[illegible]
Wk Plan	199	ADS [illegible] Plan - Phase II [illegible]	7/3/96	[illegible]
Wk Plan	200	ADS Final Work Plan - Phase II [illegible] Areas at the U.S. Army Soldier Systems Command (SSCOM) Natick, MA	7/12/96	[illegible]

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
W. Plan	201	ABES Final Quality Assurance Project Plan Phase II RI for [illegible] Area at [illegible] Natick, MA Volume I of II	[illegible]	[illegible]
W. Plan	202	ABES Final Quality Assurance Project Plan Phase II RI for [illegible] Area at [illegible] Natick, MA Volume II of II	[illegible]	[illegible]
Corresp.	203	Ltr to Mr Campbell, MADEP and Mr Keefe EPA Re: Final FS Phase II RI Work Plan, Final FS Phase II RI Quality Assurance Project Plan	[illegible]	[illegible]
Corresp.	204	8th RAB Meeting Minutes	[illegible]	[illegible]
W. Plan	205	ABES Final Health and Safety Plan RI/FS for [illegible] Area at [illegible] Natick, MA	[illegible]	[illegible]
W. Plan	206	ABES Final Quality Assurance Project Plan RI/FS Draft [illegible] Area at [illegible] Natick, MA	[illegible]	[illegible]

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Corresp	207	Ltr to Mr Campbell, NDEP and Mr Keefe EPA Re: Draft Water Report Survey of Local Properties - Final Phase I NT-25 [illegible] Plan, Final Phase [illegible] 25 Quality Assurance Project Plan, Draft Final Community Relations Plan - Draft Final Quarterly Ground Water Monitoring Report Summer and Fall 1995	8/1/96	[signature]
Corresp	208	2nd Open House Surveys	8/14/96	[signature]
[illegible]	209	[illegible]	[illegible]	[signature]
[illegible]	210	[illegible]	[illegible]	[signature]

IN

FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
AR Corr	211	AD: Final Phase Remedial		
		Investigation Report Vol. [illegible]		
		III - [illegible]	9/13/96	[illegible]
AR Corr	212	AD: Final Phase I Remedial		
		Investigation Report Vol. [illegible]		
		III - [illegible]	9/13/96	[illegible]
Corresp	213	Media Advisory on [illegible]	9/11/96	[illegible]
Newspaper	214	News: EPA Gives Grant for [illegible]	9/[illegible]/96	[illegible]
Corresp	215	9th RAB Sign-In Sheet	9/16/96	[illegible]
Corresp	216	9th RAB Meeting Minutes	9/30/96	[illegible]
Corresp	217	[illegible] Re: Draft Treat-		
		ability Study Work Plan Comment and		
		Response Package and Draft		
		Station Memorandum Comment and		
		Response Package	10/9/96	[illegible]
Corresp	218	[illegible] Training		
		[illegible]	10/[illegible]/96	[illegible]
Corresp	219	Media Advisory on [illegible]	10/30/96	[illegible]
Corresp	220	[illegible]		
		Public Notice [illegible]	10/30/96	[illegible]

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Corresp	221	Ltr to Mr. Graham Eastern Research [illegible] Document [illegible] Public Water [illegible]	[illegible]	[illegible]
Corresp	222	Letter to Dr. Glynn, Request RAB rep from schools	10/29/96	C. Fitzgerald
Newspaper	223	TAB Article "Water Fouled"	11/14/96	C. Fitzgerald
E-Mail	224	Mr. Kaltofen - Comments Regarding SSCOM Risk	12/3/96	C. Fitzgerald
Newspaper	225	Suit Against Labs - Middlesex News	12/10/96	C. Fitzgerald
News	226	Add for RAB Member	12/25/96	C. Fitzgerald
Newspaper	227	Letters to the Editor: Some Clarification by the Labs TAB	12/27/96	K. Alves
Newspaper	228	"Natick Lab Eyed Over Hike in Cancer" Boston Globe	3/3/97	K. Alves
Newspaper	229	"Cancer Closter Seen in Natick" Middlesex News	3/3/97	K. Alves
Newspaper	230	"Natick Cancer closter worries State officials" Middlesex	3/3/97	K. Alves
Newspaper	231	"Cause of High cancer rate Sought" Patriot Ledger	3/3/97	K. Alves
Newspaper	232	"Cancer Scare" Middlesex News	3/3/97	K. Alves
Newspaper	233	"Cancer Concern" Middlesex News	3/3/97	K. Alves
Newspaper	234	"Natick's water safe now" Middlesex News	3/3/97	K. Alves
Newspaper	235	"More money sought to study Natick Cancer rates"		
		Middlesex News	3/3/97	K. Alves
Corresp	236	Ltr from Martha Steele to Mr. Manning & Mr. Kaltofen	3/3/97	K. Alves

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Corresp	237	Ltr to Mr. Campbell Ammend#1 to final SSCOM Work Plan	3/3/97	K Allen
Corresp	238	Ltr to Mr. Kuck Ammend#1 to final SSCOM Work Plan	3/3/97	K Allen
CorresP	239	Questions/Comments received from the Feb 25, 1997 RAB	3/4/97	K Allen
Newspaper	240	"Officials Seek Cause of elevated cancer incidence" Morning Sentinel	3/7/97	K Allen
Newspaper	241	"Costly Exposure" TAB	3/7/97	K Allen
Corresp	242	Ltr from. Michael Berkman certifying Dr. Czeisler to be Lakewood Association Inc. representative to RAB	3/18/97	K Allen
Newspaper	243	"Water is OK" Milford Daily News	3/18/97	K Allen
Newspaper	244	"Natick's Water Safe Now" Middlesex News	3/24/97	K Allen
Newspaper	245	"State will adress Surge in local Cancer" Middlesex news	3/24/97	K Allen
Newspaper	246	"Residents to Conduct Town's Own Cancer Survey" Natick Bulletin	3/24/97	K Allen
Newspaper	247	"Task force needed to Study Cancer data" Ltr. to Editor Natick Bulletin	3/24/97	K Allen
Newspaper	248	"Natick must get its own answers on Cancer findings" Middlesex News	3/24/97	K Allen

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Newspaper	249	"Markey asks EPA to find cause of cancer" Middlesex News	3/24/97	K Alves
Newspaper	250	"EPA cancer probe urged" Middlesex News	3/24/97	K Alves
Corresp	251	Ltr to Mr. Keefe, EPA, Mr. Cambell MDEP, and Mr. Tata, Tata & Howard Inc. Re: Response to Comments Ground Water Model	3/25/97	K Alves
Newspaper	252	"Unanswered questions lead to formation of cancer task force" Middlesex News	3/25/97	K Alves
Newspaper	253	"Dubious Desires" Middlesex News	3/25/97	K Alves
Newspaper	254	"Test Show high Chemical levels" Middlesex News	3/31/97	K Alves
Corresp	255	Ltr to Mr. Keefe, EPA and Mr. Campbell, DEP Re: Draft Quality Assurance Quality Control Plan for Gym Site	4/29/97	K Alves
Newspaper	256	"Environment on hold" TAB	4/29/97	K Alves
Corresp	257	Ltr. to RAB members FY98 Budgeting Survey	5/1/97	K Alves
Corresp	258	Ltr. to Mr. Cunniff from PAO	5/1/97	K Alves
Newspaper	259	"Army Lab focus of Cancer Dispute" Union News	5/5/97	K Alves
Newspaper	260	"Town to form Cancer task force" TAB	5/5/97	K Alves
Newspaper	261	"Cancer task force to start own Study" Natick Bulletin	5/5/97	K Alves

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Newspaper	262	"RAB mtg. advertisement" PAO Newsrelease	5/5/97	K Allen
Newspaper	263	"Natick to Probe Cancers" Boston Globe	5/5/97	K Allen
Newspaper	264	"Contingent goes to State House for Cancer Study Funds" TAB.	5/5/97	K Allen
Newspaper	265	"Paw Plant Studied as Natick Cancer Source" Middlesex news	5/5/97	K Allen
Corresp	266	Ltr to Lucas Megaus (Middlesex news) from Susan Anunger PAO in response to article	5/5/97	K Allen
Corresp	267	Ltr. to Mr. Keefe, EPA and Mr. Campbell DEP Re: Health and Safety Plan Addendum for SSCOM proposed Gym Site	5/14/97	K Allen
Newspaper	268	"Natick Cancer Study funds" in State budget proposal" Middlesex News	5/22/97	K Allen
Corresp	269	Ltr. to RAB members FY98 budgeting survey #2	5/29/97	K Allen
Newspaper	270	"Water Study Breaks little new ground" Middlesex news	5/29/97	K Allen
Newspaper	271	"Federal Study Shows Labs not likely cancer Source" Natick Bulletin	5/30/97	K Allen
Newspaper	272	"Federal health report on Natick Labs is released" Natick Tab	5/30/97	K Allen

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Corresp	273	Ltr to Jerome Keefe, EPA = Robert Campbell, DEP Re: Draft Work Plan for Proposed Gymnasium Site	5/30/97	
Corresp	274	Ltr to Martha Steele, DPH Re: Draft Proposed Sampling Plan	6/5/97	
Newspaper	275	"Cochituate Park prepares for Summer Season" Natick Bulletin	6/9/97	
Newspaper	276	"Public health report on Natick Labs", "Water/Sewer rates to increase in coming years" Natick Bulletin	6/9/97	
Newspaper	277	"Natick water, sewer rates jump" Middlesex News	6/20/97	
Newspaper	278	"Water rates jump up to 32 percent in Natick" Middlesex News	6/20/97	
Newspaper	279	"Questions Remain on Natick Labs" TAB	6/23/97	
Newspaper	280	"federal health assessment of Natick Labs Site released" TAB	6/23/97	
Newspaper	281	PAO news release for 24 June 1997 RAB meeting.	6/24/97	
Corresp.	282	Ltr. to RAB members Re: Draft		

