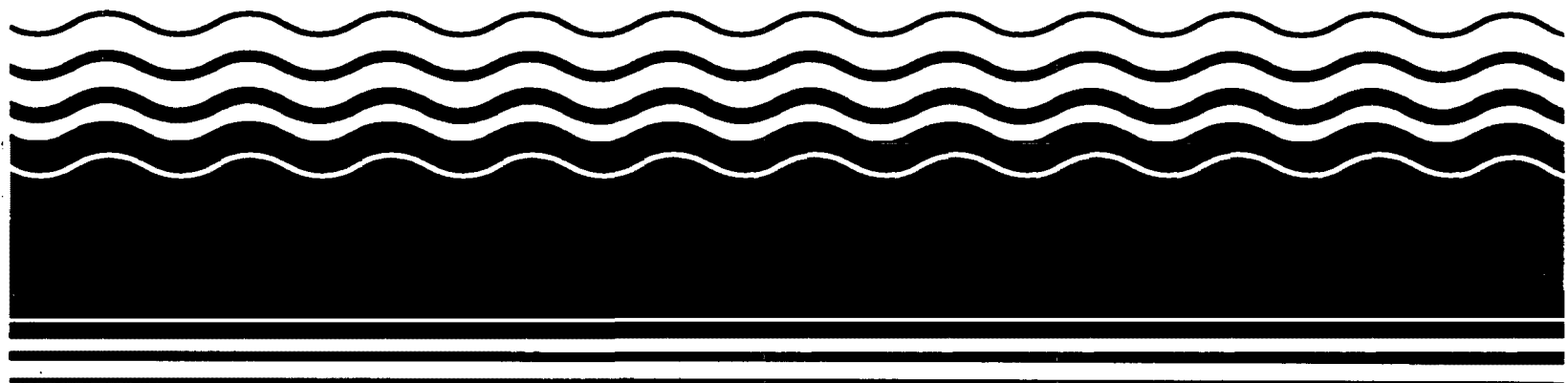


**PB94-963722
EPA/ROD/R01-93/096
January 1995**

**EPA Superfund
Record of Decision:**

**Brunswick Naval Air Station,
Site 8, ME
8/31/1993**



**RECORD OF DECISION
FOR A
REMEDIAL ACTION
AT
SITE 8
NAVAL AIR STATION, BRUNSWICK
BRUNSWICK, MAINE**

AUGUST 1993

**NAVAL AIR STATION BRUNSWICK
RECORD OF DECISION**

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NAVAL AIR STATION BRUNSWICK
RECORD OF DECISION

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DECLARATION

SITE NAME AND LOCATION

Naval Air Station (NAS) Brunswick
Perimeter Road Disposal Site: Site 8
Brunswick, Maine

STATEMENT OF BASIS AND PURPOSE

This decision document presents a selected remedial action that will remove soil, construction debris, and rubble from the Perimeter Road Disposal Site: Site 8 at NAS Brunswick in Brunswick, Maine. This decision document was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 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. Through this document, the Navy plans to remedy the potential threat to human health, welfare, or the environment posed by contaminated soil at Site 8. This decision is based on information contained in the Administrative Record for the site. Copies of this Administrative Record are located at the Public Works Office at NAS Brunswick, and at the Curtis Memorial Library, 23 Pleasant Street in Brunswick, Maine.

The State of Maine Department of Environmental Protection and the U.S. Environmental Protection Agency concur with the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from Site 8, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

This action addresses the principal threat posed by Site 8 by preventing endangerment to public health, welfare, or the environment by implementing this ROD. This ROD describes the removal of polynuclear aromatic hydrocarbon-contaminated soil, construction debris, and rubble from Site 8 and their disposal as subgrade material at the landfill at Sites 1 and 3.

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The selected remedy includes site preparation to prevent silt from entering a small tributary bordering Site 8; excavation of soil, rubble, and debris from the site; and transportation of the excavated material to Sites 1 and 3 for use as necessary subgrade fill prior to the placement of a low-permeability cap over the Sites 1 and 3 landfill. After excavating, soil samples will be collected and analyzed to confirm that waste removal is complete. The sampling results will be submitted to the regulatory agencies and Technical Review Committee for review. The Site 8 area will be graded to minimize erosion and seeded to reestablish vegetation. The landfill at Sites 1 and 3, where the material will be placed, is the subject of a separate ROD (NAVY, 1992) and will be closed in accordance with all applicable federal and state requirements, and long-term monitoring will be implemented at these sites.

STATUTORY DETERMINATIONS

The selected remedy meets the mandates of CERCLA Section 121. It protects 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. This remedy does not meet the statutory preference for treatment. Treatment was not considered to be cost-effective based on results of treatability studies and Toxicity Characteristic Leachate Procedure tests conducted on soils from Site 8. These studies indicated that contaminants at the site have very low mobility. Because this remedy will remove contaminated soils and nonhazardous debris from the site, no long-term controls will be necessary.

The foregoing represents the selection of a remedial action by the Department of the Navy and the U.S. Environmental Protection Agency, Region I, with concurrence of the Maine Department of Environmental Protection.

By: 
Robert L. Rachor, Jr.

Date: 22 July 93

Title: Captain, U.S. Navy
Commanding Officer
Naval Air Station
Brunswick, Maine

Installation Restoration Program

The foregoing represents the selection of a remedial action by the Department of the Navy, and the U.S. Environmental Protection Agency, Region I, with concurrence of the Maine Department of Environmental Protection.

By: Paul Keough
Paul G. Keough

Date: 8-31-93

Title: Acting Regional Administrator, USEPA

Installation Restoration Program

DECISION SUMMARY

I. SITE NAME, LOCATION, AND DESCRIPTION

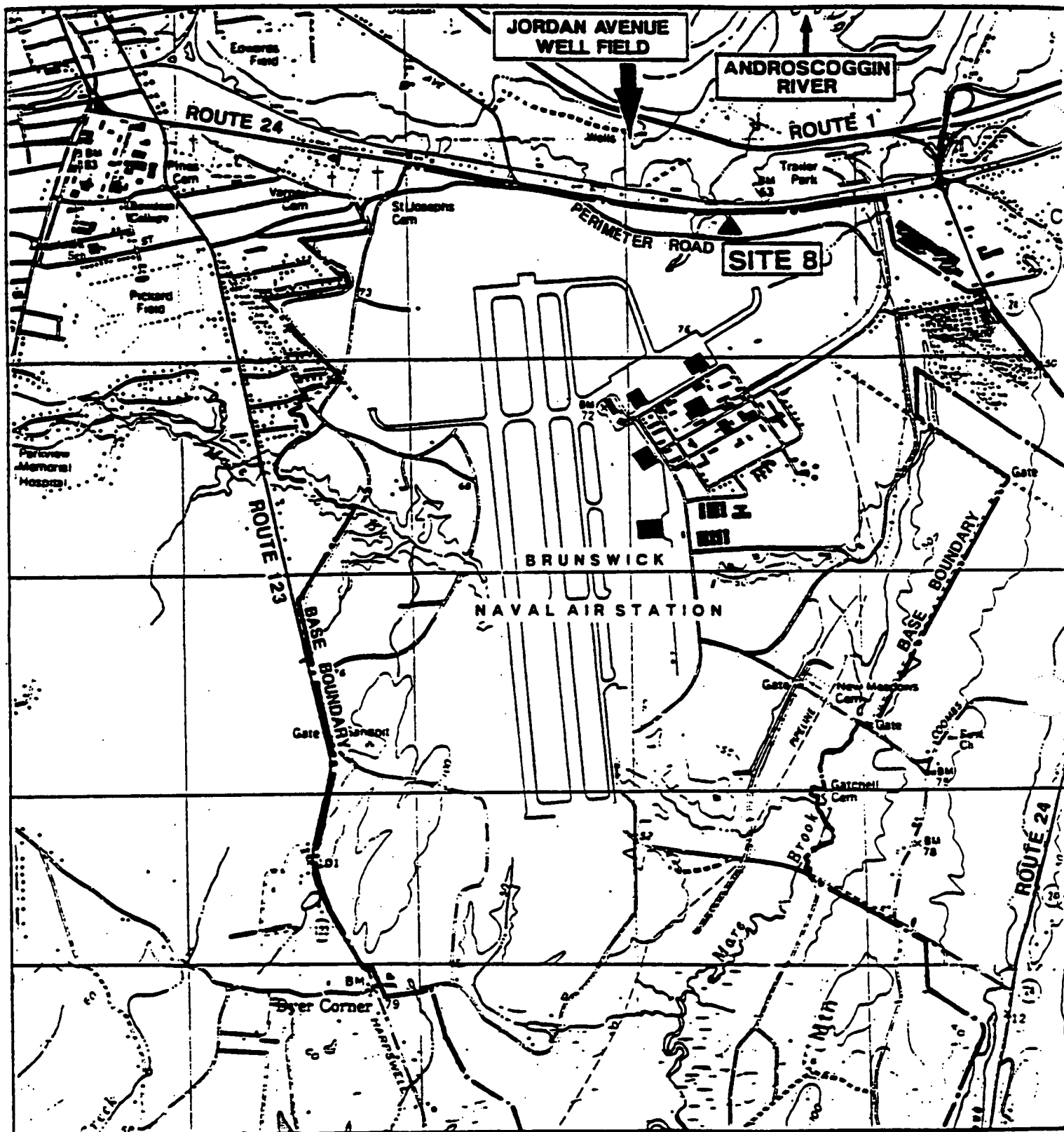
The U.S. Naval Air Station (NAS) Brunswick is located in Brunswick, Maine. In 1987, NAS Brunswick was placed on the National Priorities List (NPL). There are currently 13 areas (Sites) within NAS Brunswick under investigation. This Record of Decision (ROD) relates to the contamination at Site 8.

NAS Brunswick is located south of the Androscoggin River between Brunswick and Bath, Maine, south of Route 1 and between Routes 24 and 123 (Figure 1). Undisturbed topography at NAS Brunswick is characterized by low, undulating hills with deeply incised brooks; ground surface elevations range from mean sea level (MSL) in lowland drainage areas and the Harpswell Cove estuary, to over 110 feet MSL west and southeast of the southern end of the runways. Topography in the developed areas of the base has been modified by construction, with ground surface elevations generally ranging from 50 to 75 feet above MSL.

NAS Brunswick is located on 3,094 acres. The operations area (138 acres) lies east of the two parallel runways and consists of numerous office buildings, a steam plant, fuel farm, barracks, recreational facilities, base housing, hangars, repair shops, and other facilities to support NAS Brunswick aircraft. Forested areas (approximately 48 percent), grasslands (approximately 28 percent), and paved areas (approximately 12 percent) comprise most of the base property. Paved areas are mostly flight ramps and runways. The remaining 12 percent of the base includes the operations area (approximately 5 percent) and miscellaneous shrubland, marsh, and open water. The southern edge of the base borders the estuary of Harpswell Cove.

Property uses surrounding NAS Brunswick are primarily suburban and rural residential, with some commercial and light industrial uses along Routes 1, 24, and 123. An elementary school, a college, and a hospital are located within 1 mile of the western base boundary.

The approximately 0.6-acre Perimeter Road Disposal Site is located in the northern portion of the base (Figure 2). Perimeter Road, which runs east to west, is adjacent to the southern edge of the site. Site 8 was a disposal area reportedly used from 1964 to 1974 for rubble, debris, and trash from NAS Brunswick. Discussions with NAS personnel indicate that solvents may have been disposed of at the site; however,



SOURCE: U.S.G.S. QUADRANGLES, BRUNSWICK AND ORRS ISLAND, ME, DATED 1984/1978.
7.5 MINUTE SERIES.

POOR QUALITY
ORIGINAL

FIGURE 1
NAS BRUNSWICK
SITE 8 LOCATION



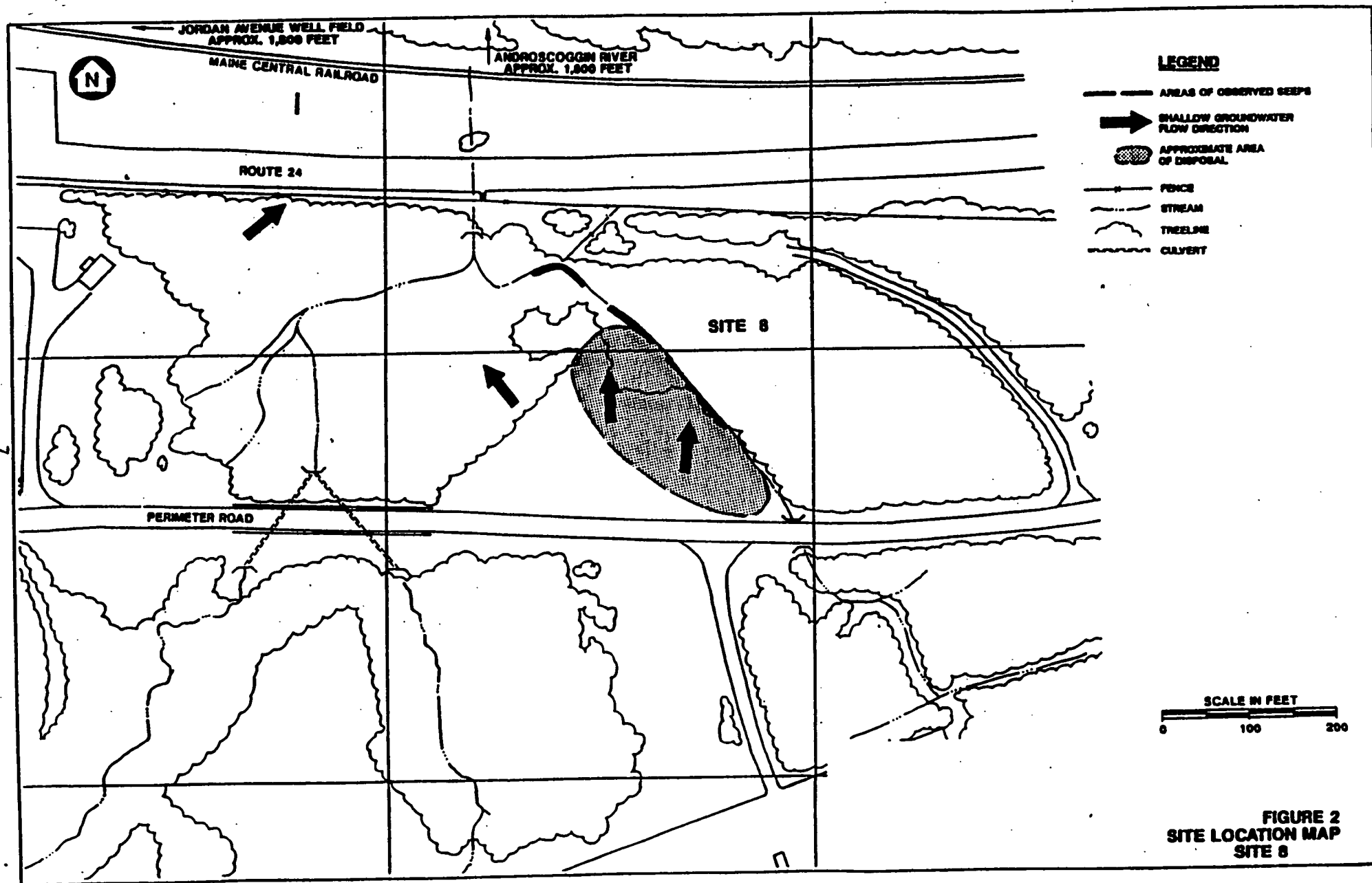


FIGURE 2
SITE LOCATION MAP
SITE 8

results of the Remedial Investigation (RI) did not show the presence of any solvent-related compounds in any medium. North of Perimeter Road, the site is a flat, open area with steep, wooded embankments down to two small tributaries bordering the site on the northeast and northwest. Surface runoff from the northern 2,000 feet of NAS Brunswick drains into these tributaries, which flow approximately 1,800 feet to the north and discharge to the Androscoggin River. The Jordan Avenue Wellfield, a municipal drinking water supply for the Town of Brunswick, is located 3,000 feet north-northwest and upgradient of Site 8.

Seeps have been observed at the base of the slope of the embankment down to the northeastern tributary (see Figure 2).

Groundwater associated with the site is not used for potable or any other purposes. The base is connected to a public water supply administered by the Brunswick-Topsham Water District.

A more complete description of the site can be found in Section 10.0 of the Draft Final RI Report (E.C. Jordan Co., 1990a) and Section 6.0 of the Draft Final Supplemental RI Report (E.C. Jordan Co., 1991a).

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. LAND USE AND RESPONSE HISTORY

NAS Brunswick is an active facility supporting the U.S. Navy's antisubmarine warfare operations in the Atlantic Ocean and Mediterranean Sea. The base's primary mission is to operate and maintain P-3 Orion aircraft. NAS Brunswick first became active in the 1940s during World War II, and underwent major expansion in the 1950s.

Site 8 is located at the northern boundary of NAS Brunswick. Material reportedly disposed of at this site was construction and demolition debris such as scrap metal, concrete, asphalt rubble, and industrial wastes. Disposal of hazardous materials reportedly included more than 1,000 pounds of solvents such as trichloroethene, methyl ethyl ketone (MEK), and toluene; however, this disposal and these quantities cannot be confirmed.

Environmental contamination at Site 8 was observed in surface and subsurface soil, surface water, sediments, seeps, and groundwater. Polynuclear aromatic hydrocarbons (PAHs) and dichlorodiphenyltrichloroethane (DDT) were identified as the contaminants of concern. The distribution of these contaminants was limited to surface and shallow soils and sediments associated with leachate and surface water. Inorganic contamination was observed in surface water, leachate, and groundwater. Of the solvents reportedly disposed of at Site 8, only MEK was detected. This contaminant was detected sporadically at low concentrations consistent with concentrations detected in sampling and analytical blank results. Blank samples are collected and analyzed with actual samples to determine the quality control and quality assurance of the sampling and laboratory procedures. No other volatile compounds were detected, indicating that only small amounts were disposed of at the site; the compounds have been flushed or volatilized out with time; or disposal of these materials did not occur at Site 8.

B. ENFORCEMENT HISTORY

The enforcement history at Site 8 is summarized as follows:

- In 1983, an Initial Assessment Study (IAS) was completed detailing historical hazardous material usage and waste disposal practices at NAS Brunswick. Ten sites were identified and ranked according to potential hazard.

- In 1984, a Pollution Abatement Confirmation Study was conducted, which recommended further investigation of seven of the 10 hazardous waste sites originally identified (i.e., Sites 1 through 4 and 7 through 9).
- In 1987, NAS Brunswick was placed on the U.S. Environmental Protection Agency's (USEPAs) NPL.
- The Remedial Investigation/Feasibility Study (RI/FS) process was initiated in 1987 for the seven sites.
- In February 1988, the first Technical Review Committee (TRC) meeting was held. TRC meetings have been held quarterly since that initial meeting.
- Four sites were added to the RI/FS program in 1989 (i.e., Sites 11, 12, 13, and 14), as well as the two additional sites originally identified in the IAS (i.e., Sites 5 and 6). Site 10, originally identified in the IAS, was no longer under the jurisdiction of NAS Brunswick and is not included in the Installation Restoration Program (IRP).
- In 1990, the Navy entered into a Federal Facility Agreement (FFA) with the USEPA and the Maine Department of Environmental Protection (MEDEP) regarding the cleanup of environmental contamination at NAS Brunswick. The FFA sets forth the roles and responsibilities of each agency, contains deadlines for the investigation and cleanup of hazardous waste sites, and establishes a mechanism to resolve disputes among the agencies.
- In August 1990, the Navy completed Draft Final RI and Phase I FS reports (E.C. Jordan Co., 1990a and 1990b). The Draft Final RI Report described field sampling investigations, geology, and hydrogeology, and presented contamination and risk assessments. The Draft Final Phase I FS identified remedial action objectives, and developed and screened remedial alternatives for the nine original sites studied in the Draft Final RI. The Navy prepared Focused Feasibility Study (FFS) Reports for Sites 1 and 3 and Site 8 in 1991 and 1992, respectively (E.C. Jordan Co., 1991c and 1992). The Navy submitted a Draft Final Supplemental RI Report for the Eastern Plume and Sites 5, 6, 8, 12, and 14, an FFS Report for Sites 5, 6, and 12, and a Feasibility Study for Sites 2, 4, 7, 9, 11, and 13 in August and July of

Installation Restoration Program

1991, and March 1992, respectively (E.C. Jordan Co., 1991a, 1991b, and 1992b).

- Currently, the Navy is studying 13 sites under the IRP.

