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U.S. DEPARTMENT OF THE NAVY

INSTALLATION RESTORATION PROGRAM

NAVAL AIR STATION, BRUNSWICK

BRUNSWICK, MAINE

DRAFT FINAL SUPPLEMENTAL FEASIBILITY STUDY

SITES 5, 6, AND 12

CONTRACT : N62472-84-C-1108

E. C. JORDAN PROJECT NO. 4607-57

JULY 1991

FINAL DRAFT
SUPPLEMENTAL FEASIBILITY STUDY
SITES 5, 6, AND 12

NAVAL AIR STATION BRUNSWICK
INSTALLATION RESTORATION PROGRAM

Prepared for:

U.S. Department of the Navy
Northern Division, Naval Facilities
Engineering Command
Contract No. N62472-84-C-1108

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Job No. 4607-57

SUPPLEMENTAL FEASIBILITY STUDY
SITES 5, 6, AND 12
NAVAL AIR STATION BRUNSWICK

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GLOSSARY OF ACRONYMS AND ABBREVIATIONS

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SUPPLEMENTAL FEASIBILITY STUDY
SITES 5, 6, AND 12
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1.0 INTRODUCTION

This Supplemental Feasibility Study (SFS) report develops and screens remedial alternatives to control and mitigate contamination at Sites 5, 6, and 12 on the Naval Air Station (NAS) in Brunswick, Maine. NAS Brunswick is an active base, owned and operated by the federal government through the Department of the Navy. This facility is currently participating in the Navy's Installation Restoration (IR) Program, which was established to identify contamination at Navy and Marine Corps facilities resulting from past operations and to institute corrective remedial actions as necessary.

In 1987, the U.S. Environmental Protection Agency (USEPA) placed NAS Brunswick on the National Priorities List (NPL), and in 1990 a Federal Facility Agreement (FFA) was established among the Navy, the USEPA, and the Maine Department of Environmental Protection. This Agreement identifies a timetable and deadlines for completion of a Remedial Investigation (RI) and Feasibility Study (FS) at NAS Brunswick.

In August 1990, E.C Jordan Company (Jordan) submitted to the Navy Draft Final RI and Phase I FS reports on nine sites at NAS Brunswick (E.C. Jordan Co., 1990c and E.C. Jordan Co., 1990b):

- Site 1 - Orion Street Landfill - North
- Site 2 - Orion Street Landfill - South
- Site 3 - Hazardous Waste Burial Area
- Site 4 - Acid/Caustic Pit
- Site 7 - Old Acid/Caustic Pit
- Site 8 - Perimeter Road Disposal Site
- Site 9 - Neptune Drive Disposal Site
- Site 11 - Fire Training Area
- Site 13 - Defense Reutilization and Marketing Office

Also submitted was a Post-Screening Work Plan that described initial environmental sampling for four additional sites: Site 5 - Orion Street Asbestos Disposal Site (originally referred to as the Asbestos Disposal Site); Site 6 - the Sandy Road Rubble and Asbestos Disposal Site; Site 12 - the Explosive Ordnance (EOD) Training Area; and Site 14 - the Old Dump No. 3 (E.C. Jordan Co., 1990a). Sites 5 and 6 were identified originally in 1983 during the Initial Assessment Study (IAS) of NAS Brunswick (Roy F. Weston, Inc., 1983) and Site 12 was identified during the 1990 field sampling program. Site 14 was identified from a 1946 base map of NAS Brunswick. Field investigations at these sites were conducted between August and November 1990 consisting of geophysical surveys, testpitting, and soil and groundwater sampling and analysis. The results and interpretation of environmental

contamination at these sites were presented in the Draft Supplemental RI Report (E.C. Jordan Co., 1991). At Site 14 no evidence of a former dump was found, leading to the conclusion that if a dump did exist, it was removed during construction of the runway and taxiway (E.C. Jordan Co., 1991).

This SFS Report is similar to the Phase I FS submitted in August 1990 for the nine original sites at NAS Brunswick. It presents the remedial alternatives developed to control and mitigate contamination at Sites 5, 6, and 12, and is based on information presented in the IAS and the Draft Supplemental RI including the baseline Risk Assessment (Roy F. Weston Inc., 1983 and E.C. Jordan Co., 1991). The contents and organization of this report are summarized in the following paragraphs.

Section 2.0 identifies specific site remedial action objectives to protect human health and the environment at NAS Brunswick for Sites 5, 6, and 12. In addition, an overview of the site contamination and risk assessment is provided for current site understanding. General response actions to achieve the remedial action objectives are also identified.

Section 3.0 presents potential chemical-, location-, and action-specific Applicable or Relevant and Appropriate Requirements (ARARs) that may govern the extent of site

remediation. ARARs are considered in establishing response objectives, defining Target Clean-up Levels, and developing remedial alternatives.

Section 4.0 identifies corrective action technologies that may achieve the remedial action objectives. Potential technologies were first identified and then screened based characteristics of effectiveness and implementability. Technologies that were retained were carried forward to alternative development.

Section 5.0 presents the remedial alternatives developed for NAS Brunswick. These alternatives were assembled by combining the technologies identified in Section 4.0. In keeping with USEPA guidance, a range of alternatives was developed for each site, including a No Action Alternative, Containment Alternatives, and Treatment Alternatives.

Section 6.0 presents the screening of remedial alternatives. The purpose of the screening evaluation is to reduce the number of alternatives that will undergo a more thorough and extensive analysis. The screening is performed by comparing the alternatives relative to effectiveness, implementability, and cost factors.

A detailed evaluation of each alternative is not included in this report; but will be included in the "Detailed Evaluation of Remedial Alternatives for NAS Brunswick" scheduled for completion in July 1991.

2.0 IDENTIFICATION OF REMEDIAL ACTION OBJECTIVES AND GENERAL RESPONSE ACTIONS

This section presents the remedial action objectives for Sites 5, 6, and 12, and the general response actions to achieve those objectives. Both the remedial action objectives and general response actions provide the basis for selecting appropriate remedial technologies and developing corrective action alternatives for each of the three sites under consideration.

