



Record of Decision
for Site 7
Naval Air Station, Brunswick, Maine

Contract No. N62472-92-D-1296
Contract Task Order No. 0082



Prepared for

Department of the Navy
Engineering Field Activity Northeast
Naval Facilities Engineering Command
10 Industrial Highway
Mail Stop No. 82
Lester, Pennsylvania 19113-2090

Prepared by

EA Engineering, Science, and Technology
The Maple Building
3 Washington Center
Newburgh, New York 12550

September 2002
FINAL
296.0082



25 September 2002

Mr. Michael Barry
U.S. Environmental Protection Agency
New England – Region 1
1 Congress Street, Suite 1100 (HBT)
Boston, Massachusetts 02114-2023

Ms. Claudia Sait and
Ms. Denise Messier
Maine Department of Environmental Protection
State House, Station 17
Augusta, Maine 04333-0017

RE: Final Record of Decision for Site 7 (Old Acid/Caustic Pit)
at Naval Air Station Brunswick, Maine
Contract No. N62472-92-D-1296; Contract Task Order No. 0082
EA Project No. 29600.82

Dear Mr. Barry, Ms. Sait, and Ms. Messier:

On behalf of the Department of the Navy, EA Engineering, Science, and Technology is pleased to submit the final Record of Decision for Site 7 (Old Acid/Caustic Pit) at the Naval Air Station Brunswick for your review and signature.

If you have any questions, please do not hesitate to contact me at (781) 275-8846, Extension 209.

Sincerely,

A handwritten signature in cursive script that reads "Alexander Easterday".

Alexander C. Easterday, P.G.
CTO Manager

ACE/caw
Enclosure

cc: L. Monaco (EFANE)
A. Williams (NAS Brunswick)
C. Lepage (Lepage Environmental)



EA ENGINEERING,
SCIENCE, AND
TECHNOLOGY

The Maple Building
3 Washington Center
Newburgh, NY 12550
(914) 565-8100

LETTER OF TRANSMITTAL

TO Remedial Project Manager
Naval Facilities Engineering Command
Engineering Field Activity Northeast
10 Industrial Highway, Mail Stop 82
Lester, Pennsylvania 19113-2090

DATE: 9/25/02	JOB NO.: 29600.82.2005
ATTENTION: Mr. Lonnie Monaco	
RE: Contract No. N62472-92-D-1296	
CTO No. 0082	

WE ARE SENDING YOU Attached Under separate cover via _____ the following items:
 Shop drawings Prints Plans Samples Specifications
 Copy of letter Change order _____

COPIES	DATE	NO.	DESCRIPTION
1	9/25/02		Final Record of Decision for Site 7, Naval Air Station Brunswick, Maine

THESE ARE TRANSMITTED as checked below:

- For approval Approved as submitted Resubmit _____ copies for approval
 For your use Approved as noted Submit _____ copies for distribution
 As requested Returned for corrections Return _____ corrected prints
 For review and comment _____
 FOR BIDS DUE _____ 19__ PRINTS RETURNED AFTER LOAN TO US

REMARKS _____

COPY TO M. Barry (EPA)
C. Sait (MEDEP)
D. Messier (MEDEP)
T. Williams (NAS Brunswick)
C. Lepage (BACSE)

SIGNED *Alexander C. Easterday*
 Alexander C. Easterday, P.G.
 CTO Manager

CONTENTS

	<u>Page</u>
LIST OF FIGURES	
LIST OF TABLES	
LIST OF ACRONYMS	
PART 1—DECLARATION	
I. SITE NAME AND LOCATION	1-1
II. STATEMENT OF BASIS AND PURPOSE.....	1-1
III. ASSESSMENT OF THE SITE	1-1
IV. DESCRIPTION OF SELECTED REMEDY	1-1
V. STATUTORY DETERMINATIONS	1-2
VI. RECORD OF DECISION DATA CERTIFICATION CHECKLIST	1-3
VII. AUTHORIZING SIGNATURES AND SUPPORT AGENCY ACCEPTANCE OF REMEDY	1-4
PART 2—DECISION SUMMARY	
I. SITE NAME, LOCATION, AND BRIEF DESCRIPTION	2-1
A. Name and Location	2-1
B. Comprehensive Environmental Response, Compensation, and Liability Act Information System Identification Number	2-1
C. Lead Agency	2-1
D. Site Description	2-1
II. SITE HISTORY AND ENFORCEMENT ACTIVITIES	2-2
A. Land Use and Site Activity History	2-2
1. Old Acid Caustic Pit Area	2-2
a. Future Land Use.....	2-3
B. History of Federal and State Investigations and Removal and Remedial Actions ...	2-3
C. History of Comprehensive Environmental Response, Compensation, and Liability Act Enforcement	2-6
III. COMMUNITY PARTICIPATION	2-6
A. Public Outreach Effort.....	2-6
B. Public Outreach Results.....	2-7
C. Technical Assistance Grants.....	2-8

	<u>Page</u>
IV. SCOPE AND ROLE OF RESPONSE ACTION.....	2-8
A. Problems Addressed	2-8
1. Groundwater Contamination	2-8
2. Soil Contamination	2-9
3. Summary	2-9
B. Planned Sequence of Action	2-10
1. Groundwater and Soil Contamination	2-10
V. SUMMARY OF SITE CHARACTERISTICS	2-11
A. Site Overview	2-11
B. Type of Contamination and Affected Media	2-12
1. Groundwater Contamination	2-12
2. Soil Contamination	2-13
C. Contamination Sources and Sampling Strategies	2-13
1. Fate of Chemical Contaminants.....	2-13
a. Soil.....	2-13
b. Groundwater	2-14
D. The Conceptual Model	2-14
1. Site Description	2-14
2. Geology and Hydrogeology	2-14
3. Impacted Media and Migration Route	2-15
a. Soil.....	2-15
b. Groundwater and Other Media	2-16
E. Principal and Low Level Threat Wastes	2-16
F. Site-Specific Factors	2-17
1. Site 7	2-17

	<u>Page</u>
VI. CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES	2-17
VII. SUMMARY OF SITE RISKS	2-18
A. Human Health Risk Assessment.....	2-18
1. Groundwater	2-20
2. Soil.....	2-20
a. Risk Assessment Uncertainties.....	2-21
B. Ecological Risks	2-21
C. Basis for Response Action.....	2-22
VIII. REMEDIATION OBJECTIVES	2-22
IX. DESCRIPTION OF ALTERNATIVES.....	2-23
A. Alternative 1—No Action.....	2-24
B. Alternative 2— Institutional Controls with Groundwater Monitoring.....	2-24
1. Groundwater and Soil Contamination	2-24
2. Applicable or Relevant and Appropriate Requirements	2-25
a. Federal Relevant and Appropriate Requirements	2-26
b. State Relevant and Appropriate Requirements	2-26
3. Five-Year Review	2-27
4. Summary of Remedial Alternatives.....	2-28
X. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES	2-28
A. Evaluation Criteria Used for Comparative Analysis	2-28
1. Threshold Criteria.....	2-29
2. Primary Balancing Criteria	2-29
3. Modifying Criteria	2-29
B. Summary of the Comparative Analysis	2-30
1. Overall Protection to Human Health and the Environment.....	2-30
2. Compliance with Applicable or Relevant and Appropriate Requirements.....	2-31
3. Long-Term Effectiveness and Permanence	2-31

	<u>Page</u>
4. Reduction in Toxicity, Mobility, or Volume through Treatment	2-31
5. Short-Term Effectiveness	2-31
6. Implementability	2-32
7. Cost	2-32
8. State Acceptance	2-32
9. Community Acceptance	2-32
XI. THE SELECTED REMEDY	2-32
A. Groundwater Cleanup Levels	2-33
B. Soil Cleanup Levels	2-33
C. Description of Remedial Components	2-33
1. Long-Term Monitoring	2-34
2. Institutional Controls	2-34
3. Five-Year Review	2-35
4. Applicable or Relevant and Appropriate Requirements	2-35
a. Federal Relevant and Appropriate Requirements	2-35
b. State Relevant and Appropriate Requirements	2-36
5. Outcomes	2-37
XII. STATUTORY DETERMINATIONS	2-37
A. The Selected Remedy is Protective of Human Health and the Environment	2-37
B. The Selected Remedy Complies with Applicable or Relevant and Appropriate Requirements	2-38
C. The Selected Remedial Action is Cost Effective	2-39
D. The Selected Remedy Utilizes Permanent Solutions and Alternative Treatment or Resource Recovery Technologies to the Maximum Extent Practicable	2-39
E. The Selected Remedy Does Not Satisfy the Preference for Treatment which Permanently and Significantly Reduces the Toxicity, Mobility, or Volume or the Hazardous Substances as a Principal Element	2-40
F. Five-Year Review Requirements	2-40
XIII. DOCUMENTATION OF NO SIGNIFICANT CHANGES	2-40
XIV. STATE ROLE	2-40
REFERENCES	

Page

APPENDIX A:	RESPONSIVENESS SUMMARY AND WRITTEN COMMENT LETTERS ON THE PROPOSED REMEDIAL ACTION PLAN AND RECORD OF DECISION AND PROPOSED REMEDIAL ACTION PLAN MEETING MINUTES	
APPENDIX B:	SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITE 7	
APPENDIX C:	DECLARATION OF CONCURRENCE BY MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION	

LIST OF FIGURES

<u>Number</u>	<u>Title</u>
2-1	Site location map, Site 7, Naval Air Station, Brunswick, Maine.
2-2	Site plan, Site 7, Naval Air Station, Brunswick, Maine.
2-3	Detailed site plan, Site 7, Naval Air Station, Brunswick, Maine.
2-4	Groundwater contour map, Site 7, Naval Air Station, Brunswick, Maine.

LIST OF TABLES

<u>Number</u>	<u>Title</u>
2-1	Summary of site investigations at Site 7.
2-2	Summary of contaminants of concern and medium-specific exposure point concentrations.
2-3	Cancer toxicity data summary.
2-4	Risk characterization summary – carcinogens.
2-5	Non-cancer toxicity data summary for groundwater.
2-6	Capital and operation and maintenance cost estimates for selected alternatives.

LIST OF ACRONYMS

ARAR	Applicable or relevant and appropriate requirement
bgs	Below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986
COC	Contaminants of concern
EPA	(U.S.) Environmental Protection Agency
MCL	Maximum Contaminant Level
MEDEP	Maine Department of Environmental Protection
MEG	Maximum Exposure Guideline
NAS	Naval Air Station
PAH	Polycyclic aromatic hydrocarbon
RAB	Restoration Advisory Board
ROD	Record of Decision
TRC	Technical Review Committee

PART 1—DECLARATION

I. SITE NAME AND LOCATION

Naval Air Station Brunswick
CERCLIS ID NO.: OU7-SITE7-ME8170022018
Site 7, Old Acid Caustic Pit
Brunswick, Maine

II. STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for Site 7, the Old Acid Caustic Pit Site, at the Naval Air Station (NAS) Brunswick. This remedial action was selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. This decision is based on information documented in the Administrative Record that can be viewed by the public at the Public Works Office at NAS Brunswick or at the Curtis Memorial Library on McKen Street, Brunswick, Maine.

The State of Maine Department of Environmental Protection (MEDEP) concurs with the selected remedy.

III. ASSESSMENT OF THE SITE

The response action selected in this Record of Decision (ROD) is necessary to protect the public health, welfare, or the environment from actual or threatened releases of hazardous substances into the environment.

IV. DESCRIPTION OF SELECTED REMEDY

The selected remedy for Site 7 is institutional controls with groundwater monitoring. The following major components of the selected remedy are needed to address soil and groundwater contamination at Site 7:

- Implement institutional controls, such as land use restrictions, to prevent human contact with and use of the soil and groundwater at the site.
- Conduct long-term monitoring of groundwater to verify that the contamination remains localized and to monitor the trend of contamination until it is consistently below the Federal Maximum Contaminant Level (MCL) and State Maximum Exposure Guideline (MEG).

- Reduction in the toxicity and volume of contaminants will occur as a result of the remedy's reliance upon the natural attenuation process. However, natural attenuation is not considered active treatment, and an alternative that relies upon natural attenuation does not meet the statutory preference for treatment under CERCLA.
- Perform five-year reviews.

It should be noted that no active sources of contamination have been identified at Site 7. The threat of consumption of contaminated groundwater is not immediate, as groundwater at Site 7 is neither a source of drinking water nor a significant potential future source of drinking water. To date, no evidence of movement of contaminants of concern (COCs) from Site 7 above Federal MCLs or State MEGs has been detected. Therefore, the selected remedy does not employ source treatment or containment activities.

The selected remedy addresses the inorganic contamination (cadmium and manganese) at Site 7 by conducting long-term monitoring of the contamination concentrations and by implementing institutional controls. The manganese detected at Site 7 could potentially be the result of past site activities, or anthropogenic. The presence of manganese in groundwater throughout Maine, including NAS Brunswick, is a common occurrence since manganese is a naturally occurring mineral and, therefore, its presence can be related to natural conditions at the site. The current remedy addresses both cadmium and manganese and, therefore, the presence of manganese does not alter the selected remedy. If the Navy can demonstrate that the level of manganese at Site 7 is similar to that of naturally occurring background range at NAS Brunswick, then the Navy will propose removing it as a COC for this site.

Beginning in Fiscal Year 2003, the Navy will evaluate different technologies, i.e., phytoremediation or groundwater neutralization, to optimize the groundwater remedy at Site 7 in order to accelerate the closure of this site. The Navy will report the findings to the U.S. Environmental Protection Agency (EPA), MEDEP, and the Restoration Advisory Board (RAB) for discussion.

V. STATUTORY DETERMINATIONS

The remedy selected for Site 7 satisfies the statutory requirements of Section 121(b)(1) of CERCLA in that it is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective.

Several investigations have been conducted to best define the nature and extent of cadmium and manganese contamination at the site. After defining this area, a removal action was conducted in an attempt to close out the site with no further action; however, cadmium concentrations in groundwater still remain above the Federal MCL and State MEG of 5 ppb. The remedial action resulted in the excavation of approximately 400 yd³ of material, of which approximately 140 yd³ were removed, transported, and disposed of at a licensed disposal facility. The remaining volume of non-hazardous soil was spread across the surface of the site. The groundwater at the

site is presently not used for a potable supply and there are no future use plans for withdrawing groundwater at the site for this purpose. Due to the small isolated area of groundwater contamination and since the groundwater is neither a present nor a significant potential future drinking water source, it was determined that institutional controls with monitoring would be protective and more cost effective. Given the low levels of the contaminants detected and the extensive source area removal conducted, it is expected that the cadmium and manganese will naturally attenuate and that monitoring will not be a long-term requirement. However, the remedy at this site does not satisfy the statutory preference for treatment as a principal element of the remedy.

This remedy will result in hazardous substances remaining onsite above levels that allow for unlimited use and unrestricted exposure. As a result, a review will be conducted within 5 years after the initiation of remedial action and at least once every 5 years thereafter, per the Federal Facility Agreement, to ensure that the remedy continues to provide adequate protection of human health and the environment. The five-year review process shall remain effective until institutional controls are no longer required at the site.

VI. RECORD OF DECISION DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary (Part 2) section of this ROD. Additional information can be found in the Administrative Record file for this site.

- COCs and their respective concentrations
- Baseline risks represented by the COCs
- Cleanup levels established for COCs and the basis for the levels
- Present and future land and groundwater use assumptions used in the baseline risk assessment and ROD
- Land and groundwater use that will be allowed at the site as a result of the selected remedy
- Estimated capital, operation and maintenance, and total present worth costs; discount rate; and the number of years over which the remedy cost estimates are projected
- Decisive factor(s) that led to selecting the remedy including cost, practicability, and implementability.

**VII. AUTHORIZING SIGNATURES AND SUPPORT AGENCY ACCEPTANCE OF
REMEDY**

This ROD represents the selected remedial action for Site 7 at NAS, Brunswick, Maine.

Concur and recommend for immediate implementation.

Department of the Navy

By: Robert S. Winneg Date: 26 SEPT 02

Robert S. Winneg, Captain
Commanding Officer
Naval Air Station Brunswick
U.S. Department of the Navy

U.S. Environmental Protection Agency

By: Richard Cavagnero FOR RC Date: 9/27/02

Richard Cavagnero, Acting Division Director
Office of Site Remediation and Restoration
Region 1

PART 2—DECISION SUMMARY

I. SITE NAME, LOCATION, AND BRIEF DESCRIPTION

A. Name and Location

NAS Brunswick is located in Brunswick, Maine, south of the Androscoggin River and south of Route 1 between Routes 24 and 123 (Figure 2-1). The old acid caustic pit site (Site 7), addressed in this ROD, is located in the northern portion of NAS Brunswick northeast of the Old Navy Fuel Farm site and west of Fitch Avenue (Figure 2-2).

B. Comprehensive Environmental Response, Compensation, and Liability Act Information System Identification Number

The CERCLA Information System identification number for NAS Brunswick/Site 7 is OU7-SITE7-ME8170022018.

C. Lead Agency

The Navy is the lead agency with regulatory oversight from EPA and MEDEP.

D. Site Description

- NAS Brunswick is an active base owned and operated by the Federal government through the Department of the Navy. The primary mission of NAS Brunswick is flight operations related to anti-submarine warfare.
- NAS Brunswick lies at the head of a peninsula with tidal areas nearby. It is located on 3,094 acres of land of which approximately 75 percent is forested areas, grassland, miscellaneous shrubland, marsh, and open water. The remaining 25 percent includes base operations in areas composed of office buildings, barracks, recreational facilities, base housing, hangars, repair shops, and other facilities to support NAS Brunswick, as well as paved areas including flight ramps and runways.
- Topography of NAS Brunswick is characterized by low, undulating hills with deeply incised brooks and bedrock outcrops. Topography at Site 7 is flat with little relief with woods surrounding the open area. There are no wetland areas or streams associated with the site.
- Ground surface elevations range from mean sea level in lowland drainage areas and the Harpswell Cove estuary to over 110 ft mean sea level west and southeast of the southern end of the runways. Site 7 ground surface elevations are approximately 71-77 ft above sea level.

- Current property uses surrounding NAS Brunswick are primarily suburban and rural residential with some commercial and light industry along nearby Routes 1, 24, and 123. An elementary school, college, and a hospital are located within 1 mi of the base boundary. The southern edge of the base borders the estuary of Harpswell Cove.
- The suspected source area at Site 7 is approximately 3,800 ft² in area and is located in the northern portion of the base. The land area is zoned industrial, and the area is undeveloped. There are no structures present such as barracks, housing, offices, etc. located at Site 7 (Figure 2-3).
- Site 7 is a generally flat, open clearing surrounded by woods to the west, north, and east.
- Groundwater occurs at Site 7 at a depth of 4-7 ft below ground surface (bgs), and is unconfined. Based on groundwater elevation data collected during several groundwater sampling rounds, groundwater flow direction is generally toward the southeast. Figure 2-4 shows the inferred groundwater flow patterns at Site 7.

A more complete description of Site 7 is provided in Chapter 9 of the Remedial Investigation (E.C. Jordan Co. 1990).

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. Land Use and Site Activity History

NAS Brunswick has been an active base since it was commissioned in 1943, except between 1946 and 1951 when the property was used by Bowdoin College and small commercial enterprises. Site 7 was the former location of the old acid caustic pit used from 1952 to 1969 for liquid waste disposal. Wastes reportedly included transformer oil, battery acid, caustics, solvents, and other miscellaneous liquids. The site was also a Defense Reuse and Marketing Office area and used for an equipment laydown area and storage. These historical activities may have contributed to current environmental conditions.

Site 7 consists of the source area and the area where contamination is present. The Site 7 boundary is defined by the institutional control boundary that includes a buffer around the contaminated media.

1. Old Acid Caustic Pit Area

- No record of the precise location of the old acid caustic pit has been found. Field investigations identified an approximate location based upon the data collected from a soil gas survey, ground penetrating radar, terrain conductivity survey, soil borings, test pit excavations, and well installations. The approximate location of the pit is located between TP-702 and TP-704 (Figure 2-3).

- It is believed that the pit was used from 1952 until 1969 to dispose of liquid wastes. The site was also used by the Defense Reuse and Marketing Office facility, and aerial photography shows the area was also used as an outdoor storage and equipment laydown area during this period.
- It is reported that the wastes disposed of in this pit included transformer oil, battery acid, caustics, solvents, and other miscellaneous liquids. During use as an outdoor storage and equipment laydown area, the handling and storage of this material potentially resulted in isolated spills and leaks of fuels and oils.
- The acid caustic pit was in operation and closed prior to the effective date of Resource Conservation and Recovery Act regulations (1976).
- Currently, the site land area is undeveloped.

a. Future Land Use

Future land use at Site 7 is likely to remain undeveloped. NAS Brunswick has no plans to cease its active base status. Groundwater is not used as a potable or domestic source and there are no plans to extract site groundwater for potable and/or domestic use. Cleanup of Site 7 groundwater is estimated to take up to 10 years.

B. History of Federal and State Investigations and Removal and Remedial Actions

- In 1983, an Initial Assessment Study was completed identifying past hazardous waste activities at NAS Brunswick; 10 sites, including the old acid caustic pit site (Site 7), were identified (R.F. Weston 1983).
- In 1984, a Pollution Abatement Confirmation Study recommended further investigation of 7 of the 10 Initial Assessment Study sites, including the old acid caustic pit site (Site 7) (E.C. Jordan Co. 1985).
- In 1987, NAS Brunswick was placed on EPA's National Priorities List.
- In 1987, a Remedial Investigation/Feasibility Study was conducted for the 7 sites recommended for further investigation in the Pollution Abatement Confirmation Study (E.C. Jordan Co. 1990).
- In 1987 and 1990, the Navy conducted environmental field activities at this site as part of a Remedial Investigation (E.C. Jordan Co. 1990) and Supplemental Remedial Investigation (E.C. Jordan Co. 1991) to determine if contamination at the site posed an unacceptable risk to human health or the environment. The investigations focused on locating the approximate area of the former pit and the area downgradient of the disposal pit.

- In 1990, the Navy completed the Draft Final Remedial Investigation Report (E.C. Jordan Co. 1990).
- A Baseline Risk Assessment was completed as part of the Draft Final Remedial Investigation Report for Site 7 to determine potential risk to human health and the environment from exposure to groundwater and soil contaminants (E.C. Jordan Co. 1990; Appendix Q, Volume 4). Results of the Risk Assessment did not indicate a risk to either human or ecological receptors based on current exposure conditions. Additional risk estimates were generated for Site 7 based on the standardized future residential exposure scenario developed by EPA (E.C. Jordan 1992). This guidance was not available at the time the Risk Assessment was conducted for the Draft Final Remedial Investigation. The incremental carcinogenic risks associated with exposure under a future potential residential land use scenario is 3×10^{-5} assuming exposure to the average concentration and 1×10^{-4} assuming exposure to the maximum concentration (E.C. Jordan Co. 1992). While both risk estimates are within EPA's target risk range of from 10^{-6} to 10^{-4} , they exceed the State of Maine's target risk threshold of 1×10^{-5} .
- In 1991, the Navy completed the Draft Final Supplemental Investigation Report (E.C. Jordan Co. 1991), which identified remedial action objectives and alternatives for the sites studied.
- A Feasibility Study was completed for several sites at NAS Brunswick, including Site 7 in 1992 (E.C. Jordan 1992). The Baseline Risk Assessment did not indicate a risk to either human or ecological receptors, therefore, a No Action alternative was recommended in the Feasibility Study. The No Action alternative that included groundwater monitoring was the only alternative developed for Site 7 in the 1992 Feasibility Study. This alternative did not include implementing any actions or controls at Site 7.
- In 1994, the State of Maine adopted the risk-based MEGs for groundwater by reference as part of the Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Construction, Altering, and Operating Certain Types of Hazardous Waste Units. Based on the MEGs, cadmium and manganese exceeded their respective limits.
- The Navy conducted additional field investigations to identify the nature and extent of the cadmium contamination at Site 7. In July 1997, 2 site wells (MW-NASB-093 [formerly MW-703] and MW-NASB-095 [formerly MW-705]) were sampled as part of background well sampling for the Long-Term Monitoring Program Event 9. The 2 wells were sampled for Target Analyte List inorganic elements by utilizing the low-flow sampling procedure. The results showed that neither MW-NASB-093 or MW-NASB-095 had an exceedance of the Federal MCL or State MEG for Target Analyte List inorganic elements. These wells are located upgradient of MW-NASB-094 and MW-NASB-096.