Because the Navy is committed to providing a timely response to environmental contamination at NAS Brunswick, a strategy was developed to expedite the RI/FS process. This strategy involves identifying the sites for which enough information is available to proceed to the ROD and design phases of the process. Separate timetables have been established for completing the Final FS reports and RODs for these sites. The Navy has identified Site 8 as a distinct area of contamination and believes the remedial process can be initiated. An FFS for Site 8 was submitted to the regulatory agencies for review (E.C. Jordan Co., 1992). A Proposed Plan, detailing the Navy's preferred alternative, was issued in September 1992 and a Public Hearing was held in October 1992. Public comments received on the Site 8 Proposed Plan requested the consideration of excavation instead of a soil cover as the preferred alternative. The Navy reconsidered and issued a revised Proposed Plan and Technical Memorandum detailing the excavation alternative (ABB-ES Inc., 1993a and 1993b). These documents were issued in March of 1993 and a second public comment period was held from March 12 through April 12, 1993.

III. COMMUNITY PARTICIPATION

Throughout the site's investigative and remediation history, the community has been active and involved. Community members and other interested parties have been informed of site activities through informational meetings, fact sheets, press releases, public meetings, and TRC meetings.

In August 1987, the Navy established an information repository for public review of site-related documents at the Curtis Memorial Library in Brunswick. In September 1992, the Navy placed the original Proposed Plan for Site 8 in the Information Repository and Administrative Record. A Public Hearing was held in October 1992. Public comments about the Site 8 Proposed Plan requested the consideration of excavation instead of a soil cover as the preferred alternative. The Navy reconsidered and issued a revised Proposed Plan and Technical Memorandum detailing the excavation alternative (ABB-ES, 1993a and 1993b). These documents were issued in March 1993 and a second public comment period was held from March 12 through April 12, 1993. The Administrative Record for Site 8 is available for public review at NAS Brunswick in the Public Works office or at the Curtis Memorial Library. A notice and brief analysis of the Proposed Plan were published in the local newspaper, *The Times Record*, on March 10, 1993.

The TRC has been an important vehicle for community participation. The TRC was established in early 1988 and comprises the Navy, USEPA, MEDEP, and various community representatives. The community members of the TRC include representatives from Brunswick, Harpswell, and Topsham, as well as the Brunswick Area Citizens for a Safe Environment. The TRC also has representatives from the Brunswick-Topsham Water District. The TRC meets quarterly, reviews the technical aspects of the program, and provides community input to the program.

In September 1988, the Navy released a Community Relations Plan outlining a program to address public concerns and keep citizens informed about and involved in remedial activities. On August 16, 1990, the Navy held an informational meeting at the Jordan Acres School in Brunswick to discuss the results of the RI, including field investigations at Site 8.

On October 15, 1992, the Navy held an informational meeting and public hearing to discuss the Proposed Plan for Site 8. During this meeting, the Navy, its consultants, and regulatory representatives answered questions from the public and accepted formal comments. During a public comment period from October 1 through 30, 1992, the Navy accepted comments on the alternatives presented in the Proposed Plan for Site 8. The corresponding responses to comments are included in Appendix A, Responsiveness Summary, of this ROD.

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As a result of comments received on the Proposed Plan, the Navy changed its preferred alternative from soil cover to excavation and issued a revised Proposed Plan and Technical Memorandum on March 10, 1993. The public comment period for the revised Proposed Plan was from March 12 to April 12, 1993. The Navy accepted comments on its revised alternative. The corresponding responses to comments are also included in Appendix A, Responsiveness Summary, of this ROD.

Installation Restoration Program

IV. SCOPE AND ROLE OF RESPONSE ACTION

The selected remedy for Site 8 at NAS Brunswick was developed in specific response to citizens' concerns that all contaminated soil, rubble, and debris be removed from the site so that no restrictions would be placed on future site use. The proposed alternative for Site 8 will be the final action for this site. The remedy includes excavation of the contaminated soil and debris at Site 8 and transport to Sites 1 and 3 to provide necessary subgrade material before a low-permeability cap is placed over the landfill. The hillside at Site 8 will be regraded and seeded. This remedial action will minimize human health risks associated with exposure to contaminated soil.

V. SUMMARY OF SITE CHARACTERISTICS

The nature and extent of contamination at Site 8 is summarized by medium in the following paragraphs. A complete discussion of the site characteristics can be found in Section 10.0 the Draft Final RI Report on pages 10-14 through 10-36 (E.C. Jordan Co., 1990a). Summary tables of site-related contaminants and their concentrations appear in Appendix Q-1 of the Draft Final RI Report and Appendix B of this document.

SOIL/DISPOSAL AREA

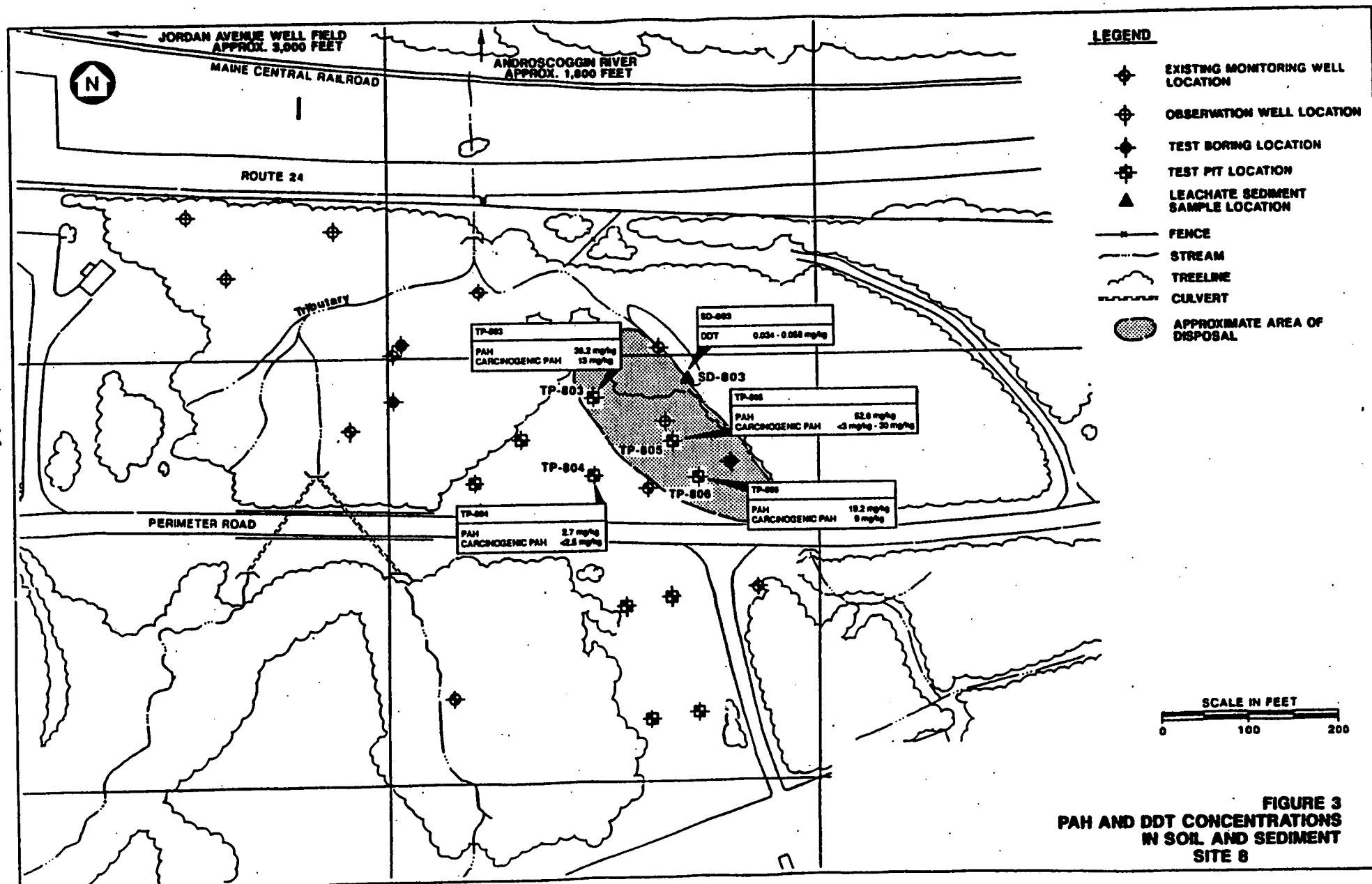
Soil boring and test pit samples were collected in the disposal area at Site 8 to identify contaminants in surface and subsurface soils (Figure 3). Environmental contamination was present in only four test pits located in the northeastern area of Site 8. Total PAH concentrations detected in test pit soil samples ranged from 2.7 to 53 milligrams per kilogram (mg/kg). Carcinogenic PAH concentrations ranged from less than 2.5 to 30 mg/kg. PAHs were detected in surface soil only, except for one test pit where they were found in decreasing concentrations to a depth of 8 feet. PAH compounds are components of coal and hydrocarbon fuels that survive the combustion process. The historical use of coal and fuels at NAS Brunswick may account for the presence of PAHs in soils across the base.

Inorganics detected in surface and shallow subsurface soil were within site-specific background ranges except for lead, detected at concentrations ranging from 9.4 to 37 mg/kg, arsenic detected at concentrations from 2.6 to 5 mg/kg, and manganese detected at concentrations from 137 to 185 mg/kg.

Endosulfan II was detected in one surface soil sample at a concentration of 17 micrograms per kilogram ($\mu\text{g/kg}$). DDT was detected in three subsurface soil samples at concentrations ranging from 20 to 330 $\mu\text{g/kg}$.

GROUNDWATER

Site 8 has been of special interest because of the location of the Jordan Avenue Wellfield approximately 3,000 feet northwest of the site. A primary goal of the subsurface investigation program of the Draft Final Supplemental RI Report was to assess the possibility of a hydraulic connection between Site 8 and this municipal wellfield (E.C. Jordan Co., 1991a). Based on available geologic, hydrogeologic, and chemical data, contaminated Site 8 groundwater should not affect the municipal wellfield. This conclusion is based on groundwater contours for the site, high hydraulic conductivities in the vicinity of the refuse, the underlying low conductivity



clay layer, and the steep hydraulic gradient adjacent to the northeast tributary. Groundwater movement directly beneath the actual disposal area is locally northward and northeastward, discharging to the adjacent ravine. Groundwater in other portions of the overall Site 8 area, although movement may be locally northwestward and westward, is not impacted by refuse leachate.

No pesticides, polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), or semivolatile organic compounds (SVOCs) were detected in Site 8 monitoring wells. Concentrations of inorganic contaminants in groundwater at Site 8 were elevated relative to concentrations of inorganics at uncontaminated wells at NAS Brunswick. High levels of sodium, chloride, and cyanide in one well appear associated with runoff from an upgradient storage pile of road salt that has since been moved to a covered building in the southern portion of the base. Cadmium concentrations exceeded the Maximum Contaminant Level (MCL) in two wells in Round II sampling and in a third well in Round IV. Lead exceeded its 15 micrograms per liter ($\mu\text{g/L}$) action level in one upgradient well.

Most inorganic contaminants were detected sporadically (i.e., inconsistently between five sampling rounds) or at low concentrations. Most Site 8 wells are screened in silt or clay. The high concentrations of inorganics occurred in unfiltered samples from these wells and are consistent with the clay-rich geologic media at the site rather than being associated with the disposal material.

LEACHATE SEEPS, SURFACE WATER, AND SEDIMENT

Leachate generated from the disposal area at Site 8 seeps out along the steep bank of the tributary running along the northeast edge of the site. Three seep locations were identified along the bank of this tributary (see Figure 2). These leachate seeps were sampled for organic and inorganic compounds. In addition, sediments were collected adjacent to the leachate outbreak areas to characterize the impact of leachate on surrounding soils. VOCs detected in the leachate and sediment included acetone (leachate and sediment), methylene chloride (sediment), chloroform (sediment), 2-butanone (sediment), and trichloroethane (sediment). Low concentrations of the compounds measured in sediments from these seeps, accompanied with sporadic detection and method blank detections, suggest these compounds do not reflect actual site conditions. SVOCs were not detected in leachate from these seeps, but PAHs were reported in all three associated sediments. PCBs and pesticides were not reported in the leachate samples, but the PCB Aroclor-1248 and DDT were found in sediment. Inorganic compounds were detected at all three seep locations. Concentrations of inorganics are elevated in leachate, and are consistently higher than background surface water and groundwater values.

Site 8 sediment samples at seep locations also have higher concentrations of inorganic compounds. Aluminum, calcium, magnesium, and manganese all have values consistent with background concentrations, but iron concentrations are elevated. High iron concentrations may be due to precipitation of iron oxides from leachate. Low concentrations of arsenic (3 to 6 mg/kg) were found in sediments in all three seep locations, but arsenic was not detected during all sampling rounds. Lead (3 to 77 mg/kg) and chromium (5 to 82 mg/kg) were found in all sediment samples and were detected in all sampling rounds, but at relatively low concentrations. Lead and chromium concentrations are consistent with the clay-rich sediment that characterizes Site 8. Other detected compounds include copper, cobalt, vanadium, and zinc. These compounds were not found at all seep sampling locations, nor were they detected in all sampling rounds, and concentrations were typically in the normal range for clay soil samples.

Twelve surface water and sediment sampling locations were established at Site 8. The VOCs acetone, methylene chloride, and chloroform were detected in sediments and surface water at low concentrations. The presence of these VOCs was attributed to laboratory contamination and is not believed to represent actual site conditions. SVOCs, pesticides, and PCBs were not detected in Site 8 surface water; however, PAHs and beta-BHC were found in sediment samples. Surface waters and sediment typically had concentrations of inorganic compounds within the background ranges for NAS Brunswick. Exceptions included sodium, cyanide, and zinc, all of which had elevated concentrations at several surface water locations. Sodium concentrations in surface water locations ranged from normal levels of 10,000 to 20,000 $\mu\text{g/L}$ to 360,000 $\mu\text{g/L}$. The high sodium levels were typically associated with winter sampling, and may result from road salting. Cyanide concentrations varied from non-detected to 128 $\mu\text{g/L}$, and detection was also limited to winter sampling. Zinc concentrations in the surface waters ranged from 11 to 163 $\mu\text{g/L}$. The highest concentrations occur off base, north of Route 24. Zinc is also detected off base at an upgradient location, but at significantly lower concentrations. Chloride concentrations in surface water were also elevated, ranging from 6,500 to 510,000 $\mu\text{g/L}$.

The presence of sodium and chloride in these surface waters suggest a salt source. A salt pile was located on the old runway (paved area) south of Site 8, and upgradient of the drainage(s) affected by the high sodium and chloride concentrations. Surface runoff from the formerly located salt pile area was collected in a drain that focuses runoff into the drainage where the affected surface water is located. The salt pile is also believed to be the source of the cyanide reported at Site 8. A recent study in Maine documents the use of sodium ferricyanide as a de-caking agent in salt, linking it to cyanide contamination near salt storage piles (Olson and Ohno, 1989). NAS Brunswick has recently analyzed the salt from the salt pile for cyanide concentration. The results demonstrate 2 to 3 mg/kg of cyanide

Installation Restoration Program

present in the salt, consistent with the Olson and Ohno study. The salt pile is currently stored in a covered building in the southern portion of the base.

Installation Restoration Program

VI. SUMMARY OF SITE RISKS

A baseline risk assessment was conducted to estimate the potential risks to human health and the environment from exposure to contaminants associated with Site 8. The human health risk assessment followed a four-step process: (1) contaminant identification, which identified those hazardous substances that, given the specifics of the site, were of significant concern; (2) exposure assessment, which identified actual or potential exposure pathways, characterized the potentially exposed populations, and established the extent of possible exposure; (3) toxicity assessment, which considered the types and magnitude of adverse health effects associated with exposure to hazardous substances; and (4) risk characterization, which integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the site, including carcinogenic and noncarcinogenic risks. The results of the baseline risk assessment are summarized in the following paragraphs.

The contaminants of concern (COC) identified in the Site 8 human health risk assessment constitute a representative subset of all the contaminants identified during the RI. The COCs were selected to represent potential site-related hazards based on toxicity, concentration, frequency of detection, and mobility and persistence in the environment. The COCs are summarized in tables in Appendix Q-1 of the Draft Final RI Report (E.C. Jordan Co., 1990a). A summary of the health effects of each COC is presented in Appendix Q, pages Q-122 through Q-151 of the Draft Final RI Report (E.C. Jordan Co., 1990a). In addition, a summary of COCs for Site 8 appears in Table 1.

Human health risks were quantitatively evaluated based on potential exposure to COCs under both current (e.g., an older child playing) and assumed future land-use (e.g., residential) scenarios. The following is a brief summary of the two scenarios. A more thorough description can be found in Appendix Q of the Draft Final RI Report (E.C. Jordan Co., 1990a).

Because access to this site is not controlled, exposure to soils, sediments, surface water, leachate seeps, and leachate sediment via direct contact and ingestion is considered possible. Exposure to groundwater does not occur under present land-use conditions. The exposure scenario used to evaluate current use was based on an older child (ages 7 to 12) who regularly accesses or trespasses on the site during a six-year period. Potential risks under a future residential scenario were estimated assuming contact for 350 days per year during a 30-year period, six years of which constitutes childhood exposure with higher estimated ingestion levels. Additional information and references for the exposure parameters used in these scenarios are listed in Tables Q-23 through Q-28 in Appendix Q of the Draft Final RI Report and

TABLE 1
CONTAMINANTS OF POTENTIAL CONCERN

ROD: SITE 8
NAS BRUNSWICK

SURFACE SOIL	SUBSURFACE SOIL	GROUNDWATER	SURFACE WATER	STREAM SEDIMENT	LEACHATE SEEP	LEACHATE SEDIMENT
Arsenic	Arsenic	Cadmium	Lead	Lead	Arsenic	Arsenic
Lead	Lead	Lead	Zinc	Manganese	Cadmium	Lead
Manganese	Manganese			Benzo(a)Anthracene	Lead	Manganese
Benzo(a)Anthracene	Benzo(a)Anthracene			Benzo(a)Pyrene	Manganese	Benzo(a)Anthracene
Benzo(a)Pyrene	Benzo(a)Pyrene			Benzo(b)Fluoranthene		Benzo(a)Pyrene
Benzo(b)Fluoranthene	Benzo(b)Fluoranthene			Benzo(k)Fluoranthene		Benzo(b)Fluoranthene
Benzo(k)Fluoranthene	Benzo(k)Fluoranthene			Chrysene		Benzo(k)Fluoranthene
Chrysene	Chrysene			Benzo(g,h,i)Perylene		Chrysene
Dibenzo(a,h)Anthracene	Dibenzo(a,h)Anthracene			Fluoranthene		Indeno(1,2,3-c,d)Pyrene
Indeno(1,2,3-c,d)Pyrene	Indeno(1,2,3-c,d)Pyrene			Phenanthrene		Benzo(g,h,i)Perylene
Acenaphthylene	Acenaphthylene			Pyrene		Fluoranthene
Anthracene	Anthracene					Phenanthrene
Benzo(g,h,i)Perylene	Benzo(g,h,i)Perylene					Pyrene
Fluoranthene	Fluoranthene					4,4'-DDT
Fluorene	Fluorene					
Phenanthrene	Phenanthrene					
Pyrene	Pyrene					
Endosulfan II	4,4'-DDT					

Note:

See Appendix B for the range and frequency of detection of each contaminant of potential concern.

in Appendix E of the FFS (E.C. Jordan Co., 1990a and 1992). A most-probable case and a realistic worst-case exposure estimates were generated assuming exposure to the average and the maximum concentrations, respectively, of each contaminant detected in a particular medium.

Excess lifetime cancer risks were estimated for each exposure pathway by multiplying the exposure level by the chemical-specific cancer slope factor (CSF). CSFs have been developed by USEPA from epidemiological or animal studies to reflect a conservative "upper bound" of the risks posed by potentially carcinogenic compounds. That is, the true risk is unlikely to be greater than the predicted risk. 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 individual is not likely to have more than a one-in-a-million chance of developing cancer over 70 years as a result of site-related exposure to the compound at the stated concentration. Current USEPA practice considers carcinogenic risks to be additive when assessing exposure to a mixture of hazardous substances.

The Hazard Index (HI) was also calculated for each pathway as USEPA's measure of the potential for noncarcinogenic health effects. The HI is the sum of Hazard Quotients (HQs), which are calculated for each chemical by dividing the exposure level by the reference dose (RfD) or other suitable benchmark for noncarcinogenic health effects. RfDs have been developed by USEPA to protect sensitive individuals during the course of a lifetime, and they reflect a daily exposure level that is likely to be without an appreciable risk of an adverse health effect. RfDs are derived from epidemiological or animal studies and incorporate uncertainty factors to help confirm that adverse health effects will not occur. The HQ is often expressed as a single value (e.g., 0.3) indicating the ratio of the stated exposure as defined to the RfD value (in this example, the exposure as characterized is approximately one-third of an acceptable exposure level for the given compound). The HQ is only considered additive for compounds that have the same or similar toxic endpoints. Risk estimates developed as part of this baseline risk assessment were evaluated using the USEPA criteria and target risk range to identify the need for remedial actions at this site.