Remedial action objectives are goals established to protect public health and the environment. These objectives are developed based on results of field investigations, the baseline human health and environmental risk assessments, and chemical-specific ARARs. General response actions describe options that may be used to achieve remedial action objectives. These can include treatment, containment, excavation, extraction, and disposal of wastes, and/or institutional control activities.

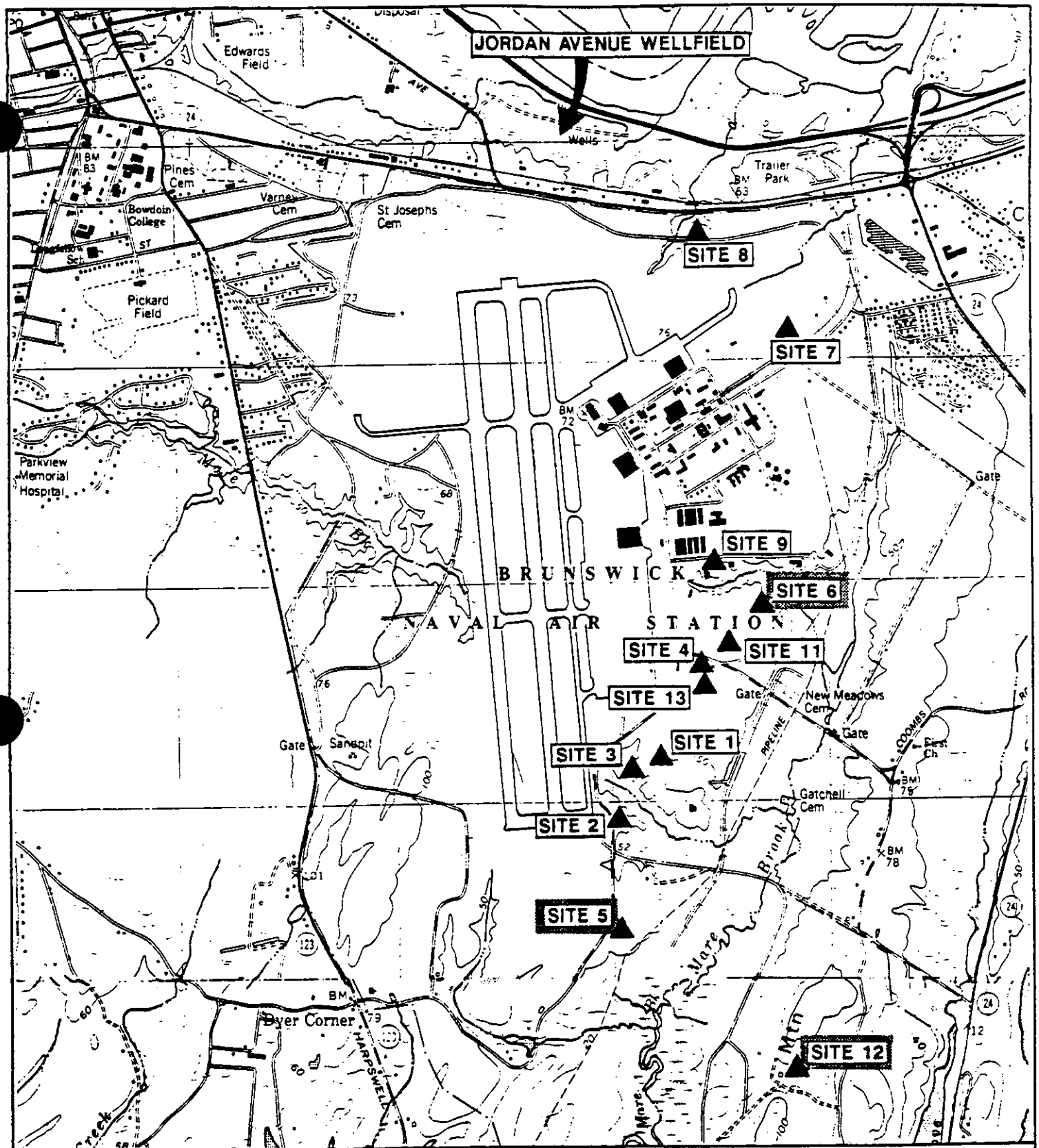
Remedial action objectives and general response actions for each of the three sites are discussed in subsequent subsections. In addition, summaries of the contamination and baseline human health and environmental risks at each site are presented. This information

provides the rationale for selecting contaminants of concern and developing remedial action objectives.

2.1 ASBESTOS DISPOSAL SITES - SITES 5 AND 6

The locations of Sites 5 and 6 are shown in Figure 2-1. Both sites reportedly were used to dispose of asbestos-lined pipes. Site 6 was also a general disposal site for rubble. The sites have not been used as disposal facilities for several years.

Site 5, located off Merriconeag Road, south of the main runway (see Figure 2-2), apparently was used for a short time in 1979 to dispose of asbestos-lined pipes from a demolished building. A facility engineer who inspected the site in 1980 described the site as consisting of two trenches; the first measuring 3 by 20 by 7 feet deep and the second, adjacent to the first, measuring 15 by 30 by 10 feet deep (Roy F. Weston, Inc., 1983). The site is currently covered with at least 1-foot of soil seeded and marked with posted signs as an asbestos disposal area. The soil and signs are believed to have been added in 1980. Site 5 is approximately one-quarter acre and is covered mostly with grass. Trees are in the surrounding area. The site is level except for a bank that drops off several feet just southeast of the site.