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
		Work Plan for Proposed Gym Site	6/24/97	K Allen
Corresp	283	Ltr to Jerome Keefe, EPA & Robert Campbell, DEP Re: Draft Removal Work Plan and Draft Site Safety and Health Plan	6/25/97	K Allen
Corresp	284	Ltr to Max Howie, ATSDR Re: forwarding Comments on ATSDR Public Health Assessment	6/27/97	K Allen
Corresp	285	Ltr to Jerome Keefe, EPA; Robert Campbell, DEP Re: Storm Water Screening of I-25; Main Outfall	8/8/97	K Allen
Corresp	286	Ltr to Jerome Keefe, EPA; Robert Campbell, DEP Re: Final Removal Action Work Plan for Storage Area (I-25 Area)	9/3/97	K Allen
~~Newspaper~~	~~287~~			
Newspaper	287	PAO News release for 23 September 1997 RAB meeting	9/24/97	K Allen
Newspaper	288	"Labs to remove Contaminated Soil" Middlesex News	10/2/97	K Allen
Corresp	289	Ltr. to Community re: Soil excavation at the Storage area	10/7/97	K Allen

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Corresp	290	Ltr. to Jerome Keefe, EPA; Robert Campbell, DEP; and Forest Lyford, USGS re: Final Treatability Study Work Plan	10/28/97	K Flues
Corresp	291	Ltr. to Donald Stoddard, DEM re: Request for Authority to Complete Installation of Ground Water Monitoring Wells on property Owned by DEM.	10/28/97	K Flues
Corresp	292	Ltr. to Jerome Keefe, EPA and Robert Campbell, DEP re: Draft Phase II I-25 Remedial Investigation Report	10/28/97	K Flues
Newspaper	293	"Tiny Critters could clean Lake Cochituate" Middlesex News	10/28/97	K Flues
Newspaper	294	"Cancer study outlook brightens" Middlesex News	10/28/97	K Flues
Newspaper	295	"Cancer group looks at town history" Middlesex News	10/28/97	K Flues
Newspaper	296	"Natick to debate school construction" Middlesex News	10/29/97	K Flues
Newspaper	297	"Preliminary report from Cancer Study Task Force expected soon" Middlesex News	10/29/97	K Flues
Newspaper	298	"Army lab cleanup on track" Natick Bulletin	10/29/97	K Flues

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Newspaper	299	"Cancer map editorial position is harmful" The Natick TAB	10/29/97	K Allen
Newspaper	300	"Cancer levels now normal" Natick Bulletin	11/21/97	K Allen
Newspaper	301	"Cancer Study allays concerns" The Natick TAB	11/21/97	K Allen
Corresp	302	Special Use Permit from DEM/Division of Forest and Parks. for Pegan Cove	11/21/97	K Allen
Newspaper	303	"Natick Labs testing clean-up System" Middlesex News	12/5/97	K Allen
Newspaper	304	"New Employee Representative Needed for RAB" SSCOM Bulletin	2/4/98	K Allen
Corresp	305	Ltr to Jerome Keefe, EPA and Robert Campbell, DEP re: Installation Action Plan	2/4/98	K Allen
Newspaper	306	"Lake overrun by ~~Dep~~ pollution, development Middlesex news	2/4/98	K Allen
Corresp	307	Ltr. to RAB members re: Draft Phase II Remedial Investigation Sections 5-9	3/3/98	K Allen
Corresp	308	Ltr to Jessica Graham re: Draft Phase II Remedial Investigation Sections 5-9	3/3/98	K Allen
Corresp	309	Ltr. to Dr. Campbell ATSDR re: maps for Public Health Assessment	3/3/98	K Allen

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Newspaper	310	"Status report on Superfund Sites" Boston Globe	3/17/98	K Alves
Corresp	311	Ltr. to Jerome Keefe, EPA and Robert Campbell, DEP re: Draft Final Quarterly Groundwater Sampling report	3/23/98	K Alves
Newspaper	312	"Army Labs an unlikely suspect, Stody Says" Natick Bulletin	4/6/98	K Alves
Corresp	313	Ltr. to Jerome Keefe, EPA and Robert Campbell, MaDEP re: Environmental Open House Posters	4/15/98	K Alves
Corresp	314	Ltr to Community from BG Floyd re: invitation to Environmental Open House	4/15/98	K Alves
Corresp	315	Ltr to Neighbors (mailing list) from BG Floyd re: Invitation to Environmental Open House	4/15/98	K Alves
Corresp	316	Ltr to Laurie Haines, AEC, Steven Young, HydroGeoLogic, and Donald Koch, ETA re: Comments on Groundwater Modeling Draft Technical Work Plan Comments	4/15/98	K Alves
Corresp	317	Ltr from Scott Pellerin re: NPDES permit exclusion for groundwater remediation	4/30/98	K Alves

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Corresp	318	Ltr. to Scott Pellegin, EPA re: NPDES Permit Exclusion Reference #98-004	4/30/98	KAlves
Corresp	319	Ltr. w/enclosure from Jerome Keefe, EPA re: Phase II RI, T-25 Area Comments	4/30/98	KAlves
Corresp	320	Ltr. w/comments from Forest Lyford, USGS re: Comments on Phase II RI T-25 Area	4/30/98	KAlves
Corresp	321	Ltr to Kathleen Thron, ADL re: Comments from EPA & USGS for Phase II RI, T-25 Area	4/30/98	KAlves
Corresp	322	Ltr to Jeffrey Pickett, ABB re: EPA & USGS Comments on the Phase II RI, T-25 Area	4/30/98	KAlves
Corresp	323	Ltr. to Laurie Haines, AEC, Steve Young, HGL Donald Koch, EPA re: EPA & USGS comments on the Phase II RI T-25 Area	4/30/98	KAlves
Corresp	324	Ltr. to Robert Campbell, DEP Jerome Keefe, EPA and Forest Lyford, USGS re: Draft Technical Work Plan for Groundwater Modeling	5/8/98	KAlves

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Corresp	325	Ltr. to Bob Campbell, DEP and Jerome Keefe, EPA re: Installation Action Plan	5/8/98	K Alves
Newspaper	326	"Army to pay for Labs cleanup" Middlesex News	5/12/98	K Alves
Corresp	327	Ltr. to Robert Campbell, DEP and Jerome ~~Keffe~~ Keefe, EPA re: Draft Removal Action report for Storage Area, I-25 Area	5/12/98	K Alves
Corresp	328	E-mail from Forest Lyford, USGS Subject: Review of Modeling Plan	5/26/98	K Alves
Newspaper	329	"Labs give $2.6 million to town for water treatment" Natick Bulletin	5/28/98	K Alves
Newspaper	330	"Some clarification by the Labs" The Natick TAB	6/9/98	K Alves
Newspaper	331	"Environmental Scene". Worcester Business Journal	6/17/98	K Alves
Corresp	332	Ltr. to Laurie Haines, AEC, Steven Young, HGL, Donald Koch, ETA re: EPA, DEP, USGS Comments for Draft Technical Work Plan, Groundwater Modeling at SSCOM	6/17/98	K Alves

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Coresp	333	Ltr. to Todd Frederick, DEM re: Quarterly Groundwater Sampling Report, Event 15	6/26/98	K Alves
Coresp	334	Ltr. to Jerome Keefe, EPA and Robert Campbell, DEP re: Draft Work Plan for Site Investigation, Boiler Plant	6/29/98	K Alves
Coresp	335	Ltr. to Kate Lewis, DEM re: Quarterly Groundwater Sampling Report. Event 15	7/14/98	K Alves
Coresp	336	Ltr. to Terrance Whalen, Natick Conservation Commission re: Quarterly Groundwater Sampling Report Event 15	7/14/98	K Alves
Coresp	337	Ltr. to Kerry Van Acker, Cochituate State Park re: Quarterly Groundwater Sampling Report Event 15	7/14/98	K Alves
Coresp	338	Ltr. to Michael Plumb, ANEPTEK re: Draft Removal Action Report, Draft Final Quaterly Groundwater Sampling Report Events 14 & 15, Draft Work Plan for Site Investigation Boiler Plant Area	8/11/98	K Alves
Coresp	339	Ltr to Scott Pellerin, EPA re: NPDES Permit Exclusion Reference #98-009	8/11/98	K Alves

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Corresp	340	Ltr. to Robert Campbell, DEP and Jerome Keefe, EPA re: Draft Comment and Response Package on Phase II T-25 Area Remedial Investigation	8/11/98	
Corresp	341	Ltr. to Robert Campbell, DEP and Jerome Keefe, EPA re: T-25 Area Schedule	8/11/98	
Corresp	342	Ltr. to Robert Campbell, DEP, Jerome Keefe, EPA and Forest Lyford, USGS re: Response to Comments, Draft Technical Work Plan, Groundwater Modeling	8/11/98	
Corresp	343	Memorandum for Peter Tuttle re: T-25 Area Current Revised Schedule	8/11/98	
ResponseCard	344	From May 1998 Newsletter	1/28/99	R Boutin
ResponseCard	345	From October 1997 Newsletter	1/28/99	R Boutin
WK PLAN	346	Tier II Ecological Risk Assessment Work Plan	2/1/99	R. Boutin
WK PLAN	347	Site Investigation Work Plan Report for Boiler Plant Area, Former Haz. Mat. Storage Building, Former Piggery & Building T-23	2/1/99	R. Boutin
Newspaper	348	TAB Article: Residents sought to monitor cleanup	2/2/99	R. Boutin