The significance of risk estimates was evaluated by comparing risks to established target levels. USEPA has established target levels for the evaluation of carcinogenic risks and noncarcinogenic hazards at hazardous waste sites. USEPA's guidelines state that the total incremental carcinogenic risk for an individual resulting from multiple-pathway exposures at a Superfund site should not exceed a range of 10^{-6} to 10^{-4} . The State of Maine has established a guideline of 1×10^{-5} incremental carcinogenic risk as a target risk level for remediation at hazardous waste sites. The risk characterizations in this report refer to the USEPA's target risk range; and carcinogenic risk estimates as being "below the target range" when risks are less than

10^{-6} ; "within the target range" when risks are between 10^{-6} and 10^{-4} ; and "above the target range" when risks are greater than 10^{-4} . The USEPA's and State of Maine's target hazard level for noncarcinogenic effects is an HI of 1.0.

Incremental cancer risks and HIs for scenarios evaluated at Site 8 are summarized in Table 2.

No carcinogenic risks exceeded the USEPA's target range for the trespassing child scenario. Incidental ingestion of and dermal contact with average concentrations of contaminants were associated with an incremental risk of 7×10^{-6} for surface soil, 4×10^{-7} with stream sediment, 1×10^{-9} with leachate seeps, and 1×10^{-6} with leachate sediment. Exposure to maximum contaminant concentrations resulted in an incremental risk of 2×10^{-5} for surface soil, 2×10^{-6} for stream sediment, 7×10^{-9} for leachate seep, and 7×10^{-6} for leachate sediment. Exposure to the maximum detected contaminant concentration resulted in a risk in excess of the State of Maine's guideline of 1×10^{-5} .

Noncarcinogenic risks were also below the target range of 1.0 for the current-use scenario. HIs for the most-probable case (i.e., based on exposure to average contaminant concentrations) were 0.01 for surface soil, 0.08 for surface water, 0.002 for stream sediment, 0.003 for leachate seeps, and 0.01 for leachate sediment. For a realistic worst case (i.e., based on exposure to maximum contaminant concentrations for surface soil), HIs are 0.02 for surface soil, 0.4 for surface water, 0.01 for stream sediment, 0.01 for leachate seeps, and 0.03 for leachate sediment.

The residential scenario was evaluated for Site 8 assuming exposure to the average and maximum carcinogenic PAH surface soil concentrations only. The total incremental carcinogenic risks were 1×10^{-4} and 3×10^{-4} based on exposure to the average and maximum detected concentrations, respectively. These risk estimates are presented in Appendix E of the FFS (E.C. Jordan Co., 1992). The risk estimates based on exposure to the average concentrations fall within the USEPA target risk range of 10^{-4} to 10^{-6} . The risk estimate based on exposure to the maximum concentration slightly exceeds the 10^{-4} risk level. Based on the conservative exposure assumptions used to develop the risk estimate (i.e., long-term repetitive exposure to the maximum detected concentration) and the limited number of contaminants of concern (i.e., only PAHs), the upper bound estimate of 3×10^{-4} is not considered to represent a significant health risk at Site 8. However, because this estimate exceeds USEPA's risk range, remedial action objectives for soil contamination are warranted to reduce concentrations of or exposure to carcinogenic PAHs in soil. The State of Maine's guidance of 1×10^{-5} for carcinogenic risk is exceeded for PAHs in the surface soils at this site.

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TABLE 2
SUMMARY OF RISK ESTIMATES

ROD: SITE 8
NAS BRUNSWICK

SCENARIO	AVERAGE		MAXIMUM	
	TOTAL CANCER RISK	TOTAL HAZARD INDEX	TOTAL CANCER RISK	TOTAL HAZARD INDEX
Current Use: Trespassing Older Child Playing On Site - Dermal and Ingestion				
Surface Soil	7×10^{-6}	0.01	2×10^{-5}	0.02
Surface Water	No carcinogens detected	0.08	No carcinogens detected	0.4
Sediment	4×10^{-7}	0.002	2×10^{-6}	0.01
Leachate Seep	1×10^{-9}	0.003	7×10^{-9}	0.01
Leachate Sediment	1×10^{-6}	0.01	7×10^{-6}	0.03
Future Use: 30-Year Residential - Dermal and Ingestion				
Child (Age: 1-6 years)	9×10^{-5}		2×10^{-4}	
Adult (Age: 7-40)	5×10^{-5}		1×10^{-4}	
Total for residential	1×10^{-4}		3×10^{-4}	

The potential risks associated with exposure to groundwater were evaluated based on a comparison of contaminant concentrations to MCLs, Maximum Contaminant Level Goals, Maximum Exposure Guidelines (MEGs), or health-based criteria. Inorganic compounds were the contaminants detected most frequently in groundwater both upgradient and downgradient of the site. Cadmium was the only contaminant detected in the groundwater downgradient of the site that exceeded its drinking water standard or health-based criteria. The concentrations of cadmium ranged from 0.007 to 0.012 milligrams per liter (mg/L); its MCL is 0.005 mg/L. In upgradient wells, lead exceeded the Maine MEG of 0.02 mg/L and the action level of 0.015 mg/L. Lead concentrations ranged from 0.006 to 0.218 mg/L. Remedial action objectives were not developed for groundwater based on the low and sporadic concentrations of only one analyte (i.e., cadmium) detected above its respective MCL. Cadmium was not detected at elevated concentrations in the soils at Site 8, indicating that its presence in groundwater is attributed to the natural geologic conditions at the site. Groundwater beneath the site is not currently or likely to be used in the future for potable purposes.

Environmental risks at Site 8 are associated with exposure to contaminants in leachate sediment and surface water. Exposure to contaminants by wildlife drinking from leachate seeps and from uptake of soil contaminants into the terrestrial food-chain appear minimal. A detailed evaluation of ecological risks may be found in Appendix Q-3 of the Draft Final RI (E.C. Jordan Co., 1990a).

Exposure to DDT in leachate sediment was an initial concern because of the propensity of this compound to bioaccumulate and bioconcentrate in food chains. However, DDT was detected at only one sampling location in two of the four sampling rounds. The average DDT concentration of all positive detects in sediments from Site 8 is 0.008 mg/kg. This is consistent with the residual concentrations of this contaminant across NAS Brunswick as DDT was widely used as an insecticide in the 1960s and early 1970s. The ecological HI associated with exposure to 0.008 mg/kg of DDT is less than 1.0. At an HI of less than 1.0, population-level effects are not expected to occur.

Aquatic and terrestrial receptors could be exposed to iron, aluminum, lead, cyanide, and zinc in surface water. These contaminants were detected in the tributary draining the western portion of Site 8. Analytes detected in the western tributary are not associated with past disposal practices at Site 8. Elevated levels of these contaminants (compared to background concentrations) were also detected in upstream and off-base sampling locations (i.e., north of Route 24). There was no consistent trend in contaminant concentrations by location or over the sampling rounds. The analytical data show inconsistent and sporadic detection of these inorganic compounds, suggesting that surface water contamination is not related

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solely to past disposal activities at Site 8. Nonpoint source discharges such as surface drainage of the runway and/or Route 24 appear to be affecting the water quality in these tributaries. Inorganic contaminants were not detected in surface water from the eastern drainage area of Site 8, which is immediately adjacent to the disposal area and would be most susceptible to contaminant impacts from past disposal activities. Potential risks to receptors are almost entirely attributable to the elevated concentrations of lead that exceed both acute and chronic Ambient Water Quality Criteria for this contaminant.

Quantitative estimates of risk are based on numerous assumptions, most of which are intended to be protective of human health and the environment (i.e., conservative). Numerical estimates of risk presented in risk assessments are subject to various sources of uncertainty as a result of multiple layers of conservative assumptions.

Sources of uncertainty can be categorized into site-specific factors and toxicity assessment factors (toxicity assessment encompasses both the hazard identification and the dose/response assessment). Most assumptions incorporated into the estimation procedures employed in this assessment are inherently conservative. Assuming that the environmental sampling data reflect the true distribution of chemicals in the soil and groundwater, it is safe to conclude that the risk estimates are more likely to overestimate than underestimate risk.

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, might present an imminent and substantial endangerment to public health, welfare, or the environment. The objective of the selected remedial action is to remove the contaminated soil at Site 8 and reduce the potential for exposure to that soil by using it as subgrade material at Sites 1 and 3 prior to placement of a low-permeability cap over the landfill.

VII. DEVELOPMENT AND SCREENING OF ALTERNATIVES

A. STATUTORY REQUIREMENTS/RESPONSE OBJECTIVES

Under its legal authorities, the lead agency's (i.e., Navy's) primary responsibility at NPL and similar sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) establishes several other statutory requirements and preferences, including a requirement that the Navy's remedial action, when complete, complies 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 uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a preference for remedies in which treatment that permanently and significantly reduces the toxicity, mobility, or volume of the hazardous substances is a principal element over remedies not involving such treatment. Remedial alternatives were developed to be consistent with these congressional mandates.

Based on preliminary information relating to the types of contaminants, environmental media of concern, and potential exposure pathways, remedial action objectives were established to aid in the development and screening of alternatives. These remedial action objectives were established to mitigate existing and future potential threats to public health and the environment, to comply with state requirements, and address community concerns, and include:

- reducing concentrations of or limit exposure of humans to carcinogenic PAHs in surface soil
- complying with Maine municipal solid waste landfill closure requirements
- complying with the community's desire for less restrictive land use on base property

B. TECHNOLOGY AND ALTERNATIVE DEVELOPMENT AND SCREENING

CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) set forth the process by which remedial actions are evaluated and selected. In accordance with these requirements, a range of alternatives was developed for the site.

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Remedial action alternatives for NAS Brunswick were developed to meet the following requirements: (1) the alternative adequately protects public health and the environment; (2) the alternative can attain chemical-specific Applicable or Relevant and Appropriate Requirements (ARARs) and can be implemented in a manner consistent with location- and action-specific ARARs; (3) the alternative uses permanent treatment technologies to the maximum extent practicable; (4) the alternatives developed are capable of achieving a remedy in a cost-effective manner, considering short- and long-term costs; and (5) the alternatives that permanently and significantly reduce the toxicity, mobility, or volume of hazardous substances will be selected, to the maximum extent practicable.

Alternatives for Site 8 were developed by combining treatment technologies to form a range of feasible alternatives that address contamination in the media of concern (i.e., surface soil). Alternatives were developed that range from no action to containment to removal.

The RI/FS screened technologies based on site conditions and waste-limiting characteristics. These technologies were combined into remedial action alternatives. The Phase I FS (E.C. Jordan Co., 1990b) presented the remedial alternatives developed by combining the technologies identified in the previous screening process in the categories denoted in Section 300.430(e)(3) of the NCP. The purpose of the initial screening was to narrow the number of potential remedial actions for further detailed analysis while preserving a range of options. Each alternative was then evaluated and screened according to its implementability, effectiveness, and cost.

Of the six remedial action alternatives screened in the Phase I FS, the following three alternatives were retained for the detailed evaluation (E.C. Jordan Co., 1990b):

- No Action
- Soil Cover
- Excavation/Solidification

The No Action Alternative described in the Phase I FS was renamed the Minimal Action Alternative because it included institutional controls and environmental monitoring. A true No Action Alternative was added and was used as the baseline alternative. The Soil Cover Alternative was revised to include a cover to meet the state's requirements for closure of a construction/demolition debris landfill. The Excavation/Solidification Alternative was eliminated because treatment of the Site 8 soils is no longer necessary based on the revised risk estimates and the response objectives. However, citizens attending a public hearing regarding remedial alternatives for Site 8 requested consideration of excavation as an alternative. As a result, Excavation and Use as Subgrade Material at Sites 1 and 3 was also evaluated

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as an alternative in a Technical Memorandum (ABB-ES, 1993b). The four alternatives evaluated are listed in Table 3.

TABLE 3
SUMMARY OF REMEDIAL ALTERNATIVES

ROD: SITE 8
NAS BRUNSWICK

ALTERNATIVE	COMPONENTS
8-A: No Action	No Remedial Action Environmental Monitoring Five-Year Reviews
8-B: Minimal Action	Land-Use Restrictions Fencing/Sign Posting Environmental Monitoring Five-Year Reviews
8-C: Soil Cover	Land-Use Restrictions Cover System Maintenance Environmental Monitoring Five-Year Reviews
8-D: Excavation/Use as Subgrade Material at Sites 1 and 3	Site Preparation Excavation and Transport Confirmation Sampling Grading and Seeding

VIII. DESCRIPTION OF ALTERNATIVES

This section summarizes each alternative evaluated. Detailed alternative descriptions can be found in Section 3.0 of the FFS and Technical Memorandum for Site 8 (E.C. Jordan Co., 1992 and ABB-ES, 1993b).

ALTERNATIVE 8-A: NO ACTION

The No Action Alternative does not include any remedial actions and provides a baseline for comparing alternatives. In the No Action Alternative, the site would remain undisturbed. Because no remedial actions would be implemented, long-term human health risks for the site would essentially be the same as those identified in the baseline risk assessment. Environmental monitoring and five-year site reviews would be included as part of this alternative.

Environmental monitoring would be conducted to identify any changes in site contamination that may occur over time. Monitoring would include sampling of groundwater, surface water, and surface soils. A five-year review would be conducted to evaluate the monitoring data and establish whether any additional actions are warranted. For cost-estimating purposes, it was assumed that environmental monitoring would be conducted annually for 30 years.

Estimated Time for Design and Construction: Not applicable

Estimated Time of Operation: Minimum 5 years of monitoring

Estimated Capital Cost: None

Estimated Operations and Maintenance Costs (net present worth): \$134,000

*Estimated Total Cost (net present worth): \$161,000**

- * Net present-worth costs are based on a 10 percent discount factor and 30 years of operation.

ALTERNATIVE 8-B: MINIMAL ACTION

This alternative would consist of the following components:

- land-use restrictions
- fencing/sign posting
- environmental monitoring
- five-year reviews

Under the Minimal Action Alternative, no active measures would be taken to reduce or contain contamination emanating from the disposal site. Institutional controls

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would consist of fencing and warning signs around the disposal site and near the leachate seeps. Restrictions to future development would be incorporated to restrict land use should the base be closed.

Environmental monitoring would be performed to identify any changes in site contamination that may occur over time. Proposed monitoring would include surface soil, groundwater, surface water, and sediment samples. Based on the site conditions and contaminants, environmental monitoring would be performed annually. This environmental monitoring program could be adjusted in the future, if appropriate, and would be subject to regulatory approval. For cost-estimating purposes, it was assumed that environmental monitoring would be conducted annually for 30 years.

Estimated Time For Design and Construction: 2 months

Estimated Time For Operation: Minimum of 5 years and up to 30 years of monitoring

Estimated Capital Cost: \$21,000

Estimated Indirect Costs: \$7,000

*Estimated Operation and Maintenance Cost (net present worth): \$143,000**

*Estimated Total Cost (net present worth): \$197,000**

- * Net present-worth costs are based on a 10 percent discount factor and 30 years of operation

ALTERNATIVE 8-C: SOIL COVER

This alternative includes a low-permeability soil cover that would be designed and constructed to minimize infiltration of rainwater into the disposal area. The design of the cover system would meet the minimum performance requirements of the MEDEP regulations for the closure of attenuation landfills (i.e., maximum permeability of 5×10^{-7} centimeters per second and 5 to 33 percent slopes). Although human health risks were not identified as a significant concern, this alternative would prevent contact with soil contaminants and mitigate the potential risk associated with exposure to the maximum concentration of carcinogenic PAHs under a future residential exposure scenario. This alternative differs from the Soil Cover Alternative presented in the FFS report based on comments received from MEDEP.

This alternative consists of the following components:

- site preparation
- soil cover construction
- site inspections and maintenance

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- institutional controls
- environmental monitoring
- five-year reviews

The cover system would be designed to meet the minimum performance requirements for closure of an attenuation landfill and would minimize future potential human health risks by reducing exposure to surface soils. The cover system requested by MEDEP and described in the State of Maine solid waste regulations includes 18 inches of recompacted clay overlain by 6 inches of soil suitable for vegetative cover growth. Other options for constructing a low-permeability cover include using a flexible membrane liner (a durable plastic material) or a bentonite geocomposite liner (a thin material composed of dry bentonite on or between a geotextile). Either of these options would require approximately 2 feet of soil above the liner to protect it from damage (the top 6 inches would be suitable to support vegetative cover growth). To promote runoff, the cover would be sloped in all directions no less than 5 percent, as required by MEDEP regulations. The approximate 100-by-100-foot area would cover the location of the maximum detected PAH concentration. To prevent adverse effects on the stream environment, the cover system would not be extended down the embankment.

Because Alternative 8-C does not remove the waste from the site, institutional controls consisting of fencing and signs would be invoked. In the event the base is closed, land-use restrictions would be enacted to prevent future development of the Site 8 area.

A long-term monitoring program would be developed and submitted for regulatory agency review. This would include periodic monitoring of surface water, sediment, and groundwater. Chemical analysis of samples for inorganic contamination would provide information for comparison to baseline conditions (i.e., data from the RI) and to Ambient Water Quality Criteria (AWQC). The sampling frequency, duration, and analytical parameters would be established following the remedial design.

Five-year site reviews would also be required because contaminants remain on site at levels that do not allow for unlimited exposure or land use. The five-year site review could recommend further remedial actions at the site or that no further action is necessary. For cost estimating purposes, it was assumed that five-year site reviews would be conducted every five years for 30 years. The five-year reviews would be conducted in cooperation with MEDEP and USEPA.

Estimated Time For Design and Construction: 7 months

Estimated Time of Operation: Minimum of 5 years of monitoring, 30 years of cover maintenance

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Estimated Capital Cost: \$185,000 to \$205,000

Estimated Operations and Maintenance Cost (net present worth): \$199,000

*Estimated Total Cost (net present worth): \$462,000 to \$484,000**

- * Net present-worth costs are based on a 10 percent discount factor and 30 years of operation

The range of costs reflects different material and installation costs for three possible cover material options. Cost estimates do not include soil borrow source studies by an engineer.

ALTERNATIVE 8-D: EXCAVATION AND USE AS SUBGRADE MATERIAL AT SITES 1 AND 3

This alternative consists of the following components:

- site preparation
- excavation and transport of material
- confirmation sampling
- grading and seeding of excavated area

This alternative involves excavating PAH-contaminated soil, nonhazardous construction rubble, and debris from Site 8. Removing the rubble and debris along with the contaminated soil will free the site of future land-use restrictions that would be required if the debris were left in place. The excavated material would be transported to Sites 1 and 3 for use as subgrade material beneath the low-permeability cap approved for the sites and documented in the ROD for Sites 1 and 3 (June 1992).

A confirmation sampling program would be developed and submitted for regulatory review. The sampling plan would identify the sampling frequency for collecting soil and Toxicity Characteristic Leachate Procedure (TCLP) test samples from the side wall and bottom of excavation. Soil samples would be analyzed for Target Compound List and Target Analyte List constituents. All analytical results will be available for regulatory and TRC review.

Estimated Time For Design and Construction: 2 months

Estimated Direct Cost: \$252,000

Estimated Indirect Cost: \$76,000

Estimated Operation and Maintenance Cost (net present worth): NA

Estimated Total Cost (net present worth): \$328,000

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IX. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

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

A detailed analysis was performed on the alternatives using the nine evaluation criteria to select a site remedy. The following is a summary of the comparison of each alternative's strengths and weaknesses with respect to the nine evaluation criteria. These criteria and their definitions are as follows:

Threshold Criteria

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

1. **Overall protection of human health and the environment** addresses whether or not a remedy provides adequate protection and describes how risks posed by each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
2. **Compliance with ARARs** describes how the alternative complies with chemical-, location-, and action-specific ARARs, or other criteria, advisories, and guidance.

Primary Balancing Criteria

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

3. **Long-term effectiveness and permanence** evaluates the effectiveness of alternatives in protecting human health and the environment after response objectives have been met, in terms of the magnitude of residual risk and the adequacy and reliability of controls.
4. **Reduction of toxicity, mobility, or volume through treatment** evaluates the treatment technologies by the degree of expected reduction in toxicity, mobility, or volume of hazardous material. This criterion also evaluates the irreversibility of the treatment

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process and the type and quantity of residuals remaining after treatment.

5. **Short-term effectiveness** addresses the period 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 the remedial action objectives are achieved.
6. **Implementability** assesses the ability to construct and operate the technology; the reliability of the technology; the ease of undertaking additional remedial actions; and the ability to monitor the effectiveness of the remedy. Administrative feasibility is addressed in terms of the ability to obtain approvals from other agencies. This criterion also evaluates the availability of required resources, such as equipment, facilities, specialists, and capacity.
7. **Cost** evaluates the capital and operation and maintenance costs of each alternative, and provides an estimate of the total present-worth cost of each alternative.

Modifying Criteria

The modifying criteria are used in the final evaluation of remedial alternatives generally after public comment on the RI/FS and Proposed Plan has been received.