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

MAINE

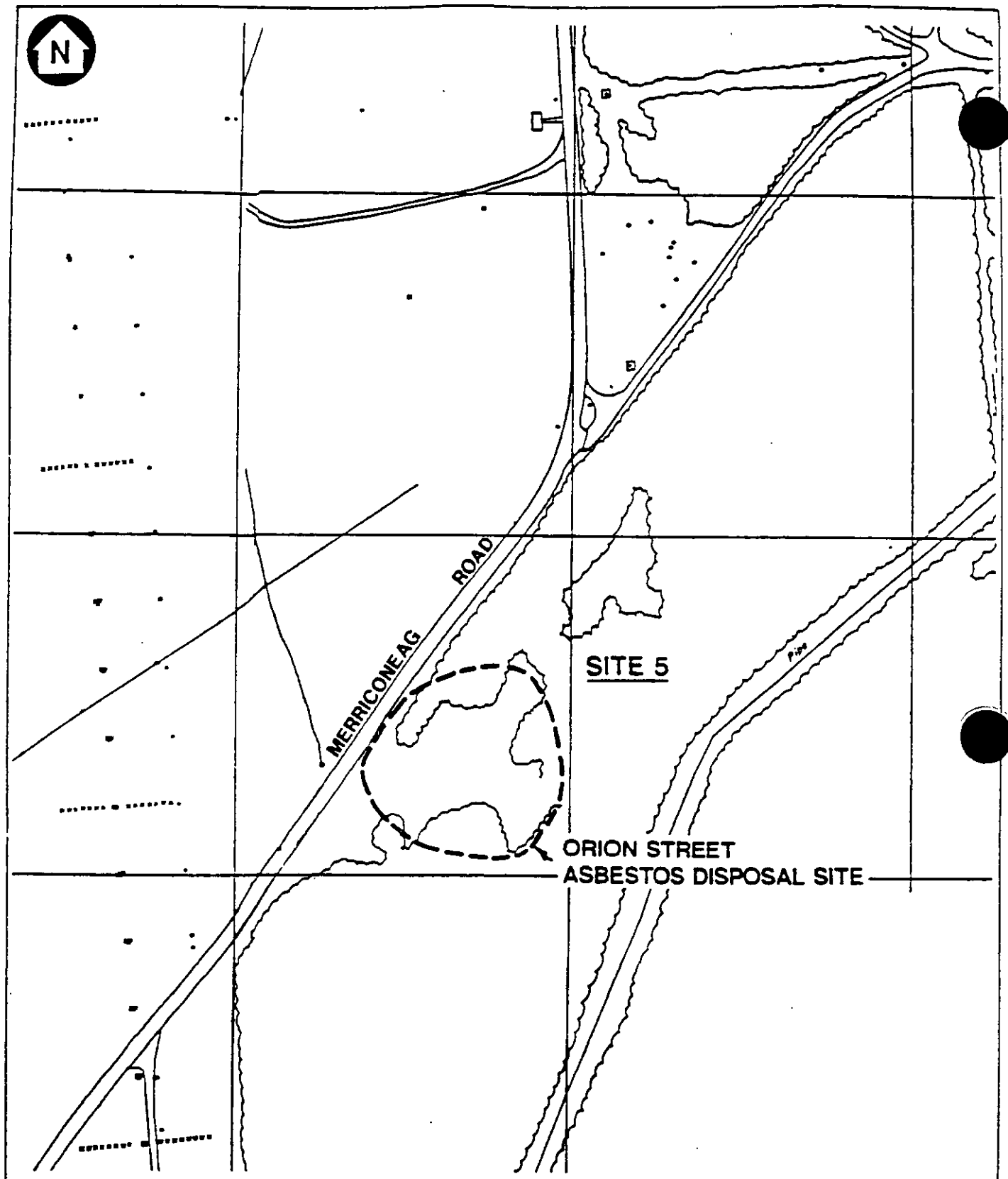
QUADRANGLE LOCATION

N

SCALE IN FEET

0 2,000 4,000

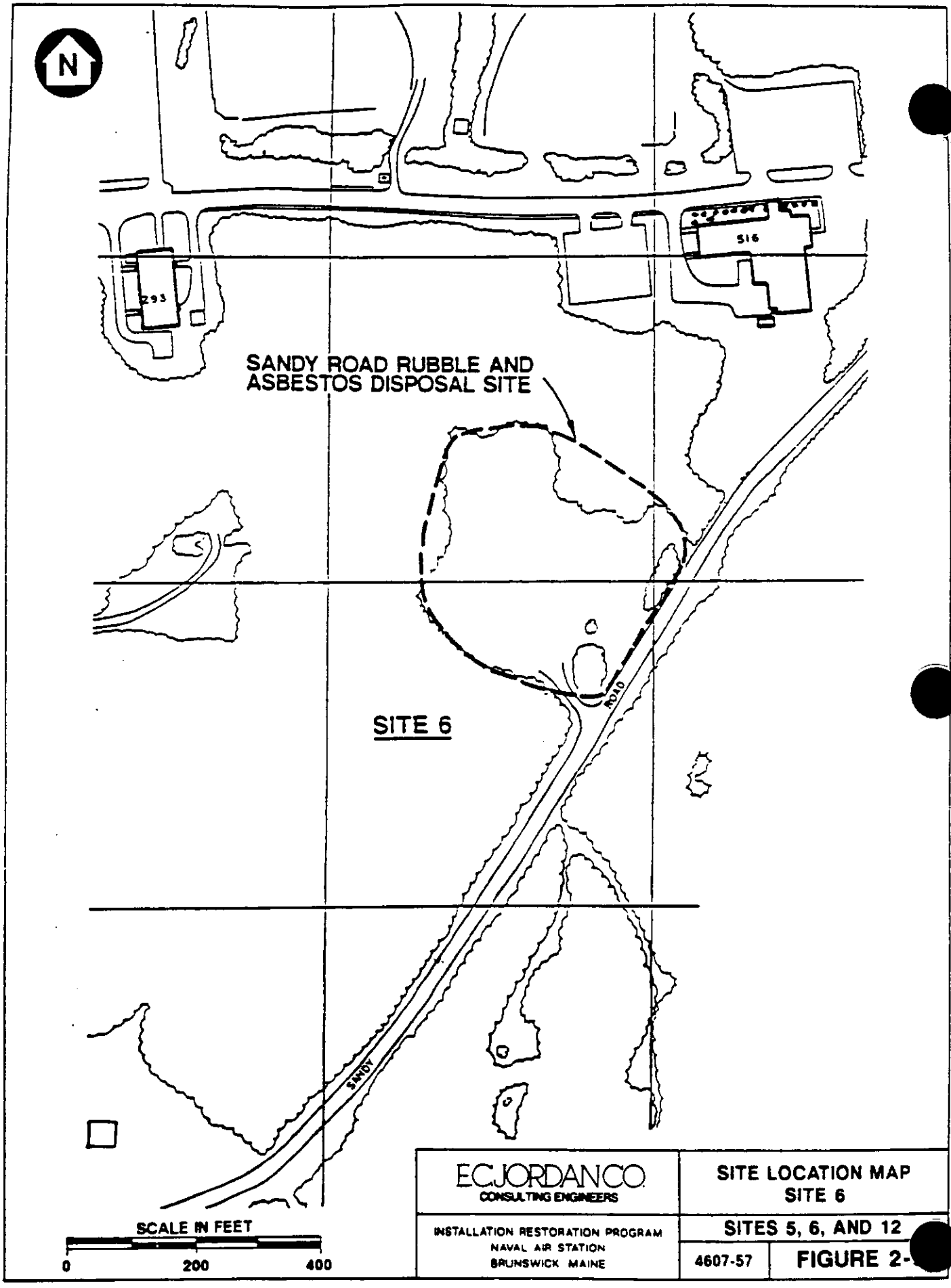
EC JORDAN CO. CONSULTING ENGINEERS	SITE LOCATION MAP
INSTALLATION RESTORATION PROGRAM NAVAL AIR STATION BRUNSWICK, MAINE	SITES 5, 6, AND 12
	4607-57 FIGURE 2-1