- In March 1999, the Navy installed 1 new well (MW-NASB-228), east-northeast of the existing well network to assess whether cadmium detected in groundwater may extend downgradient of Site 7 (i.e., more north and east than the existing well network). Monitoring wells MW-NASB-094, MW-NASB-096, and MW-NASB-228 were sampled for Target Analyte List elements. Analytical results indicated that MW-NASB-094 was the only well with elevated concentrations of cadmium (13.6 ppb) above the State MEG (5 ppb). Manganese was detected in three wells (MW-NASB-094, MW-NASB-096, and MW-228) at concentrations of 37.2 ppb, 178 ppb, and 280 ppb, respectively. The MEG for manganese (200 ppb) was only exceeded in well MW-NASB-228.
- In September 1999, based on the findings of the March 1999 sampling round, the Navy installed another new well (MW-NASB-229) to verify the concentrations of cadmium noted in MW-NASB-094. After discussion with the RAB, the location of the well was positioned within 5 ft downgradient of MW-NASB-094. A sample was collected from MW-NASB-229 and submitted for analysis of Target Analyte List elements. Cadmium was detected above both the Federal MCL (5 ppb) and State MEG (5 ppb) in well MW-NASB-229 at a concentration of 18.3 ppb and 16.3 ppb (duplicate sample). Manganese was detected above both the Federal Secondary MCL (50 ppb) and State MEG (200 ppb) in well MW-NASB-229 at concentrations of 1,290 ppb and 1,480 ppb (duplicate sample).
- In 2000 and 2001, supplemental field investigations were performed to search for and remove the source of continuing cadmium concentrations in groundwater above the Federal MCL and State MEG. In December 2000, a 51-hour pump test was conducted using MW-NASB-094 as the pumping well and monitoring 7 other nearby monitoring wells during the test. The cadmium concentrations detected during the pump test were 51 ppb (baseline sample), 52 ppb (approximately 18 hours after starting the pump test), 50 ppb (approximately 36 hours after the pump test began), 48 ppb (approximately 51 hours after the pump test began), and 41 ppb (approximately 24 hours after the pump test ended), all of which were above the Federal MCL and State MEG of 5 ppb. Following the pump test, the Navy completed additional investigations to assess whether an isolated man-made or natural source of cadmium was present in the site soils. Four temporary sampling points were installed to better define the impact of cadmium on the groundwater. Two of these points (TEMP-03 and TEMP-04) reported cadmium levels (17.7 ppb and 32.6 ppb, respectively) higher than drinking water standards of 5 ppb (Federal MCL and State MEG). These data were used to delineate the extent of the excavation. The excavation encountered metal debris and substantial organic material, either of which could be contributing to the cadmium concentrations observed. Two soil samples collected from the removed soil had cadmium detected at concentrations of 110 and 204 ppm as measured by a field x-ray fluorescence detector during the test pit excavations in July 2001. The Navy excavated over 400 yd³ of material from the site and removed 140 yd³ for disposal (EA 2002a; Foster Wheeler 2002).
- In November 2001, a groundwater sampling round was completed for all Site 7 wells. The samples were collected using the low-flow sampling procedure and were submitted for analysis of cadmium by EPA Method 6010B. Cadmium was detected in two wells (MW-NASB-099 and MW-NASB-091) at concentrations of 22 ppb and 0.7 ppb,

respectively. The MEG for cadmium (5 ppb) was only exceeded in one well (MW-NASB-099) during this sampling event. The findings of these sampling rounds have been summarized in a letter report issued in March 2002 (EA 2002b).

- Between March and April 2002, Foster Wheeler Environmental Corporation was tasked with conducting a remedial action at Site 7 to remove the stockpiled soils. This remedial action consisted of collecting soil samples to characterize the stockpiled soil, transporting and disposal of contaminated soil, and restoring the site. Two of the five stockpiles (EA-1 and EA-2) were consolidated into one stockpile (identified as FW-1). Composite soil samples were collected from stockpiles FW-1, FW-2, FW-3, and FW-5. The analytical results indicated that stockpiles FW-2 and FW-5 required disposal offsite, and stockpiles FW-1 and FW-3 could remain onsite. Debris such as asphalt and metal were removed from stockpiles FW-1 and FW-3. The debris was transported for offsite disposal. Stockpiles FW-1 and FW-3 were then spread out across the ground surface of Site 7. Stockpiles FW-2 and FW-5 were loaded, transported, and disposed of at ESMI in New Hampshire. Approximately 140 yd³ of material was disposed of at ESMI (Foster Wheeler 2002).
- The Navy published a Proposed Remedial Action Plan for Site 7 on 29 March 2002, and held a public meeting on 9 April 2002 to present the selected remedial alternatives for Site 7 (EA 2002c).

This ROD presents the selected remedial action discussed in the April 2002 Proposed Remedial Action Plan and addresses the public comments regarding the preferred alternative. Responses to written and oral comments are included in Appendix A of this ROD, the Responsiveness Summary. Responses to regulators' comments on the ROD have all been addressed and accepted by the regulators as indicated in the correspondence also provided in Appendix A.

C. History of Comprehensive Environmental Response, Compensation, and Liability Act Enforcement

In 1990, the Navy entered into a Federal Facility Agreement with EPA and MEDEP that established goals and responsibilities among the Navy and the regulatory agencies and set enforceable cleanup schedules.

III. COMMUNITY PARTICIPATION

A. Public Outreach Effort

Throughout the history of Site 7, community concern and involvement have been high. The Navy has kept the community and other interested parties apprised of site activities through informational press releases and public meetings. Below is a brief chronology of public outreach events:

- In 1987, the Navy established the Administrative Record, which includes all documents relevant to Site 7 investigations. The Administrative Record is available at the Curtis Memorial Library on McKean Street in Brunswick and at the Navy Public Works office at NAS Brunswick.
- In 1988, a Technical Review Committee (TRC), now known as the RAB, was established to create a forum for the Navy, EPA, MEDEP, and a community representative to discuss site issues. The RAB meets or conducts conference calls on an as-needed basis, usually within every 45-60 days. The RAB meets bi-annually to review the environmental program and receive community input. NOTE: RAB meetings were held quarterly up until 1999. Since then, the RAB meetings have occurred on a bi-annual basis.
- In September 1988, the Navy released a Community Relations Plan (E.C. Jordan 1988) that outlined a program to address community concerns and keep citizens informed of and involved with remedial activities at NAS Brunswick.
- On 5 April 2002, the Navy published a notice announcing a public informational meeting and a brief analysis of the Proposed Plan for Site 7 in *The Times Record*. The Navy made the Plan available at the Curtis Memorial Library in Brunswick.
- On 9 April 2002, a public information meeting was held to present the Proposed Plan for Site 7. This included a poster session followed by a presentation and a question-and-answer period.
- From 1 April to 30 April 2002, a public comment period on the Proposed Plan was held.
- Public comments; EPA, MEDEP, and the Navy's response to comments; and notes of the 9 April 2002 meeting are included in the Responsiveness Summary (Appendix A).

B. Public Outreach Results

The public outreach efforts at Site 7 have been held to inform residents who live near the site. The results of the public outreach efforts are as follows:

- One public meeting, with approximately 10 people in attendance.
- Quarterly RAB update newsletters, reaching up to 150 people, were issued until 1999, and TRC and RAB meetings were held on a quarterly basis from 1988 to 1995 and from 1995 to 1999, respectively. Since 1999, the RAB has been updated on NAS Brunswick progress and activities at different NAS Brunswick sites at least on a bi-annual basis during meetings open to the public.
- Written comment letters on the Proposed Remedial Action Plan (Appendix A).

C. Technical Assistance Grants

Local residents formed the Brunswick Area Citizens for a Safe Environment to monitor site activities. They have applied for and have been awarded a Technical Assistance Grant from EPA, and have retained a Technical Assistance Grant consultant since 1991 who attends all RAB and technical project meetings.

IV. SCOPE AND ROLE OF RESPONSE ACTION

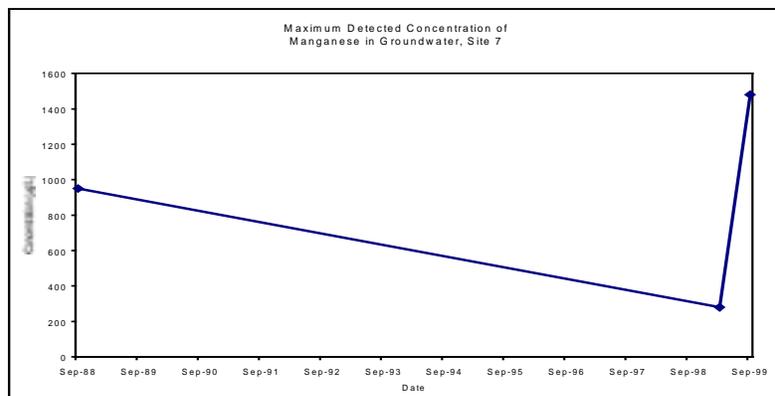
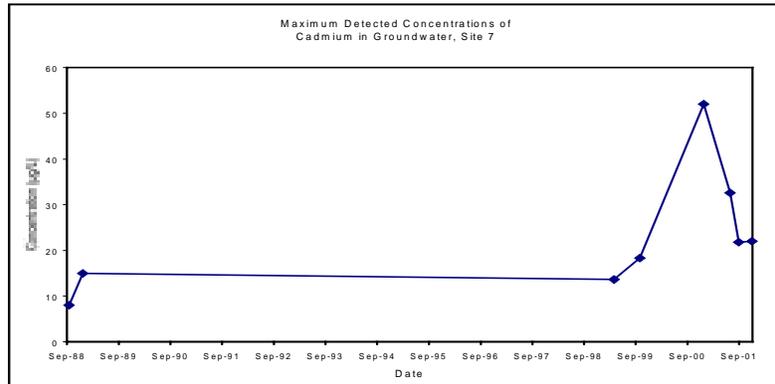
A. Problems Addressed

Based on the investigations performed by the Navy, this ROD addresses the groundwater and soil contamination at Site 7.

1. Groundwater Contamination

Inorganic elements, primarily cadmium and manganese, have been detected in groundwater at Site 7, and may represent a low level threat to groundwater. The concentrations of cadmium noted in the groundwater at Site 7 have been low, with elevated concentrations localized in the vicinity of MW-NASB-094 and MW-NASB-229. Groundwater sampling data indicate that the maximum detected concentration of cadmium was 52 ppb during the pump test in December 2000. Prior to the pump test, maximum cadmium concentrations ranged from 8 to 15 ppb. After the December 2000 pump test, cadmium concentrations have decreased from a high of 32.6 (June 2001) to 22 ppb (November 2001).

During the Remedial Investigation groundwater sampling completed in 1988, manganese was detected at concentrations exceeding the Federal Secondary MCL of 50 ppb in wells MW-NASB-094 (950 ppb) and MW-NASB-096 (51 ppb). In addition, the State



MEG of 200 ppb was exceeded in well MW-NASB-094 during the 1988 sampling event. During additional groundwater sampling activities in 1999, manganese was detected in three wells exceeding both the State MEG (200 ppb) and Federal Secondary MCL (50 ppb) in wells MW-NASB-096 (178 ppb), MW-NASB-228 (280 ppb), and MW-NASB-229 (1,290 ppb – duplicate sample reported manganese at 1,480 ppb).

To date, the Navy has not detected any evidence of movement of COCs from Site 7 above Federal MCLs or State MEGs.

2. Soil Contamination

Contamination detected during the Remedial Investigation and Feasibility Study at Site 7 identified polycyclic aromatic hydrocarbons (PAHs) and pesticide compound (DDT) present in the site soils from a depth of 0-2 ft bgs. PAHs were identified in soil samples collected from the test pits completed in 1988 and reported concentrations ranging from 350 to 20,000 ppb in the soils to a depth of 2 ft bgs. The specific test pit locations that reported concentrations of PAHs are: TP-709, TP-710, TP-711, TP-713, TP-714, TP-715, TP-716, TP-717, and TP-719. Pesticide compound DDT was reported in the top 2 ft of soil at Site 7 in test pits TP-709, TP-710, TP-711, TP-712, TP-714, TP-716, TP-717, TP-718, and TP-719 with concentrations ranging from 25 to 420 ppb. The observed contamination is consistent with the historical use of this site as an Acid Disposal Pit and Defense Reuse and Marketing Office facility. The surface and shallow soil distribution of PAHs is consistent with the former use of this area as an equipment laydown area/recycling area. The presence of pesticides in the shallow soils is related to the use of this pesticide and/or handling practices of the former DMRO facility.

3. Summary

The groundwater at Site 7 is not used as a source of potable water, is not of sufficient capacity for a public supply, and the base is served by a public water supply managed by the Town of Brunswick that is located off the base. Because the threat to human health is not immediate, there are no active sources of contamination, and there is no evidence of offsite contaminant migration above the Federal MCLs or State MEGs, removal and/or active remediation is not considered practicable for this site. Natural attenuation will reduce contaminant concentrations in the site groundwater over time, and the establishment of institutional controls will protect human health by preventing the use of and contact with impacted media. The Navy will develop a Long-Term Monitoring Program to gauge the progress of natural attenuation and detect any contaminant migration that may occur. In summary, the principal and low level threats addressed within this ROD are provided below:

Contaminant	Media	Contaminant	Action
Principal Threats			
None at Site 7	Not applicable	Not applicable	Not applicable
Low Level Threats			
SVOCs (PAHs and pesticide compounds)	Soil (0-2 ft bgs)	PAHs, DDT, DDD, and DDE	Institutional controls for soil
Inorganic	Groundwater	Cadmium and manganese	Natural attenuation with long-term monitoring and institutional controls

B. Planned Sequence of Action

The following remedial actions are planned for Site 7.

1. Groundwater and Soil Contamination

The planned sequence of action with regard to Site 7 groundwater and soil contamination includes the following:

- As part of the Remedial Action Plan for this site, the Navy will implement institutional controls to prevent the use of and contact with site groundwater and soil at Site 7. These institutional controls will consist of groundwater and soil use restrictions per the current NAS Brunswick Operations Instructions in effect. The Operations Instructions are used to identify and screen environmental areas for inappropriate construction or development activities. The Navy will generate and provide a draft of the instrument containing these groundwater and soil use restrictions to the RAB for review and comment, and to EPA and MEDEP for review, comment, and finalization pursuant to the Federal Facility Agreement within 15 months after the signature of this ROD. When finalized, the groundwater and soil use restrictions will be incorporated into the Operations Instructions and placed in the Administrative Record for Site 7. The Operations Instructions will not be modified in any way that affects these use restrictions or the Site 7 remedy. The institutional controls will be inspected, noted, verified, and reported during the Long-Term Monitoring Program to be implemented at Site 7 in accordance with the Federal Facility Agreement. The monitoring and reporting of institutional controls will be described in the Site 7 Long-Term Monitoring Plan which will be prepared and finalized pursuant to the Federal Facility Agreement as part of the Remedial Action Plan for this site within 15 months after the signature of this ROD.

The radius of the proposed institutional control is 225 ft that will include the locations of the Remedial Investigation test pits where PAHs and DDT were detected in the site soils (0-2 ft bgs). If, in the future, the Navy decides to change the site use to a residential type of use, it will submit a memo to EPA, MEDEP, and the RAB for review and comment detailing the soil removal actions that it will take to remove the soil containing PAHs and DDT in accordance with applicable laws and regulations and with the Federal Facility Agreement. Once the soil has been removed from the site, the Navy will revise or modify the Site 7 ROD in accordance with applicable laws and regulations and will ensure that the institutional control instrument according to its terms will provide for the removal of the institutional controls for soils at the site.

- Should the Navy transfer or lease any real property affected by Site 7, whether or not as a result of base closure, the Navy will notify EPA and MEDEP, in accordance with the Federal Facility Agreement, and the RAB at least 60 days prior to the transfer or lease. In consultation with EPA and MEDEP, the Navy will include appropriate provisions (i.e., restrictive covenants or other use restrictions such as institutional controls) in all

documents that evidence the transfer or lease to prevent the use of and contact with site groundwater and soil. If the property is transferred, or the lease allows capital improvements, a technical evaluation of the effectiveness and appropriateness of the remedy will be undertaken considering long-term monitoring results to date, the proposed land use, and the fact that the Navy may no longer actively own or operate the property.

- As part of the Remedial Action Plan for this site, the Navy will institute a Long-Term Monitoring Program that will be adjusted based on sample results. A monitoring plan will be developed and forwarded to the RAB for consultation as well as to EPA and MEDEP for review, comment, and finalization in accordance with the Federal Facility Agreement. If the Navy revises the Long-Term Monitoring Program, it will forward the revisions to the RAB for consultation as well as to EPA and MEDEP for review, comment, and finalization in accordance with the Federal Facility Agreement, prior to incorporating the revisions into the plan. The goals of the Long-Term Monitoring Program are as follows:
 - Assessing variations in the concentrations of cadmium and manganese in groundwater to determine the effectiveness of natural attenuation
 - Assessing whether contamination is migrating offsite
 - Assessing variations in groundwater flow patterns
 - Monitoring structural integrity of the groundwater monitoring wells.

In addition, pursuant to the Federal Facility Agreement and CERCLA, a review will be completed at least once every 5 years to evaluate the progress and effectiveness of the remedial action and to ensure that human health and the environment continue to be protected. The five-year review process shall remain effective until institutional controls are no longer required at the site.

V. SUMMARY OF SITE CHARACTERISTICS

A. Site Overview

- The suspected source area at Site 7 is approximately 3,800 ft² in area and is located in the northern portion of NAS Brunswick. It consists of an undeveloped, level open field surrounded by woods on three sides of the site.
- Hydrogeology at Site 7 is characterized by shallow groundwater in the overburden soil, and the water table varies in depth between 4 and 7 ft bgs.
- Overburden soil at Site 7 is a stratified formation consisting of a fine to medium sand layer, underlain by a prominent clay unit. The depth to bedrock at the site ranges from 11.7 to 20.6 ft bgs (inferred by refusal depths).

- Groundwater flow at the site is to the southeast.
- Historical data indicate Site 7 was the location of a former acid and caustic disposal pit where hazardous material disposal activities reportedly occurred.
- There are no wetland areas, ponds, or streams located at Site 7.
- Currently, there are no buildings or other structures located at Site 7.
- The groundwater at Site 7 is not used as a source of potable water, is not of sufficient capacity for a public supply, and the base is served by a public water supply managed by the Town of Brunswick that is located off the base.
- Older children aged 7-12 comprise the population potentially at highest risk from Site 7 contamination as they would be the most likely group to be playing in soil and would have less supervision than younger children. Risk associated with adult residents and workers is minimal.
- Wildlife populations at or near Site 7 include birds, reptiles, amphibians, and small mammals. There are no threatened or endangered species living at or near Site 7.

A more complete description of Site 7 is provided in Chapter 9 of the Remedial Investigation report (E.C. Jordan Co. 1990).

B. Type of Contamination and Affected Media

1. Groundwater Contamination

The groundwater contamination at Site 7 is considered to represent a low level threat based on the following:

- The primary COCs in groundwater are cadmium and manganese, which have been detected above the Federal MCLs and State MEGs. Other inorganic elements and compounds detected in groundwater include iron, potassium, sodium, and bis(2-ethylhexyl)phthalate.
- No evidence of offsite migration of COCs above Federal MCLs or State MEGs has been detected.
- Cadmium contamination has been detected above Federal MCLs and State MEGs, but at levels that would present only a low level risk in the event of exposure.
- Manganese has been detected at elevated concentrations above the State MEG and Federal Secondary MCL, but at levels that would present only a low level risk in the event of exposure.

- Site 7 groundwater is neither a current drinking water source nor a significant potential future drinking water source.

2. Soil Contamination

The soil contamination at Site 7 is considered to represent a low level threat based on the following:

- The primary COCs in soil are PAH compounds and the pesticide DDT, which have been detected in the shallow soils and appeared confined to a depth no greater than 2 ft bgs.
- There is no exposure to the soils under the current site use.
- PAHs and DDT are relatively stable in the soils since they readily adhere and sorb to the soils that are followed by biodegradation. They also have low solubility in water that limits transport to groundwater via leaching.

An overview of the significant findings of the investigations at Site 7, and a description of the types of contamination and the affected media, are provided in Table 2-1.

C. Contamination Sources and Sampling Strategies

Media that have been sampled during field investigations include surface soil, subsurface soil, and groundwater. To date, a Remedial Investigation, Supplemental Remedial Investigation, Soil and Groundwater Investigation, a limited soil removal action, and several groundwater sampling events have been completed. These investigations identified the following potential sources of contamination:

Contaminant Type	Media Affected	Suspected Source
Inorganics	Groundwater	Acid caustic pit, or natural site conditions
PAHs	Surface and shallow soils	Motor vehicle exhaust, burning materials
Pesticides	Surface and shallow soils	Historical base usage

1. Fate of Chemical Contaminants

The fate of chemical COCs at Site 7 is as follows.

a. Soil

- PAHs and the pesticide DDT were identified in the surface and shallow soils of the site.
- PAHs and pesticides in soil are relatively stable due to high sorption properties and have low solubility in water. Therefore, they pose limited threat to groundwater and offsite receptors.

- Based on the monitoring results to date, there is no evidence of offsite contaminant migration from Site 7 in groundwater or soil.

b. Groundwater

- Inorganics have been detected in groundwater, primarily the inorganic elements cadmium and manganese. Other inorganic elements detected in the groundwater at Site 7 include aluminum, calcium, iron, lead, potassium, sodium, and zinc; however, these elements were consistent with background levels and did not exceed any regulatory levels (E.C. Jordan 1990, 1992).
- Groundwater sampling data indicate that the maximum detected concentration of cadmium was 52 ppb during the pump test in December 2000. Prior to the pump test, maximum cadmium concentrations ranged from 8 to 15 ppb. After the December 2000 pump test, cadmium concentrations decreased from a high of 32.6 (June 2001) to 22 ppb (November 2001).
- Monitoring data indicate manganese concentrations detected in 3 monitoring wells at Site 7 have exceeded the State MEG of 200 ppb and the Federal Secondary MCL of 50 ppb.
- Groundwater at Site 7 is neither a drinking water source nor a significant potential future drinking water source.
- To date, no evidence of movement of COCs from Site 7 above Federal MCLs or State MEGs has been detected.

D. The Conceptual Model

1. Site Description

The suspected source area at Site 7 is approximately 3,800 ft² in size. The site is an open field that is generally flat across its extent and is surrounded by woods on three sides of the site. There are no wetland areas, streams, or ponds located on the site. There are no structures such as buildings, paved roadways, or parking areas located on the site. No areas of archaeological or historical importance are known to be present (E.C. Jordan 1990).

2. Geology and Hydrogeology

The Site 7 area is underlain by fine to medium sand at depths ranging in thickness up to 20 ft. A transitional unit, common elsewhere at NAS Brunswick, was not identified underlying the sand at Site 7. Underlying the sand is a clay unit. The depth to bedrock at the site has been inferred based upon refusal depth to range from 11.7 to 20.6 ft bgs.

Groundwater occurs at the site at a depth ranging from 4 to 7 ft bgs, and is unconfined. Based on groundwater elevation data gathered during the several groundwater sampling rounds, the groundwater flow direction is generally toward the southeast. Figure 2-4 shows the inferred groundwater contours at Site 7.

3. Impacted Media and Migration Route

a. Soil

Surface soil at Site 7 does not pose an unacceptable risk to human health or the environment under current site uses (i.e., undeveloped and undisturbed). During the Remedial Investigation/Feasibility Study program, PAH and pesticide contamination was detected in the surface and shallow soils, but was confined to this interval. The results are consistent with the findings of the 1985 Pollution Abatement Confirmation Study. The observed distribution of contamination in surface and shallow soils is confined vertically to the 0- to 2-ft interval. Handling and storage of materials potentially gave rise to isolated spills and leaks of fuels and oils (E.C. Jordan Co. 1991).

The surface and shallow soil distribution of PAHs (associated with the weathering of petroleum fuels and oils; PAHs are typically tightly bound to soils in the presence of organic material) is consistent with the use of this site as an equipment laydown area/recycling yard. Pesticides detected in the shallow Site 7 soils are related to the use of DDT and/or DDT handling practices at the Defense Reuse and Marketing Office facility at Site 7 (E.C. Jordan Co. 1991).

The contamination at Site 7 includes low levels of PAHs (350-20,000 ppb) and DDT (25-420 ppb) in the surface and shallow soils. PAHs are relatively stable in the soil environment due to the high sorption properties. The ultimate fate of PAHs in soils at Site 7 is sorption to the soils, followed by slow biodegradation, therefore, PAH mobility is limited in the soil environment. PAHs also typically have low solubility in water, further limiting potential transport to groundwater via leaching (E.C. Jordan Co. 1990).

DDT also has a strong propensity to adhere to soils, and sorption is the dominant fate of DDT in soils. Therefore, like PAHs, DDT will sorb to the soils and ultimately biodegrade. Two major processes direct the degradation of DDT. First, aerobic degradation results in the formation of DDE; and second, anaerobic degradation typically results in the formation of DDD. DDT and its metabolites have lower water solubility, which acts to minimize migration in the environment (E.C. Jordan Co. 1990).

A Risk Assessment was conducted in 1990 for human health and ecological receptors. The 1990 Risk Assessment found that no human health risks are associated with exposure to contaminants detected in the surface soils at Site 7. The 1990 Baseline Risk Assessment evaluated risks associated with repetitive direct contact and incidental ingestion exposure incurred by young children who may trespass and/or play in this area. No environmental risks are associated with contaminants detected in the surface soils at Site 7. Since there are no streams or wetland areas associated with Site 7, environmental risks were estimated for terrestrial organisms. Exposure to

PAHs and DDT in the soils was evaluated using a food web analysis. The modeled exposure to terrestrial receptors was below levels considered to present an environmental risk (E.C. Jordan Co. 1990). Additional risk estimates were generated for Site 7 based on the standardized future residential exposure scenario developed by EPA (E.C. Jordan 1992). This guidance was not available at the time the Risk Assessment was conducted for the Draft Final Remedial Investigation Report. The incremental carcinogenic risks associated with exposure under a future potential residential land use scenario is 3×10^{-5} assuming exposure to the average concentration and 1×10^{-4} assuming exposure to the maximum concentration (E.C. Jordan Co. 1992). While both risk estimates are within EPA's target risk range of from 10^{-6} to 10^{-4} , they exceed the State of Maine's target risk threshold of 1×10^{-5} .

b. Groundwater and Other Media

Groundwater contamination at Site 7 consists only of elevated cadmium concentrations in two monitoring wells and manganese in three wells. Plume migration of contaminated groundwater does not have the potential to impact other media, including stream sediment and surface water. Likely migration routes for human exposure to these media are through contact or ingestion. The quantity of impacted groundwater at Site 7 is limited to the shallow aquifer.