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
R.I. Report	349	Final, Phase II Remedial Investigation Report, Vol. I, Sect. 1-4, T-25 Area at U.S. Army SSCOM	2/2/99	R. Boutin
R.I. Report	350	Final, Phase II, R.I Report, Vol. II, Sect. 5-9 with Comment & Response Packages	2/2/99	R. Boutin
Correspondance	351	Cover Letter - Final Phase II RI Report	2/11/99	R. Boutin
Correspondance	352	Caitlin Fitzgerald - Earth Science Student - Replied to	2/11/99	R. Boutin
Correspondance	353	Maria Wolman - Earth Science Student - Replied to	2/11/99	R. Boutin
Corresp.	354	Groundwater Use & Value Determination	2/23/99	R. Boutin
Newspaper	355	Contamination threatens towns backup well TAB 3/2	3/4/99	R. Boutin
Newspaper	356	Long Road to Remediation - Natick Tab 3/2/99	3/4/99	R. Boutin
Correspondance	357	Request for visit to S.S.C - Caitlin Fitzgerald	3/29/99	R. Boutin
Correspondance	358	Request & Response to Info about Pegan Cove	3/29/99	R. Boutin
Newspaper	359	Public Notices for RAB Meeting 3/4/99 - BAH	4/22/99	R. Boutin
Correspondance	360	Ltr. to New RAB Members - Intro Packet	5/6/99	R. Boutin
Response Card	361	From Winter 1999 Newsletter	5/17/99	R. Boutin
Corresp.	362	Applications for RAB membership	5/20/99	R. Boutin
Corresp.	363	Comments on FFS/Treatability Study for T-25 Area - Environmental Insight	5/21/99	R. Boutin
~~Corresp.~~	~~364~~			
Corresp.	364	Comments on FFS/Treatability Study - C. Czeisler	5/28/99	R. Boutin
Corresp.	365	Response to C. Czeisler/Lakewood Assn.	6/2/99	R. Boutin

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Newspaper	366	Boston Sunday Globe, Army, Natick talk on tainted wells	6/13/99	R. Boutin
Corresp	367	Dept. Public Health - Health Consultation on T-25 Outfall Area	6/30/99	R. Boutin
Contacts	368	Original Members of the Restoration Advisory Bd	7/8/99	R. Boutin
Corresp.	369	Ltr. to Chief Fredette requesting Meeting room	8/12/99	R. Boutin
Corresp.	370	Ltr. from Tata & Howard on T-25 FFS/TS	8/12/99	R. Boutin
Corresp.	371	Ltr. to Bob Campbell, Jerry Keefe, Kathy Thrun @ Draft FFS for T-25	8/12/99	R. Boutin
Corresp.	372	Comments on Draft Proposed Plan of T-25 Area from Environmental Insight	8/13/99	R. Boutin
Newspaper	373	T-25 Proposed Plan Public Hearing Ad - MetroWest Daily 8-23-99	8/26/99	R. Boutin
Corresp.	374	Attendance List for Informational Meeting on T-25 Proposed Plan on 9/9	9/13/99	R. Boutin
Newspaper	375	Natick Bulletin - $3.1M to keep drinking H2O Safe	9/22/99	R. Boutin
Newspaper	376	Boston Globe, Army set to pay $3.1M for cleanup	9/28/99	R. Boutin
Newspaper	377	MetroWest Daily, Army Plans Big Cleanup 9/23/99	9/29/99	R. Boutin
Correspondence	378	T-25 GW Proposed Plan Comment, Larry Meik, Citizen of Natick	10/1/99	R. Boutin
Corresp.	379	T-25 GW Proposed Plan Comment, Marco Kaltofen	10/1/99	R. Boutin
Corresp.	380	T-25 GW P.P. Comment, Environmental Insight	10/1/99	R. Boutin
Corresp.	381	P.A.D. Press Release - 10-5-99 RAB Meeting	10/5/99	R. Boutin

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
Report	382	FFS/TS T-25 Area at SSC - Final	9/99	R. Bouton
Newspaper	383	Globe Article - Army-Natick agreement to depend on EPA	10/18/99	R. Peret
Corresp	384	T-25 Groundwater Responsiveness Summary	11/15/99	R. Peret
Newspaper	385	Herald Article - Gvt. agencies on list of worst polluters in State	12/1/99	R. Peret
Newspaper	386	Metrowest Daily News - Natick Labs mates 'Dirty Dozen' List	12/4/99	R. Peret
Report	387	Public Hearing Transcript: T-25 Proposed Plan	12/7/99	R. Peret
Newspaper	388	Metrowest Daily News - Natick Settlement may not be for the best	12/9/99	R. Peret
Correspondance	389	Environmental Insight: Responses to Proposed Plan Comments	12/13/99	R. Peret
Correspondance	390	Adam Last's Letter of Resignation from RAB	1/12/00	R. Peret
Correspondance	391	Response Cards from Newsletter # 8	5/10/00	R. Peret
Newspaper	392	Framingham TAB - Natick Legal Woes	9/19/00	J. McHugh
Newspaper	393	Metrowest Daily News - Labs Cleanup Plan needs debate	11/03/00	J. McHugh
Newspaper	394	Boston Globe - "Swallowing a Bitter pill"	11/06/00	J. McHugh
Newspaper	395	Boston Globe - "A two year wait"	02/05/01	J. McHugh
NEWSPAPER	396	BOSTON GLOBE - "METAL PULLED FROM LAKE"	4/19/01	Harold J. Cabaniss
NEWSPAPER	397	METROWEST DAILY NEWS - "NATICK LABS CLEANUP CLOSED?"	4/22/2004	JAMES B. CONNOLLY
REPORT	398	FINAL TIER III DETERMINISTIC ECOLOGICAL RISK ASSESSMENT	7/21/09	JAMES B. CONNOLLY

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
REPORT	399	T-25 AREA (OU-1) GROUNDWATER TREATMENT SYSTEM O+M MANUAL	7/21/04	JAMES B. CONNOLLY
NEWSPAPER	400	METROWEST DAILY NEWS - POISONOUS PASTIME (UNSAFE FISH)	8/17/04	JAMES B. CONNOLLY
NEWSPAPER	401	METROWEST DAILY NEWS - NATICK LABS ABUZZ OVER NEW FOCUS	8/22/04	JAMES B. CONNOLLY
NEWSPAPER	402	METROWEST DAILY NEWS - . ARMY URGES NO CLEANUP OF LAKE	4/6/05	JAMES B. CONNOLLY
BOOK	403	U.S. ARMY NATICK LABS, - THE SCIENCE BEHIND THE SOLDIER	4/27/05	JAMES B. CONNOLLY
NEWSPAPER	404	METROWEST DAILY NEWS - ARMY IS LIKELY OFF HOOK FOR PCB	5/5/05	JAMES B. CONNOLLY
NEWSPAPER	405	BOSTON GLOBE - NATICK LABS DISCUSSION	3/9/06	JAMES B. CONNOLLY
NEWSPAPER	406	BOSTON GLOBE - ALONG LAKE COCHITUATE, CLEANUP VYING FOR ATTENTION	3/16/06	JAMES B CONNOLLY
NEWSPAPER	407	METROWEST DAILY NEWS - SUPERFUND CLEANUP HAS GONE WELL, BUT	4/12/06	JAMES B CONNOLLY
CORRESP.	408	EPA COMMENT DRAFT SUPP. RI RPT FPGS	6/12/06	JAMES B. CONNOLLY
CORRESP	409	EPA COMMENT DRAFT 1ST 5 YEAR REVIEW	9/12/06	JAMES B. CONNOLLY
CORRESP	410	EPA COMMENTS GW REMEDIAL OPTIMIZATION STUDY - T-25 (OU-1)	10/2/06	JAMES B. CONNOLLY
CORRESP	411	LTR TO COMMISSIONER DCR RE SEDIMENT	11/26/07	JAMES B. CONNOLLY
NEWSPAPER	412	METROWEST DAILY NEWS - LABS TO REMOVE TOXIC SOIL	10/28/06	JAMES B. CONNOLLY
REPORT	413	FIRST FIVE YEAR REVIEW REPORT	1/31/07	JAMES B. CONNOLLY
REPORT	414	FINAL ROD FOR FPGS, BUILDINGS T-62, T-68	9/28/07	JAMES B. CONNOLLY
REPORT	415	FINAL FEASIBILITY STUDY REPORT	3/1/2008	J.B. CONNOLLY
REPORT	416	FINAL SI REPORT BLDG 63, 2, 45	6/5/2008	J.B. CONNOLLY
REPORT	417	FINAL FALL 2007 FISH + SEDIMENT SAMPL MEMO	9/28/2008	J.B. CONNOLLY
REPORT	418	FINAL FEASIBILITY STUDY OU-2	3/5/2009	J.B. CONNOLLY

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FILE	FILE #	DESCRIPTION	DATE	SIGNATURE
REPORT	419	FINAL PROPOSED PLAN FOR SEDIMENT	5/18/2009	JAMES B. CONNOLLY

APPENDIX B

DECLARATION OF STATE CONCURRENCE

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

September 18, 2009

Mr. James T. Owens III, Director
Office of Site Remediation and Restoration
U.S. Environmental Protection Agency, Region 1
One Congress Street, Suite 1100
Boston, MA 02114-2023

Re: State Concurrence with Record of Decision
Natick Soldier Systems Command (NSSC)
For Sediments (OU-2)
Natick, MA

Dear Mr. Owens:

The Massachusetts Department of Environmental Protection (MassDEP) has reviewed the selected remedy recommended by the U.S. Environmental Protection Agency (EPA) for the cleanup of the Natick Soldier Systems Center (NSSC) Sediments – Operable Unit 2 (OU-2). MassDEP concurs with the selection of the remedy as presented in the Record of Decision.