E.C.JORDAN CO. CONSULTING ENGINEERS	SITE LOCATION MAP SITE 5
INSTALLATION RESTORATION PROGRAM NAVAL AIR STATION BRUNSWICK MAINE	SITES 5, 6, AND 12
	4607-57 FIGURE 2-[illegible]

Site 6, the Sandy Road Rubble and Asbestos Disposal Site and is bordered by Sandy Road to the southeast and by a stream behind Building 516 to the north (see Figure 2-3). The site reportedly was used for general dumping of construction debris until the late 1970s (Roy F. Weston, Inc., 1983). It appears the site was originally a small depression which was later filled with construction debris and other nonputrescible wastes. Aircraft parts reportedly were disposed of at this site and asbestos-lined pipes were seen protruding from the surface (Roy F. Weston, Inc., 1983). Currently, vehicle access to Sandy Road is restricted by locked gates; however, portions of this site may be used by NAS Brunswick personnel. The site is nearly level except for a large soil stockpile approximately 15 feet at its highest elevation on the eastern side. There are empty pipes, concrete, asphalt, and other debris visible on the site surface. In addition, there are steel dumpsters stored on the southwest corner of the site. Site 6 is approximately 1-acre.

Sites 5 and 6 are being combined in this report based on their common geologic and hydrogeologic conditions and historical use as disposal sites for asbestos. Both sites are reported to contain buried asbestos-lined pipes in the sub-surface soils above the groundwater tables. Both sites are subject to similar ARARs and response objectives. Because the sites are similar, the same remedial technologies and actions will be applicable for each site; therefore, the sites will be combined for the development and screening of alternatives. However, the sites are not in close proximity, have different site features and


N
516
293
SANDY ROAD RUBBLE AND
ASBESTOS DISPOSAL SITE
SITE 6
SANDY
ROAD
SCALE IN FEET
0
200
400
EC JORDAN CO.
CONSULTING ENGINEERS
INSTALLATION RESTORATION PROGRAM
NAVAL AIR STATION
BRUNSWICK MAINE
SITE LOCATION MAP
SITE 6
SITES 5, 6, AND 12
4607-57
FIGURE 2-

physical constraints (i.e., the large stockpile of soil at Site 6); therefore, the sites will be considered separately during the detailed evaluation of alternatives and the remedial action decision process.