The manganese detected at Site 7 could potentially be the result of past site activities, or anthropogenic. However, manganese is found in groundwater throughout Maine, including NAS Brunswick, since it is a naturally occurring mineral and, therefore, its presence could be related to natural conditions at the site. The current remedy addresses both cadmium and manganese and, therefore, the presence of manganese does not alter the selected remedy. If the Navy can demonstrate that the level of manganese at Site 7 is similar to that of naturally occurring background range at NAS Brunswick, then the Navy will propose removing it as a COC for this site.

E. Principal and Low Level Threat Wastes

Principal threat wastes are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. The manner in which principal threats are addressed generally will determine whether the statutory preference for treatment as a principal element is satisfied. Wastes generally considered to be principal threats are liquid, mobile, and/or highly-toxic source material.

Low level threat wastes are those source materials that generally can be reliably contained and that would present only a low risk in the event of exposure. Wastes that are generally considered to be low level threat wastes include non-mobile contaminated source material of low to moderate toxicity, surface soil containing COCs that are relatively immobile in air or groundwater, low leachability contaminants, or low toxicity source material.

Principal and low level threat wastes at Site 7 are summarized in the following table:

Source Media	Affected Media	Contaminant(s)	Reason	Concentration	Receptors
Principal Threats					
None at Site 7	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Low Level Threats					
	Groundwater	Cadmium	Limited mobility, monitoring, institutional controls	0-52 ppb	Not a drinking water source
	Groundwater	Manganese	Limited mobility, monitoring, institutional controls	0-1,480 ppb	Not a drinking water source
Shallow soil	Soil	PAHs	Limited mobility, institutional controls	360-20,220 ppb	Children ages 7-12 incidental ingestion and contact
Shallow soil	Soil	Pesticide (DDT)	Limited mobility, institutional controls	25-420 ppb	Children ages 7-12 incidental ingestion and contact
NOTE: The source at Site 7 was not positively identified, but an approximate area of the old acid/caustic pit was identified during the 1990 Remedial Investigation (Figure 2-3).					

F. Site-Specific Factors

1. Site 7

Site 7 is not presently used for any specific purposes; there are no plans to develop the site area.

VI. CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

Current and potential future site and resource uses are summarized in the following table:

Resource	Current Onsite Use	Current Adjacent Use	Potential Use	Potential Use Basis	Potential Use Timeframe
Land	None	Old Navy Fuel Farm and base housing	Residential and recreational	NAS Brunswick plans to remain active; if it should close, Site 7 could become a residential area	Unknown
Shallow Groundwater	None	None	Minimal potable use potential	Low yielding aquifer	Unknown
Deep Groundwater	None	None	Minimal potable use potential	Low yielding aquifer	Unknown

Currently, NAS Brunswick is operated by the Department of Defense. Should the base close, the reuse of Site 7 will be assessed through the base closure process.

VII. SUMMARY OF SITE RISKS

A Baseline Risk Assessment was completed as part of the Remedial Investigation at Site 7 to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with Site 7, assuming no remedial action was taken. It provides the basis for taking action and identifies the contaminants and exposure pathways needed to be addressed by the remedial action. The Human Health Risk Assessment followed a 4-step process:

1. **Contaminant Identification**—Identified those hazardous substances which, given the specifics of the site, were of significant concern
2. **Exposure Assessment**—Identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure
3. **Toxicity Assessment**—Considered the types and magnitude of adverse health effects associated with exposure to hazardous substances
4. **Risk Characterization**—Integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the site, including carcinogenic and non-carcinogenic risks.

A summary of those aspects of the Human Health Risk Assessment that support the need for remedial action is discussed below, followed by a summary of the Ecological Risk Assessment.

A. Human Health Risk Assessment

The Human Health Risk Assessment was completed for Site 7 surface and subsurface soils and groundwater. The Human Health Risk Assessment was completed in 1990 (E.C. Jordan Co. 1990, Appendix Q) using the established methods at that time.

Sixteen COCs were identified in the Remedial Investigation and were selected for evaluation in the Human Health Risk Assessment. COCs were selected to represent potential site-related hazards based on toxicity, concentration, frequency of detection, and mobility and persistence in the environment. Tables Q-5, Q-12, Q-13, and Q-14 in Appendix Q of the Draft Final Remedial Investigation Report (E.C. Jordan Co. 1990) show a summary of all COCs, exposure point concentrations used to evaluate the reasonable maximum exposure scenario, and estimates of average or central tendency exposure concentrations.

Table 2-2 presents each COC and its exposure point concentration for groundwater. This table includes the average and maximum concentrations detected for each COC, the frequency of detection, the exposure point concentration, and how the exposure point concentration was derived. The maximum concentration for each COC was used to determine the worst-case scenario risk estimate at Site 7.

Potential human health effects associated with exposure to the COCs were estimated quantitatively or qualitatively through the development of several hypothetical exposure pathways. These pathways were developed to reflect the potential for exposure to hazardous substances based on the present uses, potential future uses, and location of the site.

Conservative assumptions for the Risk Assessment included the following:

- Site 7 is presently undeveloped land with no structures present at the site.
- Groundwater at Site 7 is not currently used as a source of drinking water.
- It is predicted that land and groundwater use will remain the same, as there are no plans to close the base in the foreseeable future.
- Risks were also calculated to determine residential exposure based on incidental ingestion of soil occurring 350 days per year for 30 years. This scenario includes potential risk for both current and reasonable future land use.

The following paragraphs contain a brief summary of the exposure pathways that were found to present a significant risk. A more thorough description of all exposure pathways evaluated in the Risk Assessment, including estimates for an average exposure scenario, can be found in Appendix Q of the Remedial Investigation (E.C. Jordan Co. 1990).

Table 2-3 provides carcinogenic risk information relevant to the COCs in both soil and groundwater. Cancer slope factor adjustments were used for chemicals with less than 50 percent absorption via the ingestion route. However, adjustments were not necessary for the chemicals evaluated at this site. As a result, the same values presented in Table 2-3 were also used as dermal carcinogenic slope factors. Inhalation and external radiation routes of exposure were not applicable at Site 7.

Table 2-4 provides risk estimates for the significant routes of exposure at Site 7. These risk estimates are based on a reasonable maximum exposure and were developed by taking into account various conservative assumptions about the frequency and duration of an exposure to groundwater. Risk estimates for surface water were not included since they do not exist at this site.

Excess lifetime cancer risks were determined for each exposure pathway by multiplying a daily intake level with the chemical-specific cancer potency factor. Cancer potency factors have been developed by EPA from epidemiological or animal studies to reflect a conservative “upper bound” of the risk posed by potentially carcinogenic compounds; that is, true risk is unlikely to be greater than the risk predicted. The resulting risk estimates are expressed in scientific notation as a probability (e.g., 1×10^{-6} for 1/1,000,000) and indicate (using this example) that an average individual is not likely to have greater than a one in a million chance of developing cancer over 70 years as a result of site-related exposure (as defined) to the compound at the

stated concentration. All risks estimated represent an “excess lifetime cancer risk,” or the additional cancer risk on top of that which individuals face from other causes such as cigarette smoke or exposure to ultraviolet radiation from the sun. The chance of an individual developing cancer from all other (non-site-related) causes has been estimated to be as high as 1 in 3. EPA’s generally acceptable risk range for site-related exposure is from 10^{-4} to 10^{-6} . MEDEP’s incremental carcinogenic guideline is 1×10^{-5} . Current EPA practice considers carcinogenic risks to be additive when assessing exposure to a mixture of hazardous substances.

In assessing the potential for adverse effects other than cancer, a hazard quotient is calculated by dividing the daily intake level by the reference dose or other suitable benchmark. Reference doses have been developed by EPA, and they represent a level to which an individual may be exposed that is not expected to result in any deleterious effect. Reference doses are derived from epidemiological or animal studies and incorporate uncertainty factors to help ensure that adverse health effects will not occur. A hazard quotient indicates that a receptor’s dose of a single contaminant is less than the reference dose, and that toxic non-carcinogenic effects from that chemical are unlikely. The hazard index is generated by adding the hazard quotients for all COCs that affect the same target organ (e.g., liver) within or across all media to which a given individual may reasonably be exposed. A hazard index <1 indicates that toxic non-carcinogenic effects are unlikely.

1. Groundwater

Table 2-5 provides non-carcinogenic risk information relevant to the COCs in groundwater. Dermal contact and inhalation were not considered applicable routes of exposure at Site 7 since the groundwater at Site 7 is not used as a private or public water supply.

Cadmium was detected in monitoring wells at Site 7 in excess of its Federal MCL and State MEG of 5 ppb, respectively. Manganese did not have a MEG at the time of the Remedial Investigation, but did have a Secondary Federal MCL of 50 ppb, and was not included in the Baseline Risk Assessment. A quantitative exposure assessment for the ingestion of groundwater was not developed since exposure to cadmium in groundwater is unlikely because there are no downgradient receptors and there is no domestic use of the groundwater from this site currently or planned for the future. The Navy has no plans to develop the site groundwater for domestic use in the future.

2. Soil

No human health risks are associated with exposure to contaminants detected in the surface soils at Site 7. The Baseline Risk Assessment evaluated risks associated with repetitive direct contact and incidental ingestion exposure incurred by young children who may trespass and/or play in this area (E.C. Jordan 1990). The incremental carcinogenic risks for this exposure scenario ranged from 1×10^{-6} to 6×10^{-6} (the upper risk estimate is based on long-term exposure to the maximum detected contaminant level in soil) (E.C. Jordan 1990). The noncarcinogenic Hazard Indices for this exposure scenario were all below 1.0 (E.C. Jordan 1990).

Additional risk estimates were generated for Site 7 based on the standardized future residential exposure scenario developed by EPA (U.S. EPA 1991a). This guidance was not available at the time the Risk Assessment was conducted for the Draft Final Remedial Investigation Report. The incremental carcinogenic risks associated with exposure under a future potential residential land use scenario is 3×10^{-5} assuming exposure to the average concentration and 1×10^{-4} assuming exposure to the maximum concentration (E.C. Jordan Co. 1992). While both risk estimates are within EPA's target risk range of from 10^{-6} to 10^{-4} , they exceed the State of Maine's target risk threshold of 1×10^{-5} .

a. Risk Assessment Uncertainties

Risk assessment uncertainties identified in the Human Health Risk Assessment may include the following factors:

- Use of established standards, criteria, and carcinogen exposure values for calculation of site risk
- Extrapolating potential adverse human health effects from animal studies
- Extrapolating effects observed at high dose to low dose effects
- Modeling dose response effects
- The potential future residential use of this site may pose an unacceptable risk to human health if the soils are not removed from the site.

To minimize the impact of these uncertainties on the outcome of the Risk Assessment, realistic lower and upper bounds of risk are provided for each exposure scenario. These numbers are not indices of absolute risk, but rather a range that should include the actual risk.

B. Ecological Risks

No environmental risks are associated with the contaminants detected in the surface soils or groundwater at Site 7. Because there are no streams or wetland areas associated with this site, environmental risks were estimated for terrestrial organisms. Exposure to PAHs and DDT in the soils was evaluated using a food web analysis. The modeled exposure to terrestrial receptors was below levels considered to present an environmental risk. Risks to terrestrial organisms with regards to contact or ingestion with soil are presumed to be minimal or insignificant. Groundwater contamination poses no threat to wildlife, as it is inaccessible.

C. Basis for Response Action

The response action for Site 7 is based on the following:

- Residential use of the site in the future may present an unacceptable risk to human health.
- The Baseline Human Health Risk Assessment revealed that children who may trespass or play in this area are not potentially at risk if exposed to COCs via repetitive dermal contact or accidental ingestion (E.C. Jordan 1990). However, additional risk estimates (E.C. Jordan 1992) identified risks that exceed the State of Maine risk threshold.
- If not addressed by implementing the selected remedy in this ROD, these factors may present an unacceptable risk to human health or the environment.

VIII. REMEDIATION OBJECTIVES

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA established several other statutory requirements and preferences, including:

- A requirement that the Navy's remedial action, when complete, must comply with all federal and more stringent state environmental standards, requirements, criteria, or limitations, unless a waiver is invoked.
- A requirement that the Navy select a remedial action that is cost effective and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.
- A preference for remedies in which treatment that permanently and significantly reduces the volume, toxicity, or mobility of the hazardous substance as a principal element over remedies not involving such treatment.

Response alternatives were developed to be consistent with these congressional mandates.

Based on preliminary information relating to types of contaminants, environmental media of concern, and potential exposure pathways, remedial action objectives were developed to aid in the development and screening of alternatives. These remedial action objectives were developed to mitigate existing and potential future threats to public health and the environment. The remedial action objectives for Site 7 are to:

- Reduce contaminant concentrations in Site 7 groundwater consistently below Federal MCL and State MEG target cleanup levels
- Prevent human and ecological exposure (i.e., ingestion, dermal contact) to Site 7 groundwater and soil.

- Prevent any migration of the Site 7 groundwater plume offsite.

The basis and rationale for these remedial objectives are the most practical for Site 7 based on current and reasonably anticipated exposure routes. With regard to the groundwater, Site 7 is located on an active military base whose water is supplied by the Brunswick Water District; groundwater from the site is not a current or significant potential future source of water for drinking or residential use as the shallow aquifer there provides limited groundwater yield and is considered an unlikely source for potential potable use.

The remedial action objectives address risks identified in the Risk Assessment by reducing or eliminating exposure to site contaminants.

IX. DESCRIPTION OF ALTERNATIVES

CERCLA and the National Contingency Plan set forth the process by which remedial actions are evaluated and selected. In accordance with these requirements, a range of alternatives was developed for Site 7. With respect to groundwater response action, the Remedial Investigation/Feasibility Study developed a No Action alternative based on the results of the Baseline Risk Assessment completed in 1990, which indicated that there were no risks to either humans or ecological receptors at Site 7.

As discussed in Chapter 7 of the Feasibility Study, this alternative did not involve implementing any actions or controls, but did include monitoring. Based on the EPA guidance in effect at the time the Feasibility Study was presented, the requirements under CERCLA Section 121 cleanup standards for selection of a Superfund remedy, including the requirements to meet applicable or relevant and appropriate requirements (ARARs), were not triggered. Therefore, since CERCLA Section 121 (a) required only that those remedial actions that are “determined to be necessary... under Section 104 or...106...be selected in accordance with Section 121” (E.C. Jordan Co. 1990), chemical-specific ARARs would not be triggered.

Since the earlier remedial investigations at Site 7 and the Risk Assessment, the State of Maine adopted the risk-based MEGs for groundwater. In response, the Navy has conducted several investigations to best define the nature and extent of the contamination at Site 7. After identifying an area, a removal action was conducted in an attempt to close out the site with no further action; however, cadmium and manganese concentrations still remained above the Federal MCL and State MEG.

This section presents a description of the two remedial alternatives considered for Site 7:

- Alternative 1—No Action
- Alternative 2—Institutional Controls with Groundwater Monitoring.

A. Alternative 1—No Action

Under the No Action alternative, no remedial action would be implemented. The No Action alternative is required by CERCLA to serve as a baseline for comparison. The No Action alternative does not meet the remedial goals for Site 7 because it would not control or prevent contact with affected groundwater, i.e., it would not require any remedial activity, long-term monitoring, or institutional controls. Hence, the No Action alternative is not protective of human health and the environment. However, five-year reviews will be conducted.

- Estimated Time for Design and Construction: 0
 - Estimated Time for Operation: 0
 - Estimated Capital Cost: \$0
 - Estimated Annual Operation and Maintenance (Present-Worth): \$18,000*
 - Estimated Total Cost (20-Year Present-Worth): \$18,000
- *Includes cost of five-year reviews for 20 years.

B. Alternative 2—Institutional Controls with Groundwater Monitoring

1. Groundwater and Soil Contamination

To address groundwater contamination at Site 7, this alternative would include the following:

- Allow the toxicity and volume of the contamination to be reduced through the natural attenuation processes.
- As part of the Remedial Action Plan for this site, the Navy will implement institutional controls to prevent the use of and contact with site groundwater and soil at Site 7. These institutional controls will consist of groundwater and soil use restrictions per the current NAS Brunswick Operations Instructions in effect. The Operations Instructions are used to identify and screen environmental areas for inappropriate construction or development activities. The Navy will generate and provide a draft of the instrument containing these groundwater and soil use restrictions to the RAB for review and comment, and to EPA and MEDEP for review, comment, and finalization pursuant to the Federal Facility Agreement within 15 months after the signature of this ROD. When finalized, the groundwater and soil use restrictions will be incorporated into the Operations Instructions and placed in the Administrative Record for Site 7. The Operations Instructions will not be modified in any way that affects these use restrictions or the Site 7 remedy. The institutional controls will be inspected, noted, verified, and reported during the Long-Term Monitoring Program to be implemented at Site 7 in accordance with the Federal Facility Agreement. The monitoring and reporting of institutional controls will be described in the Site 7 Long-Term Monitoring Plan which will be prepared and finalized pursuant to the Federal Facility Agreement as part of the Remedial Action Plan for this site within 15 months after the signature of this ROD.

The radius of the proposed institutional control is 225 ft that will include the locations of the Remedial Investigation test pits where PAHs and DDT were detected in the site soils (0-2 ft bgs). If, in the future, the Navy decides to change the site use to a residential type of use, it will submit a memo to EPA, MEDEP, and the RAB for review and comment detailing the soil removal actions that it will take to remove the soil containing PAHs and DDT in accordance with applicable laws and regulations and with the Federal Facility Agreement. Once the soil has been removed from the site, the Navy will revise or modify the Site 7 ROD in accordance with applicable laws and regulations and will ensure that the institutional control instrument according to its terms will provide for the removal of the institutional controls for soils at the site.

- Should the Navy transfer or lease any real property affected by Site 7, whether or not as a result of base closure, the Navy will notify EPA and MEDEP in accordance with the Federal Facility Agreement, and the RAB at least 60 days prior to the transfer or lease. In consultation with EPA and MEDEP, the Navy will include appropriate provisions (i.e., restrictive covenants or other use restrictions such as institutional controls) in all documents that evidence the transfer or lease to prevent the use of and contact with site groundwater and soil. If the property is transferred, or the lease allows capital improvements, a technical evaluation of the effectiveness and appropriateness of the remedy will be undertaken considering long-term monitoring results to date, the proposed land use, and the fact that the Navy may no longer actively own or operate the property.
- As part of the Remedial Action Plan for this site, the Navy will institute a Long-Term Monitoring Program, which will be adjusted based on sample results. A monitoring plan will be developed and forwarded to the RAB for consultation as well as to EPA and MEDEP for review, comment, and finalization in accordance with the Federal Facility Agreement. If the Navy revises the Long-Term Monitoring Program, it will forward the revisions to the RAB for consultation as well as to EPA and MEDEP for review, comment, and finalization in accordance with the Federal Facility Agreement, prior to incorporating the revisions into the plan. The goals of the Long-Term Monitoring Program are as follows:
 - Assessing variations in the concentrations of cadmium and manganese in groundwater to determine the effectiveness of natural attenuation
 - Assessing whether contamination is migrating offsite
 - Assessing variations in groundwater flow patterns
 - Monitoring structural integrity of the groundwater monitoring wells.

2. Applicable or Relevant and Appropriate Requirements

Appendix B provides the specific ARARs.

a. Federal Relevant and Appropriate Requirements

Chemical-Specific:

- Safe Drinking Water Act – MCLs (40 CFR 141.11–141.16) (U.S. EPA 1999)
- Safe Drinking Water Act – MCL Goals (40 CFR 141.50 –141.51).

Action-Specific:

- Resource Conservation and Recovery Act Identification and Listing of Hazardous Waste Toxicity Characteristics (40 CFR 261.24).

b. State Relevant and Appropriate Requirements

Chemical-Specific:

- Maine Department of Human Services Rules Relating to Drinking Water (10-144E, Chapters 231-233)
- Maine Department of Human Services (Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants [10-144A Code of Maine Regulations Chapter 233, Appendix C])
- Maine Hazardous Waste Rules relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)
- 38 M.R.S.A. 465-C, Maine Classification of Waters Program – Groundwater and Classification of Maine Waters (§464 (4)(A)(1).

Action-Specific:

- Maine Surface Water Toxics Control Program (38 MRSA Sections 420, 464, 06-096 CMR-530)
- Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)
- Maine Solid Waste Management Rules – General Provisions (06-096 CMR 400)
- Maine Solid Waste Management Rules – Water Quality Monitoring, Leachate Monitoring, and Waste Characterization (06-096 CMR 405).

To Be Considered:

- EPA Risk Reference Doses (U.S. EPA 1999)
- EPA Human Health Assessment Group Cancer Slope Factors (U.S. EPA 1999)
- Guidance Manual for Conducting Human Health Risk Assessment at Hazardous Substance Sites (June 1994)
- Draft Interim MEGs (Bureau of Health, Maine Department of Human Services, 3 January 2000)
- MEDEP, Draft Implementation of Remedial Action Guidelines (May 1997).

3. Five-Year Review

In addition, a review would be completed at least once every 5 years, pursuant to the Federal Facility Agreement, to evaluate the progress and effectiveness of the remedial action and to ensure that human health and the environment continue to be protected. The five-year review process shall remain effective until institutional controls are no longer required at the site.

- Estimated Time for Design and Construction: 0
- Estimated Time for Operation: Up to 10 years
- Estimated Capital Cost: \$1,150
- Estimated Annual Operation and Maintenance (10-Year Present-Worth): \$366,520
- Estimated Total Cost (10-Year Present-Worth): \$367,670

A detailed summary of the cost estimate for this alternative is provided in Table 2-6.

The major cost drivers of this remedial alternative are the sampling, analysis, and reporting associated with long-term monitoring and institutional controls. A major source of uncertainty for this cost estimate is the duration of the Long-Term Monitoring Program.

COMPONENTS AND EXPECTED OUTCOME OF REMEDIAL ALTERNATIVES		
Component	Alternative 1 No Action	Alternative 2 Institutional Controls with Groundwater Monitoring
COMPONENTS OF REMEDIAL ALTERNATIVES		
Treatment Technologies	None	Institutional controls and monitoring
Containment Components	None	None
Institutional Controls	None	Land use restrictions to prevent contact with impacted media
Operations and Maintenance	None	Maintain monitoring network
Monitoring Requirements	None	Assess and track concentration trends, and plume location
Five-Year Review for 10 Years	Yes ^(a)	Yes
(a) Alternative 1 is based on a 20-year period.		

COMPONENTS AND EXPECTED OUTCOME OF REMEDIAL ALTERNATIVES		
Component	Alternative 1 No Action	Alternative 2 Institutional Controls with Groundwater Monitoring
EXPECTED OUTCOME OF REMEDIAL ALTERNATIVES		
Land Use Following Remediation	Industrial or residential	Industrial or residential
Duration of Remedy	Not applicable	Determined based on five-year reviews
Available Groundwater Use Following Remediation	None	None
EXPECTED COST		
10-Year Projected	\$18,000*	\$367,670
* Alternative 1 is based on a 20-year period.		

4. Summary of Remedial Alternatives

Component	Alternative 1 No Action	Alternative 2 Institutional Controls with Groundwater Monitoring
Treatment Technologies	None	Institutional controls with groundwater monitoring
Containment Compounds	None	None
Institutional Controls	None	Land use restrictions to prevent contact with impacted media
Monitoring Requirements	None	Assess degree of natural attenuation, track concentration trends, and plume location
Five-Year Review	Yes	Yes
EXPECTED OUTCOME OF REMEDIAL ALTERNATIVE		
Land Use Following Remediation		Industrial or residential
Duration of Remedy	Not applicable	Determined based on five-year review
Available Groundwater Use Following Remediation	None	None
Expected Projected 10-Year Cost	\$18,000*	\$367,670
* Alternative 1 expected project cost is for 20 years.		

X. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

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

A. Evaluation Criteria Used for Comparative Analysis

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

1. Threshold Criteria

The two threshold criteria described below must be met in order for the alternative to be eligible for selection in accordance with the National Contingency Plan:

- a. **Overall protection of human health and the environment** addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
- b. **Compliance with ARARs** addresses whether or not a remedy will meet all of the ARARs of other federal and state environmental laws and/or provide grounds for invoking a waiver.

2. Primary Balancing Criteria

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

1. **Long-term effectiveness and permanence** assesses alternatives for the long-term effectiveness and permanence they afford, along with the degree of certainty that they will prove successful.
2. **Reduction of toxicity, mobility, or volume through treatment** addresses the degree to which alternatives employ recycling or treatment that reduces toxicity, mobility, or volume, including how treatment is used to address the principal threats posed by the site.
3. **Short-term effectiveness** addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until cleanup goals are achieved.
4. **Implementability** addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
5. **Cost** includes estimated capital and operation and maintenance costs, as well as present-worth costs.

3. Modifying Criteria

1. **State acceptance** addresses the State's position and key concerns related to the preferred alternative and other alternatives, and the State's comments on ARARs or the proposed use of waivers.
2. **Community acceptance** addresses the public's general response to the alternatives described in the Proposed Plan and Remedial Investigation/Feasibility Study report.

Following the detailed analysis of each individual alternative, a comparative analysis, focusing on the relative performance of each alternative against the nine criteria, was conducted, as shown below:

Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls with Groundwater Monitoring
1. Overall protection of human health and the environment	Poor	Moderate
2. Compliance with ARARs	Moderate	Good
3. Long-term effectiveness and permanence	Moderate (no treatment)	Moderate (no treatment)
4. Reduction of toxicity, mobility, or volume through treatment	Poor (no treatment)	Poor (no treatment)
5. Short-term effectiveness	Moderate	Moderate
6. Implementability	Good	Good
7. Cost	\$18,000	\$367,670
8. State acceptance	Not acceptable	Acceptable
9. Community acceptance	Not acceptable	Acceptable
NOTE: Good indicates the alternative meets the intent of the criteria. Moderate indicates the alternative partially meets the intent of the criteria. Poor indicates the alternative does not meet the intent of the criteria.		