8. **State acceptance** addresses whether, based on its review of the RI/FS and Proposed Plan, the state concurs with, opposes, or has no comment on the alternative the Navy proposed for the remedial action.

The State of Maine has commented on the Proposed Plan and has documented its concurrence with the remedial action in the letter of concurrence presented in Appendix C of this ROD.

9. **Community acceptance** addresses whether the public concurs with the Navy's Proposed Plan. Community acceptance of the Proposed Plan was evaluated based on comments received at the public hearing and during the public comment periods.

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This is documented in the Responsiveness Summary presented in Appendix A of this ROD.

The state acceptance criterion has been addressed by incorporating comments received from the state on the Proposed Plan. The state is a party to the FFA and has had the opportunity to review and comment on all documents.

Community acceptance criterion is addressed as part of the Responsiveness Summary in Appendix A of this ROD. Based on input from the community received during the first public comment period, the Navy changed the preferred alternative from a soil cover to excavation and use as subgrade material at Sites 1 and 3.

Following the detailed analysis of each individual alternative, a comparative analysis, focusing on the relative performance of each alternative against seven of the nine criteria, was conducted. This comparative analysis for the original alternatives can be found in Table 4-1 of the FFS (E.C. Jordan Co., 1992). A description of the preferred alternative can be found in the Technical Memorandum (ABB-ES, 1993b).

The section below presents the nine criteria and a brief summary of each alternative and its strengths and weaknesses according to the detailed and comparative analyses.

Overall Protection of Human Health and the Environment

The selected alternative will remove the contaminated soil and its associated risk from this site. Placement under an approved cap at the Sites 1 and 3 landfill will limit access to contaminated soil. This alternative provides the greatest protection to human health and the environment by removing contaminated soil and construction rubble and debris from the site and placing it under an approved landfill cap at Sites 1 and 3. The other alternatives, except for the No Action Alternative, would provide a similar degree of protection by preventing or reducing the possibility of contact with the contaminated soil at the site.

The No Action Alternative would not achieve overall protection of human health and the environment because no action would be taken to either reduce contaminant concentrations or exposure to soils.

Compliance with Applicable or Relevant and Appropriate Requirements

The selected alternative and the soil cover alternative would meet all ARARs. The No Action and Minimal Action Alternatives would not meet ARARs because they do not comply with Maine regulations for the closure of construction debris landfills.

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Long-term Effectiveness and Permanence

The selected alternative would permanently remove contaminated media from the site, requiring neither long-term monitoring nor land-use restrictions. Although the volume of contaminated soil would not be reduced, it would provide some of the needed volume of subgrade fill for the proper closure of the landfill at Sites 1 and 3. None of the other alternatives reduces the nature or magnitude of contamination at Site 8. The soil cover alternative provides long-term effectiveness and permanence if long-term management is provided to maintain the soil cover.

Neither the No Action Alternative nor the Minimal Action Alternative would provide long-term effectiveness or permanence. The site would continue to pose a risk to humans and the environment.

Reduction of Toxicity, Mobility, or Volume through Treatment

None of the alternatives use treatment technologies to reduce the toxicity, mobility, or volume of the contaminated soil. TCLP tests performed on site soils showed that the PAHs have a very low mobility in the present state. The soil samples passed the TCLP test.

Short-term Effectiveness

The No Action Alternative and the Minimal Action Alternative would not result in any adverse impacts to the public and the environment.

No risks to the community or environment are expected during either the excavation or soil cover alternatives. Any risks to workers would be controlled by providing personal protection equipment and safe work practices as outlined in a Health and Safety Plan developed for the site. Dust levels would be monitored and controlled if necessary.

Implementability

All the alternatives evaluated in the FFS are implementable. No special techniques, materials, permits, or labor would be required. All the necessary construction equipment and services for each alternative are readily available. The No Action Alternative would be the easiest to implement. The Soil Cover Alternative would also be easily implemented; however, a suitable borrow source would need to be located. The Minimal Action and the Soil Cover Alternatives would require land-use restrictions.

The Selected Alternative would not require land-use restrictions. Excavation and transportation of material is a common practice for which equipment is readily available.

Cost

The capital, operation and maintenance, and total costs for each alternative are provided as part of Section VIII, Description of Alternatives. Although the Selected Alternative does not have the lowest estimated capital cost of the four alternatives, it does have the lowest operation and maintenance cost and total cost. The lower operation and maintenance and total costs are a result of there being no need for long-term monitoring or any sort of maintenance.

State Acceptance

As a party to the FFA, the State of Maine has provided comments on the RI, FS, FFS, Technical Memorandum, and the Proposed Plan. The state has documented its concurrence with the remedial action as stated in Section XIII of this ROD. A copy of the state's letter of concurrence is presented in Appendix C of this ROD.

Community Acceptance

Community acceptance of the Proposed Plan was evaluated based on comments received at the public meeting and during the two public comment periods. In September 1992, the Navy placed the original Proposed Plan for Site 8 in the Information Repository and Administrative Record. A Public Hearing was held in October 1992 and a public comment period extended from October 1 through 30, 1992. During the public comment period, the Navy accepted comments on the alternatives presented in the Proposed Plan for Site 8. Many of these comments requested the consideration of excavation instead of a soil cover as the preferred alternative. The Navy reconsidered and issued a revised Proposed Plan and Technical Memorandum detailing the excavation alternative (ABB-ES Inc., 1993a and 1993b). These documents were issued in March of 1993 and a second public comment period was held from March 12 through April 12, 1993. No comments were received during the second public comment period. The Selected Alternative was developed specifically to address concerns expressed by the community. This is documented in the Responsiveness Summary presented in Appendix A of this ROD.

X. THE SELECTED REMEDY

The selected remedial alternative chosen for Site 8 (i.e., Alternative 8-D) is a comprehensive remedy that includes excavation of contaminated soil and construction rubble and debris. It is designed to remove the buried waste and place it beneath a permanent, low-permeability cap at Sites 1 and 3.

A. CLEANUP LEVELS

Based upon data presented in the RI and the revised Risk Assessment presented in the FFS, remedial measures to address risk associated with possible exposure to soils are warranted because the future residential scenario exceeds USEPA's acceptable carcinogenic risk range. This was the only exposure scenario that resulted in risk estimates slightly in excess of USEPA's target risk range. The scenario was based on the conservative assumption of long-term repetitive exposure to the maximum detected PAH concentration under a residential scenario. The future residential scenario and current exposure to PAH-contaminated soil resulted in risk estimates in excess of the State of Maine's guideline risk level of 1×10^{-5} (see Table 2).

B. DESCRIPTION OF REMEDIAL COMPONENTS

The Selected Alternative involves excavating PAH-contaminated soil and nonhazardous construction rubble and debris from Site 8. Removing the rubble and debris along with the contaminated soil will free the site of future land-use restrictions for proper closure of this disposal area, which would be required if the debris were left in place. The excavated material would be transported to Sites 1 and 3 to provide necessary subgrade material beneath the low-permeability cap approved for the sites and documented in the ROD. To minimize erosion, the Navy proposes to conduct excavation activities during dry periods, to the extent practicable. The alternative includes the following components.

- site preparation
- excavation and transportation of material
- confirmation sampling
- grading and seeding

Site Preparation

Site preparation would be minimal because the area is flat and relatively free of trees and brush. Equipment would be brought to the site and stored in a designated area.

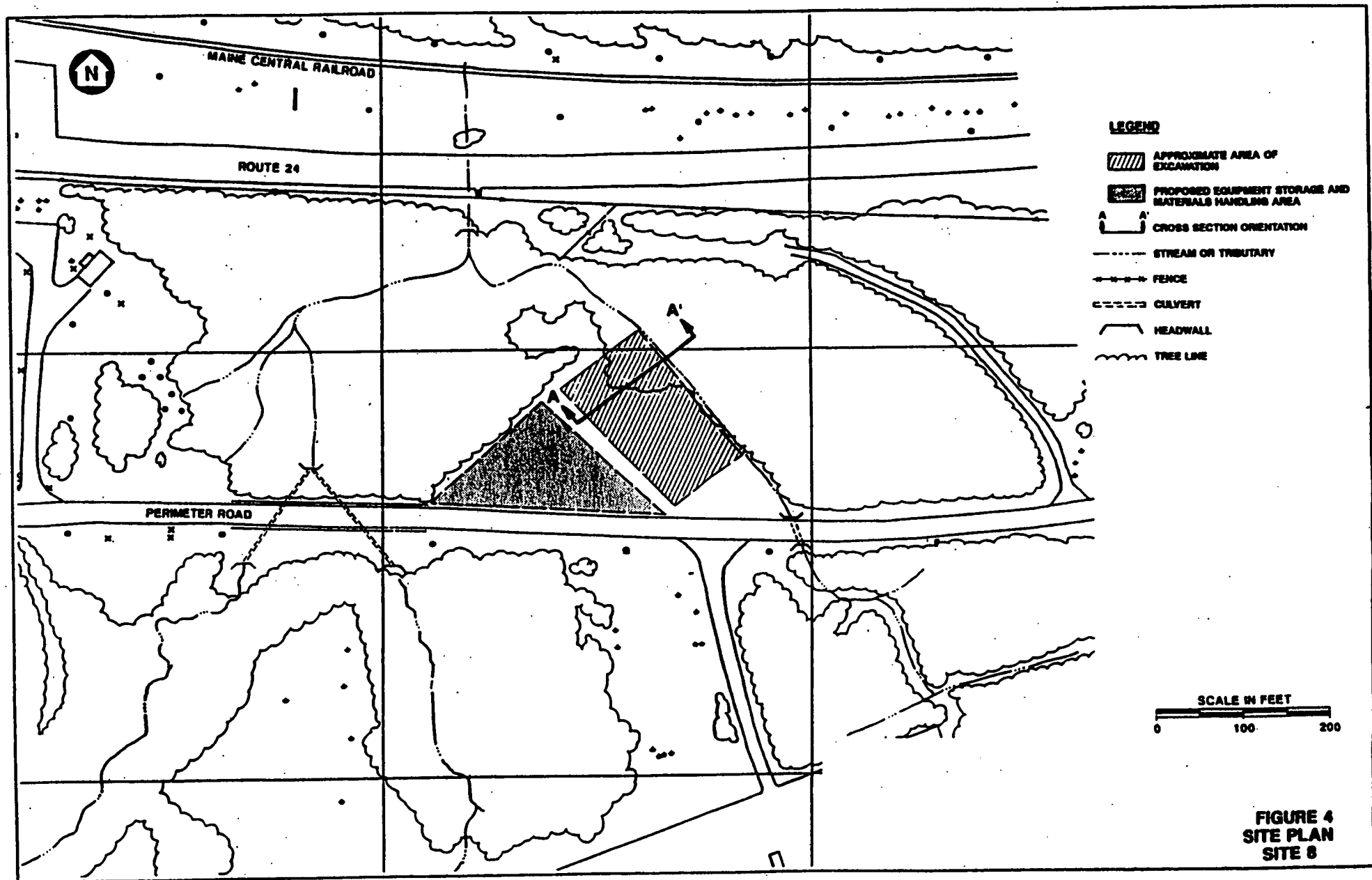
To minimize the impact of the excavation on the stream at the bottom of the embankment, siltation fencing or hay bales would be placed along the edge of the stream to prevent silt from entering the water. Excavation work would be performed during dry periods of summer and early fall, to the extent practicable, to minimize erosion and siltation of the stream and to allow a good vegetation catch on exposed soils.

Excavation and Transportation of Material

An upper estimate of 14,000 cubic yards of soil, construction rubble, and debris would be excavated from the embankment of the site. Information obtained during pre-design field activities indicates this volume may be as low as 5,600 cubic yards. The conservative volume of 14,000 cubic yards is assumed in the selected alternative. The approximate area of excavation is shown on Figure 4; a conceptual cross-section of this area is shown on Figure 5. The amount of material to be excavated was estimated from boring, test pit, and monitoring well installation logs presented in the Draft Final RI and the Draft Final Supplemental RI Reports and information obtained during pre-design field activities (E.C. Jordan Co., 1990a and 1991).

Material would be excavated and loaded with a backhoe with an estimated reach of approximately 20 feet, which would enable the operator to excavate from the slope without moving the equipment to the bottom of the embankment. Material-handling activities such as screening, sorting, and crushing the construction debris and rubble would occur after excavation and before the material is transported to Sites 1 and 3. Dust emissions from excavated material would be controlled by wetting the material prior to excavation. Approximately 800 to 1,000 cubic yards of material would be excavated for transportation per day.

Material would be transported approximately 3 miles in dump trucks to Sites 1 and 3. Increased truck traffic is anticipated on the base. The material would be placed and spread at Sites 1 and 3 for use as subgrade material before landfill cap construction. Eight to 10 12-cubic-yard dump trucks would be required to haul material at the projected pace of excavation; approximately 90 cubic yards per truck, per day. At this rate, and with an assumed volume of material of 14,000 cubic yards, excavation and transport would last from 15 to 20 days. The proposed truck route, and Sites 1, 3, and 8 appear on the Site Map (Figure 6). An engineering evaluation of the fill requirements for the Sites 1 and 3 landfill cap indicates this material is suitable subgrade material and will provide some of the required fill necessary for completion of the Sites 1 and 3 remediation.





A

A'

TP-803

MW-810

APPROXIMATE 3.5:1 SLOPE

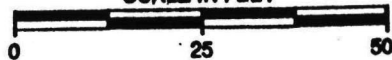
APPROXIMATE 2:1 SLOPE

NATIVE
MATERIAL

RUBBLE AND
DEBRIS TO BE
EXCAVATED

STREAM

SCALE IN FEET



VERTICAL EXAGGERATION 1:5

FIGURE 5
CONCEPTUAL CROSS SECTION
SITE 8

Confirmation Sampling

After excavation of the rubble and debris, soil samples would be collected and analyzed to confirm that no site-related contaminants are left in place. The presence of debris or rubble would be evaluated visually. The sampling and analysis plan would be developed by the remedial construction contractor before work begins and submitted for regulatory review and comment. At a minimum, three soil samples would be collected and analyzed for VOCs, SVOCs, pesticides/PCBs, and inorganics. The sample locations would be selected by a Navy representative from areas where staining is apparent (if any). Excavation would proceed if these contaminants are detected above background concentrations (non-detect for organics). If contamination is detected, and cannot be physically removed by excavation, long-term monitoring of groundwater may be implemented to evaluate the impacts on groundwater downgradient of the site. Long-term monitoring is not a component of the remedial action because contamination is not expected, based on results of the RI and pre-design field programs. However, if necessary, Site 8 could be included in the long-term monitoring program to be developed for NAS Brunswick.

Grading and Seeding

After excavation and confirmation monitoring are complete, the area would be graded to establish a maximum 3:1 (vertical to horizontal) slope down to the stream to promote drainage and minimize erosion. It is anticipated that no additional fill material would be required to achieve the desired 3:1 final slope. The area would be mulched and seeded to reestablish vegetation.

XI. STATUTORY DETERMINATIONS

The remedial action selected for implementation at NAS Brunswick Site 8 is consistent with CERCLA and, to the extent practicable, the NCP. The selected remedy is protective of human health and the environment, attains ARARs, and is cost-effective.

A. THE SELECTED REMEDY IS PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT

The remedy at Site 8 will permanently reduce the risks posed to human health and the environment by eliminating, reducing, and controlling exposures to human and environmental receptors through engineering controls. The removal of material from the site will eliminate direct contact and incidental ingestion exposure to residual soil contaminants. Placement of the material under the landfill cap at Sites 1 and 3 would limit accessibility to the excavated material and contaminated soil. Removal

Installation Restoration Program

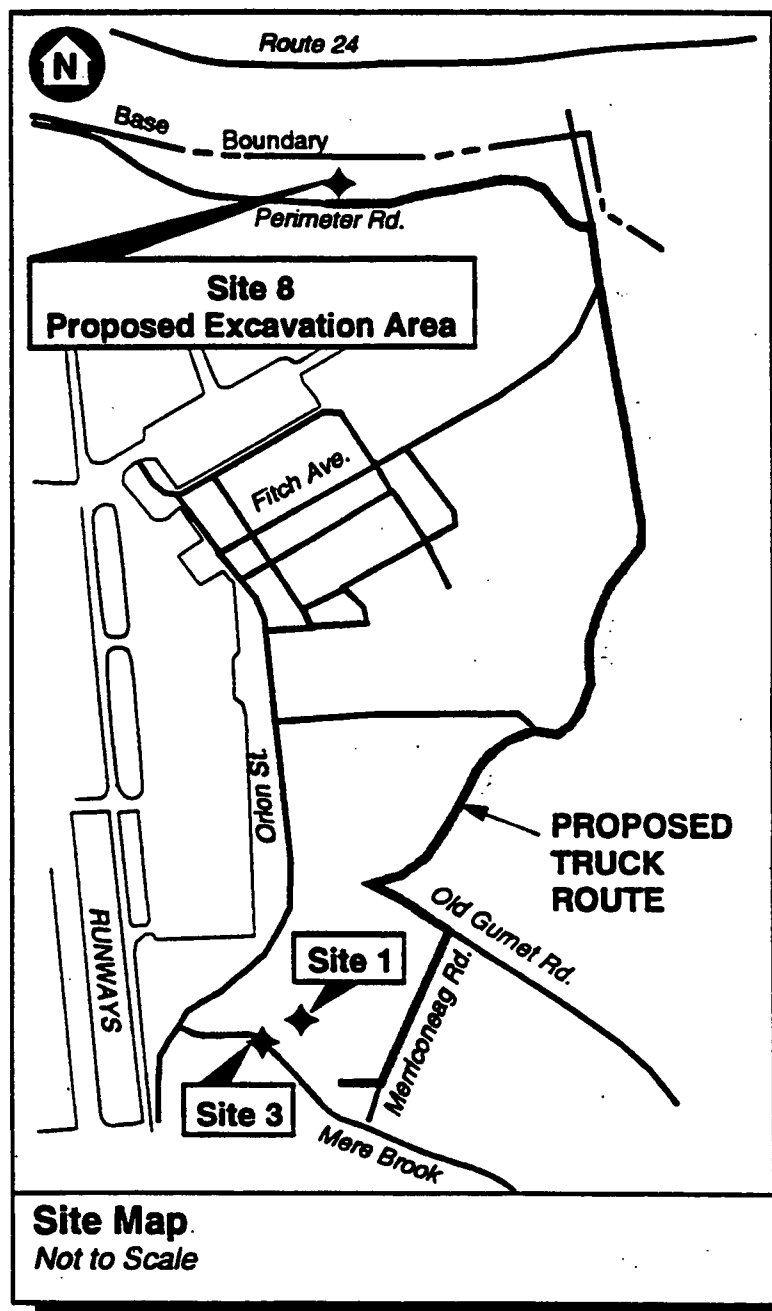


FIGURE 6
PROPOSED TRUCK ROUTE
SITE 8

of the material from the site will also eliminate any contribution it may have made to the high levels of inorganics detected in the leachate seeps and surface water at the site. The selected remedy will result in human exposure levels that are within the 10^{-4} to 10^{-6} incremental cancer risk range and that are below an HI of 1.0 for noncarcinogens. Finally, implementation of the selected remedy will not pose unacceptable short-term risks or cross-media impacts.

B. THE SELECTED REMEDY ATTAINS ARARS

This remedy will attain all applicable or relevant and appropriate federal and state requirements that apply to Site 8. ARARs for Site 8 were identified in the RI, FFS, and Technical Memorandum (E.C. Jordan Co., 1990a, 1992, and ABB-ES, 1993b). Appendix D presents tabular summaries of the ARARs that apply to the remedy including the regulatory citation and a brief summary of the regulatory requirement and its consideration in the remedial process.