2.1.1 Summary of Contamination Assessment: Sites 5 and 6

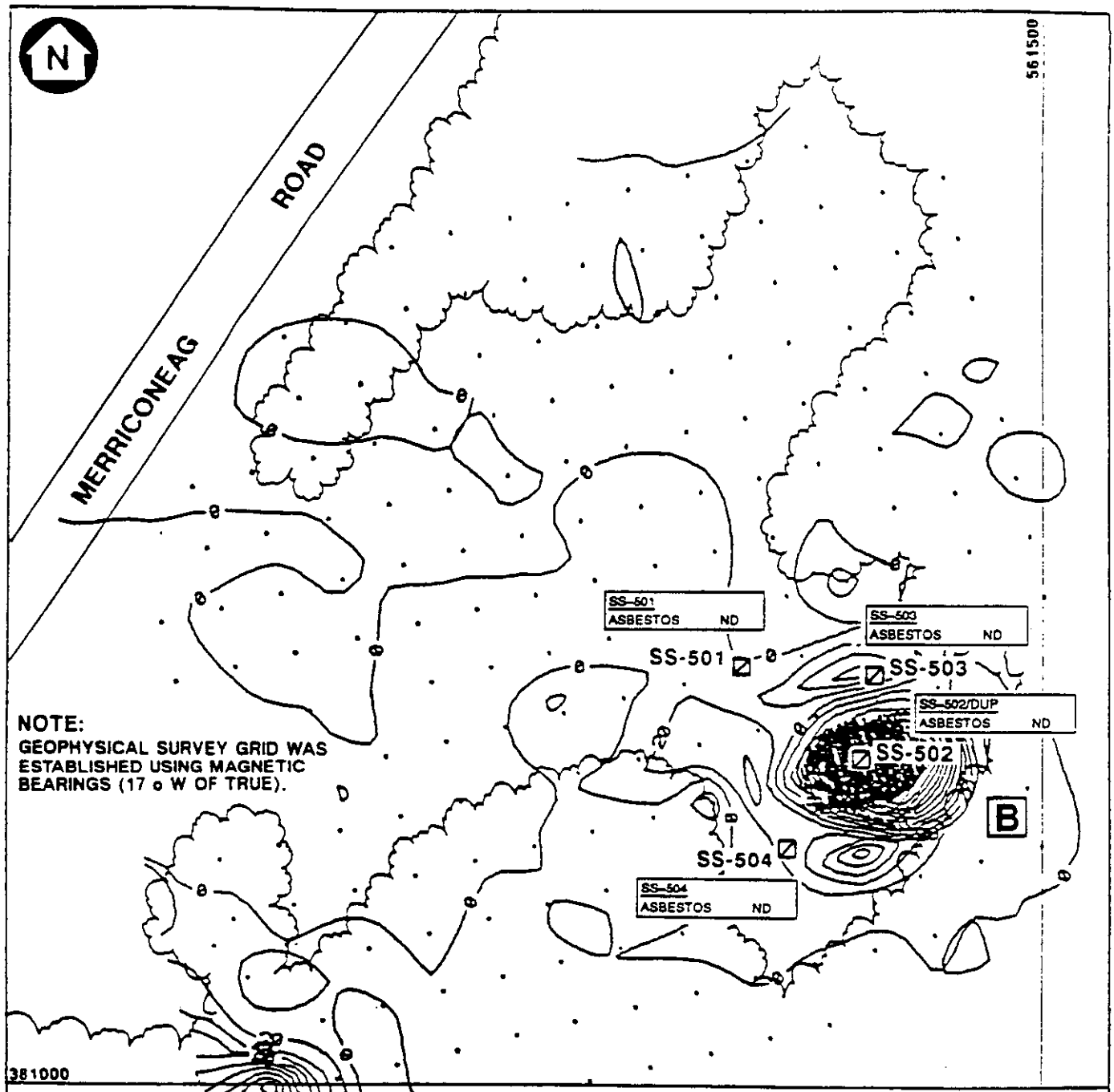
The following site contamination assessment summaries were developed based on information collected during field investigations in the fall of 1990 and presented in the Draft Supplemental RI (E.C. Jordan Co., 1991).

2.1.1.1 Site 5: Orion Street Asbestos Disposal Site. Shortly after disposal activities ceased at Site 5, a facility engineer inspected the site. He described the site as containing six asbestos pipes ranging from 4 to 12 feet long in one trench and a second trench containing six to eight lengths of corrugated pipe, with smaller asbestos pipe inside (Roy F. Weston, Inc., 1983). Because asbestos does not migrate through soils, only those soils in the immediate vicinity of the pipes are expected to be contaminated with asbestos. It is not possible to determine exactly how much of the surrounding soils may have been contaminated by the asbestos-covered pipes without excavating the site. Asbestos may have contaminated soils during disposal depending on how much care was shown in handling the

pipes. Little or no migration of asbestos is likely to have occurred once the trenches were refilled.

In 1990, Jordan personnel conducted a field investigation of Site 5. Field exploration at the site included a ground-penetrating radar (GPR) survey, a magnetometer survey, a detailed surface inspection, and analysis of four surface soil samples for asbestos. Asbestos-lined pipes were the only reported material disposed of at the site and asbestos is the only contaminant of concern.

The GPR and magnetometer surveys were conducted to locate the two trenches where the asbestos-covered pipes were buried. The magnetometer located a single primary magnetic anomaly and a second minor anomaly. The primary anomaly indicates a definite presence of subsurface metallic materials, but the second minor anomaly is believed to be caused by the presence of surface debris (e.g., old tin cans and bottles). It is possible that the single primary anomaly indicates both trenches and, because they are directly adjacent, the survey could not distinguish between them. The GPR survey did not reveal additional finding but did support the results of the magnetometer survey. The results of the investigations are shown in Figure 2-4.



NOTES:

1. SAMPLES COLLECTED DURING SEPTEMBER AND OCTOBER 1990.

LEGEND

- MAGNETIC STATION LOCATION
  CONTOUR INTERVAL: 20 GAMMAS
- SS-501 SURFACE SOIL SAMPLE LOCATION
- A SURVEY ANOMALY

SCALE IN FEET

0 50 100

ECJORDANCO CONSULTING ENGINEERS	VERTICAL MAGNETIC GRADIENT CONTOURS AND SURFACE SOIL ANALYTICAL DATA SITE 5
INSTALLATION RESTORATION PROGRAM NAVAL AIR STATION BRUNSWICK MAINE	SITES 5, 6, AND 12
4607-57	FIGURE 2-4

A detailed visual surface inspection was conducted to identify any exposed asbestos materials. No evidence of exposed asbestos materials was found in the vicinity of Site 5. The site is marked as an asbestos disposal site with two warning signs; surface debris (e.g., metal buckets, tin cans, and bottles) is scattered about the site. Four surface soil samples were collected from the site (see Figure 2-4) and analyzed for asbestos using polarized light microscopy. The location of the surface soil samples was based on the geophysical survey and surface inspection. Asbestos was not detected in any of the samples.