B. Summary of the Comparative Analysis

The section below presents the nine criteria and a brief narrative summary of the alternative and the strengths and weaknesses according to the detailed and comparative analysis. Only those alternatives which satisfied the first two threshold criteria were balanced and modified using the remaining seven criteria.

1. Overall Protection to Human Health and the Environment

This criterion addresses each alternative's ability to provide protection to human health and the environment and describes how risks are reduced, controlled, or eliminated through engineering or institutional controls.

- Alternative 1 provides limited protection to human health and the environment, as it does not prevent possible contact with contaminants.
- Alternative 2 best fulfills these criteria as it establishes institutional controls to limit human contact with impacted groundwater, thus reducing or eliminating potential for human health hazards. The alternative implements a program to monitor potential risks to human health or the environment which can occur over time, such as contaminant migration.

2. Compliance with Applicable or Relevant and Appropriate Requirements

- Alternative 1 does not comply with ARARs as hazardous chemical contaminants will remain onsite with no action.
- Alternative 2 complies with the above ARARs through the utilization of groundwater monitoring and comparing analytical results of State MEGs and Federal MCLs. Remediation goals include reducing contaminant levels to below federal and state standards and minimizing carcinogenic and non-carcinogenic compounds so that the risk factors are below federal requirements (cancer risk factor between 1×10^{-4} and 1×10^{-6} and hazard index less than 1.0) and state guidelines (cancer risk of less than 1×10^{-5} and hazard index less than 1.0).

3. Long-Term Effectiveness and Permanence

This criterion refers to the ability of a remedial action to protect human health and the environment over time.

- Alternative 1 would provide no long-term effectiveness.
- Alternative 2 would provide the greatest long-term effectiveness. Alternative 2 would provide institutional controls to limit exposure in the long-term and monitor the changes in chemical concentration and migration over time. This would effectively provide information as to the progress of remediation and provide a warning system should contaminants migrate to areas/media that could be harmful to human health or the environment.

4. Reduction in Toxicity, Mobility, or Volume through Treatment

This criterion addresses the performance of treatment technologies implemented by the remedial action.

- Alternatives 1 and 2 do not utilize an engineered treatment method.

5. Short-Term Effectiveness

Short-term effectiveness deals with the period of time needed to achieve remediation goals, including any deleterious impacts that may be caused by the construction and implementation period.

- Alternative 1 would have no short-term effectiveness.
- Alternative 2 provides the best short-term effectiveness. No adverse impacts will occur during the implementation of this remedy since there is no construction phase.

6. Implementability

Implementability addresses the technical and administrative feasibility of a remedial action.

- Alternative 1 provides the best implementability because no action will be instituted.
- Alternative 2 provides good implementability as it utilizes an institutional control process and monitoring will be conducted in accordance with the Long-Term Monitoring Program that will be established for the site. Additionally, Site 7 is located within an active Naval Installation.

7. Cost

This criterion estimates the monetary cost of the proposed alternatives over a 20-year period for Alternative 1 and a 10-year period for Alternative 2.

- Alternative 1 has the least cost (estimated at \$18,000)
- Alternative 2 is estimated to be \$367,670.

8. State Acceptance

This criterion includes the state/support agency preference, comments, and/or support of the selected remedial alternative.

- Alternative 1—Not acceptable
- Alternative 2—Acceptable, the state agrees with the Navy's selection.

9. Community Acceptance

This criterion includes the community preference, comments, and/or support of the selected remedial alternative:

- Alternative 1—Not acceptable
- Alternative 2—Acceptable.

XI. THE SELECTED REMEDY

Alternative 2 (Institutional Controls with Groundwater Monitoring) is the selected remedy for Site 7. This remedy is not comprehensive in that it does not utilize source control and/or management of migration. However, it should be noted that no identified source of contamination is present, and monitoring results to date do not show that any offsite migration of COCs above Federal MCLs or State MEGs exists. An expected outcome of the selected remedy is that Site 7 will no longer present an unacceptable risk to humans via dermal contact or ingestion with no changes to the current site use. If, in the future, the site use were to change

(i.e., to residential use), the Navy would issue a memo to the RAB for review and comment, and to EPA and MEDEP for review, comment, and finalization in accordance with the Federal Facility Agreement detailing the tasks to be completed to remove the shallow soil that has concentrations of PAHs and DDT. The removal would be conducted according to applicable federal and state laws and regulations and the Federal Facility Agreement. Once the soil has been removed from the site, the Navy would modify or revise the Site 7 ROD in accordance with applicable federal laws, regulations, and the Federal Facility Agreement and will modify the institutional controls instrument according to its terms to remove the institutional controls for soils at the site. The selected remedy will treat the low level threats associated with site contaminants. The amount of time necessary to achieve the goals consistent with groundwater use is estimated to be up to 10 years.

Beginning in Fiscal Year 2003, the Navy will evaluate different technologies, i.e., phytoremediation or groundwater neutralization, to optimize the groundwater remedy at Site 7 in order to accelerate the closure of this site. The Navy will report the findings to the RAB for review and comment, and to EPA and MEDEP for review and consultation.

A. Groundwater Cleanup Levels

Target cleanup concentrations are less than 5 µg/L for cadmium and 200 µg/L for manganese, and are equivalent to the Federal MCLs and State MEGs.

B. Soil Cleanup Levels

No cleanup levels for soil have been established for Site 7.

C. Description of Remedial Components

As part of the Remedial Action Plan, a Long-Term Monitoring Plan will be developed and implemented to monitor natural attenuation of cadmium and manganese in groundwater. The Long-Term Monitoring Plan will be submitted to the RAB for review and comment, and to EPA and MEDEP for review, comment, and finalization in accordance with the Federal Facility Agreement. The Navy will continue the monitoring program in accordance with the Long-Term Monitoring Plan until it is determined that the program is no longer necessary. The Navy will make this determination with the review and comment of the RAB and with the review and comment of EPA and MEDEP in accordance with the Federal Facility Agreement. The Navy and EPA have concluded that it is impracticable to remove and/or treat the COCs in a cost effective manner, beyond the remedial actions undertaken to date at Site 7. Thus, the selected remedial action does not satisfy the statutory preference for treatment that reduces toxicity, mobility, or volume as a principal element.

1. Long-Term Monitoring

Long-term monitoring will be conducted. A Long-Term Monitoring Plan will be developed and implemented by the end of 2003. The final cleanup levels for groundwater are below Federal MCLs and State MEGs. Groundwater concentrations will be compared to these criteria and the selected remedy will be continued until they are consistently achieved.

The monitoring program will be detailed in the Long-Term Monitoring Plan, and will include the following:

- Assessing whether contamination is migrating offsite
- Assessing contaminant trends of cadmium and manganese to determine the effectiveness of the natural attenuation processes
- Assessing variations in groundwater flow patterns
- Monitoring structural integrity of the groundwater monitoring wells.

The Long-Term Monitoring Plan may be revised based on the sample results with the review and comment of the RAB, and review and comment of the EPA and MEDEP in accordance with the Federal Facility Agreement.

2. Institutional Controls

- As part of the remedial action plan for the site, the Navy will implement institutional controls to prevent the use of and contact with site groundwater and soil at Site 7. These institutional controls will consist of groundwater and soil use restrictions per the current NAS Brunswick Operations Instructions in effect. The Operations Instructions are used to identify and screen environmental areas for inappropriate construction or development activities. The Navy will generate and provide a draft version of these groundwater and soil use restrictions to the RAB for review and comment, and to the EPA and MEDEP for review, comment, and finalization in accordance with the Federal Facility Agreement within 15 months after signature of this ROD. When finalized, the groundwater and soil use restrictions will be incorporated into the Operations Instructions and placed in the Administrative Record for Site 7. The Operations Instructions will not be modified in any way that affects these use restrictions or the Site 7 remedy. The institutional controls will be inspected, noted, verified, and reported during the Long-Term Monitoring Program to be implemented at Site 7 in accordance with the Federal Facility Agreement. The monitoring and reporting of institutional controls will be described in the Site 7 Long-Term Monitoring Plan that will be prepared and finalized pursuant to the Federal Facility Agreement as part of this Remedial Action Plan for this site within 15 months after the signature of this ROD.

The radius of the proposed institutional control is 225 ft that will include the locations of the Remedial Investigation test pits where PAHs and DDT were detected in the site soils (0-2 ft bgs). If, in the future, the Navy decides to change the site use to a residential type of use, it will submit a memo to EPA, MEDEP, and the RAB for review and comment detailing the soil removal actions that it will take to remove the soil containing PAHs and DDT in accordance with applicable laws and regulations and the Federal Facility Agreement. Once the soil has been removed from the site, the Navy will revise or modify the Site 7 ROD in accordance with applicable laws and regulations and will ensure that the institutional control instrument according to its terms will provide for the removal of the institutional controls for soils at the site.

- Should the Navy transfer or lease any real property affected by Site 7, whether or not as a result of base closure, the Navy will notify EPA and MEDEP in accordance with the Federal Facility Agreement and the RAB at least 60 days prior to the transfer or lease. In consultation with the EPA and MEDEP, the Navy will include appropriate provisions (i.e., restrictive covenants or other use restrictions such as institutional controls) in all documents that evidence the transfer or lease to prevent the use of and contact with site groundwater and soil. If the property is transferred, or the lease allows capital improvements, a technical evaluation of the effectiveness and appropriateness of the remedy will be undertaken considering long-term monitoring results to date, the proposed land use, and the fact that the Navy may no longer actively own or operate the property.

3. Five-Year Review

A review will be completed every 5 years, pursuant to the Federal Facility Agreement, to evaluate the progress and effectiveness of the remedial action and to ensure that human health and the environment continue to be protected. Data collected during the Long-Term Monitoring Program will be reviewed, and recommendations for modifications will be made as part of each monitoring event report and in the five-year reviews. The five-year review process shall remain effective until institutional controls are no longer required at the site.

4. Applicable or Relevant and Appropriate Requirements

Appendix B includes a detailed analysis of the ARARs that are listed below.

a. Federal Relevant and Appropriate Requirements

Chemical-Specific:

- Safe Drinking Water Act – MCLs (40 CFR 141.11–141.16) (U.S. EPA 1999)
- Safe Drinking Water Act – MCL Goals (40 CFR 141.50 –141.51).

Action-Specific:

- Resource Conservation and Recovery Act Identification and Listing of Hazardous Waste Toxicity Characteristics (40 CFR 261.24).

b. State Relevant and Appropriate Requirements

Chemical-Specific:

- Maine Department of Human Services Rules Relating to Drinking Water (10-144E, Chapters 231-233)
- Maine Department of Human Services Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144A Code of Maine Regulations Chapter 233, Appendix C)
- Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)
- 38 M.R.S.A. 465-C, Maine Classification of Waters Program – Groundwater and Classification of Maine Waters (§464 (4)(A)(1)).

Action-Specific:

- Maine Surface Water Toxics Control Program (38 MRSA Sections 420, 464, 06-096 CMR-530)
- Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)
- Maine Solid Waste Management Rules – General Provisions (06-096 CMR 400)
- Maine Solid Waste Management Rules – Water Quality Monitoring, Leachate Monitoring, and Waste Characterization (06-096 CMR 405).

To Be Considered:

- EPA Risk Reference Doses (U.S. EPA 1999)
- EPA Human Health Assessment Group Cancer Slope Factors (U.S. EPA 1999)

- Guidance Manual for Conducting Human Health Risk Assessment at Hazardous Substance Sites (June 1994)
- Draft Interim MEGs (Bureau of Health, Maine Department of Human Services, 3 January 2000)
- MEDEP, Draft Implementation of Remedial Action Guidelines (June 1997).

5. Outcomes

After completion of the remedial action, groundwater at Site 7 will no longer present a hazard to human health or the environment if it is used as a drinking water source.

During operation of the remedy, human health and the environment will be protected from unacceptable risks due to contact with cadmium and manganese in the groundwater and with the site soils.

If excavations are required, proper hazardous material handling will be in accordance with OSHA, Navy procedures, the Base Operations Instructions, and ARARs with review and consultation by EPA and MEDEP.

XII. STATUTORY DETERMINATIONS

The remedial action selected for implementation at Site 7 is consistent with CERCLA and, to the extent practicable, the National Contingency Plan. The selected remedy is protective of human health and the environment, will comply with ARARs, and is cost effective. In addition, the selected remedy utilizes permanent solutions and alternate treatment technologies or resource recovery technologies to the maximum extent practicable.

Beginning in Fiscal Year 2003, the Navy will evaluate different technologies, i.e., phytoremediation or groundwater neutralization, to optimize the remedy at Site 7 to accelerate the closure of this site. The Navy will report the findings to the RAB for review and comment and to EPA and MEDEP for review and consultation.

A. The Selected Remedy is Protective of Human Health and the Environment

The remedy at this site will adequately protect human health and the environment by eliminating, reducing, or controlling exposures to human and environmental receptors through natural chemical processes and institutional controls, and long-term monitoring.

The selected remedy will reduce potential human health risk levels to within EPA's acceptable risk range of from 10^{-4} to 10^{-6} for incremental carcinogenic risk and to below the hazard index of 1 for non-carcinogenic risk. It will reduce potential human health risk levels to protective ARARs levels, i.e., the remedy will comply with ARARs and To Be Considered criteria. Implementation of the selected remedy will not pose any unacceptable short-term risk or cause any cross-media impacts.

B. The Selected Remedy Complies with Applicable or Relevant and Appropriate Requirements

The selected remedy will comply with all federal and any more stringent state ARARs that pertain to the site. In particular, this remedy will comply with the following federal ARARs:

1. Safe Drinking Water Act MCLs (40 CFR 141.11-141.16) (U.S. EPA 1999)
2. Safe Drinking Water Act MCL Goals (40 CFR 141.50-141.51)
3. Resource Conservation and Recovery Act Identification and Listing of Hazardous Wastes; Toxicity Characteristics (40 CFR 261.24).

This remedy will also comply with the following State ARARs:

1. Maine Department of Human Services Rules Relating to Drinking Water (10-144E Chapters 231-233)
2. Maine Department of Human Services Rules Relating to Testing of Private Drinking Water Systems or Potential Hazardous Contaminants (10-144E Chapters 232-233, Appendix B)
3. Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Construction, Altering, and Operating Certain Types of Hazardous Waste Units (06-096-CMR-854)
4. Maine Surface Water Toxics Control Program (38 MRSA Sections 420, 464; 06-096 CMR 530)
5. Maine Solid Waste Management Rules – General Provisions (06-096 CMR 400)
6. Maine Solid Waste Management Rules – Water Quality Monitoring, Leachate Monitoring, and Waste Characterization (06-096 CMR 405)
7. Guidance Manual for Conducting Human Health Risk Assessment at Hazardous Substance Sites (June 1994)
8. 38 M.R.S.A. 465-C, Maine Classification of Waters Program – Groundwater and Classification of Maine Waters (§464 (4)(A)(1).

The Navy would use EPA Risk Reference Doses (U.S. EPA 1999) and EPA Human Health Assessment Group Cancer Slope Factors (U.S. EPA 1999), and Maine Draft Interim MEGs (MEDHS 2000) and Draft Implementation of Remedial Action Guidelines (MEDEP 1997) as To Be Considered criteria for characterizing risk from inorganics in groundwater.

C. The Selected Remedial Action is Cost Effective

The selected remedy is cost effective because the remedy costs are proportional to its overall effectiveness (40 CFR 300.430[f][1][ii][D]). This determination was made by evaluating the overall effectiveness of those alternatives that satisfied the threshold criteria (i.e., that are protective of human health and the environment and comply with all federal and any more stringent ARARs, or as appropriate, waive ARARs). Overall effectiveness was evaluated by assessing 3 of 5 balancing criteria; long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness, in combination. The overall effectiveness of each alternative was compared to the alternative's cost to determine cost effectiveness. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs and hence represents a reasonable value for the money to be spent.

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

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

The selected remedial action does not utilize permanent solutions and alternative treatment or resource recovery technologies because they are not the most practicable for this site. Contamination at Site 7 does not pose an immediate threat to human health that would require active remediation. The institutional controls that will be implemented as part of the remedy rely on natural chemical processes to dilute and degrade chemical contaminants over time. This remedy, when compared to the active remediation alternative, had the highest balance of trade-offs.

Beginning in Fiscal Year 2003, the Navy will evaluate different technologies, i.e., phytoremediation or groundwater neutralization, to optimize the groundwater remedy at Site 7 to accelerate the closure of this site. The Navy will report the findings to the RAB for review and comment and to EPA and MEDEP for review and consultation.

E. The Selected Remedy Does Not Satisfy the Preference for Treatment which Permanently and Significantly Reduces the Toxicity, Mobility, or Volume of the Hazardous Substances as a Principal Element

The Navy and EPA have concluded that it is impracticable to remove and/or treat the COCs in a cost effective manner, beyond the remedial actions undertaken to date at Site 7. Thus, the selected remedial action does not satisfy the statutory preference for treatment that reduces toxicity, mobility, or volume as a principal element. However, as groundwater at Site 7 is not used as drinking water and there is no significant potential groundwater source, potential danger to human health or the environment is not immediate. Given the low concentrations and recent source area removal, it is expected that the low levels of cadmium and manganese will naturally attenuate and that monitoring will not be a long-term requirement.

F. Five-Year Review Requirements

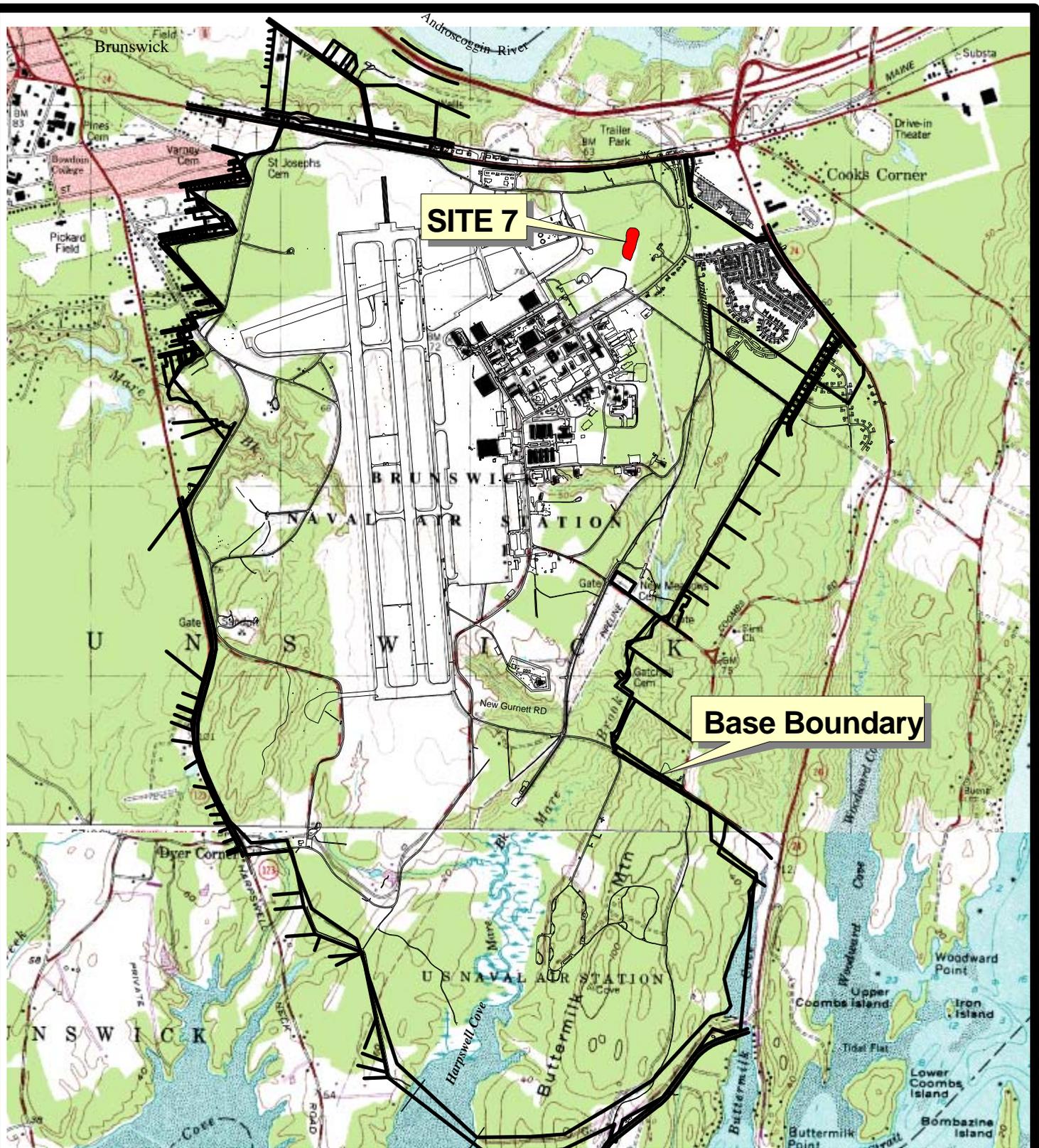
This remedy will result in hazardous substances remaining onsite above levels that allow for unlimited use and unrestricted exposure. A review will be conducted within 5 years after initiation of the remedial action and at least every 5 years thereafter to ensure that the remedy continues to provide adequate protection of human health and the environment. The five-year review process shall remain effective until institutional controls are no longer required at the site.

XIII. DOCUMENTATION OF NO SIGNIFICANT CHANGES

The Navy presented a Proposed Plan of institutional controls with groundwater monitoring for remediation of Site 7 on 9 April 2002. EPA reviewed all written and verbal comments submitted during the public comment period. It was determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary.

XIV. STATE ROLE

MEDEP has reviewed the various alternatives and has indicated its support for the selected remedy. The State has also reviewed the Remedial Investigation, Risk Assessment, and Feasibility Study to determine if the selected remedy is in compliance with ARAR state environmental laws and regulations. MEDEP concurs with the selected remedy for Site 7. A copy of the declaration of concurrence by MEDEP is provided as Appendix C.



2000 0 2000 4000 Feet



SOURCE MAPS: USGS ORRS ISLAND (1978) AND BRUNSWICK (1980) 7.5 MINUTE QUADRANGLES.