The selected remedy contains two elements. The first proposes that no further action is necessary for sediments at the NSSC shoreline outside of Pegan Cove, which includes outfalls at the T-25, Buildings 2 and 45, the Boiler Plant and the Building 22 and 36 areas. The second proposes that for NSSC shoreline sediments within Pegan Cove, hydraulic dredging will reduce polychlorinated biphenyl (PCB) contaminated sediment concentrations to levels below the specified average cleanup goal of 1 mg/kg. EPA established the cleanup levels for sediment by applying human health and ecological risk assessment methodologies, as well as state and federal standards. The selected remedy also meets applicable or relevant and appropriate state requirements (ARARs) for the selected remedy.

MassDEP looks forward to continued cooperation with EPA as work progresses for other activities at this site. If you have any questions regarding this concurrence, please contact the project manager, Robert Campbell, at 617-292-5732.

Sincerely,

Janine Commerford, Assistant Commissioner
Bureau of Waste Site Cleanup
Department of Environmental Protection

APPENDIX C

EPA LETTER REGARDING RISK ASSESSMENT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
1 Congress Street, Suite 1100
BOSTON, MA 02114-2023

April 13, 2009

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

Re: Final Sediment Feasibility Study, dated March 5, 2009, for the US Army Soldier Systems Center, Natick Massachusetts

Dear Mr. McHugh:

Pursuant to §10.7 of the Natick Soldier Systems Center federal facility agreement dated August 2, 2006, as amended, (FFA), the Environmental Protection Agency (EPA) has reviewed the referenced document. We do not require any changes to the final FS, however, we have some comments for the record. Please see below.

The FS is vague on the issue of how "high" the PCB concentrations would be in the decant water to require special handling of the filters and activated carbon used for water treatment. Please provide. Decant water itself must not be higher than 0.5 ppb for Lake discharge. Please provide a limit at which time the dredging would stop and the decant water would be treated. EPA suggests 0.25 ppb.

The landfill must be permitted by the state for receipt of PCB containing waste < 50 ppm, this specific concentration was not noted in the FS section 6.3.6.1. As noted, the policy for MA indicates that the PCB concentration must be <2 ppm for PCB remediation waste to be disposed of at MA landfills.

It is noted that Army will continue to maintain signage prohibiting fishing from the NSSC shoreline. While this may be necessary for security reasons, it is not necessary for the ROD if Army cleans up the sediments to the background of Fisk Pond.

While EPA agrees with the Army that there is a need for remediation at this site, the risk assessment as described in the final FS is not consistent with previous EPA comments. However, since both the Army's risk assessment and EPA's comments require remedial action, EPA will not require the Army to make any changes to appendix B. Please see attached comments from our EPA risk assessor.

****

If you have any questions with regard to these comments, please contact me at (617) 918-1384.

Sincerely,

Christine A.P. Williams, RPM
Federal Facilities Superfund Section

cc: James Connally, SSC
Robert Campbell, MassDEP
Rona Gregory, EPA (via e-mail only)
Margaret McDonough, EPA (via e-mail only)
Cornell Rosiu, EPA (via e-mail only)
Kim Tisa, EPA (via e-mail only)

MEMO

Subject: Final Sediment Feasibilty Study for Lake Cochituate
To: Christine Williams, RPM
From: Margaret McDonough, Risk Assessor MM
Date: March 26, 2009

Comment 1. Table 1 below is a summary of potential risks associated with consumption of fish from Lake Cochituate. The text and table that follows describes the underlying parameters and values. These risks and parameters/values should form the basis of the need for action. The information in the Feasibility Study is inconsistent with this assessment.
Comment 2. The inconsistency described in Comment 1 does not require any changes to the proposed alternative because both the risk assessment in the Feasibilty Study as well as the corrected risk assessment below, will result in the need to base the remedy on background contaminant levels in sediment.

Risk Summary

TABLE 1
RISK SUMMARY

	RME	RME	CTE	CTE
	Cancer Risk (adult + child)	HI (child)	Cancer Risk (adult+child)	HI (child)
Site (MSO Area)	1E-04	8	5E-05	4
Reference (Rte 135 Culvert)	5E-05	4	3E-05	2
Background (Fisk)	9E-06	<1	5E-06	1

Ingestion Rate
The above RME risks are based on an adult ingestion rate of 16 g/day which is consistent with the 2004 assessment. This ingestion rate is also consistent with RME estimates found in EPA's Exposure Factors Handbook. The child ingestion rates are typically assumed to be 1/3 to ½ of an adult's, thus, 5 g/day was assumed for a young child.

The CTE risks are based on an adult ingestion rate of 8 g/day which is consistent with estimates in the Exposure Factors Handbook. The child ingestion rate is half of that used in the RME.

Exposure Point Concentration
The 95UCL for the 2007 data set as recommended by ProUCL 4.0 was selected as the EPC. Results of outlier tests using ProUCL showed an outlier in the data set for the Route 135 Culvert area. Thus, the outlier was not included in the data set used to calculate the EPC for this area.

TABLE 2
95 UCL EXPOSURE POINT CONCENTRATION FOR BASS FILLET

Area	EPC (mg/Kg)	Basis
Site (MSO Area)	0.496	Approx. Gamma Distribution
Reference (Rte 135 Culvert)	0.249	Approx. Gamma Distribution
Background (Fisk Pond)	0.036	Maximum (95UCL exceeds maximum)

The equation used to calculate the risks and the value used for each exposure parameter and toxicity value are shown in the attached spreadsheet (Attachment 1).

Attachments

Natick - Lake Cochituate Risk Associated with Consumption of PCBs in Largemouth Bass - All Data

Equations: Cancer Intake = Conc x IR x EF x ED x Conv. Factor / BW x ATcancer

Cancer Risk = CSF x Cancer Intake

Noncancer Intake = Conc x IR x EF x ED x Conv. Factor / BW x ATnoncancer

HI = Noncancer Intake/RfD

Adult Exposure Parameters *
IR - 16 g/day
ED - 30 years
EF - 365 days
Conv Factor - 0.001
AT cancer - 25550
AT noncancer - 10950

Child Exposure Parameters
IR - 5 g/day
ED - 6 years
EF - 365 days
AT cancer - 25550
AT noncancer - 2190

*Sediment Risk Management Technical Memorandum Draft Final December 9, 2004:

Where concentration = 95UCL of Site Data

		Conc (mg/kg)	BW (kg)	Meal Size(g)	Meals/yr	IR (g/day)	EF (d/yr)	ED (yrs)	Conv. F (kg/g)	Cancer Avg Time (d)	NonCan Avg (d)	Cancer Intake	CSF	Cancer Risk	Noncan Intake	RfD	HQ
2004 data	Adult	1.57E+00	7.00E+01			1.60E+01	3.65E+02	3.00E+01	1.00E-03	2.56E+04	1.10E+04	1.54E-04	2.00E+00	3.07E-04	3.58E-04	2.00E-05	1.79E+01
All data	Adult	9.62E-01	7.00E+01			1.60E+01	3.65E+02	3.00E+01	1.00E-03	2.56E+04	1.10E+04	9.42E-05	2.00E+00	1.88E-04	2.20E-04	2.00E-05	1.10E+01
All - No Out	Adult	5.64E-01	7.00E+01			1.60E+01	3.65E+02	3.00E+01	1.00E-03	2.56E+04	1.10E+04	5.52E-05	2.00E+00	1.10E-04	1.29E-04	2.00E-05	6.45E+00
2007 only	Adult	4.96E-01	7.00E+01			1.60E+01	3.65E+02	3.00E+01	1.00E-03	2.56E+04	1.10E+04	4.86E-05	2.00E+00	9.72E-05	1.13E-04	2.00E-05	5.67E+00
2004 data	Child	1.57E+00	1.50E+01			5.00E+00	3.65E+02	6.00E+00	1.00E-03	2.56E+04	2.19E+03	4.48E-05	2.00E+00	8.95E-05	5.22E-04	2.00E-05	2.61E+01
All data	Child	9.62E-01	1.50E+01			5.00E+00	3.65E+02	6.00E+00	1.00E-03	2.56E+04	2.19E+03	2.75E-05	2.00E+00	5.50E-05	3.21E-04	2.00E-05	1.60E+01
All - No Out	Child	5.64E-01	1.50E+01			5.00E+00	3.65E+02	6.00E+00	1.00E-03	2.56E+04	2.19E+03	1.61E-05	2.00E+00	3.22E-05	1.88E-04	2.00E-05	9.40E+00
2007 only	Child	4.96E-01	1.50E+01			5.00E+00	3.65E+02	6.00E+00	1.00E-03	2.56E+04	2.19E+03	1.42E-05	2.00E+00	2.83E-05	1.65E-04	2.00E-05	8.27E+00
2004 data	Child	1.57E+00	1.50E+01			4.00E+00	3.65E+02	6.00E+00	1.00E-03	2.56E+04	2.19E+03	3.58E-05	2.00E+00	7.16E-05	4.18E-04	2.00E-05	2.09E+01
All data	Child	9.62E-01	1.50E+01			4.00E+00	3.65E+02	6.00E+00	1.00E-03	2.56E+04	2.19E+03	2.20E-05	2.00E+00	4.40E-05	2.57E-04	2.00E-05	1.28E+01
All - No Out	Child	5.64E-01	1.50E+01			4.00E+00	3.65E+02	6.00E+00	1.00E-03	2.56E+04	2.19E+03	1.29E-05	2.00E+00	2.58E-05	1.50E-04	2.00E-05	7.52E+00
2007 Only	Child	4.96E-01	1.50E+01			4.00E+00	3.65E+02	6.00E+00	1.00E-03	2.56E+04	2.19E+03	1.13E-05	2.00E+00	2.27E-05	1.32E-04	2.00E-05	6.61E+00