The selected remedy would meet the following federal and state ARARs:

Chemical-specific ARARs

- Safe Drinking Water Act (SDWA) - MCLs and non-zero Maximum Contaminant Level Goals
- Maine Drinking Water Rules
- Clear Air Act - National Ambient Air Quality Standards
- Maine Ambient Air Quality Standards

The following chemical-specific policies, criteria, and guidelines were also considered:

- Maine Department of Human Services Rule 10-144A, CMR Chapter 233 - Maximum Exposure Guidelines (MEGs)
- USEPA RfDs
- USEPA Human Health Assessment Group CSFs

Location-specific ARARs

- Maine Natural Resources Protection Act

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- **Maine Standards for Classification for Groundwater**
- **Maine Standards for Classification of Minor Drainages**
- **Maine Solid Waste Management Regulations**
- **Maine Site Location Development Law and Regulations**
- **Maine Solid Waste Management Rules: Land Disposal Facilities**
- **Natural Resources Protection Act, Permit by Rule Standards**

Action-specific ARARs

- **Resource Conservation and Recovery Act (RCRA) - Preparedness and Prevention**
- **RCRA - Contingency Plan and Emergency Procedures**
- **RCRA - Closure and Post-closure**
- **Maine Hazardous Waste Management Rules**
- **Occupational Safety and Health Administration (OSHA) - General Industry Standards**
- **OSHA - Safety and Health Regulations**
- **OSHA - Recordkeeping, Reporting, and Related Regulations**
- **Clean Air Act - National Ambient Air Quality Standards**
- **Maine Landfill Disposal Regulations**

Federal and State Drinking Water Regulations. The chemical-specific ARARs identified for Site 8 were applied to the RI/FS process to determine the need for groundwater remediation. The drinking water standards, MCLs and other guidance and criteria to be considered (TBCs) were used to evaluate potential risk to human health from the ingestion of groundwater. In the evaluation of potential risk, the groundwater in the aquifer underlying the site is classified by the state as GW-A, a drinking water source. The quality and safety of drinking water sources is regulated by the SDWA and Maine Drinking Water Rules. MCLs are enforceable standards

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under the SDWA that represent the maximum level of contaminants that is acceptable for users of public drinking water supplies. MCLs are relevant and appropriate because, while the groundwater on and off site is not currently used as a drinking water source, the groundwater underlying NAS Brunswick potentially could be used as a drinking water source in the future. Target cleanup levels for groundwater at Site 8 were not considered necessary based on the results of the baseline risk assessment.

Federal and State Air Quality Regulations. The excavation of soil and construction debris and rubble proposed in the selected remedy will not create any new sources of air emissions. Therefore, many federal and state regulations governing air quality do not apply to the selected remedy. The only air quality standards that are applicable are particulate standards promulgated under the Clean Air Act and Maine Ambient Air Quality Standards. The particulate standard would apply to remedial construction activities associated with excavation. These standards would be attained through monitoring and, if necessary, use of dust suppression techniques or engineering controls.

State Location-specific Regulations. All of the location-specific ARARs that apply to the selected remedy are based on the close proximity of the site to the unnamed tributary. The Maine Natural Resources Protection Act provides that removal of soils or other activities conducted adjacent to streams must not cause unreasonable soil erosion, cause unreasonable harm to significant wildlife habitats, unreasonably interfere with natural water flow, lower water quality, or unreasonably cause or increase flooding. Chapter 305 of the MEDEP regulations provides further standards for erosion control and soil excavation. Implementation of the selected remedy would not impact the drainage or natural flow of this tributary. Erosion control measures will be employed during construction to minimize soil/sediment from entering the surface water.

Federal and State Hazardous Waste Regulations. The applicability of RCRA and Maine Hazardous Waste Regulations depends on whether the wastes are RCRA-hazardous wastes as defined under these regulations. To date, there is no information available (i.e., manifests) to indicate that RCRA-regulated materials were disposed of at Site 8. However, because toxic constituents are present in the soil at Site 8, many portions of the federal and state hazardous waste regulations are relevant and appropriate to the selected remedy.

RCRA Preparedness and Prevention and Contingency Plan and Emergency Procedures will be attained during excavation of the material from Site 8. During construction, safety and communication equipment will be installed at the site, and local authorities will be familiarized with site operations. Contingency plans will be

Installation Restoration Program

developed and implemented during site work and treatment plant operation. A program will be developed for handling, storage, and recordkeeping, in accordance with Maine Hazardous Management Rules.

Because toxic constituents are present on site, OSHA regulations protecting worker health and safety at hazardous waste sites are applicable to the implementation and long-term operation of the selected remedy. Site workers will have completed training requirements and will have appropriate health and safety equipment on site. Contractors and subcontractors working on site will follow health and safety procedures.

RCRA Land Disposal Restrictions are not applicable or relevant and appropriate for the Site 8 remediation because the soils and construction rubble and debris are not considered to be hazardous waste. No listed wastes were disposed of and analytical results were not above regulatory limits for the TCLP analysis collected at Site 8.

C. THE SELECTED REMEDIAL ACTION IS COST-EFFECTIVE

The selected remedy is cost-effective; that is, the remedy affords overall effectiveness proportional to its costs. In selecting this remedy, once the Navy identified alternatives that are protective of human health and the environment and that attain ARARs, the Navy evaluated the overall effectiveness of each alternative by assessing the relevant three criteria in combination: (1) long-term effectiveness and permanence; (2) reduction in toxicity, mobility, and volume through treatment; and (3) short-term effectiveness. The relationship of the overall effectiveness of the selected remedial alternative was established as being proportional to its costs. The costs of this remedial alternative are:

Estimated Capital Cost: \$328,000

Estimated Operation and Maintenance Cost (net present worth): NA

Estimated Total Cost (net present worth): \$328,000

The least expensive alternative is clearly the No Action Alternative, which requires only long-term monitoring. The Minimal Action Alternative is expected to cost approximately \$197,000. The soil cover alternative costs \$484,000 and includes long-term monitoring. The selected remedy is also relatively inexpensive at approximately \$328,000.

All the alternatives considered, except No Action and Minimal Action, are protective of human health and the environment, meet ARARs and response objectives, and have similar long-term effectiveness and permanence. While the selected remedy does not have the lowest estimated capital cost of the four treatment alternatives, it

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does have the lowest estimated operation and maintenance cost and estimated total cost. This is due to the fact that long-term monitoring will not be required.

D. THE SELECTED REMEDY UTILIZES PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE

The Navy identified those alternatives that attain ARARs and that are protective of human health and the environment. The Navy also identified which alternative uses 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 factors 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 off-site land disposal of untreated waste, and community and state acceptance. The selected remedy provides the best balance of trade-offs among the alternatives because it is implementable, provides long-term effectiveness, disposes of waste in a way that contributes to closure of another site, and releases the site from future land-use restrictions. The selected remedy, however, does not satisfy the statutory preference for treatment. Treatment of such a volume of heterogeneous material (e.g., construction debris, rubble, and soil) is not considered to be cost-effective or feasible.

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

This remedy does not meet the statutory preference for treatment. Treatment was not considered to be cost-effective based on results of treatability studies and TCLP tests conducted on soils from Site 8. A small volume of the excavated soil at Site 8 contains PAHs. However, TCLP tests conducted on these soils showed that the PAH contaminants are not very mobile. The rubble and debris at the site are nonhazardous and not contaminated; therefore, no contaminants are considered to be mobile or toxic. The volume of the material, estimated at 14,000 cubic yards, could increase slightly from bulking during excavation and handling. However, this volume contributes to the volume of subgrade fill needed at Sites 1 and 3 to complete the closure of the landfill. Physical hazards (e.g., protruding debris and rebar) associated with the disturbed material and risks from exposure to PAHs via

direct contact and ingestion would be eliminated once the cap is constructed at Sites 1 and 3.

XII. DOCUMENTATION OF SIGNIFICANT CHANGES

The Navy presented a Proposed Plan for remediation of Site 8 on October 15, 1992. The preferred alternative included a low-permeability cover including vegetation to minimize rainfall infiltration and to prevent contact with the contained material. The soil cover alternative also included site inspections and maintenance, fencing and warning signs, and land-use restrictions. Citizen responses at the hearing to discuss remedial actions for Site 8 expressed a clear preference for removal of the waste, largely to avoid having land-use restrictions placed on a small piece of land. Considering this suggestion in light of all available data, the Navy issued a revised Proposed Plan in February 1993 which presented Excavation and Use as Subgrade Material at Sites 1 and 3 as the preferred alternative. A second public comment period for this alternative was held from March 12 through April 12, 1993.

XIII. STATE ROLE

As a party to the FFA, MEDEP has reviewed the various alternatives and has indicated its support for the selected remedy. MEDEP concurs with the selected remedy for NAS Brunswick Site 8. A copy of the letter of concurrence is presented in Appendix C of this ROD.

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (the Superfund statute)
CSF	cancer slope factor
COC	contaminant of concern
DDT	dichlorodiphenyltrichloroethane
FFA	Federal Facility Agreement
FFS	Focused Feasibility Study
FS	Feasibility Study
HI	Hazard Index
HQ	Hazard Quotient
IAS	Initial Assessment Study
IRP	Installation Restoration Program
MCL	Maximum Contaminant Level
MEDEP	Maine Department of Environmental Protection
MEG	Maximum Exposure Guidelines
MEK	methyl ethyl ketone
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MSL	mean sea level
NAS	Naval Air Station
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
OSHA	Occupational Safety and Health Administration
PAH	polynuclear aromatic hydrocarbons
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RfD	reference dose

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REFERENCES

- ABB Environmental Services, Inc. (ABB-ES), 1993a. "Revised Proposed Plan for Site 8, the Perimeter Road Disposal Site NAS Brunswick"; Portland, Maine; March.
- ABB-ES, 1993b. "Draft Final Technical Memorandum: Detailed Evaluation of Alternative 8D: Excavation and Use as Subgrade Material at Sites 1 and 3"; Portland, Maine; March.
- E.C. Jordan Co., 1990a. "Draft Final Remedial Investigation Report NAS Brunswick"; Portland, Maine; August.
- E.C. Jordan Co., 1990b. "Draft Final Phase I Feasibility Study Development and Screening of Alternatives NAS Brunswick"; Portland, Maine; August.
- E.C. Jordan Co., 1991a. "Draft Final Supplemental Remedial Investigation Report NAS Brunswick"; Portland, Maine; August.
- E.C. Jordan Co., 1991b. "Draft Final Supplemental Feasibility Study Sites 5, 6, and 12 NAS Brunswick"; Portland, Maine.
- E.C. Jordan Co., 1991c. "Focused Feasibility Study Sites 1 and 3 NAS Brunswick"; Portland, Maine; October.
- E.C. Jordan Co., 1992. "Focused Feasibility Study Site 8 NAS Brunswick"; Portland, Maine; April.
- E.C. Jordan Co., 1992b. "Feasibility Study Sites 2,4,7,9,11 and 13 NAS Brunswick"; Portland, Maine; March.
- Northern Division, Naval Facilities Engineering Command (NAVY), 1992. "Record of Decision for a Remedial Action at Sites 1 and 3 Naval Air Station Brunswick, Maine"; Portland, Maine; June.
- Olson and Ohno, 1989. "Determination of Free Cyanide Levels in Surface and Ground Waters Affected by Highway Salt Storage Disposal Facilities in Maine"; Maine Department of Transportation; Department of Plant and Soil Sciences, University of Maine, Orono, Maine.

APPENDIX B

MEDIA-SPECIFIC DATA SUMMARY TABLES

Installation Restoration Program

MEDIA-SPECIFIC DATA SUMMARY TABLE

**ROD: SITE 8
NAS BRUNSWICK**

CONTAMINANT	DETECTION FREQUENCY	MAXIMUM CONCENTRATION	MINIMUM CONCENTRATION
SURFACE SOIL (mg/kg)			
Arsenic	4/4	5	2.6
Lead	4/4	37	9.4
Manganese	4/4	185	137
Endosulfan II	1/4	0.017	0.017
Benzo(a)Anthracene	3/4	4.3	0.33
Benzo(a)Pyrene	3/4	3.9	0.32
Benzo(b)Fluoranthene	4/4	7.6	0.54
Benzo(k)Fluoranthene	4/4	7.6	0.54
Chrysene	4/4	4.1	0.46
Dibenzo(a,h)Anthracene	1/4	0.77	0.12
Indeno(1,2,3-c,d)Pyrene	2/4	1.4	0.19
Acenaphthylene	1/4	1.1	1.1
Anthracene	2/4	0.72	0.32
Benzo(g,h,i)Perylene	2/4	1.7	0.22
Fluoranthene	4/4	8.8	0.58
Fluorene	1/4	0.39	0.39
Phenanthrene	3/4	5.4	0.15
Pyrene	4/4	10	0.56
SUBSURFACE SOIL (mg/kg)			
Arsenic	7/12	10.3	1.3
Lead	11/12	37	2.6
Manganese	12/12	200	80.3
4,4'-DDT	3/12	0.076	0.02
Benzo(a)Anthracene	5/12	4.3	0.05
Benzo(a)Pyrene	5/12	3.9	0.18
Benzo(b)Fluoranthene	6/12	7.6	0.13
Benzo(k)Fluoranthene	6/12	7.6	0.13
Chrysene	6/12	4.1	0.065
Dibenzo(a,h)Anthracene	1/12	0.77	0.77
Indeno(1,2,3-c,d)Pyrene	2/12	1.4	0.15
Acenaphthylene	2/12	1.1	0.28
Anthracene	2/12	0.72	0.25
Benzo(g,h,i)Perylene	3/12	1.7	0.22
Fluoranthene	5/12	8.8	0.092
Fluorene	1/12	0.39	0.39
Phenanthrene	4/12	5.4	0.065
Pyrene	6/12	10	0.16
STREAM SEDIMENT (mg/kg)			
Lead	6/6	16	2.5
Manganese	6/6	220	72
Benzo(a)Anthracene	1/9	0.89	0.89
Benzo(b)Fluoranthene	2/9	1.3	1
Benzo(k)Fluoranthene	1/9	1	1
Chrysene	2/9	1.7	0.61
Benzo(g,h,i)Perylene	1/9	1.3	1.3
Fluoranthene	2/9	2.6	1.1
Phenanthrene	2/9	2	0.96
Pyrene	3/9	2.3	0.47
SURFACE WATER (ug/L)			
Lead	3/6	2100	1500
Zinc	4/6	161	70.6

MEDIA-SPECIFIC DATA SUMMARY TABLE

**ROD: SITE 8
NAS BRUNSWICK**

CONTAMINANT	DETECTION FREQUENCY	MAXIMUM CONCENTRATION	MINIMUM CONCENTRATION
LEACHATE SEDIMENT (mg/kg)			
Arsenic	7/11	6.1	3.2
Lead	11/11	77	5
Manganese	11/11	570	74.9
Benzo(a)Anthracene	3/11	2.7	0.63
Benzo(a)Pyrene	2/11	1.9	0.66
Benzo(b)Fluoranthene	5/11	3	0.57
Benzo(k)Fluoranthene	3/11	0.78	0.57
Chrysene	5/11	3.9	0.66
Indeno(1,2,3-c,d)Pyrene	1/11	1.5	1.5
Benzo(g,h,i)Perylene	2/11	2.6	1.4
Fluoranthene	9/11	7.7	0.59
Phenanthrene	5/11	4	0.63
Pyrene	7/11	5.5	0.44
4,4'-DDT	2/11	0.058	0.038
Aroclor 1240	1/11	0.44	0.44
LEACHATE SEEP (ug/L)			
Arsenic	2/11	24.6	14.5
Cadmium	3/11	46	7
Lead	10/11	738	6.5
Manganese	11/11	6500	504
GROUNDWATER (ug/L)			
Aluminum	8/24	188000	242
Arsenic	1/24	12	12
Barium	1/24	615	615
Beryllium	1/24	12.2	12.2
Cadmium	3/24	12.6	7.2
Calcium	23/24	69100	5230
Chromium	4/24	300	23.1
Cobalt	1/24	147	147
Copper	3/24	243	25.4
Iron	16/24	228000	119
Lead	6/24	218	6.2
Magnesium	15/24	66300	5100
Manganese	23/24	4240	17
Mercury	2/24	1.5	0.62
Nickel	2/24	237	62.5
Potassium	5/24	33300	5800
Sodium	22/24	78800	5430
Vanadium	2/24	74.8	52
Zinc	8/24	280	26
Cyanide	4/24	38	11

APPENDIX C

MEDEP LETTER OF CONCURRENCE

Installation Restoration Program



DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN R. McKEERNAN, JR.
GOVERNOR

DEAN C. MARRIOTT
COMMISSIONER

DEBRAH RICHARD
DEPUTY COMMISSIONER

July 27, 1993

W.A. Waters
Captain, CEC, U.S. Navy
Commanding Officer
Department of the Navy, Northern Division
Naval Facilities Engineering Command
Building 77-L
Philadelphia Naval Shipyard
Philadelphia, PA 10112-5094

RE: Naval Air Station Brunswick Superfund Site, Brunswick,
Maine

Dear Captain Waters:

The Maine Department of Environmental Protection (MEDEP) has reviewed the July 1993 Record of Decision (ROD) regarding Site 8 for the Naval Air Station Brunswick Superfund Site located in Brunswick, Maine.

Based on this ROD the MEDEP concurs with the selected remedial action. This action includes excavating PAH-contaminated soil, non hazardous construction rubble, and debris from Site 8. Removing the rubble and debris along with the contaminated soil will free the site of future land-use restrictions that would be required if the debris were left in place. The excavated material would be transported to Sites 1 and 3 for use as a subgrade material beneath the low-permeability cap approved for the sites and documented in the ROD for Sites 1 and 3 (June 1992). The four components of the remedial action are outlined in the following:

I. Site Preparation

A. Silt fencing or hay bales will be placed along the edge of the stream to prevent silt from entering the water.

B. Excavation work will be performed during dry periods of summer and early fall, to the extent practicable, to minimize erosion and siltation of the stream and to allow a good vegetation catch on exposed soils.

II. Excavation and Transportation of Material

AUGUSTA
STATE HOUSE STATION 17
AUGUSTA, MAINE 04333-0017
(207) 287-7888 FAX: (207) 287-7828
OFFICE LOCATED AT: RAY BUILDING, HOSPITAL STREET

PORTLAND
312 CANCO ROAD
PORTLAND, ME 04103
(207) 879-6300 FAX: (207) 879-6303

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

PRESQUE ISLE
1235 CENTRAL DRIVE SKYWAY PARK
PRESQUE ISLE, ME 04769
(207) 784-0477 FAX (207) 764-1507

printed on recycled paper

A. An upper estimate of 14,000 cubic yards of soil, construction rubble, and debris will be excavated from the embankment of the site. This volume may be as low as 5,600 cubic yards.

B. Material would be excavated from the slope without moving the equipment to the bottom of the embankment.

C. Material-handling activities such as screening, sorting, and crushing the construction debris and rubble would occur after excavation and before material is transported to Sites 1 and 3.

D. Transported material will be placed and spread at Sites 1 and 3 for use as subgrade material before landfill cap construction. An engineering evaluation of the fill requirements for the Sites 1 and 3 landfill cap indicates this material is suitable subgrade material and will provide some of the required fill necessary for completion of the Sites 1 and 3 remediation.

III. Confirmation Sampling

A. After excavation of the rubble and debris, soil samples would be collected and analyzed to confirm that no site-related contaminants are left in place.

B. The sampling and analysis plan will be developed by the remedial construction contractor before work begins and submitted for regulatory review and comment.

C. At a minimum, three soil samples would be collected and analyzed for VOCs, SVOCs, pesticides/PCBs, and inorganics.

D. If contamination is detected and cannot be physically removed by excavation, long-term monitoring of groundwater may be implemented to evaluate the impacts on groundwater downgradient to the site.

IV. Grading and Seeding

A. After excavation and confirmation are complete, the area will be graded to establish a maximum 3:1 (vertical to horizontal) slope down to the stream to promote drainage and minimize erosion.

This concurrence is based upon the State's understanding that:

A. The MEDEP will continue to participate in the Federal Facilities Agreement dated October 19, 1990 and

in the review and approval of operational designs and monitoring plans.

The MEDEP looks forward to working with the Department of the Navy and the USEPA to resolve the environmental problems posed by this site. If you need any additional information, do not hesitate to contact me or members of my staff.

Sincerely,

A handwritten signature in black ink, appearing to read "Dean C. Marriott". The signature is stylized with a large, looped initial "D" and a long, sweeping horizontal stroke at the end.

Dean C. Marriott
Commissioner

pc: Captain Robert Rachor, BNAS
Robert McGirr, ABB-ES
Meghan Cassidy, USEPA
Mark Hyland, MEDEP

APPENDIX D

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Installation Restoration Program

TABLE D-1
CHEMICAL-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR SITE 8

ROD: SITE 8
NAS BRUNSWICK

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE REMEDIAL RESPONSE PROCESS
GROUNDWATER/SURFACE WATER				
<u>Federal</u>	Safe Drinking Water Act (SDWA) - Maximum Contaminant Levels (MCLs) (40 CFR Parts 141.11 - 141.16)	Relevant and Appropriate	MCLs have been promulgated for several 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 groundwater aquifers used for drinking water.	To assess the potential risks to human health due to consumption of groundwater, contaminant concentrations were compared to their MCLs.
	SDWA - Maximum Contaminant Level Goals (MCLGs) (40 CFR Parts 141.50 - 141.51)	Relevant and Appropriate	MCLGs are health-based criteria to be considered for drinking water sources as a result of the Superfund Amendments and Reauthorization Act. MCLGs are available for several organic and inorganic contaminants.	The 1990 National Contingency Plan states that non-zero MCLGs are to be used as goals. Contaminant concentrations in groundwater were compared to their MCLGs.
<u>Federal Guidance and Criteria To Be Considered</u>	U.S. Environmental Protection Agency (USEPA) Risk Reference Doses (RfDs)	To Be Considered	RfDs are considered the levels unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure for a lifetime.	USEPA RfDs were used to characterize risks due to noncarcinogens in various media.
	USEPA Cancer Slope Factors (CSFs)	To Be Considered	CSFs represent the most up-to-date information on cancer risk potency available from USEPA's Integrated Risk Information System.	USEPA CSFs were used to compute the individual incremental cancer risk resulting from exposure to certain compounds.
<u>State</u>	Maine Drinking Water Rules (10-144A CMR Chapters 231-233)	Relevant and Appropriate	Maine's Primary Drinking Water Standards are equivalent to federal MCLs. Maine Maximum Exposure Guidelines have been promulgated for several contaminants. When state levels are more stringent than federal levels and have been legally and consistently applied, the state levels may be used.	Primary drinking water standards were used during the Remedial Investigation for purposes of comparison to groundwater analytical data and to evaluate the extent of groundwater contamination.
<u>State Criteria and Guidance to be Considered</u>	Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144A CMR Chapter 233, Appendix C)	To Be Considered	Appendix C outlines Maximum Exposure Guidelines (MEGs) for organic and inorganic compounds. MEGs include health advisories, which are maximum allowable concentrations of specific contaminants in drinking water.	MEGs have been considered for chemical compounds for which there are no promulgated standards. These concentrations were considered during the Remedial Investigation for comparison to groundwater analytical data.