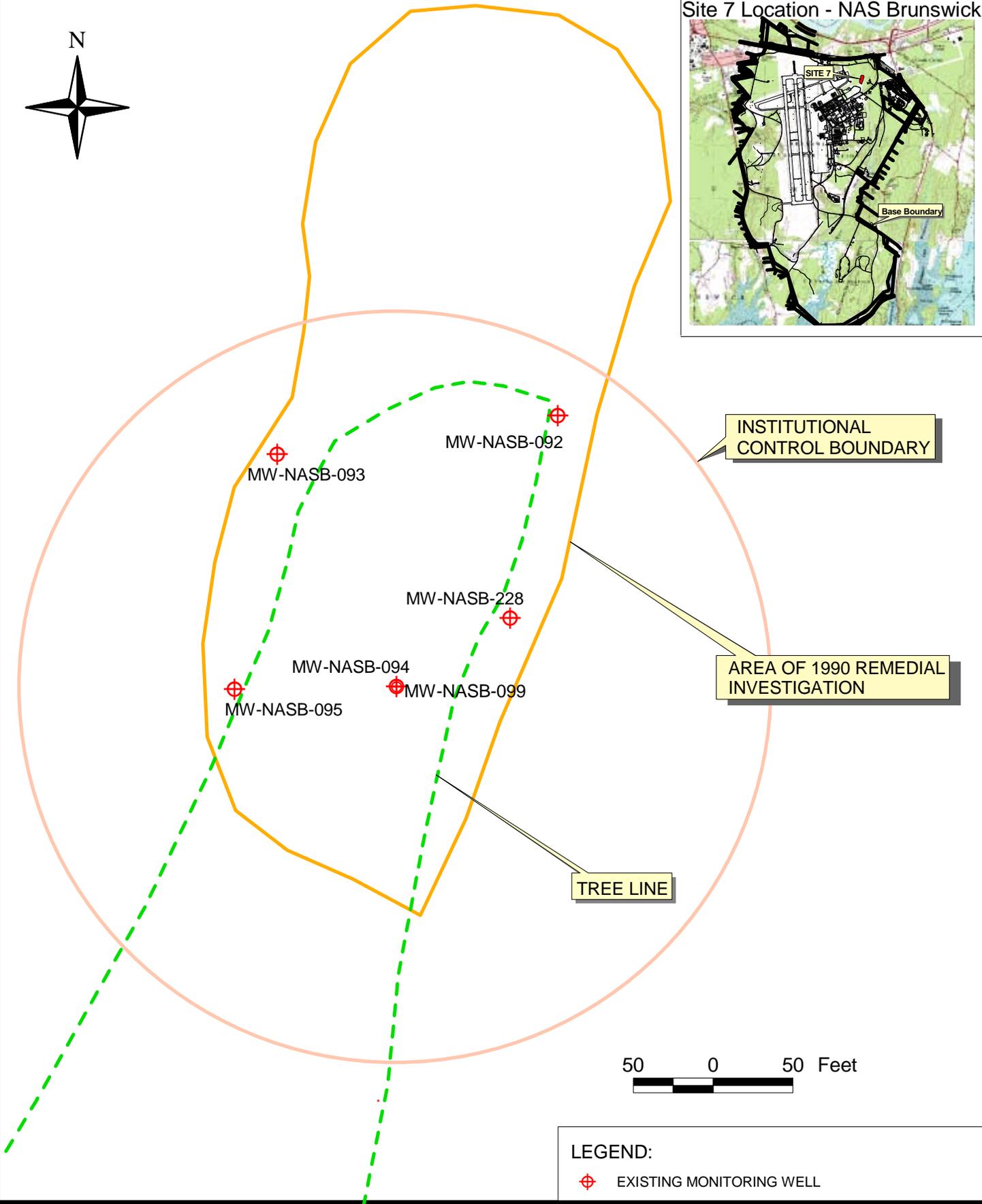
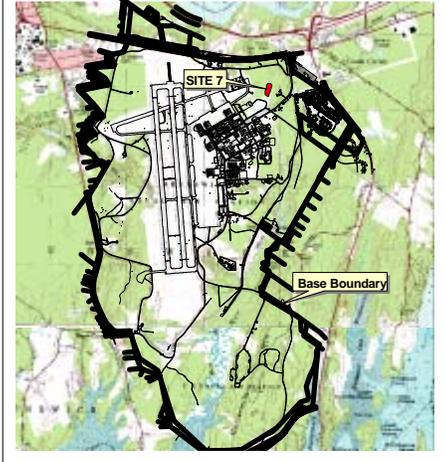
EA ENGINEERING,
SCIENCE, AND
TECHNOLOGY

SITE 7
NAVAL AIR STATION
BRUNSWICK, MAINE

FIGURE 2-1
SITE LOCATION MAP

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT No	FILE No
ACE	JG	JG	ACE	AS SHOWN	SEPT 2002	29600.82	I:\NASB_GIS \NAVY.APR

Site 7 Location - NAS Brunswick



LEGEND:
 EXISTING MONITORING WELL

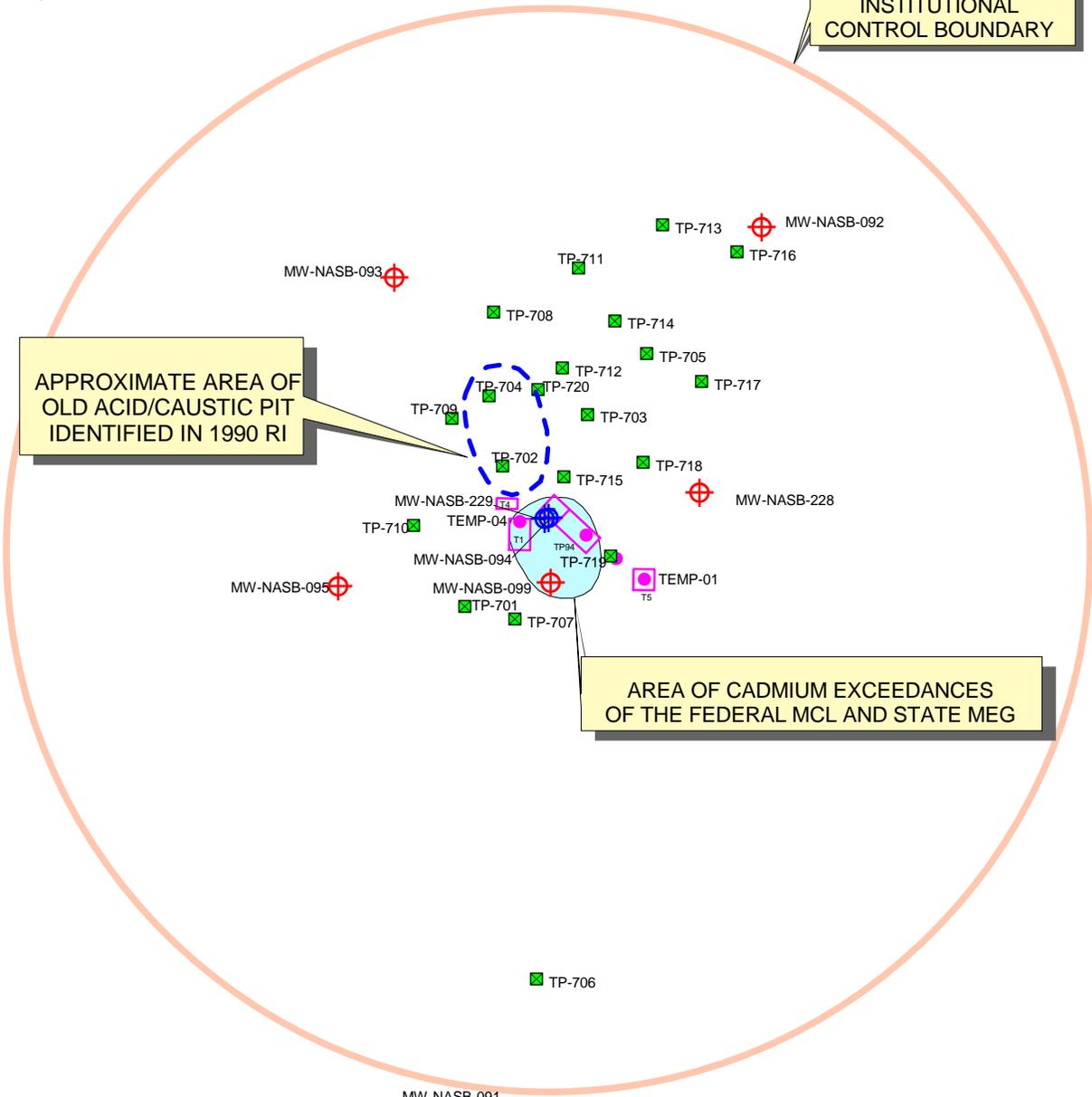
EA ENGINEERING, SCIENCE, AND TECHNOLOGY		SITE 7 NAVAL AIR STATION BRUNSWICK, MAINE				FIGURE 2-2 SITE PLAN	
PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT No	FILE No
ACE	JG	JG	ACE	AS SHOWN	SEPT 2002	29600.82	I:\NASB_GIS \NAVY.APR



INSTITUTIONAL CONTROL BOUNDARY

APPROXIMATE AREA OF OLD ACID/CAUSTIC PIT IDENTIFIED IN 1990 RI

AREA OF CADMIUM EXCEEDANCES OF THE FEDERAL MCL AND STATE MEG



LEGEND:

- EXISTING MONITORING WELL
- FORMER MONITORING WELL
- FORMER TEMPORARY SAMPLING POINT (JUNE 2001)
- TEST PIT EXCAVATION (JULY 2001)
- REMEDIAL INVESTIGATION TEST PIT (1988-1989)

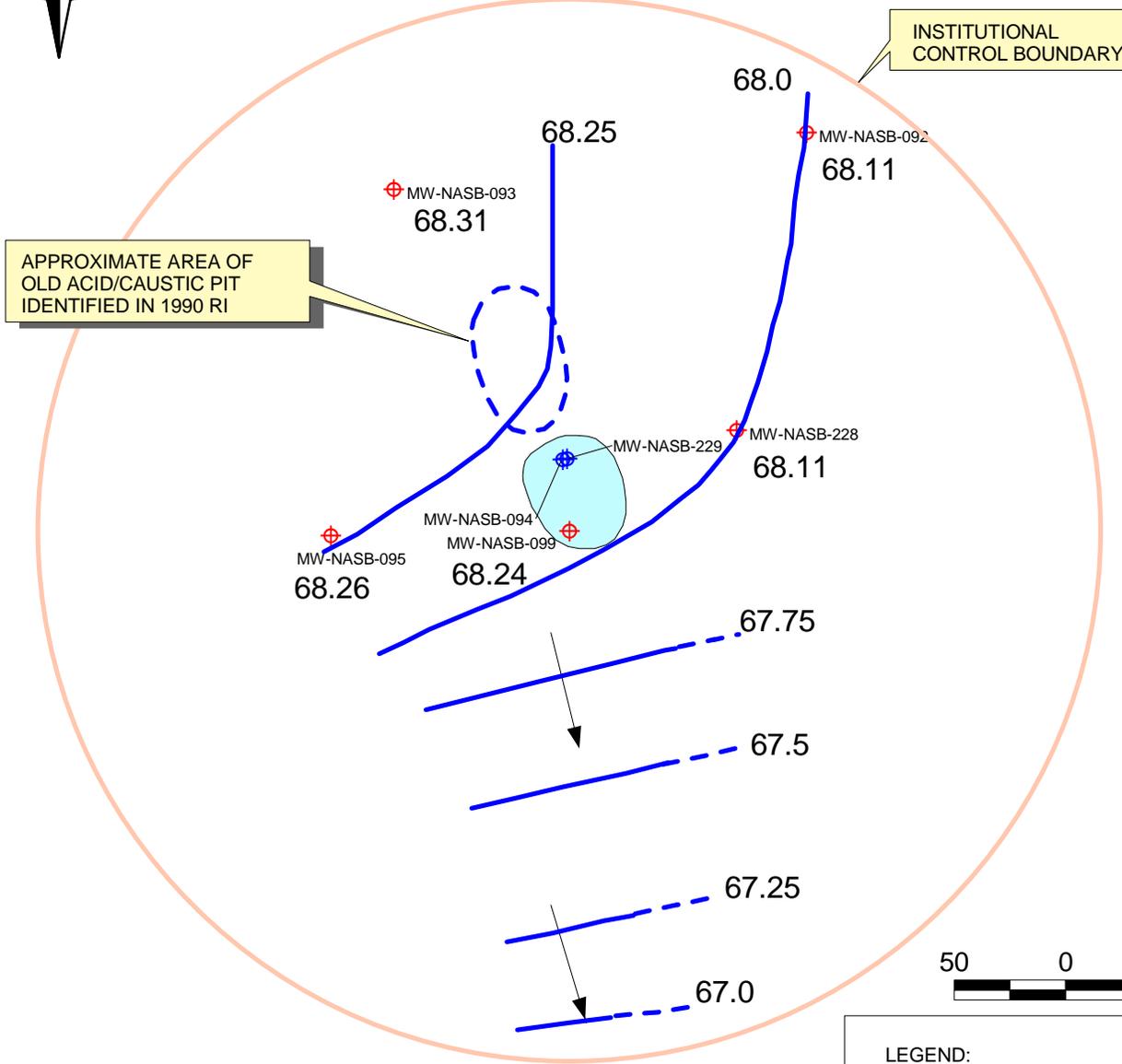


EA ENGINEERING,
SCIENCE, AND
TECHNOLOGY

SITE 7
NAVAL AIR STATION
BRUNSWICK, MAINE

FIGURE 2-3
DETAILED SITE PLAN

PROJECT MGR ACE	DESIGNED BY JG	DRAWN BY JG	CHECKED BY ACE	SCALE AS SHOWN	DATE SEPT 2002	PROJECT No 29600.82	FILE No I:\NASB_GIS \NAVY.APR
--------------------	-------------------	----------------	-------------------	-------------------	-------------------	------------------------	-------------------------------------



APPROXIMATE AREA OF OLD ACID/CAUSTIC PIT IDENTIFIED IN 1990 RI

INSTITUTIONAL CONTROL BOUNDARY

50 0 50 Feet

NOTES:
 ND = No Data. Monitoring well MN-NASB-094 and MW-NASB-229 were destroyed during the July 2001 test pit excavation activities.
 (a) = Monitoring well MW-NASB-091 is screened in the clay unit underlying the shallow sand, and is not considered to be representative of shallow ground-water conditions. The ground-water elevation for MW-NASB-091 was not used to interpret shallow ground-water contours, and is provided for information purposes only.

LEGEND:
 EXISTING MONITORING WELL
 66.63 Elevations
 FORMER MONITORING WELL
 66.63 Elevations
 INTERPRETED DIRECTION OF GROUNDWATER FLOW
 INTERPRETED POTENTIOMETRIC SURFACE
 (Dashed Where Inferred)

EA ENGINEERING, SCIENCE, AND TECHNOLOGY		SITE 7 NAVAL AIR STATION BRUNSWICK, MAINE			FIGURE 2-4 GROUNDWATER CONTOUR MAP		
PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT No	FILE No
ACE	JG	JG	ACE	AS SHOWN	SEPT 2002	29600.82	I:\NASB_GIS \NAVY.APR

TABLE 2-1 SUMMARY OF SITE INVESTIGATIONS AT SITE 7

Remedial Investigation (1988-1989)	Supplemental Remedial Investigation (1990)	Ground-Water Monitoring (1998)	Ground-Water Monitoring (1999)	Supplemental Remedial Investigation (2000-2001)	Ground-Water Monitoring (2001)	Conclusions
SOIL						
VOCs –Low concentrations, toluene identified as a common laboratory artifact Pesticides –Low concentrations, DDD, DDE, and DDT consistent with basewide levels PAH –Moderate concentrations, consistent with urban soils Inorganics –Low concentrations, consistent with background levels	VOCs –None detected Pesticides –Low concentrations near Building 201 PAH –Low concentrations, near Building 201 Inorganics –Low concentrations, consistent with background levels	Not sampled	Not sampled	VOCs –Not sampled based on previous sampling data Inorganics –Low concentrations, consistent with background levels	Not sampled	Not recommended for further remediation or monitoring activities based on past sample data
GROUND WATER						
VOCs – Inorganics –Low concentrations, consistent with site background levels	VOCs –Not sampled Inorganics –Low concentrations, consistent with site background levels	VOCs –Not sampled Inorganics –Low to moderate concentrations, cadmium and manganese in excess of MEG and MCL	VOCs –Not sampled Inorganics –Low to moderate concentrations, cadmium and manganese in excess of MEG and MCL	VOCs –Not sampled Inorganics –Low to moderate concentrations, cadmium in excess of MEG and MCL	VOCs –Not sampled Inorganics –Low to moderate concentrations, cadmium in excess of MEG and MCL	Cadmium concentrations are generally stabilizing. There is no evidence of contaminant migration offsite.
SURFACE WATER						
Not sampled – no surface water pathway is located on or near to Site 7.	Not sampled	Not sampled	Not sampled	Not sampled	Not sampled	
STREAM SEDIMENT						
Not sampled – no streams are located on or near to Site 7.	Not sampled	Not sampled	Not sampled	Not sampled	Not sampled	
LEACHATE SEEP						
Not sampled – no leachate seeps have been observed at Site 7.	Not sampled	Not sampled	Not sampled	Not sampled	Not sampled	
NOTE: VOC = Volatile organic compounds. DDD = Dichlorodiphenyldichloroethane DDE = Dichlorodiphenyldichloroethylene. DDT = Dichlorodiphenyltrichloroethane. PAH = Polycyclic aromatic hydrocarbons. MEG = Maximum Exposure Guideline. MCL = Maximum Contaminant Level. Low concentrations = No evidence of release. Moderate Concentrations = Concentrations above state or federal criteria. Continued study warranted.						

TABLE 2-2 SUMMARY OF CONTAMINANTS OF CONCERN AND MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATIONS

Scenario Timeframe: Current Worst-Case Scenario						
Medium: Surface Soil						
Exposure Medium: Surface Soil						
Exposure Point	Contaminant of Concern	Concentration Detected (ppm)		Frequency of Detection	Exposure Point Concentration (ppm)	Statistical Measure
		Min	Max			
Surface soil	Total Carcinogen PAHs ^(a)	0.354	10.38	4/12 (b)	10.38	Max
Surface soil	Total Non-Carcinogen PAHs	0.474	1.67	4/12	1.67	Max
Surface soil	4,4-DDE	0.014	0.056	5/12	0.056	Max
Surface soil	4,4-DDD	0.067	0.024	4/12	0.024	Max
Surface soil	4,4-DDT	0.053	0.34	7/12	0.34	Max
Surface soil	Aroclor-1254	<0.026	0.31	2/12	0.31	Max
Surface soil	Arsenic	2.33	9.9	6/12	9.9	Max
Surface soil	Cadmium	0.85	8	2/12	8	Max
Surface soil	Lead	53.4	104.8	12/12	104.8	Max
Surface soil	Manganese	124.03	267	12/12	267	Max
Surface soil	Mercury	0.10	1	2/12	1	Max
Scenario Timeframe: Current Worst-Case Scenario						
Medium: Ground Water						
Exposure Medium: Ground Water						
Ground Water	Cadmium	0.00257	0.052	8/17	0.052	Max
Ground Water	Manganese	0.25	0.950	9/17	0.950	Max
<p>(a) Total carcinogenic PAHs include benz(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and dibenz(a,h)anthracene. In the Human Health Risk Assessment conducted as part of the Site 7 Remedial Investigation, risk estimates were calculated for carcinogenic PAHs as a group, and will be referred to as such in subsequent tables.</p> <p>(b) Represents the average number of detections of the 7 carcinogenic PAH compounds.</p> <p>NOTE: Min = Minimum concentration (NOTE: In the 1990 Human Health Risk Assessment and the Technical Memorandum, the average concentration was used to estimate the most probable risk). Max = Maximum concentration used to generate worst-case scenario risk. PAH = Polycyclic aromatic hydrocarbon. NA = Not available.</p> <p>SOURCE: Remedial Investigation (E.C. Jordan Co. 1990); Summary Report of the Ground-Water and Soil Investigation (EA 2002a); Ground-Water Letter Report (EA 2002b), and Feasibility Study (E.C. Jordan Co. 1992).</p>						

TABLE 2-3 CANCER TOXICITY DATA SUMMARY

Contaminant of Concern	Oral Cancer Slope Factor	Absorption Efficiency (for Dermal)	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/Cancer Guideline Description	Source	
Ingestion – Dermal Contact							
Carcinogenic PAH	0.50	0.20	0.50	(mg/kg)/day	A	IRIS 1999	
Arsenic	0.25	0.10	0.25	(mg/kg)/day	A	IRIS 1999	
4,4-DDE	0.50	0.20	0.50	(mg/kg)/day	A	IRIS 1999	
4,4-DDD	0.50	0.20	0.50	(mg/kg)/day	A	IRIS 1999	
4,4-DDT	0.50	0.20	0.50	(mg/kg)/day	A	IRIS 1999	
Aroclor-1254	0.50	0.20	0.50	(mg/kg)/day	A	IRIS 1999	
Contaminant of Concern	Unit Risk	Units	Adjustment	Inhalation Cancer Slope Factor	Units	Weight of Evidence/Cancer Guideline Description	Source
Inhalation							
Not applicable at Site 7							
Contaminant of Concern	Cancer Slope or Conversion Factor	Exposure Route	Units	Weight of Evidence/Cancer Guideline Description	Source		
External (Radiation)^(a)							
Not applicable at Site 7							
(a) Only to be completed if there are radionuclide contaminants of concern.							
NOTE: PAH = Polycyclic aromatic hydrocarbons. IRIS = Integrated Risk Information System; EPA human data are available (1999).							
EPA Group: A = Human carcinogen.							
Source: Remedial Investigation (E.C. Jordan Co. 1990) and Feasibility Study (E.C. Jordan Co. 1992).							

TABLE 2-4 RISK CHARACTERIZATION SUMMARY – CARCINOGENS

Medium	Exposure Medium	Exposure Point	Contaminant of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Scenario Timeframe: Current							
Receptor Population: Resident							
Receptor Age: Child^(a)							
Surface	Surface	Soil Direct	Carcinogenic PAH	1.3×10^{-6}	NA	5.6×10^{-6}	6.9×10^{-6}
Soil	Soil	Contact					
Surface Soil Risk (Carcinogenic PAH) Total							6.9×10^{-6}
Scenario Timeframe: Current							
Receptor Population: Resident							
Receptor Age: Adult^(b)							
Ground	Ground	NA	NA	NA	NA	NA	NA
Water	Water						
Ground-Water Risk Total							NA
(a) Child: Most likely target age group.							
(b) Adult: Risks calculated for adults only.							
NOTE: PAH = Polycyclic aromatic hydrocarbons.							
NA = Route of exposure is not applicable to this medium.							
Source: Remedial Investigation (E.C. Jordan Co. 1990).							

TABLE 2-5 NON-CANCER TOXICITY DATA SUMMARY FOR GROUNDWATER

Contaminant of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Absorption Efficiency (for Dermal)	Adjusted RfD (for Dermal)	Adjusted Dermal RfD Units	Primary Target Organ	Combined Uncertainty/ Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ
Ingestion – Dermal Contact										
Cadmium	Chronic	0.005	mg/kg/day	5%	0.0005	mg/kg/day	Kidneys	10	IRIS	1985
Manganese	Chronic	0.14	mg/kg/day	NA	NA	NA	Central nervous system	3	IRIS	1995

Contaminant of Concern	Chronic/ Subchronic	Value Inhalation RfC	Inhalation RfC Units	Adjusted Inhalation RfD	Adjusted Inhalation RfD Units	Primary Target Organ	Combined Uncertainty/ Modifying Factors	Sources of RfC:RfD: Target Organ	Dates
Inhalation									
Not applicable at Site 7									
NOTE: RfD = Reference dose. IRIS = Integrated Risk Information System. NA = Not an applicable route of exposure at Site 7. RfC = Reference concentration.									

TABLE 2-6 CAPITAL AND OPERATION AND MAINTENANCE COST ESTIMATES FOR SELECTED ALTERNATIVES

Item No.	Cost Categories and Items	Descriptions	Unit Cost	Alternative 1 No Action		Alternative 2 Institutional Controls and Long-Term Monitoring		Quantity	Total Cost
				Quantity	Total Cost	Quantity	Total Cost		
A. CAPITAL COSTS									
1	Land Use Restriction								
1.1	Site-specific use plan	Govern activities at site	\$500	0	\$0	1	\$500		\$0
1.2	Land use restriction	Declaration of environmental restriction to prevent groundwater and soil use	\$500	0	\$0	1	\$500		\$0
		<i>Subtotal</i>			\$0		\$1,000		\$0
1.3	Contingency		15%	0	\$0	Plus 15%	\$150		\$0
		Line item total			\$0		\$1,150		\$0
B. OPERATION AND MAINTENANCE (O&M) COSTS									
1	Land Use Restriction								
1.1	Institutional controls	Govern activities at site	\$500	0	\$0	1	\$500		\$0
		Annual O&M Costs			\$0		\$500		\$0
2	Bi-Annual Groundwater Monitoring								
2.1	Sample collection - labor and equipment costs	Sample 7 existing wells twice a year	\$385	0	\$0	14	\$5,390		\$0
2.2	Analytical costs	Analyses of samples for contaminants of concern							
2.2.1	Inorganic analysis	Semi-annual sampling	\$95	0	\$0	14	\$1,330		\$0
2.3	Reporting	Semi-annual report to regulators and Navy	\$3,500	0	\$0	2	\$7,000		\$0
2.4	Disposal	Gloves, tubing, PPE, etc.	\$200	0	\$0	2	\$400		\$0
2.5	Sampling preparation, mobilization, and demobilization	For each sampling event	\$1,000	0	\$0	2	\$2,000		\$0
2.6	System repair and replacement	Upkeep of monitoring wells and sampling equipment	10%	0	\$0	Plus 5%	\$806		\$0
		Annual O&M Costs			\$0		\$16,926		\$0
3	CERCLA Mandated Five-Year Review Meeting								
3.1	Meetings	Meet once every 5 years for 20 years	\$2,000	4	\$8,000	4	\$8,000		\$0
3.2	Travel	Travel to the meeting site	\$1,000	4	\$4,000	4	\$4,000		\$0
3.3	Reports	One report every 5 years	\$1,500	4	\$6,000	4	\$6,000		\$0
		Line Item Total			\$18,000		\$18,000		\$0
		Five-Year Review Costs			\$18,000		\$18,000		\$0
		Total Annual O&M Costs			\$18,000		\$35,426		\$0
C. COST SUMMARY									
	Capital Costs				\$0		\$1,150		\$0
	Present Worth of Annual Operation and Maintenance Costs ^(a)				\$18,000		\$366,520		\$0
	20-Year Present Worth Costs				\$18,000		\$367,670		\$0
(a) Capital costs are not discounted because the construction work will be performed in the first year. O&M costs are reported as present worth estimates given a 5 percent rate and 2 percent inflation rate for a 20-year period.									

REFERENCES

- EA Engineering, Science, and Technology. 2002a. Summary Report of the Ground-Water and Soil Investigations at Site 7, Naval Air Station, Brunswick, Maine. March.
- EA. 2002b. Letter Report. Site 7 – Ground-Water Sampling Results, Naval Air Station, Brunswick, Maine. March.
- EA. 2002c. Proposed Remedial Action Plan for Site 7, Naval Air Station, Brunswick, Maine. March.
- E.C. Jordan Company. 1985. Pollution Abatement Confirmation Study NAS Brunswick, Portland, Maine. July.
- E.C. Jordan Company. 1988. Community Relations Plan for Naval Air Station, Brunswick National Priority List Sites. September.
- E.C. Jordan Company. 1990. Draft Final Remedial Investigation Report. Volume 1, Volume 2 (Appendixes A through J), Volume 3 (Appendixes K through P), and Volume 4 (Appendix Q – Risk Assessment), NAS Brunswick. Portland, Maine. August.
- E.C. Jordan Company. 1991. Draft Final Supplemental Investigation Report NAS Brunswick, Portland, Maine. August.
- E.C. Jordan Company. 1992. Feasibility Study Sites 2, 4, 7, 9, 11, and 13 NAS Brunswick. Portland, Maine. March.
- Foster Wheeler Environmental Corporation. 2002. Draft Completion Report for Stockpiled Soil Removal, Site 7. July.
- Maine Department of Human Services (MEDHS). 2000. Revised Maximum Exposure Guidelines for Chemical Contaminants in Drinking Water. January.
- Maine Department of Environmental Protection (MEDEP). 1997. Draft Implementation of Remedial Action Guidelines. May.
- R.F. Weston Inc. 1983. Initial Assessment Study of Naval Air Station, Brunswick Maine. Westchester, Pennsylvania. June.
- U.S. Environmental Protection Agency (U.S. EPA). 1999. Integrated Risk Information System On-Line Database Maintained in Toxicology Data Network by the National Library of Medicine Bethesda, Maryland. EPA Environmental Criteria and Assessment Office, Cincinnati.