Where concentration = 95UCL of Reference Data

		Conc (mg/kg)	BW (kg)	Meal Size(g)	Meals/yr	IR (g/day)	EF (d/yr)	ED (yrs)	Conv. F (kg/g)	Cancer Avg Time (d)	NonCan Avg (d)	Cancer Intake	CSF	Cancer Risk	Noncan Intake	RfD	HQ
2004 data	Adult	8.50E-01	7.00E+01			1.60E+01	3.65E+02	2.40E+01	1.00E-03	2.56E+04	1.10E+04	6.66E-05	2.00E+00	1.33E-04	1.55E-04	2.00E-05	7.77E+00
All data	Adult	6.97E-01	7.00E+01			1.60E+01	3.65E+02	2.40E+01	1.00E-03	2.56E+04	1.10E+04	5.46E-05	2.00E+00	1.09E-04	1.27E-04	2.00E-05	6.37E+00
All - No Out	Adult	3.68E-01	7.00E+01			1.60E+01	3.65E+02	2.40E+01	1.00E-03	2.56E+04	1.10E+04	2.88E-05	2.00E+00	5.77E-05	6.73E-05	2.00E-05	3.36E+00
2007 (includes outlier)	Adult	6.89E-01	7.00E+01			1.60E+01	3.65E+02	2.40E+01	1.00E-03	2.56E+04	1.10E+04	5.40E-05	2.00E+00	1.08E-04	1.26E-04	2.00E-05	6.30E+00
2007 (outlier removed)	Adult	2.49E-01	7.00E+01			1.60E+01	3.65E+02	2.40E+01	1.00E-03	2.56E+04	1.10E+04	1.95E-05	2.00E+00	3.90E-05	4.55E-05	2.00E-05	2.28E+00
2004 data	Child	8.50E-01	1.50E+01	1.14E+02	1.20E+01	5.00E+00	3.65E+02	6.00E+00	1.00E-03	2.56E+04	2.19E+03	2.43E-05	2.00E+00	4.86E-05	2.83E-04	2.00E-05	1.42E+01
All data	Child	6.97E-01	1.50E+01	1.14E+02	1.20E+01	5.00E+00	3.65E+02	6.00E+00	1.00E-03	2.56E+04	2.19E+03	1.99E-05	2.00E+00	3.98E-05	2.32E-04	2.00E-05	1.16E+01
All - No Out	Child	3.68E-01	1.50E+01	1.14E+02	1.20E+01	5.00E+00	3.65E+02	6.00E+00	1.00E-03	2.56E+04	2.19E+03	1.05E-05	2.00E+00	2.10E-05	1.23E-04	2.00E-05	6.13E+00
2007 (includes outlier)	Child	6.89E-01	1.50E+01	1.14E+02	1.20E+01	5.00E+00	3.65E+02	6.00E+00	1.00E-03	2.56E+04	2.19E+03	1.97E-05	2.00E+00	3.94E-05	2.30E-04	2.00E-05	1.15E+01
2007 (outlier removed)	Child	2.49E-01	1.50E+01	1.14E+02	1.20E+01	5.00E+00	3.65E+02	6.00E+00	1.00E-03	2.56E+04	2.19E+03	7.11E-06	2.00E+00	1.42E-05	8.30E-05	2.00E-05	4.15E+00
2004 data	Child	8.50E-01	1.50E+01	1.14E+02	1.20E+01	4.00E+00	3.65E+02	6.00E+00	1.00E-03	2.56E+04	2.19E+03	1.94E-05	2.00E+00	3.89E-05	2.27E-04	2.00E-05	1.13E+01
All data	Child	6.97E-01	1.50E+01	1.14E+02	1.20E+01	4.00E+00	3.65E+02	6.00E+00	1.00E-03	2.56E+04	2.19E+03	1.59E-05	2.00E+00	3.19E-05	1.86E-04	2.00E-05	9.29E+00
All - No Out	Child	3.68E-01	1.50E+01	1.14E+02	1.20E+01	4.00E+00	3.65E+02	6.00E+00	1.00E-03	2.56E+04	2.19E+03	8.41E-06	2.00E+00	1.68E-05	9.81E-05	2.00E-05	4.91E+00
2007 (includes outlier)	Child	6.89E-01	1.50E+01	1.14E+02	1.20E+01	4.00E+00	3.65E+02	6.00E+00	1.00E-03	2.56E+04	2.19E+03	1.57E-05	2.00E+00	3.15E-05	1.84E-04	2.00E-05	9.19E+00
2007(outlier removed)	Child	2.49E-01	1.50E+01	1.14E+02	1.20E+01	4.00E+00	3.65E+02	6.00E+00	1.00E-03	2.56E+04	2.19E+03	5.69E-06	2.00E+00	1.14E-05	6.64E-05	2.00E-05	3.32E+00

Where concentration = Maximum detected in Background (Fisk Pond) NOTE: 95UCL Exceeds Maximum

	Conc (mg/kg)	BW (kg)	Meal Size(g)	Meals/yr	IR (g/day)	EF (d/yr)	ED (yrs)	Conv. F (kg/g)	Cancer Avg Time (d)	NonCan Avg (d)	Cancer Intake	CSF	Cancer Risk	Noncan Intake	RfD	HQ
2007 Adult	3.60E-02	7.00E+01			1.60E+01	3.65E+02	3.00E+01	1.00E-03	2.56E+04	1.10E+04	3.53E-06	2.00E+00	7.05E-06	8.23E-06	2.00E-05	4.11E-01
2007 Child	3.60E-02	1.50E+01	1.14E+02	1.20E+01	5.00E+00	3.65E+02	6.00E+00	1.00E-03	2.56E+04	2.19E+03	1.03E-06	2.00E+00	2.06E-06	1.20E-05	2.00E-05	6.00E-01
2007 Child	3.60E-02	1.50E+01	1.14E+02	1.20E+01	4.00E+00	3.65E+02	6.00E+00	1.00E-03	2.56E+04	2.19E+03	8.23E-07	2.00E+00	1.65E-06	9.60E-06	2.00E-05	4.80E-01

TOTAL RISK = 9.E-06 0.6

APPENDIX D

PUBLIC HEARING TRANSCRIPTS

PUBLIC HEARING

RE: PROPOSED PLAN FOR SEDIMENT

AT THE

U.S. ARMY NATICK SOLDIER

SYSTEMS CENTER (SSC)

THURSDAY, MAY 21, 2009

7:00 P.M.

LEBOWITZ MEETING HALL

MORSE INSTITUTE PUBLIC LIBRARY

14 EAST CENTRAL STREET

NATICK, MASSACHUSETTS

JOEL McCASSIE

HEARING OFFICER

ORIGINAL

P R O C E E D I N G S

MR. McCASSIE: I will formally open the public hearing for comments. Richard.

MR. MILLER: A. Richard Miller, Dick Miller, 61 Lake Shore Road in Natick. I am a member of the Restoration Advisory Board for this program, have been since its founding. The primary reason is I have also been a member of the Cochituate State Park Advisory Committee since its founding and before that I was Executive Director of what some of you may remember as The Lake Cochituate Watershed Association. I have a long history here, 1968 and after.

First of all, I want to go on record tonight and at the next hearing. I am hopeful that my comments may start some other comments so I'm glad I was able to go early.

I have two items that I want to flag. One of them is just these hearings and this process itself right now at this stage in the cleanup. The second one is what I see as a major shortfall in what was presented as the range of what could be done. I'll fill them,

but those are the two things I want to address.

On the hearing, the Restoration Advisory Board got formal notice of this meeting and of its meeting two nights before last Thursday afternoon, late afternoon I think. So there's been less than a week of get ready time. We have, last year, discussed some pieces in this.

I found out Wednesday night at a different meeting that it would be coming up. It's much too fast. In fact, it fell on a night that was even more terrible than it is because the Conservation Commission was having a Lake Cochituate hearing tonight. They're not having it, they're not having it for the reason above. People aren't here tonight because the Natick Town Meeting is running tonight. So we've had bad conflicts. Without contacting the local members there was no input towards that collision of dates.

I hope we'll have more turnout at the next meeting. I'm grateful that on Tuesday night there was an agreement that we should have a second meeting over here. That wasn't a given

and I appreciate that. You will too if there's more people from Town and more Town organizations, etc.

So that's item one, we just need to do better on the coordination. We have a group to do that. It has to be done in an appropriate way.

The second topic is the bigger one in terms of the background and the foreground. Ever since these hearings began I've had a very simple position. It might be too simple, it might not work, but it's very simple: Don't use Lake Cochituate, a major recreational lake in eastern Mass., as a receptacle for dumping. We've been meeting all these years on this process because it was used as a receptacle for dumping. You don't have to decide who to blame and how much, but we're discussing how much of it to leave as a receptacle for dumping. That's what we're talking about when we say how many parts per million, which areas, in which areas will we leave the junk in the lake and in which areas will we take it out of.