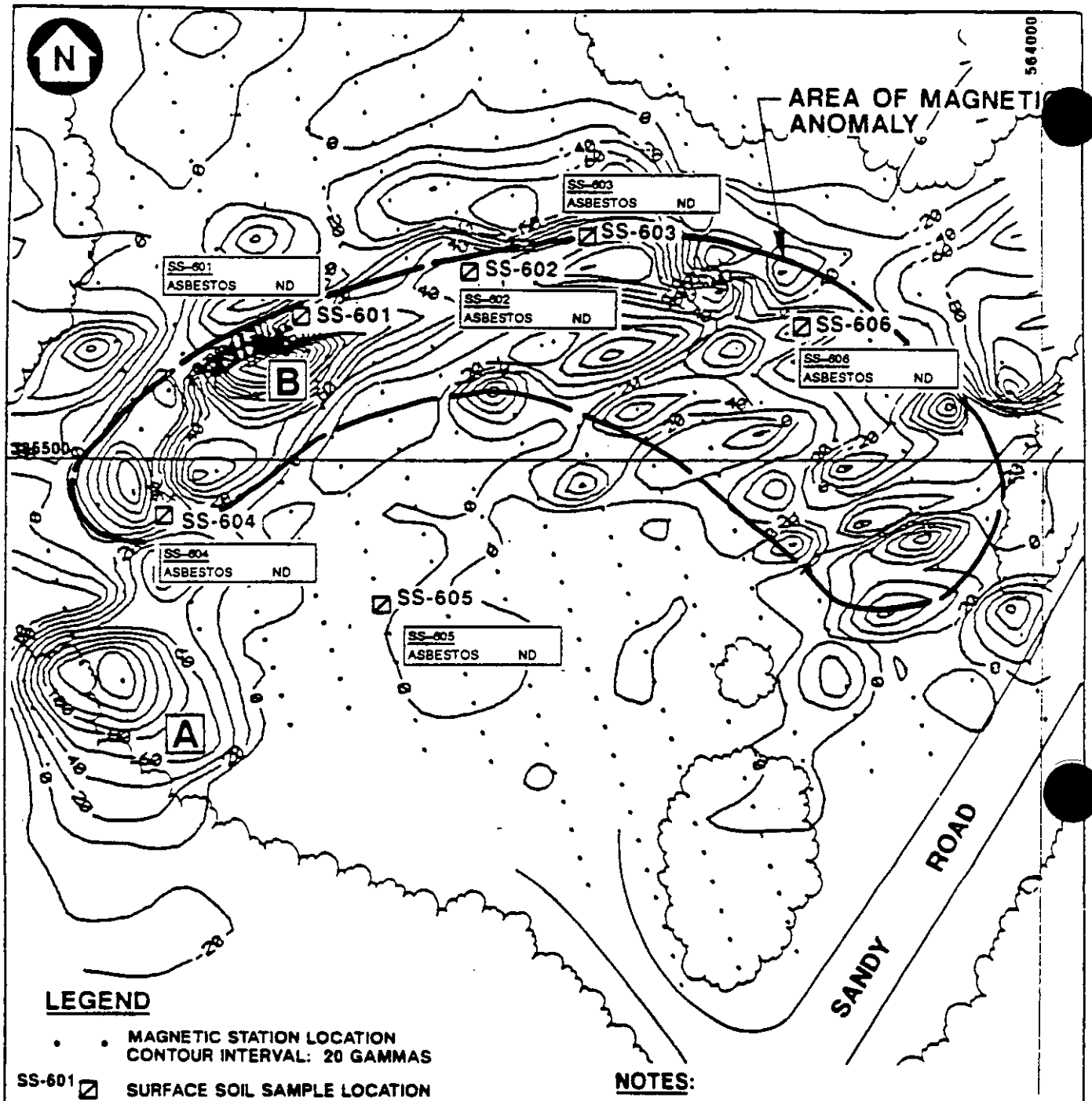
2.1.1.2 Site 6: Sandy Road Rubble and Asbestos Disposal. There is little indication how much asbestos may be buried at Site 6. The presence of asbestos at Site 6 was suggested based on a visual inspection of the site (Roy F. Weston, Inc., 1983). At that time, some asbestos-lined pipes were observed protruding through the surface. Because the site was used for disposal of rubble, it is probable that asbestos is buried beneath Site 6.

In 1990, Jordan personnel conducted a field investigation of Site 6. The field exploration included GPR and magnetometer surveys, a detailed surface inspection, analysis of six surface soil samples for asbestos, and installation of four test borings and monitoring wells. The primary contaminant of concern was asbestos. The monitoring wells were installed to determine if Site 6 was associated with groundwater several hundred feet downgradient and contaminated by VOCs and SVOCs.

GPR and magnetometer surveys were used to assess the areal extent of the dump. Unlike Site 5, no single primary magnetic anomaly was found. However, readings forming a semicircular shape were found across the site. This suggests that the semicircular region is probably where asbestos and rubble were disposed of at Site 6. The GPR survey supported these findings. The results of the investigations are shown in Figure 2-5. Anomaly A was attributed to dumpsters stored along the southwest edge of the site and is not considered part of the disposal site.

A visual surface inspection was conducted to identify any exposed asbestos materials. No conclusive evidence of exposed asbestos materials was found. This is in contrast with an earlier report of exposed asbestos pipes (Roy F. Weston, Inc. 1983). It is unknown what may have happened to the pipes because there are no reports that the pipes were covered or removed. Construction debris (e.g., concrete blocks, asphalt rubble, and pipes) is scattered about the site and some may contain asbestos.

Six surface soil samples were collected from the site (see Figure 2-5) and analyzed for asbestos using polarized light microscopy. The surface soil sample locations were chosen based on the geophysical survey and site inspection. SS-605 was sampled among some debris that appeared might contain asbestos. Asbestos was not detected in any of the samples collected.



LEGEND

• • MAGNETIC STATION LOCATION
CONTOUR INTERVAL: 20 GAMMAS

SS-601 ▨ SURFACE SOIL SAMPLE LOCATION

[A] SURVEY ANOMALY

NOTES:

1. SAMPLES COLLECTED DURING SEPTEMBER AND OCTOBER 1990.

NOTE:
GEOPHYSICAL SURVEY GRID WAS ESTABLISHED USING MAGNETIC BEARINGS (17° W OF TRUE).

SCALE IN FEET
0 50 100

ECJORDANCO CONSULTING ENGINEERS	VERTICAL MAGNETIC GRADIENT CONTOURS AND SURFACE SOIL ANALYTICAL DATA SITE 6
INSTALLATION RESTORATION PROGRAM NAVAL AIR STATION BRUNSWICK MAINE	SITES 5, 6, AND 12
4607-57	FIGURE 2-5

Four test borings and monitoring wells were installed in the vicinity of Site 6. Groundwater was sampled and analyzed for TCL VOCs, SVOCs, and TAL inorganics. Groundwater at Site 6 was found to contain normal background levels of inorganics and no significant contamination by organic compounds. The site is not believed to be associated with downgradient groundwater contamination.