Appendix A

Responsiveness Summary and Written Comment Letters on the Proposed Remedial Action Plan and Record of Decision and Proposed Remedial Action Plan Meeting Minutes

A.1 Proposed Remedial Action Plan

- C. Lepage (BASCE) – 30 April 2002
- C. Sait (MEDEP) – 25 February 2002
- C. Sait (MEDEP) – 28 March 2002
- M. Barry (U.S. EPA) – 28 February 2002
- M. Barry (U.S. EPA) – 27 March 2002

A.2 Record of Decision

- C. Lepage (BASCE)
- D. Messier (MEDEP)
- M. Barry (U.S. EPA)

A.3 Meeting Minutes from 9 April 2002 Proposed Remedial Action Plan Public Meeting

Appendix A.1

Proposed Remedial Action Plan

- C. Lepage (BASCE) – 30 April 2002
- C. Sait (MEDEP) – 25 February 2002
- C. Sait (MEDEP) – 28 March 2002
- M. Barry (U.S. EPA) – 28 February 2002
- M. Barry (U.S. EPA) – 27 March 2002

**RESPONSE TO COMMENTS FROM THE
BRUNSWICK AREA CITIZENS FOR A SAFE ENVIRONMENT
ON THE PROPOSED REMEDIAL ACTION PLAN FOR SITE 7
MARCH 2002
NAVAL AIR STATION, BRUNSWICK, MAINE**

COMMENTOR: Carolyn A. Lepage, C.G.

DATED: 30 April 2002

The following comments on the March 2002 *Proposed Remedial Action Plan for Site 7* (PRAP) are submitted on behalf of the Brunswick Area Citizens for a Safe Environment (BACSE).

1. ***General Comment***—BACSE supports the Navy's proposed remedial action of groundwater monitoring and institutional controls for Site 7. BACSE looks forward to the results of the Navy's evaluation of different technologies, such as phytoremediation or groundwater neutralization, that might accelerate closure at the site.

Response—A review of alternatives that could accelerate groundwater cleanup is scheduled to be conducted in 2002.

2. ***Groundwater Contamination Trends***—As discussed at the 9 April 2002 Public Informational Meeting, given the recent removal action, the Navy is hoping that concentrations of groundwater contamination will decrease over time. However, as BACSE pointed out at the meeting, the likely trend is unknown, and might actually increase. What will the Navy do at Site 7 should contamination show an increasing trend over time?

Response—Groundwater concentrations of cadmium will be monitored as part of the selected remedy. If concentration trends show a significant increase over time to a concentration where the remedy is no longer considered to be effective, additional actions would be taken (if required) that could include installation of additional monitoring points or active remediation of soil or groundwater. However, due to the low concentrations of cadmium currently measured in Site 7 groundwater, additional remedial measures are not considered to be likely.

3. ***Institutional Controls***—BACSE believes that implementing institutional controls at a site where contamination exceeds protection criteria is vital for protection of human health. Of particular concern is how institutional controls will remain effective as time passes, especially if the Navy sells or leases the base property. What are the specific institutional controls that will be implemented, and how will the Navy ensure that the controls remain effective in the future, including if the property is sold or leased?

Response—The institutional controls implemented for Site 7 include prohibitions for consumption or contact with groundwater. The institutional controls will be added to the Base Master Plan that will limit contact with groundwater while the base property is under

Navy control. If the base was to be sold or leased, the institutional controls will be added to the property deed to alert new landowners of the potential for impacted groundwater at Site 7.

4. ***Process for Implementing Technologies***—Once the Navy completes the evaluation of technologies for accelerating site cleanup, what are the criteria for deciding which, if any, of the methods will be applied to Site 7? How much weight are costs given? What is the process for planning (work plan, etc.) and communicating with the regulators and the public? Will there be a public meeting? How will the Record of Decision be modified?

Response—The current proposed remedy for the site (i.e., institutional controls and long-term monitoring) is the most applicable and cost-effective remedial option for the low levels of contaminants present in groundwater at Site 7. No decision has been made to proceed with the use of other remedial technologies at Site 7. A review of phytoremediation and other remedial technologies to speed cleanup was requested by MEDEP, and is scheduled to be completed during 2002. This review will be used to assess if other technologies could be used at Site 7 and would be cost effective to implement, although these remedial technologies would be considered only if significantly higher levels of contaminants are detected at Site 7 that would require action. No formal process has been established at this time to decide how evaluation criteria (such as cost) would be weighed. At this time, the Navy believes the existing Record of Decision process is adequate to address issues at Site 7, and an additional work plan or public meeting will not be required.

5. ***Phytoremediation***—If the Navy chooses to implement phytoremediation at Site 7, what happens to the vegetation that takes up the contamination? For example, what do you do with the wood once trees have removed the contamination from the ground?

Response—At phytoremediation sites, the plant material that contains metals is commonly removed from the site, turned into ash to reduce volume, sampled to determine disposal options, and then disposed of at an appropriate facility.

**RESPONSE TO COMMENTS FROM THE
MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
FOR THE PROPOSED REMEDIAL ACTION PLAN FOR SITE 7
AT THE NAVAL AIR STATION, BRUNSWICK, MAINE**

COMMENTOR: Claudia Sait

DATED: 25 February 2002

GENERAL COMMENTS

1. As discussed in a recent telephone conversation, it is critical that for the Navy to finalize the Summary Report of the Ground-water and Soil Investigations for Site 7 so that it may become part of the Administrative Record and be reviewed by the public.

Response—The Summary Report of the Ground-Water and Soil Investigation will be finalized and issued in early March 2002.

2. If the cadmium was mobilized by the disposal of acid, has the Navy considered neutralizing the groundwater to aid re-adsorption of the cadmium? This would provide a permanent solution and meet more of the CERCLA criteria. Obviously it would not be without cost. Monitoring and hydraulic control would be necessary. The Navy should consider this option and possibly include in as a third alternative.

Response—The Navy will initiate an evaluation of different remedial options to accelerate the closure of Site 7 during 2002 and report the results of the evaluation to EPA, MEDEP, and the RAB. A significant evaluation factor of different remedial technologies is the cost of implementation, and the Navy appreciates that MEDEP is aware of this significant factor when determining appropriate remedial options for a site.

SPECIFIC COMMENTS

1. *Introduction, 1st Paragraph, 2nd Line*—Site 7 is the Old Acid/Caustic Pit. Please correct.

Response—The site name has been corrected.

2. *Introduction, 2nd Paragraph, 5th Line*—Restoration Advisory Board meetings are no longer held on a quarterly basis. At best they are semi annual. Please correct.

Response—The frequency of the Restoration Advisory Board has been revised to semi-annual basis.

3. *Column 1*—A new bullet should be added which reads “Update information contained in the Remedial Investigation issued in 1990 with the results of subsequent investigations. Adding a box with remedial component bullets would be an improvement to members of the public that may want just a brief synopsis.

Response—The bullet text recommended has been inserted into this section of the PRAP. A summary box that presents the remedial components has been added to the first page of the PRAP.

4. “Limited Groundwater Monitoring” needs to be changed to Groundwater Monitoring or Navy needs to be very clear on what is meant by Limited Groundwater Monitoring. In any event, if the Navy means to limit the monitoring in term, periodicity or both, this should be discussed in the PRAP.

Response—The word “limited” has been deleted from this sentence.

5. Since the Institutional Controls (IC) are a key part of this remedial action the IC boundaries must be shown on the site map.

Response—The institutional control boundary has been shown on the Site 7 PRAP Figures 1 and 2.

6. **Page 3, Proposed Remedial Action, Column 1, Bullet 2**

- a. MEDEP recommends the following language: “The investigation work has shown elevated cadmium levels in groundwater as the contaminant of concern.”

Response—The following sentence has been inserted at the beginning of this bullet:

The investigation work has shown elevated cadmium levels in the groundwater as the contaminant of concern.

- b. Another item below this should read: “Extensive investigation have not identified the source responsible for cadmium in Site 7 groundwater.”

Response—Agreed, the second bullet sentence has been revised as follows:

The Extensive investigations work done to date has shown slightly elevated have not identified the source responsible for cadmium levels in a few isolated wells Site 7 groundwater.

7. **Page 3, Proposed Remedial Action, Column 1, Bullet 4—**

- a. MEDEP recommends the following language: “Post-removal sampling efforts continue to show elevated levels of cadmium in groundwater, still marginally above the Federal Maximum Contaminant Levels and State Maximum Exposure Guidelines.”

Response—The sentence has been revised as follows:

Post-removal sampling efforts continue to show ~~indicate reduced~~ elevated levels of cadmium with concentrations ranging from 21.8 to 22.0 ug/L in groundwater, ~~but~~ still marginally above ~~drinking water standards~~ Federal Maximum Contaminant Levels (MCLs) (5 ~~mg~~ug/L) and State Maximum Exposure Guidelines (MEGs) (5 ~~mg~~ug/L).

- b. MEDEP also recommends removing the last sentence of this bullet since it a component of the proposed remedy and not a fact on which the remedy was selected.

Response—Agree, the sentence has been deleted from the bullet.

8. **Page 3, Site History, Column 1, Paragraph 3**—According to the Remedial Investigation (RI) Report in addition to being the Old Acid/Caustic Pit this area was the site of the Defense Reutilization and Marketing Office. This information needs to be included in this section.

Response—This information has been added to the Site History section of the PRAP.

9. **Page 3, Summary of Investigations, Column 1, 1st Paragraph**—The acronym NACIP can be deleted without effecting the value of the sentence, otherwise it needs to be written out in full.

Response—The acronym “NACIP” has been deleted from this sentence.

10. **Page 4, Site History, Column 1**

- a. The sequencing between the 1985 report with “no evidence of groundwater contamination” and the current situation needs to be resolved.

Response—The text of the PRAP has been revised to provide more description of the work that has occurred at Site 7 from 1985 to the present date.

- b. There should be a summary of results provided after the 1988 RI/FS and the 1989 RI/FS. Also it needs to be clear that this is a groundwater site and not a soil site and how that was determined.

Response—The text for the 1988-1989 RI/FS has been revised as follows:

1988-1989 Remedial Investigation/Feasibility Study Field Work at Site 7

- *Twenty soil gas points*
- *Ground-penetrating radar and terrain conductivity surveys*
- *Twenty test pits*
- *Soil and ground-water sampling*
- *In situ aquifer permeability testing.*

During the RI field investigation in 1988, acid salts were observed in portions of test pits TP-702 and TP-704 and occurred at a depth of approximately 2 ft bgs. Test pits TP-702 and TP-704 correspond to the area of magnetic anomalies identified during the ground penetrating radar survey of the site. In 1989, the area between these test pits was excavated to attempt to determine the area distribution of the acid salts. The RI report stated that the area with acid salts is believed to be the location of the former Old Acid/Caustic Pit.

Ground-water sample data indicated that cadmium was the only inorganic detected at concentrations exceeding the Federal MCL for cadmium in wells MW-NASB-094 (formerly identified as MW-704) and MW-NASB-096 (formerly identified as MW-706). A baseline risk assessment evaluated risks associated with repetitive direct contact and incidental ingestion exposure incurred by young children who may trespass and/or play in this area. For that reason, the RI/FS concluded that there are no human health risks associated with exposure to contaminants detected in the surface soils or ground water at Site 7 based on current and assumed future exposure conditions.

Since the baseline risk assessment did not indicate a risk to either human health or the environment, and in accordance with EPA guidance, the RI/FS recommended a No Further Action alternative for the site as providing an adequate level of protection.

11. **Page 4, Site History, Column 1, Summary Report of the Ground-water ...1st Sentence**— This work was performed in two phases during 2000 and 2001. MEDEP recommends revising the sentence as follows: “In 2000 and 2001 the Navy conducted a phased field investigation ...” The last sentence in this paragraph can then be deleted.

Response—The last sentence has been deleted and the first sentence has been revised as follows:

Despite the results of the risk assessments in 2000 and 2001, the Navy conducted a phased field investigation effort to search for and remove the source of continuing cadmium contamination in the groundwater above the Federal MCLs/State MEGs at Site 7.

12. **Page 4, Site History Column 1 & 2, Phase I**—Please revise the third sentence as follows: “The cadmium concentration initially increased to 50 ppb then fell to 22 ppb in concentration during the pumping, which still remains above the MCLs/MEGs.”

Response—The sentence has been revised as recommended.

13. **Page 4, Site History Column 2, Phase 2, 1st Sentence**—MEDEP recommends the following language: “Following the pump test, the Navy completed additional investigations to assess whether an isolated man-made or natural source of cadmium was present in the soils.”

Response—The sentence has been revised as follows:

Following the pump test, the Navy completed additional investigations to assess whether an isolated ~~source (either natural or man-made)~~ or natural source of cadmium was present in the soil.

14. **Last Sentence**—MEDEP recommends the following language: “The excavation encountered metal debris and substantial organic material either or both which could be contributing to the cadmium concentrations observed.”

Response—The sentence has been revised as follows:

The excavation encountered metal debris and substantial organic material ~~that either or both of which could be a natural occurring source that is contributing to the cadmium concentrations observed.~~

15. **Page 4, Summary of Remedial Alternatives, Item 2**—The remedies proposed do not reduce the contaminant of concern, therefore please revise as follows: Monitor groundwater concentrations of cadmium until MCLs and MEGS are consistently met.

Response—The text has been revised as follows:

Monitor groundwater concentrations of cadmium until concentrations are consistently below the MCL and MEG.

16. **Table 1**

- a. Five year reviews must be added to alternative 2 components.

Response—Agree, five-year reviews have been added to Table 1, Alternative 2 components.

- b. Bullet 1 should be revised to read “Institutional controls will limit excavation at Site 7 and restrict the pumping and use of groundwater.”

Response—The text has been revised as follows:

Institutional controls will ~~limit control excavations at Site 7 in the area of groundwater contamination and restrict installation of drinking water wells the pumping and use of groundwater.~~

17. **Page 5, Column 1, Alternative 2, Paragraph 1**—There was no indication that the levels of cadmium have gone down. Therefore, please revise as follows: “After defining this area, a removal action was conducted in an attempt to close out the site with no further action, however the cadmium levels still remained above the MCLs/MEGs.”

Response—The second sentence has been revised as follows:

After defining the area, a removal action was conducted in an attempt to close out the site with no further action; however, cadmium concentrations still remain above the Federal MCLs and State MEGs.

18. **Page 5, Column 1 Alternative 2, Paragraph 2**—

- a. Please revise as follows: “To prevent exposure to this isolated area of shallow groundwater, the Navy will establish institutional controls preventing the excavation of soil and pumping or use of the groundwater.”

Response—The sentence has been revised as follows:

To prevent exposure to this isolated area of shallow groundwater, the Navy will ~~install~~establish institutional controls ~~preventing~~ restricting the excavation of soil and pumping or use of the groundwater.

- b. Please provide more information on the institutional control; identify what document will contain the Institutional Controls for this site and how they will be administered.

Response—The following text has been added to this section of the Site 7 PRAP to provide more detail on the institutional controls for Site 7:

Land use restrictions shall be documented in the current NAS Brunswick Operations Instructions (NASBINST 5090.1A “Restriction on Excavating Activities”). The Operations Instructions are used by NAS Brunswick to identify and screen environmental areas from inappropriate construction or development activities. Should NAS Brunswick ever close, lease, and/or transfer this property, EPA and MEDEP shall be notified and appropriate wording shall be included in the necessary real estate documents to prevent disturbance of the site without regulatory review and approval.

- c. It is also unclear exactly where the institutional boundaries are proposed to be. The term “area” is used throughout the document which indicates that only the area of groundwater contamination is proposed for institutional controls. If this is the case, than the Navy must proposed a buffer and provide a justification for how the buffer was determined. The area would need to be surveyed and permanent markers installed. Or is it all of Site 7? This needs to be clarified.

Response—The following text has been added to this section to provide further detail with regards to the dimensions of the institutional controls and the marker/monument for the IC. The Navy has determined to use a well, since the location of the well has been surveyed and will be a permanent marker at the site.

The area of institutional controls will include the area covered by a radius of 150 ft from monitoring well MW-NASB-099 at Site 7.

- d. Additional information on what the Navy means by “limited” groundwater monitoring should be included in this section. This is important information for both the regulatory agencies and for the public to know before a decision can be made on the appropriateness of the remedy.

Response—The use of “limited” has been removed from this section of the PRAP.

- e. “Given the low levels and recent source area removal action, it is expected that the low levels of cadmium will naturally attenuate and that monitoring will not be a long-term requirement.”

It would be helpful to specify what natural attenuation processes would be at work because after reading the definition for natural attenuation in the PRAP the term does not appear to fit cleanly. Also please provide an estimate for how long the Navy believes that it will take to attenuate.

Response—The natural attenuation process relies on a variety of physical, chemical, or biological processes that act without human intervention to reduce the mass of contamination present in soil and groundwater. These processes include biodegradation, dispersion, dilution, sorption, chemical and biological stabilization, transformation, or destruction of contaminants. The natural processes at Site 7 may include sorption reactions such as precipitation, adsorption on the surfaces of soil minerals, adsorption into the matrix of soil minerals, or partitioning into organic matter. The estimated time for attenuation at Site 7 is 10 years.

- f. Why is the estimation of cost based on 10 years rather than the normal 30 year cost estimation used under CERCLA?

Response—As stated on Page 4-2 of the current EPA Guidance (EPA 540-R-00-002, OSWER 9355.0-75, July 2000) titled *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study*, “Past USEPA guidance recommended the general use of a 30-year period of analysis for estimating present value costs of remedial alternatives during the FS (USEPA 1988). While this may be appropriate in some circumstances, and is a commonly made simplifying assumption, the blanket use of a 30-year period of analysis is not recommended.” Therefore, an estimated time period of 10 years was determined based on site-specific data and information collected at Site 7 for the remedy.

19. **Page 6, Column 2, The Navy’s Proposed Remedy, Paragraph 1**—Please revise the last sentence as follows: “This remedy includes institutional controls to prevent human exposure to cadmium in the groundwater, and a limited groundwater monitoring program to ensure this localized contamination remains isolated and decreases over time.”

Response—The sentence has been revised as follows:

This remedy includes institutional controls to prevent human exposure to cadmium in the groundwater, and a ~~limited~~ groundwater monitoring program to ensure this localized contamination remains isolated and concentration trends over time are monitored and documented.

20. **Table 2**—

- a. Alternative 2 needs to be changed to “Groundwater Monitoring and Institutional Controls.”

Response—The text has been revised as requested.

- b. Row 3 (Long Term Effectiveness Ranking) Wouldn't both alternatives be the same?. There is no real remedy so by the time that groundwater meets the ARARs long term effectiveness should be the same. MEDEP recommends that the following: "Moderate (No Treatment)" for both alternatives.

Response—The text has been revised as recommended.

- c. Row 4 needs to be revised to "Poor (No treatment)".

Response—Agree, "(No treatment)" has been added to Table 2, Row 4.

21. **Page 7, Glossary**—Please add the definitions for Contaminants of Concern and In Situ.

Response—Definitions for contaminants of concern and *in situ* have been included in the Glossary of the Site 7 PRAP.

**RESPONSE TO COMMENTS FROM THE
MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
FOR THE REVISED DRAFT PROPOSED REMEDIAL ACTION PLAN
FOR SITE 7
AT THE NAVAL AIR STATION, BRUNSWICK, MAINE**

COMMENTOR: Claudia Sait

DATED: 28 March 2002

Thank you for the revised draft Proposed Remedial Action Plan for Site 7 (March 2002 version). Most of Maine Department of Environmental Protection's (MEDEP) previous comments were incorporated. Additional editing comments were transmitted directly to the Navy's consultant today. However, there is one remaining comment.

1. The Navy is proposing a radius of 150 ft from MW-NASB-099. Since the proposed area within the Institutional Control Boundary is not clearly delineated with a road or some other non-moveable marker, it will be necessary to establish the area using metes and bounds and install permanent markers. Therefore, the Navy may want to consider using a square rather than a circle. Markers could be easily placed on the four corners.

Response—Based on a telephone conversation between MEDEP, Navy, and EA, it was determined that the proposed well, a surveyed location that will remain in at Site 7 until site closure is achieved, could remain as the center point of the institutional control boundary, which is a 150-ft radius from MW-NASB-099.

2. MEDEP also requested that a map showing the location of the institutional control area in relationship to Site 7 be included in the PRAP.

Response—The institutional control boundary has been included in all the Site 7 PRAP figures.

**RESPONSE TO COMMENTS FROM THE
U.S. ENVIRONMENTAL PROTECTION AGENCY
FOR THE DRAFT PROPOSED REMEDIAL ACTION PLAN
FOR SITE 7
AT THE NAVAL AIR STATION, BRUNSWICK, MAINE**

COMMENTOR: Michael Barry

DATED: 28 February 2002

Thank you for the opportunity to review the above document; EPA's specific comments are attached. Our comments were few relative to other PRAPs and we appreciate the Navy's quick turnaround of the draft PRAP.

As earlier discussed, the final groundwater and soil investigation (removal) report should be in the admin record and available to the public at the start of the PRAP public review and comment period. EPA is pleased to confirm that all our comments to the draft report (by letter dated 11/13/2001) were satisfactorily resolved in your response to comments, sent by EA by email on 2/20/2002.

Our other substantive comment is that 5-year reviews need to be described as a remedy component since waste will remain in place in the form of groundwater contaminated with cadmium above the MCL/MEG (for a time at least). We expect/recommend the PRAP to anticipate this to be a temporary situation due to the site-specific conditions.

NOTE: Comments added to the preliminary comments sent on 2/15/2002 are in bold. Others are identical except for editorial changes.

1. Page 1, Introduction

- a. Need to add 5-year review to the remedy description (can caveat with requirement expected to end within 10 years or at least at some point).

Response—Text has been added to the PRAP to present the five-year review in the description of the remedy.

- b. Also, please consider using a box with remedial component bullets as was done with Site 9 as it's easier to read.

Response—A summary box with remedial component bullets has been added to the final PRAP.

- c. It's understood why "Limited" LTM is described; i.e., to convey a small, short duration program. However, this is covered well on Page 5 and "Limited" has no regulatory meaning and may be ambiguous to the reader - would you consider deleting it?

Response—Yes, "Limited" has been deleted from the PRAP.

- 2. **Page 2 – Figure**—When you put this together consider including all the test pits/borings/wells/removal area, etc. This will take more effort and might be too busy a graphic. However, the rationale is to show that:

- a. This SMALL area has been very well studied, thus there is good reason to feel all the source material is removed, i.e., this will address the question "how do you know it's so limited and if so why don't you look at further excavation?"

Response—The test pits have been shown in the PRAP figure(s) to address this comment.

- b. This would graphically relate a lot of the investigation results/history - and maybe cut required text.

Response—Comment noted.

- c. It seems like a full page can be allotted to the figure, maybe all the data will fit. Perhaps there will be room for box of the key results?

Response—A whole page has been dedicated to this figure.

- d. The IC boundary should also be included.

Response—The institutional control boundary for Site 7 has been included in the figure.

- 3. **Page 3, Proposed RA**—In the 4th bullet, we prefer to cite the actual cadmium and MCL concentrations.

Response—The cadmium concentrations have been cited in the text.

- 4. **Page 3-4, Summary of Remedial Investigations**—The PRAP needs to state what the findings of the RI/FS were and why was further action taken? As is it jumps from no threat on the 1985 study to what was done for the RI/FS to further work in 2000.

- a. Per EPA's understanding, the FS recommended NFA due to cadmium only in one well at about 15 ppb - and no exposure pathway. Since then the MEGs were promulgated, thus triggering action as an ARAR. This should be laid out (or exactly what did happen).

Response—The text has been revised to present the actions that were conducted at Site 7.

- b. Recommend you consolidate the 1988 and 1989 fieldwork. The public is probably more interested in what was found, rather than the level of effort, unfortunately.

Response—Agreed, the text regarding fieldwork in 1988 and 1989 has been consolidated.

- c. On the IA, recommend deleting “NACIP,” confirmation study will suffice - or define what NACIP is.

Response—Agreed, “NACIP” has been deleted from the text.

- d. The final results of the RI and Phase II should be stated - or could be put in a table on Page 2 with the figure.

Response—Final results of the Remedial Investigation have been added to the text of the PRAP.

5. **Page 4, End of “Summary of Investigations” Section**

- a. Usually a “Summary of Site Risks” section follows at this point in the PRAP. Including the cadmium results vs. the MCL/MEG as commented above will sufficiently address the omission of a summary site risks section for this PRAP.

Response—Comment noted.

- b. Suggest adding the following: “Based upon the results of this removal, the Navy has determined that further excavation is not feasible.”

Response—The suggested text has been added as recommended.

6. **Page 4 Summary of Remedial Alternatives**—A. The first part of the section is really the RAO’s (Remedial Action Objectives) and should have a separate header. Also, because the MEGs are an ARAR aquifer restoration should be an RAO.

Response—Agreed, the text has been revised to incorporate comments into the PRAP.

7. **Page 5, Alternative 2**

- a. Need to add the 5-year review to the table and text. Suggest a caveat that we expect the groundwater contamination to clear up in the near to mid term timeframe. There isn’t a need to add 5-year review to the alternative title, however.

Response—The five-year review has been added to the text and table as suggested.