(continued)

TABLE D-1
CHEMICAL-SPECIFIC ARARs, CRITERIA, ADVISORIES, AND GUIDANCE FOR SITE 8

ROD: SITE 8
NAS BRUNSWICK

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE REMEDIAL RESPONSE PROCESS
AIR	Guidance Manual for Human Health Risk Assessment at Hazardous Substance Sites	To Be Considered	This document was prepared by both the MEDEP and Maine Department of Human Services (DHS). It outlines an approach intended to expedite the process of risk assessment development and review for sites in Maine.	MEDEP and DHS have set 1×10^{-5} as the upper bound limit for an acceptable incremental Lifetime Cancer Risk.
	<u>Federal</u>			
	Clean Air Act - National Primary and Secondary Ambient Air Quality Standards (40 CFR Part 50)	Applicable	Primary ambient air quality standards define levels of air quality to protect public health. Secondary ambient air quality standards protect public welfare from known or anticipated adverse effects from pollutants.	The particulate standard for matter less than 10 microns is $150 \mu\text{g}/\text{m}^3$, 24-hour average concentration. This standard applies to excavation activities.
	<u>State</u>			
	Establishment of Air Quality Regions (38 MRSA, Section 583; MEDEP Regulations, Chapter 114)	Relevant and Appropriate	The Metropolitan Portland Air Quality Region is Class II.	Remedial actions should not result in the degradation of air quality classification.
	Maine Ambient Air Quality Standards (38 MRSA, Section 584; MEDEP Regulations, Chapter 110)	Applicable	This Chapter establishes ambient air quality standards that are maximum levels of a particular pollutant permitted in the ambient air.	The standard for particulate matter is $150 \mu\text{g}/\text{m}^3$, 24-hour average concentration, which applies to excavation activities.

NOTES:

ARAR - Applicable or Relevant and Appropriate Requirement
CFR - Code of Federal Regulations
CMR - Code of Maine Rules
CSF - Cancer Slope Factor
DHS - Department of Human Services
MCL - Maximum Contaminant Level
MCLG - Maximum Contaminant Level Goal
MEDEP - Maine Department of Environmental Protection
MEGs - Maximum Exposure Guidelines
MRSA - Maine Revised Statutes Annotated
NAS - Naval Air Station
RfD - reference dose
SDWA - Safe Drinking Water Act
USEPA - U.S. Environmental Protection Agency
 $\mu\text{g}/\text{m}^3$ - micrograms per cubic meter

TABLE D-2
LOCATION-SPECIFIC ARARs, CRITERIA, ADVISORIES, AND GUIDANCE FOR SITE 8

ROD: SITE 8
NAS BRUNSWICK

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE REMEDIAL RESPONSE PROCESS
WETLANDS/FLOODPLAINS				
<u>State</u>	Maine Natural Resources Protection Act (38 MRSA, Section 480-A through S)	Applicable	This act outlines requirements for certain activities adjacent to any freshwater wetland greater than 10 acres or with an associated stream, brook, or pond or adjacent to a coastal wetland. The activities must not unreasonably interfere with certain natural features, such as natural flow or quality of any waters, nor harm significant aquatic habitat, freshwater fisheries, or other aquatic life.	Remedial activities regulated under this act must meet activity standards. Substantive requirements of these regulations must be met by any action taken within 100 feet of a wetland or stream.
	Natural Resources Protection Act, Permit by Rule Standards (Maine Department of Environmental Protection (MEDEP) Regulations, Chapter 305)	Applicable	This rule outlines prescribed standards for specific activities that may take place in or adjacent to wetlands and water bodies.	Proposed activities involving disturbance of soil material and discharge of treatment water, within 100 feet of the normal high water line, would be designed to incorporate all applicable standards.
OTHER NATURAL RESOURCES				
<u>State</u>	Maine Standards for Classification of Groundwater (38 MRSA, Section 470)	Applicable	This law requires the classification of the state's groundwater to protect, conserve, and maintain groundwater resources in the interest of the health, safety, and general welfare of the people of the state.	Under the Maine standards, groundwater is classified as GW-A.
	Maine Standards for Classification of Minor Drainages (38 MRSA, Section 468)	Applicable	These requirements set forth the classifications of surface water bodies within the State of Maine. Best usage and associated standards for protection of those usages are established under this regulation.	Remedial actions should not result in the degradation of water quality classification.
	Maine Water Pollution Control Law: Solid Waste Disposal Areas; Location (38 MRSA, Section 421)	Relevant and Appropriate	No boundary of any public or private solid waste disposal area shall lie closer than 300 feet to any classified body of surface water; also known as the Three-Hundred-Foot Law.	Excavation and removal of Site 8 waste materials will eliminate the solid waste disposal area on this site.

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(continued)

TABLE D-2
LOCATION-SPECIFIC ARARs, CRITERIA, ADVISORIES, AND GUIDANCE FOR SITE 8

ROD: SITE 8
NAS BRUNSWICK

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE REMEDIAL RESPONSE PROCESS
D-4 <u>State Guidance and Criteria To Be Considered</u>	Maine Site Location Development Law and Regulations (38 MRSA Sections 481-490; MEDEP Regulations, Chapters 371-377)	Applicable	This act and regulations govern drilling for natural resources and includes hazardous activities that consume, generate, or handle hazardous wastes and oil. Activities cannot adversely affect existing uses, scenic character, or natural resources in the municipality or neighboring municipality.	Remedial alternatives will be developed considering these regulations. A permit will not be required if the activity is on-site.
	Maine Solid Waste Management Rules: Landfill Disposal Facilities (38 MRSA, Section 1301 <u>et seq.</u> ; MEDEP Regulations, Chapters 400-406)	Applicable	These regulations outline landfill siting requirements including minimum distances to aquifers, bedrock, and geologic faults.	The standards outlined in this Chapter 404, construction and demolition landfills, of these regulations are applicable to the remediation of Site 8. The requirements set forth under this chapter will be incorporated into the closure of the Site 8 waste disposal area.
	Town Shoreland Zoning Ordinances and State Minimum Guidelines	To Be Considered	These minimum guidelines and town ordinances apply to activities proposed within 200 feet of a high-water mark of a stream or other body of water.	These guidelines will be considered in the siting of treatment facilities during the development and evaluation of remedial alternatives.
	Maine Critical Areas Program and Maine Natural Heritage Program	To Be Considered	These state programs issue policies and regulations governing special habitats or communities.	Where such special areas exist, these state programs will become involved in the project and/or permit review process.
	Maine Critical Areas Act (5 MRSA 3310 through 3316)	To Be Considered	This nonregulatory legislation allows Maine agencies such as the Critical Areas Program and the Natural Heritage Areas Program to identify, research, and protect critical areas and endangered or threatened plants.	Where such special areas exist, these state programs will become involved in the project and/or permit review process.

Notes:

ARAR = Applicable or Relevant and Appropriate Requirements
MRSA = Maine Revised Statutes Annotated
MEDEP = Maine Department of Environmental Protection
NAS = Naval Air Station

**TABLE D-3
ACTION-SPECIFIC ARARs, CRITERIA, AND GUIDANCE FOR SITE 8**

**ROD: SITE 8
NAS BRUNSWICK**

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE REMEDIAL RESPONSE PROCESS
Federal			
RCRA - Preparedness and Prevention (40 CFR Parts 264.30-264.37)	Relevant and Appropriate	This regulation outlines requirements for safety equipment and spill-control requirements for hazardous waste facilities. Part of the regulation includes a requirement that facilities be designed, maintained, constructed, and operated to minimize the possibility of an unplanned release that could threaten human health or the environment.	Safety and communication equipment will be available at the site during implementation of the final remedy. Local authorities will be familiarized with site operations.
RCRA - Contingency Plan and Emergency Procedures (40 CFR Parts 264.50-264.56)	Relevant and Appropriate	This regulation outlines the requirements for emergency procedures to be used following explosions, fires, etc.	Emergency plans will be developed and implemented during the final site remedy. Copies of the plans will be kept on-site.
RCRA - Closure and Post-closure (40 CFR Parts 264.110-264.120)	Relevant and Appropriate	This regulation details general requirements for closure and post-closure of hazardous waste facilities, including installation of a groundwater monitoring program.	Those parts of the regulation concerned with long-term monitoring and maintenance of the site will be considered during remedial design.
D-5 RCRA Land Disposal Restrictions (LDRs) (40 CFR Part 268)	Not Applicable	Land disposal of RCRA hazardous wastes is restricted without specified treatment. It must be determined that the waste, beyond a reasonable doubt, meets the definition of one of the specified restricted waste and the remedial action must constitute "placement" for the land disposal restrictions to be considered applicable. For each hazardous waste, the LDRs specify that the waste must be treated either by a treatment technology or to a concentration level prior to disposal in a RCRA Subtitle C permitted facility.	Waste materials disposed at Site 8 were established as non-hazardous under RCRA definitions; therefore, are not subject to LDRs.
Occupational Safety and Health Act (OSHA) - General Industry Standards (29 CFR Part 1910)	Applicable	These regulations specify the 8-hour time-weighted average concentration for various organic compounds. Training requirements for workers at hazardous wastes operations are specified in 29 CFR Part 1910.120.	Proper respiratory equipment will be worn if it is impossible to maintain the work atmosphere below the concentration. Workers performing activities would be required to have completed specific training requirements.
OSHA - Safety and Health Standards (29 CFR Part 1926)	Applicable	This regulation specifies the type of safety equipment and procedures to be followed during site remediation.	All appropriate safety equipment will be on-site. In addition, safety procedures will be followed during on-site activities.

(continued)

TABLE D-3
ACTION-SPECIFIC ARARs, CRITERIA, AND GUIDANCE FOR SITE 8

ROD: SITE 8
NAS BRUNSWICK

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE REMEDIAL RESPONSE PROCESS
OSHA - Recordkeeping, Reporting, and Related Regulations (29 CFR Part 1904)	Applicable	This regulation outlines the recordkeeping and reporting requirements for an employer under OSHA.	These requirements apply to all site contractors and subcontractors, and must be followed during all site work.
Clean Air Act - National Ambient Air Quality Standards (40 CFR Part 50)	Applicable	This regulation specifies maximum annual arithmetic mean and maximum 24-hour concentrations for particulate matter.	Fugitive dust emissions from site excavation activities will be maintained below the 24-hour maximum of 150 $\mu\text{g}/\text{m}^3$ and the annual arithmetic mean of 50 $\mu\text{g}/\text{m}^3$ by dust suppressants, if necessary.
<u>State</u>			
Maine Landfill Disposal Regulations (Maine Department of Environmental Protection [MEDEP] Regulations, Chapter 401)	Applicable	These regulations outline the permitting requirements for solid waste disposal by landfill. Chapter 401 specifies closure and post-closure maintenance requirements.	Those portions of Section 401 pertaining to closure are relevant and appropriate to Site 8 and will be addressed under the Sites 1 and 3 final remedy.
Maine Hazardous Waste Management Rules (MEDEP Regulations, Chapters 800-802, 850, 851, 853-857)	Relevant and Appropriate	The rules provide a comprehensive program for handling, storage, and recordkeeping at hazardous waste facilities. They supplement the RCRA regulations.	Only those regulations paralleling RCRA requirements identified above would pertain to the final remedy implemented at Site 8. State requirements more stringent than federal requirements take precedence.

NOTES:

CFR = Code of Federal Regulations
CMR = Code of Maine Regulations
LDR = Land Disposal Restrictions
MEDEP = Maine Department of Environmental Protection
MRSa = Maine Revised Statutes Annotated
NAS = Naval Air Station

OSHA = Occupational Safety and Health Administration
RCRA = Resource Conservation and Recovery Act
SDWA = Safe Drinking Water Act
 $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter

APPENDIX E

ADMINISTRATIVE RECORD INDEX: SITE 8

Installation Restoration Program

W0019378.080

6836-05

Site 8 PERIMETER ROAD DISPOSAL SITE

ADMINISTRATIVE RECORD

INDEX

Prepared for:
Naval Air Station Brunswick
Brunswick, Maine

Installation Restoration Program

SECTION I

INTRODUCTION

This document is the Index to the Administrative Record for Site 8 at the NAS Brunswick.

The Administrative Record is required by CERCLA, as amended by SARA at Section 113(k).

The Administrative Record is established to service two primary purposes. First, the basis for the remedial response selection is set forth in the record, and judicial review of any issue concerning the adequacy of a response selection is limited to the record. Second, the Administrative Record acts as a vehicle for public participation in the selection of the remedial response action.

The Administrative Record is available for public review at NAS Brunswick Public Works Office, Brunswick, Maine and the Curtis Memorial Library, 23 Pleasant Street, Brunswick, Maine.

Questions concerning the Administrative Record should be addressed to Lt. Cmdr. Michael J. L'Abbe at NAS Brunswick Public Affairs Office (207) 921-2340, Brunswick, Maine.

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SECTION 1:

PRELIMINARY ASSESSMENTS

Volume I: *Initial Assessment Study of Naval Air Station Brunswick, Maine*, prepared by Roy F. Weston, Inc.; June 1983 (Sites 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10).

Correspondence:

1. USEPA Notification of Hazardous Waste Site Forms identifying three landfills, and one asbestos disposal area at Naval Air Station Brunswick; May 22, 1981.

SECTION 2:

SITE INSPECTIONS

Volume I: *Field Site Inspection Report for the U.S. Naval Air Station, Brunswick, Maine*, prepared by NUS Corporation; August 1984 (Sites 1, 2, and 3).

Pollution Abatement Confirmation Study, Step 1A - Verification, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; June 1985 (Sites 1,2,3,4,7,8,9).

Correspondence:

1. Memo to Don Smith, NUS Corporation, from Colin Young, NUS Corporation, regarding the site inspection at the U.S. Naval Air Station; September 22, 1983.
2. Memo to Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, from William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding the schedule of on-site exploration and sampling activities during the Pollution Abatement Confirmation Study; October 30, 1984.
3. Memo of conversation between Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, and William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding the preliminary data from the Confirmation Study at Brunswick and the status of fieldwork; December 11, 1984.
4. Memo of conversation between Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, and William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding the preliminary results of the NACIP Study at Brunswick and the expected completion of the sampling; January 3, 1985.
5. Memo of conversation between Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, and William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding the results of the NACIP Study at Brunswick and the expected submittal of the report; January 15, 1985.

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6. Letter to William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], from A. Rhoads, Department of the Navy, Northern Division Environmental Protection Section, regarding comments on the Draft Confirmation Study Verification Step report; April 15, 1985.
7. Meeting minutes of May 22, 1984[5], meeting among Department of the Navy, Northern Division, NAS Brunswick, and E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding the NACIP Confirmation Study Verification Phase report; May 24, 1985.
8. Letter to William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], from A. Rhoads, Department of the Navy, Northern Division Environmental Protection Section, regarding comments on the revised Confirmation Study Verification Step Report; August 2, 1985.
9. Letter to Robert Jackson, U.S. Environmental Protection Agency (USEPA), from L.K. Jones, Naval Air Station, Brunswick, regarding transmittal of the June 1985 [Pollution Abatement Confirmation Study, Step 1A - Verification] Report; December 3, 1985.
10. Letter to L.K. Jones, Naval Air Station, Brunswick, from Robert Jackson, USEPA, regarding comments on the [June 1985] Pollution Abatement Confirmation Study, Step 1A - Verification Report; January 13, 1986.
11. Letter to L.K. Jones, Naval Air Station, Brunswick, from Anthony Leavitt, Maine Department of Environmental Protection (DEP), regarding comments on the [June 1985] Pollution Abatement Confirmation Study, Step 1A - Verification Report; January 13, 1986.

SECTION 3:

REMOVAL ACTIONS

Volume I:

Closure Order. Board Order in the matter of: Naval Air Station Brunswick; Brunswick, Cumberland County, Maine; 04011-5000; Closure Plan for Hazardous Waste Storage Facility and Termination of Interim License No. I-052; Maine Hazardous Waste Septage and Solid Waste Management Act; Findings of Fact and Order.

Site Evaluation Work Plan and Addendum, prepared by ABB Environmental Services, Inc.; November 1991 Issued February 1992 (Building 95)

Engineering Evaluation and Cost Analysis, Volume I, prepared by ABB Environmental Services, Inc.; November 1992 (Building 95)

Correspondence:

1. Letter to Ted Wolfe, Maine DEP, from R.E. Terry, Naval Air Station, Brunswick, regarding analytical sampling results in the vicinity of the old

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pesticide shop Building 95 and request to include Building 95 in the Installation Restoration Program (IRP); May 9, 1991.

2. Memorandum to: Board of Environmental Protection, from Joel Farley, BHMSWC, Maine DEP, regarding Interim License No. I-052, May 22, 1991.
3. Letter to Ronald Terry, Naval Air Station, Brunswick, from Ted Wolfe, Maine DEP, regarding the concurrence of Maine DEP to include Building 95 in the IRP as a removal action site; May 29, 1991.
4. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the November 1991 Draft Site Evaluation Work Plan for Building 95; December 19, 1991.
5. Letter to James Shafer, Department of the Navy, Northern Division, from Sheila Eckman, USEPA, regarding comments on the November 1991 Draft Site Evaluation Work Plan for Building 95, December 20, 1991.
6. Letter to Loukie Lofchie, Brunswick Area Citizens for a Safe Environment, from Carolyn Lepage, Robert G. Gerber, Inc., regarding comments on the November 1991 Draft Site Evaluation [Work] Plan, Building 95, January 28, 1992.
7. Letter to James Shafer, Department of the Navy, Northern Division, from Mark Hyland, Maine DEP, regarding comments on the August 1992 Draft Engineering Evaluation and Cost Analysis; October 16, 1992.
8. Letter to James Shafer, Department of the Navy, Northern Division, from Mark Hyland, Maine DEP, regarding comments on the November 1992 Draft Final Engineering Evaluation and Cost Analysis; December 22, 1992.
9. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the November 1992 Draft Final Engineering Evaluation and Cost Analysis; December 23, 1992.
10. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding additional comments on the November 1992 Draft Final Engineering Evaluation and Cost Analysis; December 28, 1992.

Volume II: *Draft Final Engineering Evaluation and Cost Analysis*, Volume II, prepared by ABB Environmental Services, Inc.; November 1992 (Building 95).

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SECTION 4: REMEDIAL INVESTIGATIONS

Volume I: *Remedial Investigation/Feasibility Study Work Plan*, formerly Draft Pollution Abatement Confirmation Study Work Plan - Step 1 prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; April 1988 (Sites 1,2,3,4,7,8,9).

Addendum to RI/FS Work Plan, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; July 1988 (Sites 1,2,3,4,7,8,9).

Additional Sampling Plan, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1989 (Sites 1,2,3,4,7,8,9).

Correspondence:

1. Letter to Commander L.K. Jones, Naval Air Station Brunswick, from Matthew Hoagland, USEPA, regarding comments on the September 1986 Draft Pollution Abatement Confirmation Study Work Plan - Step 1B: Characterization; November 24, 1986.
2. Letter to Matthew Hoagland, USEPA, from T.G. Sheckels, Naval Air Station Brunswick, regarding responses to USEPA comments on the September 1986 Draft Pollution Abatement Confirmation Study Work Plan - Step 1B: Characterization; March 31, 1987.
3. Letter to Commander L.K. Jones, Naval Air Station Brunswick, from David Webster, USEPA, regarding clarification as to the status of incorporating USEPA's comments into the revised report, and communication of their concerns for Site 8; April 9, 1987.
4. Letter to Charlotte Head, USEPA, from Sharon Christopherson, National Oceanic and Atmospheric Administration (NOAA), regarding responses to Navy comments on NOAA's work plan recommendations; May 8, 1987.
5. Letter to David Epps and Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, from Charlotte Head, USEPA, regarding the [Pollution Abatement Confirmation Study, Step] 1B - Characterization Work Plan meeting, and a discussion for the Superfund program; June 29, 1987.
6. Meeting summary of June 12, 1987, planning meeting at USEPA Region I offices in Boston, Massachusetts, among USEPA; U.S. Navy; E.C. Jordan Co. [ABB Environmental Services, Inc.]; Maine DEP; NOAA; Camp, Dresser & McKee; June 30, 1987.
7. Letter to Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, from Jack Hoar, Camp, Dresser & McKee, regarding meeting notes from a June 12, 1987, planning meeting at USEPA Region I offices in Boston, Massachusetts, among USEPA; U.S. Navy; E.C. Jordan Co. [ABB

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Environmental Services, Inc.]; Maine DEP; NOAA; Camp, Dresser & McKee; July 8, 1987.