When we talk about one part per

million we're coming fairly close to, at least a few years ago and I think still, is close to the detectable limit. The same measuring equipment can't measure way down beneath that level. That doesn't mean it's good or it's bad, it just means that it may not be practical this year to do a lot more detailed evaluation. But there are several reasons that we might worry in the future here if we don't.

One of them is that we have learned over the years that we had a bad limit. As we measure better, both in terms of what people suffer from and in terms of how we measure what's in the environment, we learned that we should change the limits. We've done that quite often, it's been going on in the last month and it will be going on in the next 20 years. So yes, we have to pick some limits and draw some lines on what we do. Lake Cochituate is a rather special place to decide that we can leave it in because it's a handy receptacle as long as we stay within that guideline. I don't think that's the way to go.

In addition to that there's another

reason we shouldn't do it and it came up in 2002. When the Eurasian Water Milfoil started growing in Lake Cochituate, and it was discovered in May of 2002, it was entirely within Pegan Cove, right there. The proper approach with Eurasian Water Milfoil was, my God, this stuff spreads like crazy, get it out fast before it gets everywhere else. It is everywhere else. It's not thick in North Pond yet, but it's thick in all of South Pond and most of Middle Pond. Let's say it's thick and thin in a few spots on North Pond. We did it all wrong.

This was upstream of everything else, and yet we couldn't go in and hand pull those plants because everyone is afraid of this toxic sediment. Everyone said, "Whatever you do, don't disturb the bottom fill, muck it up, pull it loose." We now have a lake full of a problem.

Did the Army start the problem? Quite possibly they did. Why did it show up next to their boat launching ramp and not next to the State's boat launching ramp to begin with?

Quite possibly they did. I don't know. You don't know. They don't know. We won't know. But it's more likely than not, just by looking at how far you have to take a boat without the Milfoil coming off it to get it to the far end of the lake. But from the near end of the lake it's pretty easy to do.

In any case, the very fact that it was there prevented an early cleanup. Now there's a big bill attached. I don't think you saw any mention of that problem in this presentation. I didn't either. I think we should. The range from no cleanup to thorough cleanup should include that giant headache that the lake is facing now.

When I first brought this up it was many years ago. We realized it was an obstacle. More recently we knew what the limits were of where the toxic sediment was and how thick it was in each spot. It has taken years to decide where we could and where we couldn't say it was okay to leave the sediment in and perhaps disturb it now and again. What happens when you put anchors in there and you pull the anchor

loose, etc. It hasn't been well managed and that's not entirely the Army's fault. Mass. DCR runs the lake management, but it came from Pegan Cove.

I think we can argue what percent of responsibility and liability the Army should have for cleaning this up. To sweep it under the carpet, under the sediment, and say that it isn't an issue is just totally wrong. That's my comment.

My request is to assign it as an issue to focus on as well as these other issues, to go through the records, to actually substantiate what I remember well that we did discuss it often and from early on, and to start quantifying what portion of the restoration fees for that problem should be included because it resulted from this problem. Thank you.

MR. McCASSIE: Thank you, Richard. Are there any other comments from the public? Kannan.

MR. VEMBU: Kannan Vembu, 9 Stonebridge Circle, Natick. I'm also a member of the RAB. I have a comment regarding the

concern that I have on the chosen cleanup option. I don't see any institutional control or any follow-up action after the work is done. In this process you're going to start probably in the hot zone and there's a chance that's where you have the silt curtain around so that it might spread around. I don't know what the settling rate is of those sediments or how long it would take before it spreads, at least some of the concentration, to the rest of the area covered under the silt curtain outside of the hot zone.

I wish some concern or some action is taken to make sure that there is one ppm average for whatever period of time. You know, you want it so that it is actually one ppm in the final analysis. So there's a time that needs to be included for monitoring the sediments that may have spread from the hot zone through the operation and without taking a lot of time to settle in the rest of the areas.

MR. McCASSIE: Thank you, Kannan. Any other public comments? Jim.

MR. CONNOLLY: It's not a comment,

just an observation. Marco left, he said he was going to try to come back. I don't know if he has an additional comment or not. He had another meeting to go to. He did say he would be back so you might want to wait a little bit for him.

MR. McCASSIE: Okay.

MR. CONNOLLY: Secondly, and I said this before, if you came in and you didn't sign in please do so before you go so we know who came tonight. The sign-in sheets are in back on the table.

MR. McCASSIE: A question?

MR. MILLER: Yes. Is there anyone here tonight from Mass. DCR?

MR. McCASSIE: I don't believe so. I would have to look at the sign-in sheet.

MR. MILLER: I already did and I didn't notice anyone. I just took a quick look.

MR. McCASSIE: I'll ask the question in general. Is there anyone here from DCR?

MR. MILLER: I guess not.

MR. McCASSIE: No response, okay.

MR. MILLER: Marco told me he had to

go back to the Town Meeting. I think it was the Town Meeting. I'm not aware of his coming back. If we're going to wait a long time I suggest we start calling him by cell phone or something.

MR. VEMBU: He did send an e-mail to Jim Connolly.

MR. CONNOLLY: I have e-mail comments from him, but I don't know if he may have something else that he wants to say. Since we did say we were going to stay here until 8:45 P.M. we might want to wait just a little bit, which is not to say that everyone has to wait. I'm going to wait.

MR. McCASSIE: At this point, why don't we just take a break.

(The formal public meeting then suspended at 7:35 P.M. and reconvened at 8:03 P.M.)

MR. McCASSIE: Could we reconvene please. Do we have any other public comments? Marco.

MR. KALTOFEN: Hello, my name is Marco Kaltofen and I'm the Community Co-chair of the Natick Soldier Systems Center Restoration

Advisory Board. I wanted to thank the staff at the Soldier Systems Center for putting this proposed plan together. I wanted to express my appreciation for the work that they've done to protect the health and safety of the community and the lake users and the environment and also that of the employees at the Soldier Systems Center. Thank you.

MR. McCASSIE: Thank you, Marco. Do we have any other public comments? Okay. I declare the hearing closed.

I just want to point out that we have another public meeting tentatively on June 10th at the Selectman's Meeting Room across the street. It's a tentative location, but that will all be firmed up.

I would like to thank everyone for coming this evening. Thank you for the comments that we did receive. If not, you can submit them in writing or by e-mail. Just make sure that they're postmarked by the 16th of June. Thank you very much.

(The formal public hearing then ended.)

CERTIFICATION

I, DENISE O'LEARY, hereby certify the foregoing to be a true and complete transcript of the oral evidence presented at the subject hearing.

Denise M. O'Leary
REGISTERED PROFESSIONAL REPORTER

DATED: May 21, 2009

THE FOREGOING CERTIFICATION OF THIS TRANSCRIPT DOES NOT APPLY TO ANY REPRODUCTION OF THE SAME IN ANY RESPECT UNLESS UNDER THE DIRECT CONTROL AND/OR SUPERVISION OF THE CERTIFYING REPORTER.

PUBLIC HEARING

RE: PROPOSED PLAN FOR SEDIMENT

AT THE

U.S. ARMY NATICK SOLDIER

SYSTEMS CENTER (SSC)

WEDNESDAY, JUNE 10, 2009

7:00 P.M.

NATICK TOWN HALL

SELECTMEN'S MEETING ROOM

13 EAST CENTRAL STREET

NATICK, MASSACHUSETTS

JOEL McCASSIE

HEARING OFFICER

ORIGINAL

P R O C E E D I N G S

MR. McCASSIE: I call the formal part of the hearing open. One of the things that people need to do is to state their full name and address so that it can go on the record. Also, I would like to ask anyone that didn't sign in to sign in because that's part of the record as well. Richard.

MR. MILLER: My name is A. Richard Miller, Dick Miller. I live at 61 Lakeshore Road in Natick and on Lake Cochituate. I have been a member of this group's Restoration Advisory Board since its inception and I have been active on this question before there was a Restoration Advisory Board.

I have three different issues I want to address. I'm glad to be speaking early because perhaps it will get some other people thinking about some of these issues in time for comments now or in the follow-up.

First, I would like to point out that I became Executive Director of the Lake Cochituate Watershed Association in 1968. As I started finding out what everyone had to tell me

about a very busy and complex Lake Cochituate, a lot of questions pointed towards what's on the Natick Laboratories. When I went to find out more, I was essentially relegated to the public relations arm rather than the environmental arm on base and I found out that not only wasn't I allowed free access to information, but neither were the State agency people. That changed within two years.

In 1970 the Federal Clean Water Act was passed and suddenly EPA and the State agency people and I got a better level of access. But of course, the damage had been done by then. We had been working many, many years talking about how to clean up the pre-existing damage.

First of all, I want to say I'm glad for all the changes. I have been working with people who have been working with me for many years. The change is phenomenal, but we're left with old problems and still with half baked ways to address those problem in some respects, in other respects we're much more scientific and committed than we were before. Having given that quick introduction to why I know a little

more from way back when, I would like to zoom up to the present.

I have two documents in my hand. One is the 19-pager that you can pick up on the front table and it's also available on-line. The second one is from an operation slightly preceding this one, the Nyanza Chemical Cleanup that many of you know about in nearby Ashland, Mass. A similar process, but details are quite different.

On this particular plan, 19 pages include a lot of information and I think it's very well presented, but they missed some information. I want to address three items that I think are pretty much totally missing from the presentation. You can check me for size afterwards to see whether you agree or not.