2.1.2 Summary of Baseline Human Health Risk Assessment: Sites 5 and 6

As part of the Draft Supplemental RI, a baseline public risk assessment was conducted for Sites 5 and 6 (E.C. Jordan Co., 1991). The evaluation assesses the relative magnitude of anticipated health problems that can be associated with exposure to chemicals detected at the sites. The intention is to determine whether there is a significant threat to human health and to assess the need for site remediation. The results are summarized for two components: (1) exposure assessment, (2) toxicity assessment, and (3) risk characterization. A more detailed description of the baseline risk assessments can be found in the Draft Supplemental RI (E.C. Jordan Co., 1991).

2.1.2.1 Exposure Assessment. Site 5 is not near any recreational areas and is remote from base housing. No asbestos was detected in surface soils; therefore, no current exposure is believed to exist. Asbestos minerals are very stable in the subsurface environment and are

unlikely to migrate. In addition, at Site 5, the depth to groundwater is believed to be 15 to 20 feet below ground surface, eliminating mobilization of the asbestos from groundwater flow.

Although Site 6 is in an area with easy access to children, it is unknown if children actually visit the site. Site 6 is not located near any residential or recreational areas, suggesting that potential exposure would be infrequent (e.g., less than 10 times per year). No asbestos was detected in surface soil samples collected in this area and current exposure to asbestos is considered minimal. Asbestos minerals are stable in the subsurface environment and are unlikely to migrate. In addition, at Site 6, the depth to groundwater is 25 to 30 feet below ground surface, eliminating mobilization of asbestos from groundwater flow. The maximum depth of asbestos at Site 6 is unknown; however, it is very unlikely that the disposal site extends as deep as the groundwater.

In addition to on-site exposures (i.e., direct contact with soils), the potential for future exposures to off-site receptors through ingestion of contaminated groundwater was evaluated. Because of the site's history as a dump, groundwater samples were collected at Site 6 and analyzed for TCL VOCs, SVOCs, and TAL inorganic compounds. No contaminants were detected in the groundwater samples collected at Site 6 other than the common laboratory contaminant, bis(2-ethylhexyl)phthalate. (Note Subsection 5.3.5 of the

Draft Final RI [(E.C. Jordan Co., 1990c)] containing a detailed discussion on laboratory contaminants.) The concentration of inorganics detected in the groundwater samples at Site 6 were consistent with background values (E.C. Jordan Co., 1990c). Because asbestos is stable and groundwater is an unlikely transport mechanism, groundwater samples were not analyzed for asbestos.

2.1.2.2 Toxicity Assessment. Asbestos is the only contaminant of concern at Sites 5 and 6. Asbestos is a general term applied to a family of silicate minerals. These minerals, when crushed or milled, separate into flexible fibers. The toxic and carcinogenic effects of asbestos are related to the length and diameter of these fibers. Inhalation exposure to asbestos fiber or dust has been shown to cause respiratory diseases including lung cancer. Synergistic effects of asbestos toxicity have been demonstrated by cigarette smoking. The health effects of asbestos in water are not well known. It is not clear whether the ingestion of asbestos-contaminated water will lead to the same health effects observed after inhalation exposure (Doull et al., 1980).

Air concentrations of asbestos are regulated under the National Emissions Standards for Hazardous Air Pollutants (NESHAP) and water concentrations are regulated under the Safe Drinking Water Act.

2.1.2.3 Human Health Risk Characterization. Because asbestos was not detected in surface soil samples, no current route of exposure is believed to exists. Therefore, the potential risks to human health are considered to be minimal to non existent. The asbestos exists at depth and is very stable in the subsurface environment. Because no subsurface samples were collected, quantitative risk associated with future potential exposure to asbestos during construction or excavation related activities cannot be estimated.

No contaminants were detected in Site 6 groundwater above background concentrations. No current or future potential risk is associated with the use of this media.

2.1.3 Summary of Environmental Risk Assessment: Sites 5 and 6

The potential for deleterious impacts associated with exposure to site-related contamination by environmental receptors was evaluated in the Ecological Risk Assessment (E.C. Jordan Co., 1990c). The various types of ecological habitats at NAS Brunswick and the environmental receptors associated with these habitats are described in detail in the previous Ecological Risk Assessment. Additional data gathered during the October 1990 sampling round does not alter the conclusions of this assessment. The concentration of contaminants in surface soils at Sites 5 and 6 were within background concentrations