8. Letter to Charlotte Head, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding the June 10, 1987, Trustee Notification Form; November 10, 1987.
9. Letter to Captain E.B. Darsey, Naval Air Station Brunswick, from Merrill Hohman, USEPA, regarding comments on the [January 1988] Pollution Abatement Confirmation Study RI and Extended SI Studies, the Site Quality Assurance Plan, the Site Health and Safety Plan, and the Quality Assurance Program Plan; March 15, 1988.
10. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Cynthia Kuhns, Maine DEP, regarding comments on the January 1988 Remedial Investigation Work Plan, and the January 1988 Quality Assurance Program Plan (see Section 10 of this index); April 7, 1988.
11. Letter to Charlotte Head, USEPA, from Gordon Beckett, U.S. Fish and Wildlife Service, regarding comments on the [April 1988] RI/FS Work Plan; May 10, 1988.
12. Letter to Charlotte Head, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding the [April 1988 Remedial Investigation/ Feasibility Study] Work Plan; May 13, 1988.
13. Letter to Captain E.B. Darsey, Naval Air Station Brunswick, from Cynthia Kuhns, Maine DEP, regarding comments on the April 1988 Remedial Investigation/ Feasibility Study Work Plan; June 6, 1988.
14. Letter to Captain E.B. Darsey, Naval Air Station Brunswick, from David Webster, USEPA, regarding comments on the April 1988 Remedial Investigation/ Feasibility Study] Work Plan; June 17, 1988.
15. Memo from M. Aucoin, Naval Air Station Brunswick, regarding laboratory analytical methods discussed in the RI/FS Work Plan; August 12, 1988.
16. Letter to Naval Facilities Engineering command, Northern Division, from Anthony Sturtzer, Naval Energy and Environmental Support Activity, regarding laboratory approval for Installation Restoration Program analyses; August 22, 1988.
17. Letter to Charlotte Head, USEPA, from T.G. Sheckels, Department of the Navy, Northern Division, regarding status and completion of the first phase of fieldwork and sampling under the RI/FS Work Plan: October 26, 1988.
18. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Denise Messier, Maine DEP, regarding comments on the April 1989 Draft Additional Sampling Plan; May 22, 1989.

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19. Letter to T.G. Sheekels, Naval Facilities Engineering Command, Northern Division, from David Webster, USEPA, regarding comments on the April 1989 Draft Additional Sampling Plan; June 9, 1989.
20. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Denise Messier, Maine DEP, regarding approval of the Draft Additional Sampling Plan; June 15, 1989.
21. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Melville Dickenson, E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding transmittal of the Additional Sampling Plan and some outstanding issues that needed further discussion with the regulatory agencies; August 9, 1989.
22. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from David Webster, USEPA, regarding comments on the August 1989 Draft Additional Sampling Plan; September 26, 1989.
23. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Denise Messier, Maine DEP, regarding comments on the August 1989 Additional Sampling Plan; December 28, 1989.

Volume II: *Post-Screening Work Plan, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; July 1990 (Sites 1,2,5,6,8,9,11,12,13, Eastern Plume; Treatability Studies 8; 11).*

Addendum - Post-Screening Work Plan, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; November 1990 (Sites 1,2,5,6,8,9,11,12,13,14, Eastern Plume; Treatability Studies 8; 11).

Correspondence:

1. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the April 1990 Draft Post-Screening Work Plan; May 1, 1990.
2. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Michael Jasinski for David Webster, USEPA, regarding the April 1990 Draft Remedial Investigation Report and the April 1990 Draft Post-Screening Work Plan; May 17, 1990.
3. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Susan Weddle, TRC community member, regarding comments on the February 1990 Draft Phase I Feasibility Study - Development and Screening of Alternatives, and the April 1990 Draft Remedial Investigation Report and the April 1990 Draft Post-Screening Work Plan; May 23, 1990.

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4. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the July 1990 Post-Screening Work Plan; July 27, 1990.
5. Letter to James Shafer, Department of the Navy, Northern Division, from David Webster, USEPA, regarding comments on the July 1990 Post-Screening Work Plan; August 30, 1990.

Volume III: *Round I Data Package, Phase I - Remedial Investigation*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; January 1989 (Sites 1,2,3,4,7,8,9).

Correspondence:

2. Letter to Ronald Springfield, Department of the Navy, Northern Division, from David Gulick, E.C. Jordan Co. [ABB-ES] regarding the transmittal of the Round I Data Package; January 13, 1989.
3. Letter to T.G. Sheckels, Department on the Navy, Northern Division, from David Webster, USEPA, regarding comments on the Round I Data Package and recommendations on future data packages; March 13, 1989.
4. Letter to Charlotte Head, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding comments on the Rounds I and II Data Packages; March 13, 1989.

Volume IV: *Round II Data Package, Phase I - Remedial Investigation*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; March 1989 (Sites 1,2,3,4,7,8,9).

Round III Data Package, Phase I - Remedial Investigation, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; July 1989 (Sites 1,2,3,4,7,8,9).

Correspondence:

1. Letter to Ronald Springfield, Northern Division, Naval Facilities Engineering Command, from David Gulick, E.C. Jordan, Co. [ABB-ES], regarding transmittal of and comments on the Round II Data Package; March 10, 1989.
2. Letter to Ronald Springfield, Northern Division, Naval Facilities Engineering Command, from David Gulick, E.C. Jordan, Co. [ABB-ES], regarding transmittal of and comments on the Round III Data Package; July 14, 1989.
3. Letter to Jack Jojokian, USEPA, from John Walker, Camp, Dresser & McKee Federal Programs Corporation, regarding comments on the Round III Data Package; August 31, 1989.

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4. Letter to Ronald Springfield, Northern Division, Naval Facilities Engineering Command, regarding comments on the Round III Data Package; October 4, 1989.

Volume V: *Remedial Investigation Feasibility Study - Round IV Data Package*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; January 1990 (Sites 1,2,3,4,7,8,9,11,13).

Correspondence:

1. Letter to Meghan Cruise, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding comments on the Round 4 [IV] Data Package; August 28, 1989.
2. Letter to Kenneth Marriott, Northern Division, Naval Facilities Engineering Command, regarding comments on the Round IV Data Package; March 5, 1990.

Volume VI: *Draft Final Remedial Investigation Report Volume 1*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1990 (Sites 1,3; 2; 4,11,13; 7; 8; 9).

Correspondence:

1. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Susan Weddle, TRC community member, regarding comments on the April 1990 Draft Remedial Investigation Report; May 15, 1990.
2. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Michael Jasinski for David Webster, USEPA, regarding comments on the April 1990 Draft Remedial Investigation Report and the April 1990 Draft Post-Screening Work Plan; May 17, 1990.
3. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the August 1990 Draft Final Remedial Investigation Report; October 10, 1990.
4. Letter to James Shafer, Department of the Navy, Northern Division, from Mary Jane O'Donnell, USEPA, regarding comments on the August 1990 Draft Final Remedial Investigation Report; October 17, 1990.

Volume VII: *Draft Final Remedial Investigation Report Volume 2: Appendices A-J*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1990 (Sites 1,3; 2; 4,11,13; 7; 8; 9).

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Volume VIII: *Draft Final Remedial Investigation Report Volume 3: Appendices K-P*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1990 (Sites 1,3; 2; 4,11,13; 7; 8; 9).

Volume IX: *Draft Final Remedial Investigation Report Volume 4: Appendix Q - Risk Assessment*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1990 (Sites 1,3; 2; 4,11,13; 7; 8; 9).

Correspondence:

1. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Charlotte Head for David Webster, USEPA, regarding the inclusion of the [Step] 1A Verification Study data in the risk assessment for the air station; September 15, 1988.
2. Letter to T.G. Sheckels, Naval Facilities Engineering Command, Northern Division, from David Webster, USEPA, regarding review comments on the Phase I Feasibility Study Preliminary Development of Alternatives, and the Preliminary Risk Assessment; May 5, 1989.
3. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Ted Wolfe for Denise Messier, Maine DEP, regarding comments on the February 1989 Preliminary Risk Assessment; February 8, 1990.
4. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the April 1990 Draft Remedial Investigation Report; May 17, 1990.

Volume X: *Remedial Investigation Feasibility Study Round V Data Package*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; March 1991 (Sites 5,6,8,9,11,12,14, Eastern Plume; Treatability Study for Sites 8,11).

Volume XI: *Draft Final Supplemental RI Report Volume 1*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1991 (Sites 5,6,8,9,11,12, Eastern Plume).

Correspondence:

1. Letter to Meghan Cassidy, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding comments on the [April 1991] Draft Focused Feasibility Study for Sites 1 and 3; the [April 1991] Draft Supplemental Remedial Investigation; and the [April 1991] Draft Supplemental Feasibility Study for Sites 5, 6, and 12; May 1, 1991.

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2. Letter to Captain H.M. Wilson, Naval Air Station Brunswick, from Samuel Butcher, regarding comments on the [April 1991] Draft Supplemental Remedial Investigation Report; May 1, 1991.
3. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the [April 1991] Draft Supplemental Remedial Investigation Report; May 23, 1991.
4. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the [April 1991] Draft Supplemental Remedial Investigation Report; May 30, 1991.
5. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding additional comments on the April 1991 Draft Supplemental Remedial Investigation Report; June 19, 1991.
6. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the [August 1991] Draft Final Supplemental Remedial Investigation Report; September 4, 1991.
7. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the [August 1991] Draft Final Supplemental Remedial Investigation Report; September 10, 1991.

Volume XII: *Draft Final Supplemental RI Report Volume 2: Appendices A-J*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1991 (Sites 5,6,8,9,11,12, Eastern Plume).

Volume XIII: *Draft Final Supplemental RI Report Volume 3: Appendices K-Q*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1991 (Sites 5,6,8,9,11,12, Eastern Plume).

SECTION 5:

FEASIBILITY STUDIES

Volume I: *Draft Final Phase I Feasibility Study Development and Screening of Alternatives*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1990 (Sites 1,3; 2; 4,11,13; 7; 8; 9).

Draft Final Supplemental Feasibility Study, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; July 1991 (Sites 5,6,12).

Correspondence:

1. Letter to T.G. Sheckels, Department of the Navy, Northern Division, from David Webster, USEPA, regarding comments on the February 1989 Phase I

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Feasibility Study: Preliminary Development of Alternatives, and February 1989 Preliminary Risk Assessment reports; May 5, 1989.

2. Letter to Alan Prysunka, Maine DEP, from T.G. Sheckels, Department of the Navy, Northern Division, regarding Applicable or Relevant and Appropriate Requirements (ARARs) for Remedial Investigation/ Feasibility Study (RI/FS); March 6, 1990.
3. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the February 1990 Draft Phase I Feasibility Study Development and Screening of Alternatives; April 17, 1990.
4. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from David Webster, USEPA, regarding comments on the February 1990 Draft Phase I Feasibility Study Development and Screening of Alternatives; April 23, 1990.
5. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Susan Weddle, TRC community member, regarding comments on the February 1990 Draft Phase I Feasibility Study Development and Screening of Alternatives, and the April 1990 Draft Post-Screening Work Plan; May 23, 1990.
6. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on Draft Final Phase I Feasibility Study Development and Screening of Alternatives; September 28, 1990.
7. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the August 1990 Draft Final Phase I Feasibility Study Development and Screening of Alternatives; October 16, 1990.
8. Letter to Captain H.M. Wilson, Naval Air Station Brunswick, from Samuel Butcher, regarding comments on the [April 1991] Draft Supplemental Feasibility Study for Sites 5, 6, and 12; May 1, 1991.
9. Letter to Meghan Cassidy, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding comments on the [April 1991] Draft Focused Feasibility Study for Sites 1 and 3; the [April 1991] Draft Supplemental Remedial Investigation; and the [April 1991] Draft Supplemental Feasibility Study for Sites 5, 6, and 12; May 1, 1991.
10. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the April 1991 Draft Supplemental Feasibility Study for Sites 5, 6, and 12; June 3, 1991.
11. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the April 1991 Draft Supplemental Feasibility Study for Sites 5, 6, and 12; June 7, 1991.

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12. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the July 1991 Draft Final Supplemental Feasibility Study for Sites 5, 6, and 12; August 23, 1991.
13. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the July 1991 Draft Final Supplemental Feasibility Study for Sites 5, 6, and 12, August 23, 1991.

Volume II: *Focused Feasibility Study*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; October 1991 (Sites 1 & 3)

Numerical Modeling Report, prepared by ABB Environmental Services, Inc.; January 1993 (Sites 1 & 3; Eastern Plume).

Correspondence:

1. Letter to Captain H.M. Wilson, Naval Air Station Brunswick, from Samuel Butcher, regarding comments on the [April 1991] Draft Focused Feasibility Study Report; May 1, 1991.
2. Letter to Meghan Cassidy, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding comments on the [April 1991] Draft Focused Feasibility Study for Sites 1 and 3; the [April 1991] Draft Supplemental Remedial Investigation; and the Draft Supplemental Feasibility Study for Sites 5, 6, and 12; May 1, 1991.
3. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the [April 1991] Draft Focused Feasibility Study Report; May 9, 1991.
4. Letter to Meghan Cassidy, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding additional comments on the [April 1991] Draft Focused Feasibility Study for Sites 1 and 3; May 10, 1991.
5. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding additional comments on the [April 1991] Draft Focused Feasibility Study Report; May 13, 1991.
6. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding state requirements for off-gas treatment for the [April 1991] Draft Focused Feasibility Study Report; May 21, 1991.
7. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the July 1991 Draft Final Focused Feasibility Study Report; August 14, 1991.

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8. Letter to Merrill S. Hohman, USEPA, from Capt. Thomas Dames, Department of the Navy, Northern Division, regarding dispute resolution pertaining to the Draft Final Focused Feasibility Study; August 14, 1991.
9. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the August 1991 Draft Final Focused Feasibility Study Report; August 15, 1991.
10. Letter to Ralph Lombardo, Department of the Navy, Northern Division, from Ted Wolfe, MEDEP, regarding dispute resolution, August 28, 1991.
11. Memorandum of agreement to resolve a dispute initiated under the Federal Facility Agreement for the Focused Feasibility Study for Sites 1 and 3; September 1991.
12. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the Focused Feasibility Study for Sites 1 and 3, September 16, 1991.
13. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the October 1991 [Draft] Numerical Modeling Work Plan; November 22, 1991.
14. Letter to James Shafer, Department of the Navy, Northern Division, from Mark Hyland, Maine DEP, regarding comments on the [October 1991] Draft Numerical Modeling Work Plan; December 5, 1991.
15. Letter to James Shafer, Department of the Navy, Northern Division, from Loukie Lofchie, Brunswick Area Citizens for a Safe Environment, regarding comments on the [October 1991 Draft] Numerical Modeling Work Plan; January 13, 1992.
16. Letter to James Shafer, Department of the Navy, Northern Division, from Mark Hyland, Maine DEP, regarding comments on the Draft Numerical Modeling Report; December 4, 1992.

Volume III: *Feasibility Study Volume 1*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; March 1992 (Sites 2; 4,11,13; 5,6; 7; 9; 12; 14; Eastern Plume).

Correspondence:

1. Letter to Meghan Cassidy, USEPA, from John Lindsay, National Oceanic and Atmospheric Administration, regarding comments on the [July 1991] Draft Feasibility Study Report; August 16, 1991.

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2. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the July 1991 Draft Feasibility Study Report; September 20, 1991.
3. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the July 1991 Draft Feasibility Study Report; September 23, 1991.
4. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the November 1991 Draft Final Feasibility Study; December 26, 1991.
5. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the November 1991 Draft Final Feasibility Study Report; January 2, 1992.
6. Comments from BACSE on the Feasibility Study Report, February 18, 1992.

Volume IV: *Feasibility Study Volume 2: Appendices A - O*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; March 1992 (Sites 2; 4,11,13; 5,6; 7; 9; 12; 14; Eastern Plume).

Volume V: *Focused Feasibility Study*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; April 1992 (Site 8)

Correspondence:

1. Memo to Mark Hyland, MEDEP, from Dick Behr, Division of Technical Services, regarding the Focused Feasibility Study (Site 8).
2. Letter to Captain H.M. Wilson, Naval Air Station Brunswick, from Samuel Butcher, regarding comments on the [May 1991] Draft Focused Feasibility Study report; May 28, 1991.
3. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the May 1991 Draft Focused Feasibility Study report; June 17, 1991.
4. Letter to Meghan Cassidy, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding comments on the [May 1991] Draft Focused Feasibility Study for Site 8; June 5, 1991.
5. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the May 1991 Draft Focused Feasibility Study Site 8 report; June 27, 1991.

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6. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the August 1991 Draft Final Focused Feasibility Study Site 8 report; August 11, 1991.
7. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the August 1991 Draft Final Feasibility Study Site 8 report; September 9, 1991.
8. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding the re-calculation of risk estimates for Site 8; February 19, 1992.

SECTION 6:

PROPOSED PLANS and PUBLIC HEARING TRANSCRIPTS

Volume I: *Proposed Plan*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; December 1991 (Sites 1 and 3).

Proposed Plan, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; December 1991 (Eastern Plume).

Transcript of the Public Hearing for Sites 1 and 3 and the Eastern Plume, prepared by Downing & Peters Reporting Associates; December 12, 1991 (Sites 1 and 3; Eastern Plume).

Correspondence:

1. Letter to James Shafer, Department of the Navy Northern Division, from Meghan Cassidy, USEPA, regarding comments on the July 1991 Draft Proposed Plan - Eastern Plume; August 2, 1991.
2. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the July 1991 Draft Proposed Plan - Eastern Plume; August 15, 1991.
3. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the August 1991 Draft Proposed Plan - Sites 1 and 3; September 23, 1991.
4. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the August 1991 Draft Proposed Plan - Sites 1 and 3; September 26, 1991.
5. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the October 1991 Draft Proposed Plan - Eastern Plume; October 31, 1991.

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6. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the October 1991 Draft Proposed Plan - Eastern Plume; November 6, 1991.
7. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the October 1991 Draft Proposed Plan - Sites 1 and 3; November 6, 1991.
8. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the October 1991 Draft Proposed Plan - Sites 1 and 3; November 12, 1991.
9. Letter to James Shafer, Department of the Navy, Northern Division, from Edmund Benedikt, regarding comments on the Brunswick Naval Air Station clean-up proposals [Proposed Plans for Eastern Plume and Sites 1 and 3, dated December 1991] submitted for public review; January 3, 1992.
10. Letter to James Shafer, Department of the Navy, Northern Division, from Ralph F. Keyes, Merrymeeting Audubon Society, regarding comments on the Proposed Remedial Action Plan [Proposed Plans for the Eastern Plume and Sites 1 and 3, dated December 1991]; January 8, 1992.
11. Letter to James Shafer, Department of the Navy, Northern Division, from Loukie Lofchie, Brunswick Area Citizens for a Safe Environment, regarding comments on the December 1991 Proposed Plans, Sites 1 and 3 and Eastern Plume; January 13, 1992.
12. Letter to James Shafer, Department of the Navy, Northern Division, from Susan C. Weddle, Brunswick community representative, regarding public comments on the December 1991 Proposed Plan Eastern Plume, the December 1991 Proposed Plan Sites 1 and 3; January 13, 1992.
13. Letter to James Shafer, Department of the Navy, Northern Division, from Edmund E. Benedikt, Friends of Merrymeeting Bay, regarding comments on the December 1991 Proposed Plans for Sites 1 and 3 and the Eastern Plume; January 3, 1992.

Volume II: *Final Proposed Plan* prepared by ABB Environmental Services, Inc.; September 1992 (Site 8).

Transcript of the Public Meeting [Hearing] for Proposed Plan, Site 8: Perimeter Road Disposal Site, prepared by Mason & Lockhart; October 15, 1992 (Site 8).

Revised Proposed Plan for Site 8 prepared by ABB Environmental Services, Inc.; March 1993.

Proposed Plan prepared by ABB Environmental Services, Inc.; March 1993 (Sites 5 and 6).