Item Number 1. This cleanup has a Restoration Advisory Board, I'm one of its members and I'm one that attends regularly and has for many, many years. The particular hearing tonight is a hearing that wouldn't have happened because its one public hearing for these things and it was on May 21st which was a

night for Natick Town Meeting. The Natick town officials weren't here, I think I was the sole exception. I have been chair of four or five Natick Boards, but not currently, and I didn't represent Natick at the meeting. Neither did anyone else.

Mass.DCR operates Lake Cochituate as Cochituate State Park. It wasn't here at the meeting. A lot of you were not here at the meeting. I'm grateful to EPA and to the Army and to everyone else for pushing for this unusual re-run of that meeting because tonight we have a better chance to compare notes with each other to see what each other is thinking and to put in better comments for processing and perhaps for adoption. I hope we never see that problem again. Simply, the Restoration Advisory Board was omitted from the planning for the meeting. Half of us could have pointed out the problem. I did one week in advance, but the steamroller was already rolling pretty hard by then.

You'll notice this report is dated May 18th. I don't think anyone saw it before

May 18th. Actually, I think most people saw it a little after. This is basically what was triggering a 30-day comment period which is a standard amount of time to comment, but we didn't have a standard release, we didn't have a standard meeting, we didn't have a standard comparing of concepts. I would like to ask for a 30-day comment period beginning tonight. If you don't want to do that, consider what you think about a six-day comment period and make us a far, far better offer than that, please. I think people did get a good presentation and I think they would like to see what they want to say about it. That's my experience with 30-day comment periods, they start with some pooling of information.

That's my comments on the Restoration Advisory Board and public participation aspect. That was my Item 1 of 3. I don't think it's covered in this. In fact, it's sort of ignored in this because we're left with a six-day comment period and that's not discussed either.

Item 2. We talked about how we're doing a very good job here. We looked at a

range from no removal whatsoever to a maximum of all the removal. We didn't throw darts, it was more careful than that. We basically fought back and forth with logic, numbers we had, the concerns we had, to find a trade-off point. The Army's offer for a trade-off point is to remove everything where it's one part per million or more of PCB and to leave the rest.

Now, I phrase this decision a little differently. I've been working on Lake Cochituate for a lot of years and during all that time I've said, "Don't use Lake Cochituate as your receptacle." It's about that simple. The Army is proposing to leave Lake Cochituate as a receptacle for the part it doesn't find cost effective to remove. That part is the part that is less than one part per million.

I told you I had a second report with me. My answer, a Superfund site analogous to this in every way except that the government is not the property owner, a company rather than a government agency put the material in. Other than that it's a similar process. They're removing everything up to one part per million.

They're doing this way out in the woods away from buildings, way up high away from the ground that other activities nearby are on, way upstream from any significant body of water for fishing, swimming or anything else, and they're finding it appropriate to clean to a level that we feel is worth shooting for, or what this proposal feels is worth shooting for, in a major recreational lake in eastern Massachusetts.

I see an immense difference between the two places. I see no difference between the level of effort. Except for one, their's is up on ground where it's dry and ours is in the water. We're not caring about that any more either for that reason. I think they're very disproportionate if you ignore the one part per million and look at the context in which it's being removed. I would like to see that we don't continue to use the lake as the receptacle for the lower levels.

Now, somebody pointed out a little earlier that we don't clean much lower than that. There's a reason for that, too. We don't do good measurements, we don't know how to

measure really carefully. I'm just saying scrape it deeper, scrape it further to the sides, take it out. It will do some help for some other purposes as well. It's in a major recreational lake in eastern Massachusetts and I don't think that's the same as up on a hill back in the woods in Ashland and it's not affecting a local or a major regional body of water. So my second part is simply don't use the lake as a receptacle. Do a more thorough cleaning job.

Jill pointed out in questioning two areas that were hot spots enough to remove and the area between them with no obvious reason other than a rather quirky relationship between extrapolation on a mathematical model and real life. There's no reason not to clean up between them and there's no reason not to clean out further to the sides as well. But that's what you get when you rely on a mathematical model instead of what to me is common sense in this particular place. I think that's it.

Oh, one thing. Why bother to clean out more? That's right, why indeed. Because cancers have not gone away. Cancers started

growing at the inception of World War II and have kept climbing. More recently cancers have been reaching down to lower and lower age groups. If we thought for a minute that all these numbers on which chemical was and was not dangerous were truly accurate as opposed to very good mathematical models attempting to model real things that we don't yet understand, then cancers would be diminishing rapidly. They would be almost gone by now. Because all the chemicals come with a label that says it's okay for a one part per million level that says take it to there and we'll be okay. Without going into how it got to be a lie, it patently isn't the truth or the cancers would be going away.

Very simply, these are chemicals that are suspect. Chemicals, unlike we, are not innocent until proven guilty. The mathematical modeling that we're relying upon has not closed the circle and they since are still far too high, the cancer incident rate. We know there's a gap. Why rely on the mathematical model when you know there's a gap. Don't use the lake as a receptacle.

My third point and final point. In this range, we have only looked at a range between nothing and everything and picked a point partway down from the everything. The range only addressed one half of what cleanups are about. The other half of what cleanups are about is paying or otherwise mitigating ancillary damages caused by the material that was in the way. What other damages were incurred?

Back to the 19-page report for tonight. There's no mention whatsoever of the other very popular topic of this week on Lake Cochituate, Eurasian Water Milfoil and other infestations of aquatic weeds in the lake which began in 2002 in Pegan Cove adjacent to that boat launching ramp and no other boat launching ramp. You heard tonight that that ramp has been used by citizens and community members as well.

Let me put that in context. It was not. It was used by anyone in the Army who could get a pass through to use it, a retired veteran, people who had an Army way into the pond, but it was not used by the community in

general. The only time that changed, and I'm glad it did, the Army has done many nice things for the community and they did one after there was a major infestation of Eurasian Water Milfoil. It spread so wide that the Middle Pond boat launching ramp was netted away from the South Pond water ski area, people were allowed to get their boats into South Pound through the Army's ramp. It was only because the Milfoil had spread and nets were in the way for boats getting there without using the Army's ramp. That's the history of how other boats got there. Until 2002 the boats that were coming near Pegan Cove were coming through that ramp. The boats that were getting to that Pegan Cove area from the main launching area had two-and-a-half ponds to race through to get there. Any Milfoil that they carried in from another pond would have been washed off almost surely long, long, long before it got to Pegan Cove. So the fact that 11 to 14 acres of Milfoil showed up first in Pegan Cove is, in my opinion, an almost sure sign that it came in from that launching ramp from U.S. Army Natick Labs.

That's doesn't make U.S. Army Natick Labs guilty of having schemed to have put it in in any sense. In terms of a degree of liability for it happening, to me anything else is much, much more far fetched than that way of introducing the Milfoil. It would have shown up somewhere else sooner otherwise.

It might have shown up there, I believe, at the end of May 2002. We have several experts on those dates in the audience from DCR. When it showed up we all knew that a net was going to be put across the south end of Pegan Cove within two weeks to catch the floating fragments of Milfoil before they could infest the rest of the lake. Pegan Cove is upstream from the whole chain of ponds that make up Lake Cochituate. It was all vulnerable. Getting the net up was important. It didn't happen at all that summer. It happened September 16th.

Now, there's a lot of people who might accept some blame for that, but that's the time during which the Milfoil spread. On September 16th when it was time to put up the net it

didn't go at Pegan Cove because the Milfoil was spread way beyond. It went between South Pond and Middle Pond and that's why boats had to be launched into South Pond from the Army's ramp. They couldn't get there any other way.

Very simply, the result of not catching the Milfoil in time has resulted in a huge bill and a huge continuing headache for the rest of the lake. This is complicated by several factors. Natick didn't particularly want to drink the herbicide chemicals in it's drinking water which comes from wells adjacent to South Pond. A lot of people argued a lot of different directions, but when it came to pulling those weeds, the non-chemical approach, from Pegan Cove which is less then ten feet deep, an easy place to contain it and remove it compared to anything that came later, it turned out to be unfeasible.

I can assure you that I brought it up on a fairly regular basis at the very beginning and several times per year ever since. We've had major concerns at those Restoration Advisory Board meetings without about releasing the toxic

sediment. Not that it was not an issue, but that the problem was an issue. This was one of the contributing factors, and not the only one, as to why there wasn't an early and effective control of the Milfoil.

What difference does it make and who cares? My favorite questions. Kids know them, parents tend to ignore them. If you can answer them it's often worth doing. What difference does it make? Well, we were told within the month by the Army that there was no way to go beyond the range of no removal to full removal. There was no vehicle for talking about restoration beyond removal even if damage was done while it was there. It has been there a long time and during that critical period. That's not true. There are a number of vehicles for restoration for ancillary damage or for mitigation.

In this Nyanza chemical operation for cleanup, half of the project, like most of these projects, goes beyond the removal. There's $3.9 million of this money that's going to groups to do something right in exchange for all that's

been done wrong. In terms of doing things right, Lake Cochituate has an interest and I've had an interest and therefore I knew about the whole project. What I didn't know a lot about was the mechanism by which that $3.9 million magically appeared. It does affect CERCLA sites as well as Superfund sites.

The particular vehicle is called the U.S. Natural Resource Damage and Restoration Assessment Program. There's an arm of it operating in Massachusetts and I am formally requesting that the Army, the EPA, all the parties concerned, cooperate and coordinate that group to find a fair and equitable assessment for how much this damage from this project can be turned into control of the Milfoil that is now infesting the entire lake.

We have some good projects, but the State nor the local residence have the kind of money it now costs now that we don't have 11 to 14 acres to wrestle with.