- b. In components on the table and in text, we prefer “control” or “restrict” for excavation since you can excavate at the site under proper Health and Safety panning and disposal, etc. Also, prefer “...pumping and use of groundwater” to “installation of drinking water wells.” This covers all groundwater uses and actually gives the Navy more flexibility.

Response—Agreed, the text has been revised to incorporate the suggested changes.

- c. Prefer to state the MCL/MEGs rather than the general “criteria”

Response—The MCL and MEG have been cited specifically in the text of the PRAP.

- d. Should add a bit more detail on what the ICs are as in the site 9 PRAP - basically NASB Operating Instructions, etc. Also need to add the paragraph about if the property is transferred - see Site 9 PRAP.

Response—Additional detail has been added to the text regarding institutional controls at Site 7.

- e. The ceasing of groundwater monitoring should be noted as being with review and approval by MEDEP/EPA.

Response—Commented noted, the PRAP has been revised to address this comment.

8. *Page 6, The Navy’s Proposed Remedy*

- a. Need to add 5-year reviews.

Response—Five-year reviews have been added to the PRAP text.

- b. Need to add in the last paragraph that the remedy does not meet the statutory preference for active treatment, though it will permanently reduce concentrations. Suggested text follows, but reads more like formal ROD language: “An irreversible reduction in the toxicity and volume of contamination will occur as a result of this alternative’s reliance upon natural attenuation processes. However, natural attenuation is not considered active treatment, and an alternative that relies upon natural attenuation processes does not meet the statutory preference for treatment under CERCLA.”

Response—Comment noted, the recommended text has been inserted into the PRAP.

9. *Page 6, Table 2*

- a. The title of Alternative 2 should be same as on Page 5; also prefer “groundwater monitoring” to “Natural Attenuation” in the title. A detailed MNA study wasn’t done (nor would EPA advocate one).

Response—Comment noted, the title has been changed as recommended.

- b. This is a technicality, but Criteria 3 is for after RAO’s are met. Thus both alternatives would rate the same. Another way of looking at it is if there isn’t any LTM how can you measure this? However, this is accounted for by rating them differently for criteria 2.

Response—Comment noted.

10. *Page 7, References*—The 10/2001 draft summary report should be finalized, see cover letter.

Response—The October 2001 draft summary report of the Ground-Water and Soil Investigations at Site 7 was finalized and issued in March 2002.

**RESPONSE TO COMMENTS FROM THE
U.S. ENVIRONMENTAL PROTECTION AGENCY
FOR THE REVISED DRAFT PROPOSED REMEDIAL ACTION PLAN
FOR SITE 7
AT THE NAVAL AIR STATION, BRUNSWICK, MAINE**

COMMENTOR: Michael Barry

DATED: 27 March 2002

Thank you for the opportunity to review the above referenced document, which was submitted by EA Engineering, Science, and Technology on behalf on the Navy on 26 March 2002. This letter formally submits EPA's comments, which I sent by e-mail yesterday.

The revised draft PRAP reads well and overall conveys the required information completely and concisely; it resolves the vast majority of EPA's comments to the draft PRAP in my letter of 28 February 2002. Our only remaining overall comment is that the reason why action was undertaken despite the risk assessment finding of "no CERCLA risk" on the RI should be more explicitly stated. Details are attached.

1. ***Summary of Investigation Section; Top of Second Column on page 4***—The reason why action was undertaken despite the risk assessment finding of "no CERCLA risk" and the FS determination of "No Further Action" should be more explicitly stated. Also in this section:
 - a. Since it was stated in the August 1990 RI (Section 9.5, Page 9-20) that cadmium was detected between 8 and 15 ppb in MW-704 (later designated MW-94), the sentence stating that cadmium not detected above the MCL should be struck.

Response—Agreed, this sentence has been deleted from the text.

- b. We understand the point the PRAP strives to get across (no CERCLA risk finding), but these two paragraphs get wordy and don't flow as well as the rest of the PRAP.

We offer the below suggested revised first three paragraphs as a possible solution. EPA is not fixed upon this specific wording, any revision that addresses the basis of our comment is acceptable. Changes are in bolded italics and underlined.

"Ground-water sample data indicate that cadmium was the only inorganic detected at concentrations exceeding the Federal MCL for cadmium in wells MW-NASB-094 (formerly identified as MW-704) and MW-NASB-096 (formerly identified as MW-706). ***Deleted sentence***. A baseline risk assessment evaluated risks associated with repetitive direct contact and incidental ingestion exposure incurred by young children who may trespass and/or play in this area. ***For that reason***, the RI/FS concluded that there are no

human health risks associated with exposure to contaminants detected in the surface soils or ground water at Site 7 **based on current and assumed future exposure conditions.**”

“Since the baseline risk assessment did not indicate a risk to either human health or the environment, and in accordance with EPA guidance, the RI/FS recommended a No Action Alternative for the site as providing an adequate level of protection.”

Summary Report of the Ground-Water and Soil Investigations at Site 7 (EA 2002a, b)

In order to meet regulatory requirements and despite the results of the risk assessment and RI/FS recommendation, the Navy conducted a phased field investigation effort in 2000-2001 to search for and remove the source of **continuing** cadmium contamination **above the Federal MCL/State MEG** in the ground water at Site 7.

Phase I – Pump Test/Ground-Water Sampling

continue as written....

Response—The recommended text edits have been incorporated into the final Site 7 PRAP.

2. (Editorial) On figure text box marking the area of cadmium exceedances, request adding the “FEDERAL MCL” to the “STATE MEG;” or just leave as “EXCEEDANCES.”

Response—The figure box label has been revised as follows:

Area of cadmium exceedances of the Federal MCL and State MEG

Appendix A.2

Record of Decision

- **C. Lepage (BASCE)**
- **D. Messier (MEDEP)**
- **M. Barry (U.S. EPA)**

Lepage Environmental Services, Inc.

P. O. Box 1195 • Auburn, Maine 04211-1195 • 207-777-1049 • Fax 207-777-1370

September 25, 2002

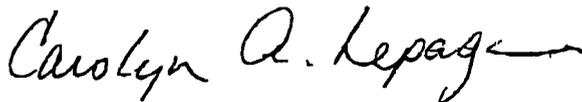
Mr. Orlando J. Monaco
Code EV21 LM
Naval Facilities Engineering Command, EFANE
10 Industrial Highway, Mail Stop #82
Lester, PA 19113-2090

Subject: The Navy's Responsiveness to BACSE Comments on the *Record of Decision for Site 7*

Dear Mr. Monaco:

The purpose of this letter is to state the Brunswick Area Citizens for a Safe Environment's (BACSE's) perspective on the Navy's responsiveness to BACSE comments on the *Record of Decision for Site 7* (ROD) for inclusion in Appendix A of the Final ROD. Written BACSE comments on the Draft Final ROD were submitted to the Navy in comment letters dated September 11, 18, and 23, 2002, and in an email dated September 20, 2002. Given time constraints as the ROD signature date approached, the Navy did not follow the normal procedure of issuing formal written responses to BACSE's comment letters and email. However, BACSE feels that the group's comments, particularly those related to the most substantive issues, have been adequately addressed by the text revisions included in the Final ROD.

Sincerely,



Carolyn A. Lepage, C.G.
President

cc: Loukie Lofchie, BACSE
Tom Fusco, BACSE
Ed Benedikt, BACSE
Anthony Williams, NASB
Claudia Sait, MEDEP
Mike Barry, EPA
Al Easterday, EA ES&T



"Messier, Denise L" <Denise.L.Messier@state.me.us> on 09/24/2002 02:05:37 PM

To: "Barry.Michael@epamail.epa.gov" <Barry.Michael@epamail.epa.gov>, Al Easterday/Boston/EAEST, "Williams, Anthony GS (NASB)" <WilliamsA@nasb.navy.mil>, "Sait, Claudia B" <Claudia.B.Sait@state.me.us>, "clepagegeo@aol.com" <clepagegeo@aol.com>, "MONACOLJ@efane.navfac.navy.mil" <MONACOLJ@efane.navfac.navy.mil>, "fohnermr@efane.navfac.navy.mil" <fohnermr@efane.navfac.navy.mil>

cc:
Subject Site 7 ROD

On Monday, September 23, I spoke with Al Easterday of EA and presented Maine DEP's comments on the most recent Draft Final ROD. It is my understanding that these changes will be made.

Additional changes were made based on comments from the BASCE group representative. The definition of the site will be revised in accordance with the definition in CERCLA and state law. The proposed language is satisfactory.

We also had some e mail discussion about changes to page 2-37 section 5. Has this been resolved?

Today, September 24, I received via fax proposed changes to parts of the Response to Comments and additional data in response to comments 31, 32 and 33 of Claudia's 7/3/02 letter. It took two tries on Table 2-2, but with the receipt of the second fax the responses and additional data are satisfactory.

Assuming that all the changes and corrections are made, and we resolve the language on Page 2-37, MEDEP has no objections to finalizing the document.

Feel free to contact me if you have any questions. Thanks everyone.



Barry.Michael@epamail.epa.gov on 09/20/2002 03:49:22 PM

To: Al Easterday/Boston/EAEST
cc: Claudia.B.Sait@state.me.us, clepagegeo@aol.com, Denise.L.Messier@state.me.us,
fohnermr@efane.navfac.navy.mil, MONACOLJ@efane.navfac.navy.mil,
WilliamsA@nasb.navy.mil
Subject Re: Draft Final - Part I of the Site 7 ROD
:

ROD declaration acceptable to EPA

Mike Barry
RPM, Federal Facilities
EPA-New England
617.918.1344



Barry.Michael@epamail.epa.gov on 09/23/2002 12:11:11 PM

To: Al Easterday/Boston/EAEST
cc: Claudia.B.Sait@state.me.us, clepagegeo@aol.com, Denise.L.Messier@state.me.us,
fohnermr@efane.navfac.navy.mil, MONACOLJ@efane.navfac.navy.mil,
WilliamsA@nasb.navy.mil
Subject Re: Draft Final Part II of the Site 7 ROD - 20 Sept 2002
:

Al et al, I've reviewed part II. All edits of EPA's concern made as discussed in our conference call are complete/resolved. MEDEP's/Carolyn's looked resolved per the call too, but I'm sure you guys will verify yourselves.

With Carolyn's call that BASCE would support the remedy, it looks like the ROD is coming together.

Thanks to all for your efforts.

Mike Barry
RPM, Federal Facilities
EPA-New England
617.918.1344

Appendix A.3

Meeting Minutes from 9 April 2002 Proposed Remedial Action Plan Public Meeting

**PRAP PUBLIC MEETING
9 APRIL 2002
MEETING MINUTES**

1. MEETING ATTENDEES

Tony Williams, IR Program Coordinator	NAS Brunswick, Public Works Environmental
Lonnie Monaco, Remedial Project Manager	U.S. Navy, Engineering Field Activity Northeast
Mike Fohner, Remedial Technical Manager	U.S. Navy, Engineering Field Activity Northeast
Mike Barry, Remedial Project Manager	U.S. Environmental Protection Agency Region 1
Claudia Sait, Remedial Project Manager	Maine Department of Environmental Protection
Larry Dearborn, Project Geologist	Maine Department of Environmental Protection
Carolyn Lepage, TAG Consultant	Lepage Environmental Services
Al Easterday, Project Manager	EA Engineering, Science, and Technology
Peter Nimmer, Project Geologist	EA Engineering, Science, and Technology
Ed Benedikt, Citizen	Brunswick Area ESC

MEETING LOCATION: The Public Meeting was held at the Parkwood Inn's Meeting Room in Brunswick, Maine. The public meeting began at 1900 hours.

2. INTRODUCTIONS

Lonnie Monaco and Mike Fohner opened the Public Meeting to present the Proposed Remedial Action Plan (PRAP) for the Old Acid Caustic Pit (Site 7) at the Naval Air Station in Brunswick, Maine. The PRAP was presented on poster boards for review by the public with a question and answer session following the review of the posters. The PRAP Public Meeting agenda is provided in Attachment A. The sign-in sheet for attendees at the meeting is provided in Attachment B. A copy of the PRAP is provided in Attachment C.

3. SITE 7 PROPOSED REMEDIAL ACTION PLAN

The Site 7 PRAP was printed on poster size paper and mounted on poster boards to allow the public to view the Site 7 PRAP. Lonnie Monaco gave an overview of the site history and highlighted the Navy's recent additional remedial action efforts at Site 7. Tony Williams provided additional comment on the site history, site characteristics, and regulatory oversight history that has occurred at Site 7.

4. VERBAL COMMENTS FROM THE PUBLIC

Ed Benedikt: Does the Commanding Officer (CO) and Executive Officer (XO) know that Site 7 is located behind (to the west) their living quarters?

Tony Williams: Yes, both the CO and XO know that Site 7 is located west of their respected living quarters. The site boundary is approximately 500 ft west of the CO's living quarters.

Ed Benedikt: Could children go out to the site?

Tony Williams: Yes they could, but remember Ed, this is strictly a groundwater issue, it is not a direct contact with contaminated soil issue. The potential for children to have direct contact with, or exposure to, the groundwater at Site 7 is remote at best.

Ed Benedikt: What is the issue with groundwater, the cadmium, and why was a monitoring with institutional control remedy selected over more active remedy?

Mike Fohner: The Navy had hoped for a "No Further Action" (NFA) remedy with the additional work that was completed 2000 and 2001; however, cadmium was still present in the groundwater at low concentrations that exceed the MCL and MEG.

Lonnie Monaco: The Navy will monitor the site groundwater to track the concentration trend of cadmium, which will hopefully continue trending downward. A long-term monitoring plan will be prepared which will describe the monitoring activities in detail for the site.

Tony Williams: We tried to remove the source in July 2001. After the removal action, a new monitoring well, MW-NASB-099, was installed and a complete round of groundwater sampling was completed in November 2001. Unfortunately, cadmium was detected above the MCL and MEG (5 ppb) at MW-NASB-099 and, therefore, the Navy will continue to monitor the groundwater at Site 7 until the concentrations of cadmium are below the MCL and MEG.

Ed Benedikt: Why are phytoremediation and stabilization technology remedies being evaluated for Site 7 by the Navy?

Al Easterday: The Navy will evaluate these two remedial options (phytoremediation and stabilization technology) to see if they can be applied to the Site 7 remedy to optimize the proposed remedy of institutional controls with groundwater monitoring. The Navy will review these two options during 2002 and report the findings of the evaluation to the regulators and the RAB.

5. MISCELLANEOUS

The Brunswick RAB will begin meeting two times a year, generally in the spring and fall. If there is a public meeting requirement and it doesn't coincide with the Spring and Fall RAB meeting time, then a meeting will be scheduled beyond the Spring and Fall meetings. The next Brunswick RAB meeting is scheduled for the week of 21 October 2002, preferably to be held on a Tuesday, Wednesday, or Thursday.

The Public Meeting ended at 2045 hours on 9 April 2002.

Attachment A
Public Meeting Agenda

Agenda
Public Meeting
Site 7 Proposed Remedial Action Plan
09 April 2002
Parkwood Inn
Brunswick, MA
1900 to 2100 hours

- 1900 – 1915 Administrative
- Introductions
- 1915 – 2015 Viewing of Posters
- Site 7 Proposed Remedial Action Plan
- 2015 – 2045 Presentation of Site 7 Proposed Remedial Action Plan
- 2045 – 2055 Questions and Answers
- 2055 – 2100 Wrap-Up/Next Meeting

Attachment B
Attendee Sign-in Sheets

Attachment C

**Proposed Remedial Action Plan for Site 7
Dated March 2002**



**DEPARTMENT OF THE NAVY
INSTALLATION RESTORATION PROGRAM
NAVAL AIR STATION, BRUNSWICK, MAINE**

**PROPOSED REMEDIAL ACTION PLAN
FOR SITE 7**

Introduction

The Department of the Navy is releasing this Proposed **Remedial Action**¹ Plan (Proposed Plan) to address the **groundwater** at the Naval Air Station (NAS) Brunswick, Site 7 (Old Acid/Caustic Pit Site), in the City of Brunswick, Maine (Figures 1 and 2). In accordance with Section 117(a) of the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)**, the law known as Superfund, the Proposed Plan presents the preferred remedial alternative for Site 7 and requests the Public's involvement in the selection of a final remedy.

This site was investigated as part of the base's Installation Restoration Program, which was conducted to identify and clean up sites created by past operations that do not meet today's environmental standards. The Navy is the "lead agency" for this project. The U.S. Environmental Protection Agency (EPA) Region 1 and the State of Maine Department of Environmental Protection (MEDEP) provide regulatory oversight of Navy environmental activities. The Public has also participated in and is invited to attend Restoration Advisory Board meetings, which are held on a semi-annual basis. This Proposed Plan is intended to accomplish the following objectives:

- Update information contained in the remedial investigation issued in 1990 with results of subsequent investigations
- Explain the preferred remedial alternative the Navy has proposed for Site 7
- Describe the other remedial alternatives assessed for Site 7
- Define how "You," the Public, can participate in the process
- Explain how you can obtain additional information.

The Proposed Plan recommends institutional controls with groundwater monitoring with 5-year reviews to address threats posed by any remaining groundwater and/or soil contamination at Site 7 that could impact public health and the environment.

THE CLEANUP PROPOSAL

After careful study of Site 7, the Navy proposes the following plan:

- ✓ Monitored **natural attenuation**
- ✓ Establish institutional controls such as land use restrictions for soil and groundwater
- ✓ Conduct long-term monitoring with 5-year reviews

Table of Contents

Introduction	1
The Proposed Remedial Action	4
Site History	4
Summary of Investigations	5
Summary of Remedial Alternatives	6
Nine CERCLA Evaluation Criteria	7
The Navy's Proposed Remedy	8
Glossary	8
References	9

1. Text first shown in **boldface** is defined in the Glossary.

Figure 1. Site 7 location.

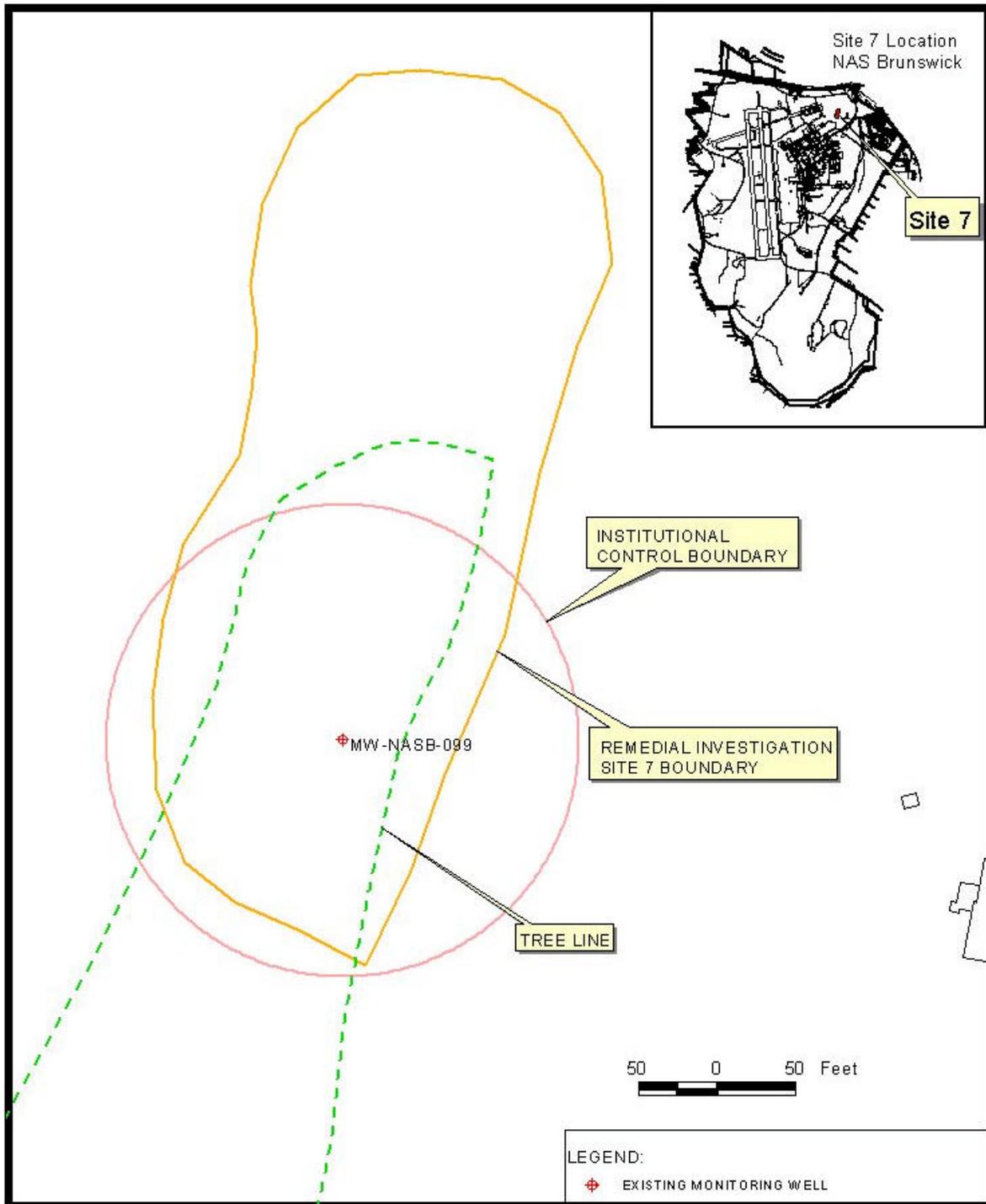
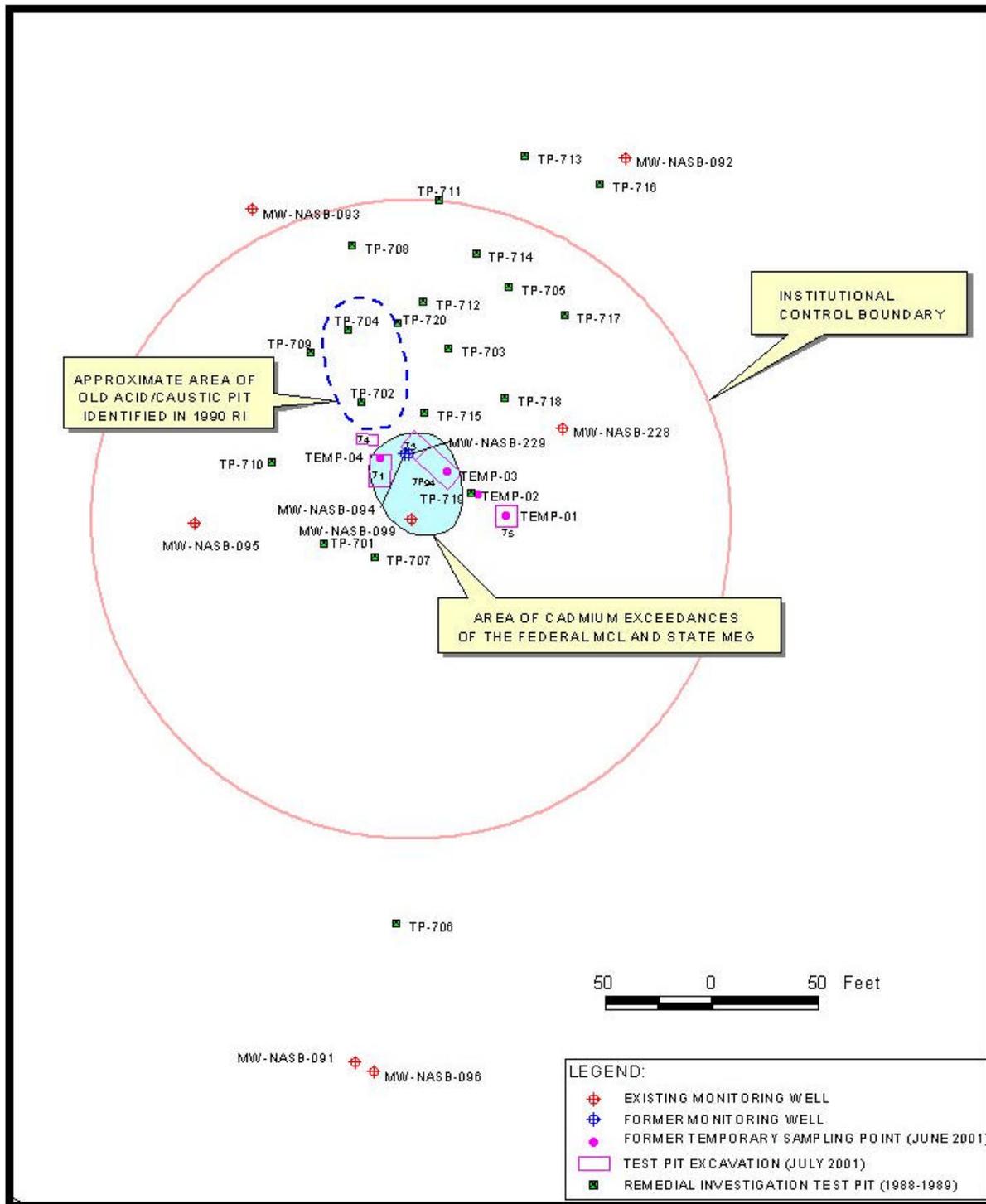


Figure 2. Site plan.