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Technical Memorandum prepared by ABB Environmental Services, Inc.; March 1993 (Sites 5,6,1 and 3).

Correspondence:

1. Memo to Mark Hyland, MEDEP, from Marianne Hubert, Technical Services, regarding the Proposed Plan for Site 8, June 18, 1992.
2. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the May 1992 Draft Proposed Plan; June 29, 1992.
3. Letter to James Shafer, Department of the Navy, Northern Division, from Mark Hyland, MEDEP, regarding the Proposed Plan for Site 8, June 30, 1992.
4. Letter to Loukie Lofchie, BACSE, from Carolyn LePage, Robert G. Gerber, Inc., regarding comments on the Proposed Plan for Site 8, August 27, 1992.
5. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the August 1992 Proposed Plan; August 31, 1992.
6. Letter to James Shafer, Department of the Navy, Northern Division, from Mark Hyland, Maine DEP, regarding comments on the August 1992 Proposed Plan; September 10, 1992.
7. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the February 1993 Revised Draft Proposed Plan; August 31, 1992.
8. Letter to Loukie Lofchie, BACSE, from Carolyn LePage, Robert G. Gerber, Inc., regarding comments on the Proposed Plan for Site 8, October 28, 1992.
9. Letter to James Shafer, Department of the Navy, Northern Division, from Mark Hyland, MEDEP, regarding the Draft Proposed Plan for Sites 5 and 6, November 6, 1992.
10. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding the Draft Proposed Plan for Sites 5 and 6, November 10, 1992.
11. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding the Draft Final Proposed Plan for Sites 5 and 6, December 18, 1992.
12. Letter to James Shafer, Department of the Navy, Northern Division, from Mark Hyland, MEDEP, regarding the Proposed Plan for Sites 5 and 6, December 22, 1992.

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13. Letter to James Shafer, Department of the Navy, Northern Division, from Mark Hyland, MEDEP, regarding the Proposed Plan for Sites 5 and 6, January 25, 1993.
14. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding the Technical Memorandum, January 29, 1993.

SECTION 7: RECORDS OF DECISION

Volume I: *Record of Decision for a Remedial Action* prepared by ABB Environmental Services, Inc.; June 1992 (Sites 1 and 3)

Record of Decision for an Interim Remedial Action prepared by ABB Environmental Services, Inc.; June 1992 (Eastern Plume)

Correspondence:

1. Letter to Meghan Cassidy, USEPA, from Gordon Beckett, Fish and Wildlife Service, regarding the Draft Records of Decision for Sites 1 and 3 and the Eastern Plume, March 25, 1992.
2. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the March 1992 Draft Record of Decision for Sites 1 and 3 and March 1992 Draft Interim Record of Decision for the: Eastern Plume; April 2, 1992.
3. Letter to James Shafer, Department of the Navy, Northern Division, from Mary Jane O'Donnell, USEPA, regarding comments on the [March 1992] Draft Interim Record of Decision for the: Eastern Plume; April 2, 1992.
4. Letter to James Shafer, Department of the Navy, Northern Division, from Mary Jane O'Donnell, USEPA, regarding USEPA's and U.S. Fish and Wildlife Services' comments on the [March 1992] Draft Record of Decision for the: Sites 1 and 3; April 6, 1992.
5. Letter to Thomas Dames, Department of the Navy, Northern Division, from Dean Marriott, Maine DEP, regarding Maine DEP's concurrence with the interim remedial action presented in the June 1992 Draft Interim Record of Decision for the Eastern Plume; June 4, 1992.
6. Letter to Thomas Dames, Department of the Navy, Northern Division, from Dean Marriott, Maine DEP, regarding Maine DEP's concurrence with the interim remedial action presented in the June 1992 Draft Record of Decision for Sites 1 and 3; June 4, 1992.

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SECTION 8: **POST-RECORD OF DECISION**

[Reserved]

SECTION 9: **COMMUNITY RELATIONS**

Volume I: *Community Relations Plan - for NASB NPL Sites* prepared jointly by Public Affairs Office, Navy Northern Division, and E.C Jordan Co. [ABB Environmental Services, Inc.]; September 1988

Correspondence:

1. Public notice for the Remedial Investigation and Feasibility Study schedule for Brunswick Naval Air Station Superfund Site published in the Portland Press Herald; February 24, 1988.
2. Memo to Commanding Officer, Naval Air Station Brunswick, from T.F. Rooney, Department of the Navy, Northern Division, regarding community relations interviews, and comments on the Draft Community Relations Plan; July 14, 1988.
3. Press release regarding the USEPA and U.S. Navy announcing the signing of the Federal Facility Agreement for the Brunswick Naval Air Station; October 6, 1989.
4. Letter to Commander Geoffrey Cullison, Naval Air Station Brunswick, from Ted Wolfe, Maine DEP, regarding analytical results from water samples collected from a Coombs Road residence; December 27, 1989.
5. Letter to Ken Marriott, Naval Facilities Engineering Command, Northern Division, from Joshua Katz, Brunswick Area Citizens for a Safe Environment, regarding Freedom of Information Act request; March 6, 1990.
6. Press release regarding an extension of application notification deadline for Technical Assistance Grant Application to be filed; March 26, 1990.
7. Letter to [Joshua] Katz, from T.J. Purul, Naval Air Station Brunswick, regarding the availability of information requested under the Freedom of Information Act; April 6, 1990.
8. Letter to Kenneth Marriott, Naval Facilities Engineering Command, from Joshua Katz, Brunswick Area Citizens for a Safe Environment, regarding the Freedom of Information Act request; a March 22, 1990 public information meeting; and the preliminary response to an April 8, 1990 site visit: April 12, 1990.

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9. Letter to file from Geoffrey Cullison, Naval Air Station Brunswick, regarding Site 8 and off-site influences; April 23, 1990.
10. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding data from the sampling at Consolidated Auto, and the revised May 30, 1990 Maximum Exposure Guidelines; June 22, 1990.
11. Fact sheet for Naval Air Station Brunswick regarding question and answers about National Priorities List Sites; August 15, 1990.
12. Press release announcing the public comment period for the Federal Facility Agreement for Brunswick Naval Air Station; November 2, 1990.
13. Press release regarding Brunswick citizens receiving a \$50,000 federal grant for a Superfund advisor; January 3, 1991.
14. Fact sheet regarding the Sites 1 and 3 Proposed Plan, and the Eastern Plume Proposed Plan; December 1991.
15. Public notice announcing the public meeting/hearing and public comment period for the Sites 1 and 3 Proposed Plan, and the Eastern Plume Proposed Plan; December 1991.
16. Press release regarding the signing of the Record of Decision for Sites 1 and 3 cleanup at Naval Air Station Brunswick; June 1992.
17. Public notice announcing the public meeting/hearing and public comment period for cleanup of the Perimeter Road Disposal Area [Site 8] at Naval Air Station Brunswick; October 1992.
18. Fact sheet regarding the Site 8 Proposed Plan; October 1992.
19. Public notice announcing the public meeting/hearing and public comment period for removal of Building 95 pesticide shop and surrounding soils; November 1992.
20. Fact sheet regarding the proposed removal actions at Building 95; November 1992.
21. Public notice announcing the public meeting/hearing and public comment period for the revised Proposed Plan for Site 8 that now includes excavation; March 1993.
22. Public notice announcing the public meeting/hearing and public comment period for the Sites 5 and 6 Proposed Plan; March 1993.
23. Fact sheet regarding the Proposed Plan for Sites 5, the Orion Street Asbestos Disposal Site, and Site 6, the Sandy Road Rubble and Asbestos Disposal Site; March 1993.

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Volume II: *Technical Review Committee Meeting Minutes (November 1987 to December 10, 1992).*

1. Meeting minutes of December 3, 1987, Technical Review Committee (TRC) meeting to get acquainted, to discuss results of completed and planned investigations, and to establish future review procedures; undated.
2. Meeting minutes of January 11, 1988, TRC meeting to discuss the project schedule; January 26, 1988.
3. Memo to TRC members from Geoffrey Cullison, Naval Air Station, Brunswick, regarding corrections to the January 11, 1988, meeting minutes; February 3, 1988.
4. Meeting minutes of May 17, 1988, TRC meeting to discuss the draft charter for the TRC at Brunswick and a review of the revised April 1988 RI/FS work plan; undated.
5. Meeting minutes of July 8, 1988, TRC meeting to attend a site tour and to confirm proposed locations; of field investigations, undated.
6. Meeting minutes of November 22, 1988, TRC meeting to review analytical data from the first round of sampling, and to establish parameters for the second round of sampling; undated.
7. Meeting minutes of February 22, 1988, TRC meeting to review validated analytical data from the first round of sampling, and to present preliminary information for the forthcoming risk analysis and alternative development deliverables; undated.
8. Memo of TRC meeting minutes of March 28, 1989, to discuss the structure of the third round of sampling; April 10, 1989.
9. Letter to Bruce Darsey, Department of the Navy, Naval Air Station, Brunswick, requesting copies of the March 27, 1989, TRC meeting minutes; April 18, 1989.
10. Letter to Senator William Cohen from E.B. Darsey, Department of the Navy, Naval Air Station, Brunswick, regarding a copy of the requested TRC meeting minutes, and the contact for the IRP program at the base; April 28, 1989.
11. Meeting minutes of June 20, 1989, TRC meeting to discuss the Additional Sampling Plan, the RI/FS program, and the schedule for its implementation; July 11, 1989.
12. Meeting minutes of August 10, 1989, TRC meeting to discuss the third round of sampling; undated.

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13. Meeting minutes of February 13, 1990, TRC meeting to discuss the fourth round of sampling; January 22, 1990.
14. Letter to TRC members from James Shafer, Department of the Navy, Northern Division, regarding the May 22, 1990, TRC meeting minutes in which the Draft Initial Screening report, Draft Remedial Investigation report, and Draft Post-Screening Plan were discussed; July 12, 1990.
15. Memo to James Shafer, Department of the Navy, Northern Division, from Geoffrey Cullison, Naval Air Station, Brunswick, transmitting the omitted handout from the previous letter; July 19, 1990.
16. Letter to TRC members from James Shafer, Department of the Navy, Northern Division, regarding minutes from the September 13, 1990, TRC meeting; October 31, 1990.
17. Letter to TRC members from James Shafer, Department of the Navy, Northern Division, regarding minutes from the January 10, 1991, TRC meeting; January 28, 1991.
18. Letter to James Shafer, Department of the Navy, Northern Division, from Melville Dickenson, ABB Environmental Services, Inc., regarding minutes from the October 3, 1991, TRC meeting; January 28, 1991.
19. Meeting minutes of February 20, 1992, TRC meeting to discuss the schedule and status of the IRP sites; undated.
20. Meeting minutes of May 20, 1992, TRC meeting to discuss schedules for the Sites 1 and 3 and Eastern Plume Records of Decision and Remedial Design, the site inspection work plan for Swampy Road Debris site and Merriconeag Extension Debris site, Site 8 Focused Feasibility Study and Proposed Plan, and the multi-site Feasibility Study; the minutes also included a discussion of the future actions scheduled for other sites; undated.
21. Meeting minutes of October 1, 1992, TRC meeting to discuss schedules for the Sites 1 and 3 and Eastern Plume Records of Decision and remedial design, the Building 95 Removal Action, the site investigation at Swampy Road Debris site and Merriconeag Extension Debris site, the proposed plans for Site 8, and Sites 5 and 6; the minutes also included a discussion of the future actions scheduled for other sites; undated.
22. Meeting minutes of December 10, 1992, TRC meeting to discuss schedules for the Building 95 Removal Action, the proposed plans for Sites 5 and 6, Site 8, and Site 9, the Sites 1 and 3 and Eastern Plume Records of Decision and remedial design, the remedial designs for Sites 5, 6, 8, 9, and Building 95, and the site investigation at Swampy Road Debris site and Merriconeag Extension Debris site; undated.

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SECTION 10:

PROGRAM GUIDANCE

Volume I: *Quality Assurance Program Plan*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; February 1988 (all sites)

Federal Facility Agreement among the U.S. Department of the Navy, USEPA, and Maine DEP; October 10, 1990.

Correspondence:

1. Letter to Robert Kowalczyk, Department of the Navy, Northern Division, from Cynthia Bertocci, Maine DEP, regarding the state's interest in the Installation Restoration Program for Brunswick Naval Air Station; February 24, 1986.
2. Letter to L.K. Jones, Naval Air Station Brunswick, from Anthony Leavitt, Maine DEP, regarding the state's interest in the Installation Restoration Program for Brunswick Naval Air Station; February 25, 1986.
3. Letter to Naval Facilities Engineering Command, Northern Division, from L.K. Jones, Naval Air Station Brunswick, regarding the Navy's assessment and control of installation pollutants (NACIP) program and guidance involving federal and state regulatory agency oversight; March 11, 1986.
4. Letter to Commanding Officer, Naval Air Station Brunswick, from Commanding Officer, Naval Facilities Engineering Command, Northern Division, regarding federal and state environmental agencies oversight authority of the NACIP program; April 7, 1986.
5. Letter to David Webster, USEPA, from K.J. Vasilik, Naval Air Station Brunswick, regarding the definition of the RI/FS program at the NAS Brunswick; January 20, 1987.
6. Letter to David Epps and Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, from Charlotte Head, USEPA, regarding the current status and goals of the investigations; June 29, 1987.
7. Letter to Charlotte Head, USEPA, from R.L. Gillespie, Naval Facilities Engineering Command, Northern Division, regarding the Navy's timetable to complete Remedial Investigation Feasibility Study at the Naval Air Station Brunswick, and outlining the Navy's understanding of the responsibilities of the various agencies involved in the RI/FS program; October 22, 1987.
8. Letter to Charlotte Head, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding the June 10, 1987, Trustee Notification Form for Naval Air Station Brunswick; November 10, 1987.
9. Letter to Charlotte Head, USEPA, from T.G. Sheckels, Department of the Navy, Northern Division, regarding the listing of Naval Air Station Brunswick

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on the NPL, the establishment of the Administrative Record, and the Technical Review Committee for the base; November 16, 1987.

10. Letter to R.L. Gillespie, Naval Facilities Engineering Command, Northern Division, from David Webster, USEPA, regarding the schedule to be published by February 1988, a mechanism for delineating the roles and responsibilities of the agencies, and the USEPA's concerns over the progress to date; November 20, 1987.
11. Memo to Charlotte Head, USEPA, from Joan Coyle, USEPA Water Monitoring Section, regarding sampling results from the Jordan Avenue Well Field in Brunswick, Maine; December 10, 1987.
12. Letter to G.D. Cullison, Naval Air Station Brunswick, and T.G. Sheckels, Naval Facilities Engineering Command, Northern Division, from David Webster, USEPA, regarding the definition of the commencement of the RI/FS under the Comprehensive Environmental Response, Compensation, and Liability Act; December 17, 1987.
13. Letter to Merrill Hohman, USEPA, from E.B. Darsey, Naval Air Station Brunswick, regarding comments received at the February 10, 1988, TRC meeting on the status of the RI/FS program; February 17, 1988.
14. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from David Webster for Charlotte Head, USEPA, regarding the extent of quality assurance and quality control of validation for samples at Naval Air Station Brunswick; April 25, 1988.
15. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from David Webster for Charlotte Head, USEPA, regarding the evaluation of sites that were not incorporated into the [Hazard Ranking System] package, especially Sites 5 and 6; April 25, 1988.
16. Letter to Meghan Cruise, USEPA, from Alan Prysunka, Maine DEP, regarding comments on the Federal Facility Agreement; November 8, 1989.
17. Letter to Meghan Cruise, USEPA, from Susan Weddle, TRC community member, regarding comments on the Federal Facility Agreement; November 16, 1989.
18. Letter to Meghan Cruise, USEPA, from Jeanne Johnson, Town of Brunswick Conservation Commission, regarding a request for an extension for review and comment of [the documents included in the Information Repository for] the Brunswick Naval Air Station; November 17, 1989.
19. Letter to Alan Prysunka, Maine DEP, from Merrill Hohman, USEPA, regarding the state's comments on the [Federal Facility] Agreement; December 18, 1989.

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20. Letter to William Adams, E.C. Jordan Co. [ABB Environmental Services, Inc.], from R.L. Gillespie, Department of the Navy, Northern Division, regarding a schedule extension for the Draft Initial Screening Report [Feasibility Study]; February 1, 1990.
21. Letter to T.G. Sheckels, Department of the Navy, Northern Division, from Merrill Hohman, USEPA, regarding an amendment to the Federal Facility Agreement; February 9, 1990.
22. Letter to Alan Prysunka, Maine DEP, from T.G. Sheckels, Department of the Navy, Northern Division, regarding Applicable or Relevant and Appropriate Requirements (ARARs) for Remedial Investigation/ Feasibility Study at Naval Air Station Brunswick; March 6, 1990.
23. Letter to Ken Marriott, Naval Facilities Engineering Command, Northern Division, from Meghan Cassidy, USEPA, regarding a request concurrence between the agencies for an extension to the Remedial Investigation schedule; March 12, 1990.
24. Letter to Thomas Sheckels, Naval Facilities Engineering Command, Northern Division, from Alan Prysunka, Maine DEP, regarding ARARs [Applicable or relevant and appropriate requirements] for Naval Air Station Brunswick; April 9, 1990.
25. Letter to Meghan Cassidy, USEPA, from K.R. Marriott, Department of the Navy, Northern Division, regarding an extension under the FFA for preparing the response to comments on the Draft Feasibility Study and Draft Remedial Investigation reports; May 18, 1990.
26. Letter to James Shafer, Naval Facilities Engineering Command, Northern Division, from Meghan Cassidy, USEPA, regarding a notice to proceed with the Feasibility Study activities at Naval Air Station Brunswick; June 21, 1990.
27. Letter to Meghan Cassidy, USEPA, from James Shafer, Naval Facilities Engineering Command, Northern Division, regarding an extension under the FFA for preparing the response to comments on the Draft Feasibility Study and Draft Remedial Investigation reports; June 25, 1990.
28. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding invertebrate tissue analysis for mercury along the Maine coast for establishing background mercury levels; February 24, 1992.
29. Letter to Cmdr. Ron Terry, Naval Air Station Brunswick, from Meghan Cassidy, USEPA, regarding sampling of Mere Brook, April 23, 1992.
30. Letter to James Shafer, Naval Facilities Engineering Command, Northern Division, from Mary Sanderson, USEPA, regarding the proposed accelerated schedules for the naval air station; January 11, 1993.

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PROGRAM (cont'd)

By Reference ONLY with location noted:

U.S. Environmental Protection Agency, 1988. "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA"; Office of Solid Waste and Emergency Response; OSWER Directive 9335.3-01; Interim Final; October 1988.

U.S. Environmental Protection Agency, 1988. "Engineering Evaluation/ Cost Analysis

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SECTION II

GUIDANCE DOCUMENTS

EPA guidance documents may be reviewed at EPA Region I, Boston, Massachusetts.

General and Site-Specific EPA Guidance Documents

1. "National Oil and Hazardous Substances Pollution Contingency Plan," Code of Federal Regulations (Title 40, Part 300), 1985.
2. U.S. Environmental Protection Agency. Superfund Public Health Evaluation Manual (OSWER 9285.4-1), October 1986.
3. U.S. Environmental Protection Agency. Comprehensive Environmental Response Compensation and Liability Act of 1980, as Amended October 17, 1986.
4. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) (Interim Final) (EPA/540/G-89/004, OSWER Directive 9355.3-1), October 1988.
5. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites (EPA/540/G-88/003), December 1988.
6. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Interim Final Guidance on Preparing Superfund Decision Documents (OSWER Directive 9355.3-02), July 1989.
7. U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. Ground Water Issue - Performance Evaluation of Pump-and-Treat Remediations (EPA/540/4-89/005), October 1989.
8. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Risk Assessment Guidance for Superfund - Volume I: Human Health Evaluation Manual (Part A - Interim Final) (EPA/540/1-89/002), December 1989.
9. U.S. Environmental Protection Agency. Risk Reduction Engineering Laboratory. Technology Evaluation Report: SITE Program Demonstration of the Ultrox International Ultraviolet Radiation/Oxidation Technology (EPA/540/5-89/012), January 1990.
10. "National Oil and Hazardous Substances Pollution Contingency Plan," Federal Register (Vol. 55, No. 46), March 8, 1990.
11. U.S. Environmental Protection Agency. Office of Communications and Public Affairs. Glossary of Environmental Terms and Acronyms List. (EPA 19K-1002), December 1989.

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12. U.S. Environmental Protection Agency. "Streamlining the RI/FS for CERCLA Municipal Landfill Sites"; OSWER Directive 9355.3-11FS; September 1990.
13. U.S. Environmental Protection Agency. Office of Water. "Drinking Water Regulations and Health Advisories"; November 1991.
14. U.S. Environmental Protection Agency. Office of Research and Development. "Design and Construction of RCRA/CERCLA Final Covers". EPA/625/4-91/025. May 1991.