So I would very much like those questions addressed and answered. I have asked already that the Army simply gather all the

comments from all those earlier minutes from all those earlier meetings to see how many times this question was brought up and to make those discussions available because it's not as simple as this picture and all those issues have disappeared from the 19-page presentation that you've heard. It may be the difference of getting our lake back to a clear lake, the one we remember from before these problems hit. Thank you very much.

MR. McCASSIE: Thank you, Richard. Any other public comments?

MS. BERKOWITZ: My name is Carole Berkowitz. I live at 9 Crescent Street, Natick, Mass. That's right across from Natick Labs on South Pond. I represent -- well, I'm the Chair of a group called Protect Our Water Resources. It's a group of Natick citizens only, 200 plus citizens who are very concerned about the drinking water in particular and about the whole lake.

What I want to say is that we're at a point where there are other citizens who very much want to use herbicides to deal with the

problem of aquatic weeds. We had one such episode in 2006 with the use of fluoridone. Fortunately, our three Natick boards, the Board of Health, the Natick Conservation Commission and our Selectmen voted against the fluoridone because the Board of Health hired an independent consultant along with the backing of the Mass. DCR. This particular consultant studied a lot of the materials that you people put together or had researched, and with that information made the decision not to put fluoridone, a whole lake treatment, into South Pond. Now in 2009 we're facing two other entries of chemicals, one on North Pond and that's a troclopyr and then in Middle Pond it's diquat dibromide.

What I want to emphasize here is this continued pressure to use chemicals. Instead, we want to use this DASH, the Diver Assisted Suction Harvester. As we all know, it's not easy to get money for this particular non-chemical device. We've been now working with Wayland. I'm doing that now, applying for a grant. The Natick Conservation Commission, they applied for a grant, they gave a DCR

matching partnership grant, they gave $17,000 to the grant. Our particular grant was not accepted and the chemical application was accepted. People from Wayland and Framingham applied for the same partnership grant and the chemicals were accepted. The grant for the DASH was not accepted even though Natick came forth with $17,000, their particular part of the grant.

So here we are. We still don't want to see chemicals used. On top of what we're hearing tonight, I hope people begin to realize that there are a lot of uncertainties with these chemicals. To think of adding more on top of what we already have and potentially, the way the water flows, those chemicals could get into our drinking water.

We know that there is evidence on both sides of the issue and we're very sensitive to that. We know that the aquatic weeds are a problem, but it's the way that you deal with the problem that becomes important to us.

I would like to say that I want to also support Dick Miller's suggestion that we

look at restoration funds as well and look at every possible opportunity to find the money so that we can use a DASH in Lake Cochituate. Thank you very much.

MR. McCASSIE: Thank you. Jim.

MR. STRAUB: My name is Jim Straub. I'm the Lakes and Ponds Program Coordinator for the Department of Conservation and Recreation. I'll keep my comments to the program that we're talking about tonight.

The one question I had was, in your proposal you planned on backfilling the areas that you suction harvested. My question is: Do you have a valid reason for that and, if possible, can that not be done? My second question is: If there are restrictions put on Pegan Cove, which we talked about possible no wake zones and things like that, does the Army have a plan or an idea of how that will be enforced? Those are the two comments that I would like addressed please. Thank you. Oh, my address is 251 Causeway Street, Boston, Mass.

MR. McCASSIE: Thanks, Jim.

MR. BOIS: I'm Bob Bois with the Town

of Natick. I'm actually representing the Board of Selectmen and the Natick Conservation Commission this evening. Both would like to submit comments, we have written comments and I have sent them along to you, Jim, I believe.

From the Board of Selectmen's point of view I just want to summarize them. The removal and backfilling of the contaminated sediments should comply with the performance standards set in both the Wetlands Protections Act and the Town's wetland bylaws. The Board of Selectmen graciously offered to the Natick Conservation Commission to work with you guys on getting that done and we're there to help out.

Further, the second point that the Board made was that further field work to define the sediment removal areas needs to be completed as part of pre-construction before you do the removal and also as post construction to know that you've got enough contaminated material. What I saw this evening suggests that you'll be doing that.

The third point, special care should be given to monitor all discharges resulting

from the proposed project to assure that the water quality of the lake is not further impacted. It's encouraging tonight, through your example, that you showed that indeed that was the case. It will be interesting to find out what standards, what discharge standards you're going to use here.

The fourth item, the long-term effectiveness of the performance of the proposed project should include ongoing fish sampling, particularly the native stuff. The purpose of the future fish sampling should be to monitor the anticipated reduction of contaminated concentrations found in the lake, native fish, in hopes of removing the current ban. If all goes well, the high PCB levels in fish should decrease and the ban should no longer be needed in the future.

Finally, the Board would like to see multilingual signage to prohibit the eating of native fish caught in the lake. They should be posted in various locations.

The Board does thank you for your hard effort and for the Proposed Plan and it fully

supports the action.

The Natick Conservation Commission, at its last meeting, voted unanimously actually to ask the Army and I believe the NRD, Natural Resource Damage, and the Trustee for the State to pursue federal funding for the possible removing of the invasive plants in South Pond of Lake Cochituate as a natural damage claim under the State NRD of Trustee Authority. That vote, as I mentioned earlier, was unanimous and we'd like to have that added to the assessment. Thank you.

MR. McCASSIE: Thank you, Bob. Any other public comments? Marco.

MR. KALTOFEN: Hello, my name is Marco Kaltofen. I'm a Natick resident, I live at 5 Water Street. I have also been the Community Co-Chair of the Restoration Advisory Board which is a community based and also regulator and U.S. Army organization that has volunteers to help review the Superfund cleanup at the Labs in the past 14 years, 13 years. Since 1995, so about 14 years.

One of our priorities has always been

to deal with a serious health problem, and that is the PCB contaminated fish continue to be eaten at the lake despite the overarching bans by the Commonwealth on that fish consumption. So any activity that is going to reduce the amount of fish that are being be consumed, especially by sensitive people like children or people that might eat more than the average amount of fish taken from the lake, is a good thing.

As the Community Co-Chair I am very supportive of the action that the Army is taking. I'm very appreciative of the work that's been done by the Army in producing this plan. I think overall it's a good one. I made some written comments about a few tweaks, some of them were repeated by the Town through their representative, particularly in signage that continues to warn people about not taking fish even after the remediation is complete.

Jill, I know you brought up something that bothered me and that was the continuity between two separate hot spots, that they be treated as one single continuous unit.

I think several people have bought up the issue of monitoring after the remediation, particularly for looking at the quality of the fish that remain when the job is done. Five years from now, assuming we sign this Record of Decision on this particular cleanup, we'll have to come back and review how we've all done. After the cleanup, fish and environmental survey, I think it's going to be very important to do that.

Lastly, I really did want to thank the people who took the time to come and make comments tonight.

MR. McCASSIE: Thank you, Marco. Do we have any other public comments? I would just like to point out that Kevin's last slide shows the ways to provide feedback, e-mail, fax, regular mail. June 16th is the close for the public comment period. I thank everyone for coming tonight and for coming to the last meeting.

MR. MILLER: May I ask a question on that? I specifically asked that that be extended. Does that mean it can't be extended

or it might be extended, the June 16th deadline?

MR. McCASSIE: I don't believe there's a precedent to extend it. If we extend it another 30 days we'd be reneging the last public meeting. So --

MR. MILLER: That's right. When most people couldn't attend, including any Town or DCR representative. That's right.

MS. WILLIAMS: We could discuss extending the public comment period as a committee of the Army and the EPA. We hear your request and we will certainly consider it.

MR. MILLER: Could I then just follow-up by saying the people here ought to know. I hope everyone signed up there and also at MillerMicro.com, I maintain a calendar where you can find out such things when I know of them so I can spread the word, too.

MS. WILLIAMS: Could we just take a five-minute break.

MR. McCASSIE: Did you have a public comment or just a question?

MR. LOWERY: I have a comment in regard to the issue that's being discussed.

MR. McCASSIE: You can make your comment, sir, and then we'll have a side bar.

MS. WILLIAMS: Closed public meeting.

MR. LOWERY: I'm Michael Lowery, 120 Lake Shore Drive in Wayland. Wayland has the North Pond of Lake Cochituate. I am a member of the Town body called the Wayland Surface Water Quality Committee. I work in partnership with some of these gentlemen and ladies to help keep the lake as a whole in good condition.

Because your effort has not really -- it's been principally in Natick. Our towns have only recently come to understand the import of these hearings and for that reason I would like to support Mr. Miller's request and ask that the public comment period be extended so that my committee can better consider some of the issues that were raised tonight that are new to us. Thank you.

MR. McCASSIE: I will temporarily close the hearing.

(Short recess taken.)

MR. CONNOLLY: We extended it 15 days from today.

MR. McCASSIE: 15 days from today so we still encompass the previous meeting.

MR. CONNOLLY: Right. 15 days from today which would be the 25th.

MR. McCASSIE: The 25th, did everyone hear that?

UNIDENTIFIED SPEAKER: I don't think so.

MR. CONNOLLY: Okay. I can be louder if necessary. We can extend the public comment period to 15 days from today which would extend it to June 25th. Did everybody get that? One thing about that, if you do have comments before that it would be very helpful if you could provide them as soon as you get them.

MR. MILLER: I have one public comment - thank you.

MR. McCASSIE: Are there any other public comments? The meeting is closed.

(The formal public hearing then ended.)

CERTIFICATION

I, DENISE O'LEARY, hereby certify the foregoing to be a true and complete transcript of the oral evidence presented at the subject hearing.

Denise M. O'Leary
REGISTERED PROFESSIONAL REPORTER

DATED: June 10, 2009

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