The Proposed Remedial Action

The Navy's recommendation of institutional controls with groundwater monitoring is based upon the following:

- A **remedial investigation** and follow-on summary report was completed to define the key site characteristics and **contaminants of concern**.
- The investigation work has shown elevated cadmium levels in the groundwater as the contaminant of concern. Extensive investigations have not identified the source responsible for cadmium in Site 7 groundwater.
- The area of contamination appears to be localized and shallow. A removal action was completed in July 2001, excavating and disposing offsite approximately 400 yd³ of soil and metal debris.
- Post-removal sampling efforts continue to show elevated levels of cadmium with concentrations ranging from 21.8 to 22.0 µg/L in groundwater, still above **Federal Maximum Contaminant Levels (MCLs)** (5 µg/L) and **State Maximum Exposure Guidelines (MEGs)** (5 µg/L).

The public comment period will be from 1 April to 30 April 2002. Upon timely request, the Navy will extend the comment period by a minimum of 30 additional days. You do not have to be a technical expert to comment—the Navy wants to hear your comments before making a final decision.

During the comment period, the Public is invited to review the documents and correspondence that support the Proposed Plan. These documents have been compiled into an **Administrative Record**. The Administrative Record, including relevant documents, is available for your review at the Curtis Memorial Library located in Brunswick.

How to Obtain More Information

The Navy will hold a Public Informational Meeting on 9 April 2002 at 7:00 p.m., at the Parkwood Inn's Conference Room, on Route 24, Cooks Corner in Brunswick to describe the proposed alternative as well as the other alternatives which were evaluated. The Public is encouraged to attend this meeting in order to hear the presentations and to ask questions.

There are two ways to offer your formal comments on the Proposed Plan:

1. Offer oral comments during the Public Informational Meeting on 9 April 2002, at 7:00 p.m., at the Parkwood Inn's Conference Room, on Route 24, Cooks Corner in Brunswick. Comments made at the meeting will be transcribed, and a copy of the transcript will be added to the site **Record of Decision** and Administrative Record.
2. Send written comments by the end of the Public comment period (postmarked no later than 30 April 2002) to the following address:

Mr. Lonnie Monaco
Remedial Project Manager (Code EV21 LM)
Naval Facilities Engineering Command
Engineering Field Activity Northeast
10 Industrial Highway, Mail Stop #82
Lester, PA 19113-2090
Fax: (610) 595-0555

Upon review and consideration of Public comments, the Navy and EPA will issue a final remedy choice in a signed Record of Decision document with expected concurrence by MEDEP. The Record of Decision will contain a Responsiveness Summary in which the Navy's responses to comments received during the Public comment period will be presented.

Site History

NAS Brunswick, located in Brunswick, Maine, is an active base owned and operated by the Federal government through the Department of the Navy. In 1987, EPA placed NAS Brunswick on the **National Priorities List**. NAS Brunswick is located south of the Androscoggin River between Brunswick and Bath, Maine, south of Route 1 and between Routes 24 and 123. The primary mission of NAS Brunswick is flight operations related to anti-submarine warfare.

Site 7 is located in the northern portion of the base, west of the main entrance road (Fitch Avenue) and northeast of the Old Navy Fuel Farm. The site is a relatively flat, open clearing surrounded by woods on three sides; the south side abuts the Old Navy Fuel Farm. Site 7 was the Old Acid Caustic Pit reportedly used from 1952 to 1969 for liquid waste disposal. Wastes reportedly included transformer oil, battery acid, caustics, solvents, and other miscellaneous liquids. Site 7 was also the Defense Reuse

and Marketing Office area and, based on aerial photographs, was used as an outdoor storage and equipment laydown area during this period.

Summary of Investigations

Initial Assessment Study (Roy F. Weston 1983)

This study was one of the first investigation reports into the disposal activity at Site 7. It describes the former disposal pit as approximately 1 yd³ in size. The report concludes with the recommendation for a confirmation study.

Pollution Abatement Confirmation Study (E.C. Jordan 1985)

In 1984, a terrain conductivity survey was conducted at Site 7. This study was done in order to measure the conductivity of the subsurface soils in the vicinity of the suspected disposal pit, and to better determine the location of the disposal pit. Following this survey, three soil borings were completed at Site 7, and monitoring wells were installed at each boring location (MW-701, MW-702, and MW-703). Both soils and groundwater from these locations were analyzed as part of this study.

The report concluded that there was no evidence of groundwater contamination at Site 7 and no perceived threat to public health or the environment.

Base-Wide Remedial Investigation/Feasibility Study (E.C. Jordan 1990)

In 1987, NAS Brunswick was listed on the National Priorities List as a Superfund Site, and Site 7 was identified as a potential site. Between 1988 and 1989, a base-wide remedial investigation/feasibility study was conducted at NAS Brunswick. The following fieldwork was performed at Site 7 as a part of this study.

1988-1989 Remedial Investigation/Feasibility Study Fieldwork at Site 7

- Twenty soil gas points
- Ground penetrating radar and terrain conductivity surveys
- Twenty test pits
- Soil and groundwater sampling
- *In situ* aquifer permeability testing.

During the RI field investigation in 1988, acid salts were observed in portions of test pits TP-702 and TP-704 and occurred at a depth of approximately 2 ft bgs. Test pits TP-702 and TP-704 correspond to the area of magnetic anomalies identified during the ground penetrating radar survey of the site. In 1989, the area between these test pits was excavated to attempt to determine the areal distribution of the acid salts. The RI report stated that the area with acid salts is believed to be the location of the former Old Acid/Caustic Pit.

Groundwater sample data indicated that cadmium was the only inorganic detected at concentrations exceeding the Federal MCL for cadmium in wells MW-NASB-094 (formerly identified as MW-704) and MW-NASB-096 (formerly identified as MW-706). A baseline risk assessment evaluated risks associated with repetitive direct contact and incidental ingestion exposure incurred by young children who may trespass and/or play in this area. For that reason, the RI/FS concluded that there are no human health risks associated with exposure to contaminants detected in the surface soils or groundwater at Site 7 based on current and assumed future exposure conditions.

Since the baseline risk assessment did not indicate a risk to either human health or the environment, and in accordance with EPA guidance, the RI/FS recommended a No Further Action alternative for the site as providing an adequate level of protection.

Summary Report of the Groundwater and Soil Investigations at Site 7 (EA 2002a, b)

Despite the results of the risk assessment, in 2000 and 2001, the Navy conducted a phased field investigation effort to search for and remove the source of continuing cadmium contamination in the groundwater above the Federal MCL/State MEG at Site 7.

Phase I – Pump Test/Groundwater Sampling

This phase was completed in December 2000 to assess the extent of the cadmium contamination. A 51-hour pump test was conducted using MW-NASB-094 as the pumping well and monitoring seven nearby wells during the test. The cadmium concentrations initially increased to 50 parts per billion (ppb) then fell to 22 ppb during the pumping test, which still remain above the MCLs and MEGs.

Phase II – Groundwater Sampling and Soil Excavation

Following the pump test, the Navy completed additional investigations to assess whether an isolated man-made or natural source of cadmium was present in the soils. Four temporary sampling points were installed at Site 7 to better define the impact of cadmium on the groundwater. Two of these points (Temp-03 and Temp-04) reported cadmium levels higher (17.7 ppb and 32.6 ppb, respectively) than drinking water standards of 5 ppb (Federal MCL and State MEG). These data were used to delineate the extent of the excavation. The excavation encountered metal debris and substantial organic material either or both of which could be contributing to the cadmium concentrations observed. Over 400 yd³ of material was removed from the site. Based upon the results of this removal, the Navy has determined that further excavation is not cost effective.

In November 2001, a round of groundwater samples was collected from the site monitoring wells. Cadmium was

detected in two wells (MW-NASB-091 and MW-NASB-099) at concentrations of 0.7 and 22 ppb, respectively, but only the cadmium concentration in well MW-NASB-099 was found exceeding the State MEG and Federal MCL of 5 ppb.

Summary of Remedial Alternatives

The primary objectives of the proposed remedies for Site 7 are two-fold:

1. Prevent human exposure to the contaminated groundwater.
2. Monitor groundwater concentrations of cadmium until concentrations are consistently below the MCL and MEG.

To meet these objectives, the Navy has developed the following two remedial alternatives, which are summarized in Table 1.

TABLE 1 COMPARISON OF THE PROPOSED REMEDIAL ALTERNATIVES

Remedial Alternatives	Components	Comment
1. No Action	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Provides no protection of human health and the environment • Does not comply with regulatory requirements. Cost: \$0 (10-year projection)
2. Institutional Controls with Groundwater Monitoring	Groundwater Contamination <ul style="list-style-type: none"> • Institutional controls will control excavations at Site 7 and restrict the pumping and use of groundwater • Continued monitoring of groundwater until criteria are met • 5-year site reviews 	<ul style="list-style-type: none"> • Protects human health • Will monitor potential risks to the environment to determine compliance with regulatory requirements • Federal MCL of 5 µg/L and State MEG of 5 µg/L are key applicable or relevant and appropriate requirements Cost: \$80,000 (10-year projection)

Alternative 1—No Action

Under the “No Action” alternative, no cleanup actions or institutional controls would be implemented. The “No Action” alternative does not meet the remedial goals for Site 7 because it would take no action to prevent contact with affected groundwater. However, consideration of the “No Action” alternative is required by the National Contingency Plan in order to serve as a baseline comparison for other remedial alternatives.

Alternative 2—Institutional Controls with Groundwater Monitoring

Since the earlier environmental investigations at NAS Brunswick, the Navy has conducted several investigations to best define the nature and extents of contamination at Site 7. After defining this area, a removal action was conducted in an attempt to close out the site with no further action; however, cadmium concentrations still remained above the Federal MCL and State MEG.

To prevent exposure to this isolated area of shallow groundwater, the Navy will establish institutional controls restricting the excavation of soil and pumping or use of the groundwater. This alternative would establish institutional controls to prevent the contact with and ingestion of the impacted groundwater at the site. Land use restrictions shall be documented in the current NAS Brunswick Operations Instructions (NASBINST 5090.1A "Restriction on Excavating Activities"). The Operations Instructions are used by NAS Brunswick to identify and screen environmental areas from inappropriate construction or development activities. Should NAS Brunswick ever close, lease, and/or transfer this property, EPA and MEDEP shall be notified and appropriate wording shall be included in the necessary real estate documents to prevent disturbance of the site without regulatory review and approval.

The area of institutional controls will include the area covered by a radius of 150 ft from monitoring well MW-NASB-099 at Site 7.

In addition, this alternative would require the development of a Long-Term Monitoring Program to monitor this area's groundwater to ensure that this

contamination remains localized and monitor the trend of contamination. Given the low levels and the recent source area removal action, it is expected that the low levels of cadmium will **naturally attenuate** and that monitoring will not be a long-term requirement. With a series of results consistently showing levels of cadmium below regulatory standards, the Navy will cease groundwater monitoring at Site 7 but not before the approval and concurrence from EPA and MEDEP.

Nine CERCLA Evaluation Criteria

The Navy used the nine CERCLA criteria described below to evaluate the remedial alternatives for Site 7. The final remedial action plan must meet the first two criteria (protecting Public health and the environment and complying with applicable or relevant and appropriate requirements of Federal and more stringent State environmental laws and regulations), and must achieve the best balance among the next five criteria. The last two criteria will be evaluated upon completion of the Public comment period as described in the Record of Decision. Table 2 provides a comparative ranking of alternatives to the nine CERCLA criteria.

TABLE 2 COMPARATIVE RANKING OF ALTERNATIVES TO NINE CERCLA CRITERIA

CERCLA Criteria	Alternative 1 – No Action	Alternative 2 – Groundwater Monitoring and Institutional Controls
1. Protection of Human Health and Environment Ranking	Poor	Moderate
2. Compliance with Applicable or Relevant and Appropriate Requirements Ranking	Moderate	Good
3. Long-Term Effectiveness Ranking	Moderate(No Treatment)	Moderate (No Treatment)
4. Reduction in Toxicity, Mobility, and Volume through Treatment Ranking	Poor (No Treatment)	Poor (No Treatment)
5. Short-Term Effectiveness Ranking	Moderate	Moderate
6. Implementability Ranking	Good	Good
7. Cost (\$)	0	80,000
8. State Acceptance	To Be Determined	To Be Determined
9. Community Acceptance Ranking	To Be Determined	To Be Determined
NOTE: Good = Alternative meets the intent of the criteria. Moderate = Alternative partially meets the intent of the criteria. Poor = Alternative does not meet the intent of the criteria. To Be Determined = These criteria will be evaluated following the Public comment period.		

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

2. *Compliance with applicable or relevant and appropriate requirements* addresses whether or not a remedy will meet applicable or relevant and appropriate requirements or other federal or state environmental statutes and/or provides grounds for invoking a waiver of those statutes and regulations.

3. *Long-term effectiveness* refers to the magnitude of residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.
4. *Reduction in toxicity, mobility, or volume through treatment* refers to the anticipated performance of the treatment technologies that may be employed in a remedy.
5. *Short-term effectiveness* refers to the speed with which the remedy achieves protection, as well as the remedy's potential to create adverse impacts on human health and the environment during the construction and implementation period.
6. *Implementability* is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.
7. *Cost* includes capital, operations, and maintenance costs shown in present worth (today's dollar value).
8. *State acceptance* indicates, based on its review of the **remedial investigation/feasibility study** and Proposed Plan, whether the State concurs with, opposes, or has no comment on the preferred alternative selected.
9. *Community acceptance* will be assessed following review of the Public comments received on the Proposed Plan.

The Navy's Proposed Remedy

The Navy recommends that Alternative 2, Institutional Controls with Groundwater Monitoring and 5-year site reviews, be implemented at Site 7. This remedy includes institutional controls to prevent human exposure to cadmium in the groundwater, and a groundwater monitoring program to ensure this localized contamination remains isolated and concentration trends over time are monitored and documented. During 2002, the Navy will evaluate different technologies, such as phytoremediation or groundwater neutralization, to optimize the remedy at Site 7 to accelerate the closure of this site and report their findings to EPA, MEDEP, and the Restoration Advisory Board.

Based on information presently available, the Navy expects the preferred alternative to satisfy the following statutory requirements in CERCLA Section 121 (b): (1) be protective of human health and the environment, (2) comply with applicable or relevant and appropriate requirements, (3) be cost effective, and (4) utilize permanent solutions. An irreversible reduction in the toxicity and volume of contamination will occur as a result of this alternative's reliance upon natural attenuation process. However, natural attenuation is not considered active treatment, and an alternative that relies upon natural attenuation processes does not meet the statutory preference for treatment under CERCLA.

Glossary

Administrative Record—An official compilation of site-related documents, data, reports, and other information that is considered important to the status of decisions made relative to a Superfund site. The Public has access to this material.

Applicable or Relevant and Appropriate Requirements—The Federal and State requirements that selected remedies must attain. These requirements may vary among sites and remedial alternatives.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)—A Federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. The Act created a trust fund, known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous substance facilities.

Contaminants of Concern—Organic compounds and/or inorganic elements found at concentrations that pose the greatest risk to human health and the environment and/or found at the highest concentrations in the source areas and groundwater at the site.

Federal Maximum Contaminant Levels and State Maximum Exposure Guidelines—The relevant and appropriate federal and state standards to be used as groundwater cleanup levels at Site 7.

Groundwater—Water found beneath the earth's surface in pore spaces and fractures in geologic formations. When formations yield water in sufficient quantity and quality, groundwater is often used as a water supply.

In Situ—In its original place; unmoved, unexcavated; remaining at the site or in the subsurface.

National Priorities List—EPA’s list of the nation’s top priority hazardous substance facilities that may be eligible to receive Federal money for response under CERCLA.

Natural Attenuation—The natural physical, chemical, or biological processes that act to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or groundwater. These *in situ* processes include biodegradation, dispersion, dilution, sorption, and chemical or biological stabilization, transformation, or destruction of contaminants.

Record of Decision—A legal document that describes the remedy selected for a Superfund facility, why the remedial actions were chosen and others not, how much they cost, and how the Public responded.

Remedial Action—Actual implementation, following design, of the selected remedy to prevent or minimize the release of hazardous substances.

Remedial Investigation/Feasibility Study—A 2-part study of a hazardous substance facility that supports the selection of a remedy for a site. The first part, the remedial investigation, identifies the nature and extent of contamination at the facility. The second part, the feasibility study, identifies and evaluates alternatives for addressing the contamination.

References

EA Engineering, Science, and Technology. 2002a. Site 7 Groundwater Sampling Results Letter Report, Naval Air Station Brunswick, Maine. 4 March.

EA Engineering, Science and Technology. 2002b. Final Summary Report of the Groundwater and Soil Investigations at Site 7 Naval Air Station, Brunswick, Maine. 14 March.

E.C. Jordan Company. 1985. Pollution Abatement Confirmation Study, Step 1A-Verification. Portland, Maine. June.

E.C. Jordan Company. 1990. Draft Final Remedial Investigation Report NAS Brunswick. Portland, Maine. August.

R.F. Weston Inc. 1983. Initial Assessment Study of Naval Air Station, Brunswick Maine. Westchester, Pennsylvania. June.

COMMENT SHEET - Proposed Remedial Action Plan for Site 7

You may use this form to send in your written comments on this Proposed Plan. Please send your comments to the address shown below **postmarked no later than 30 April 2002.**

Affix
Postage

Mr. Lonnie Monaco
Remedial Project Manager (Code EV21 LM)
Naval Facilities Engineering Command
Engineering Field Activity, Northeast
10 Industrial Highway, Mail Stop #82
Lester, PA 19113-2090

Appendix B

Specific Applicable or Relevant and Appropriate Requirements for Site 7

APPENDIX B
LIST OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITE 7

Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Applicable or Relevant and Appropriate Requirements
ACTION-SPECIFIC			
Federal Applicable or Relevant and Appropriate Requirements			
RCRA Identification and Listing of Hazardous Waste Toxicity Characteristics (40 CFR 261.24)	Relevant and Appropriate	This requirement identifies the maximum concentrations of contaminants for which the waste would be a RCRA characteristic waste because of its toxicity. The analytical test in Appendix II of 40 CFR Part 61 is referred to as the TCLP.	In the event that excavations are conducted that remove soil, the soil will be analyzed by the TCLP to determine whether they are characteristic hazardous wastes under RCRA. Excavated materials that are determined to exceed TCLP allowable concentrations will be disposed offsite in a RCRA Subtitle C treatment, storage, or disposal facility. Excavated materials that are determined to be below TCLP allowable concentrations will be disposed offsite in a RCRA Subtitle D or other appropriate treatment, storage, or disposal facility.
State Applicable or Relevant and Appropriate Requirements			
Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)	Relevant and Appropriate	This requirement outlines the State of Maine's rules relating to establishing, constructing, altering, and operating certain types of hazardous waste units.	This applicable or relevant and appropriate requirement will be met in the event that excavation is conducted at the site.
Maine Solid Waste Management Rules - Water Quality Monitoring, Leachate Monitoring, and Waste Characterization (06-096 CMR 405)	Relevant and Appropriate	Water quality monitoring, leachate monitoring, and the characterization of wastes stored or disposed of are tools used for the detection and analysis of potential threats to public health and safety or the environment. The applicable tools are required to be implemented at solid waste facilities where the Department identifies potential threats to public health and safety or the environment because of the nature of the wastes stored or disposed of and/or the type, location, design, or operation of the solid waste facilities.	The substantive requirements of these rules will be used in the monitoring of ground water at the site.
NOTE: RCRA = Resource Conservation and Recovery Act. TCLP = Toxicity Characteristic Leaching Procedure.			

Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Applicable or Relevant and Appropriate Requirements
CHEMICAL-SPECIFIC			
Federal Applicable or Relevant and Appropriate Requirements			
Safe Drinking Water Act – Maximum Contaminant Levels (40 Code of Federal Regulations 141.11–141.16) (U.S. EPA 1999)	Relevant and Appropriate	Maximum Contaminant Levels have been promulgated for many common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for ground-water aquifers used for drinking water.	Under Alternative 2, the selected remedy, the Maximum Contaminant Levels will be attained through institutional controls and long-term monitoring.
Safe Drinking Water Act – Maximum Contaminant Level Goals (40 CFR 141.50 –141.51)	Relevant and Appropriate	Maximum Contaminant Level Goals have been promulgated for many common organic and inorganic contaminants. These levels indicate the level of contaminants in drinking water at which no known or anticipated adverse effect on the health effect of a person would occur, allowing for an adequate margin of safety. Maximum Contaminant Level Goals are non-enforceable public health goals.	Under Alternative 2, the selected remedy, where Federal Maximum Contaminant Levels have not been established, non-zero Maximum Contaminant Level Goals will be attained through institutional controls and long-term monitoring.
EPA Risk Reference Doses (U.S. EPA 1999)	To Be Considered	Risk Reference Doses are the concentrations considered unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure for a lifetime.	Because there are only a limited number of promulgated standards for contaminants in water, EPA Risk Reference Doses will be used to characterize risks due to non-carcinogens in ground water, as necessary, during the five-year reviews.
EPA Human Health Assessment Group Cancer Slope Factors (U.S. EPA 1999)	To Be Considered	Carcinogenic effects presented the most up-to-date information on cancer risk potency derived from EPA’s Human Health Assessment Group.	Because there are only a limited number of promulgated standards for contaminants in water, EPA Cancer Slope Factors will be used to characterize risks due to carcinogens in ground water, as necessary, during the five-year reviews.
State Applicable or Relevant and Appropriate Requirements			
Maine Department of Human Services (Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144A Code of Maine Regulations Chapter 233, Appendix C)	Relevant and Appropriate	Maximum Exposure Guidelines include health advisories, which are maximum allowable concentrations of specific contaminants in drinking water.	Under Alternative 2, the selected remedy, the Maximum Exposure Guidelines will be attained through institutional controls and long-term monitoring.
Maine Hazardous Waste Rules relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)	Relevant and Appropriate	This requirement outlines the State of Maine’s rules relating to establishing, constructing, altering, and operating certain types of hazardous waste units.	Under Alternative 2, the selected remedy, the Maximum Exposure Guidelines will be attained through institutional controls and long-term monitoring.
Maine Department of Human Services Rules Relating to Drinking Water (10-144E, Chapters 231-233)	Relevant and Appropriate	Maine’s primary drinking water standards are similar to Federal Maximum Contaminant Levels as drinking water standards under the Maine Safe Drinking Water Rules. When State standards are more stringent than Federal standards, and have been legally and constantly applied, the State levels shall be used.	Under Alternative 2, the selected remedy, State drinking water standards that are more stringent than Federal standards will be attained through institutional controls and long-term monitoring.
Source: U.S. Environmental Protection Agency (EPA). 1999. Integrated Risk Information System On-Line Database Maintained in Toxicology Data Network by the National Library of Medicine Bethesda, Maryland. EPA Environmental Criteria and Assessment Office, Cincinnati.			

Appendix C

Declaration of Concurrence by Maine Department of Environmental Protection



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

ANGUS S. KING, JR.
GOVERNOR

MARTHA KIRKPATRICK
COMMISSIONER

September 26, 2002

Captain Robert S. Winneg, Commanding Officer
Naval Air Station, Brunswick
US Department of Navy
437 Huey Drive Box 33
Brunswick, Maine 04011-5008

Re: Record of Decision-Site 7
Naval Air Station, Brunswick, Maine

Dear Captain Winneg:

The Maine Department of Environmental Protection (MEDEP) has reviewed the Final Record of Decision (ROD) for Site 7, (September 2002) at Naval Air Station, Brunswick, Maine. Based on the review of the Final Record of Decision, MEDEP concurs with the Navy's selected remedy of Institutional Controls with Groundwater Monitoring as outlined in Section XI, which is summarized below.

Institutional Controls with Monitoring is the selected remedy for Site 7, the Old Acid Caustic Pit. No active source of contamination has been found and monitoring results to date do not show significant offsite migration of the contaminants above the Federal Maximum Contaminant Levels or the State Maximum Exposure Guidelines. However, manganese and cadmium are above their respective Maximum Exposure Guidelines thresholds in groundwater; Polycyclic Aromatic Hydrocarbons (PAHs) and dichlorodiphenyltrichlorethane (DDT) are evident in shallow soil (0-2 feet) at levels that could pose a future potential residential risk.

The major components of the Institutional Controls with Groundwater Monitoring include:

- Develop and implement institutional controls to prevent human contact with and use of the soil and groundwater at the site;
- Develop a Long Term Monitoring Program and conduct long term monitoring of groundwater to monitor contaminant migration, contaminate levels and natural attenuation; and

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688
RAY BLDG., HOSPITAL ST.

BANGOR
106 HOGAN ROAD
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769-2094
(207) 764-0477 FAX: (207) 764-1507

- Five year reviews.

It is MEDEP's understanding that the United State's Navy will provide a draft version of the Institutional Controls and Long Term Monitoring Plan for review and comment as part of the Remedial Action Plan as required under the Federal Facility Agreement. The final soil and water restrictions to be incorporated into the Naval Air Station, Brunswick Operating Instructions and the Long Term Monitoring Plan will be part of the Administrative Record for Site 7.

The State's concurrence of the selected remedy, as described above, should not be construed as the State's concurrence with any conclusion of law or finding of fact, which may be set forth in the ROD or site listed above. The State reserves any and all rights to challenge any such finding of fact or conclusion of law in any other context.

This concurrence is based on the State's understanding that the MEDEP will continue to participate in the Federal Facilities Agreement and in the review and approval of operational, design, and monitoring plans as allowed under the Federal Facilities Agreement.

MEDEP looks forward to working with the Department of the Navy and the Environmental Protection Agency to resolve the environmental problems posed by this site. If you need additional information, do not hesitate to contact Claudia Sait at (207) 287-7713.

Respectfully,



David Lennett
Director, Bureau of Remediation and Waste Management

Cc: File
Mark Hyland-MEDEP
Claudia Sait-MEDEP
Michael Barry-EPA
Carolyn Lepage
Al Easterday-EA
Orlando Monaco, EFANE