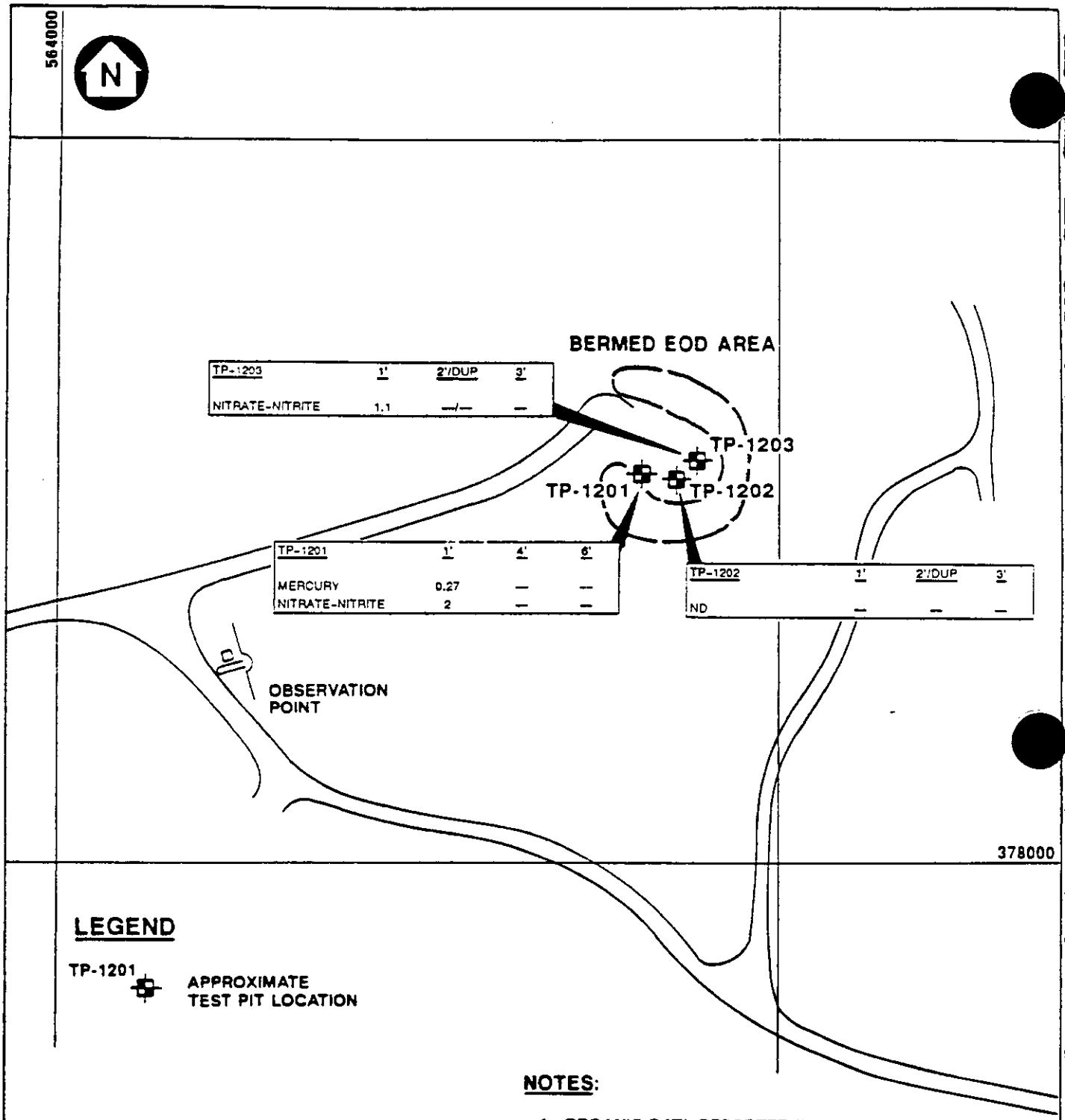
previously described (E.C. Jordan Co., 1990c) and are not expected to adversely impact environmental receptors.

2.2 EXPLOSIVE ORDNANCE DUMP TRAINING AREA

The location of Site 12 is shown in Figure 2-1 and Figure 2-6. This site was used for disposal of small quantities of ordnance, pyrotechnics, privately manufactured explosives, and potentially dangerous war souvenirs. The site has been in use since 1981 and consists of a bermed area approximately 60 by 100 feet. Three small demolition craters and a dumpster are located in this area. The dumpster is used for flashing small quantities of explosives/propellants, such as grenade fuses. Since 1984, there have been approximately six "burns" to destroy ordnance/explosives, as well as training exercises. Apparently, the site will continue to be used in the same manner.

2.2.1 Summary of Contamination Assessment: Site 12

During the 1990 field investigation, three test pits were excavated and soil samples collected. The pits were dug 6 feet deep and samples were taken at various depths. A total of 11 samples were taken from the three test pits. Analyses for explosive by-products and



TP-1203	1'	2'/DUP	3'
NITRATE-NITRITE	1.1	—/—	—

TP-1201	1'	4'	6'
MERCURY	0.27	—	—
NITRATE-NITRITE	2	—	—

TP-1202	1'	2'/DUP	3'
ND	—	—	—

NOTES:

1. ORGANIC DATA REPORTED IN ug/kg.
2. SAMPLES COLLECTED IN SEPTEMBER 1990.

EC JORDAN CO. CONSULTING ENGINEERS	TEST PIT LOCATION AND SOIL ANALYTICAL DATA MAP SITE 12	
INSTALLATION RESTORATION PROGRAM NAVAL AIR STATION BRUNSWICK MAINE	SITES 5, 6, AND 12	
	4607-57	FIGURE 2-6

some inorganics (cadmium, chromium, mercury, lead, phosphorus, and total nitrogen) were conducted. No explosives or explosive by-products were detected in the soil samples. Low concentrations of some inorganics were found, but these concentrations fall within background levels. The results of the field investigation are shown in Figure 2-6. Numerous small metal fragments were found in the top foot of soils at the site; the result of "car bomb" training. The potential hazards associated with metal fragments (i.e., physical hazards) are not addressed in the risk evaluations.

2.2.2 Summary of Baseline Human Health Risk Assessment: Site 12

The Supplemental RI includes a baseline public risk assessment for Site 12 (E.C. Jordan, Co. 1991). The results of components of the RI are summarized in this report: (1) exposure assessment and (2) risk characterization. A more detailed description of the baseline risk assessments can be found in the Supplemental RI (E.C. Jordan, Co., 1991).

Soil samples were collected from three test pits excavated at Site 12 and analyzed for explosives and explosives by-products (see Figure 9-1; Supplemental RI Report, E.C. Jordan Co., 1991). No explosive compounds were detected and low levels of chromium (11 to 62 mg/kg), lead (9 to 47 mg/kg), and phosphorus (100 to 530 mg/kg) were detected in all

analytical soil samples. In addition, mercury was detected in one sample at a concentration of 0.27 mg/kg.

2.2.2.1 Exposure Assessment. Site 12 is remote, within a highly secured area of the base where access is controlled. Because children cannot access this area, direct contact exposure to soils is considered unlikely. Therefore, exposure to children was not evaluated. Exposure to contaminated soil during work-related activities is very limited in this area. Explosive ordnance activity in the past has been limited to six burns (one burn per year from 1984 to 1989) for training and destruction of ordnance/explosives (Keirn, 1989). Because of the limited frequency of exposure and the low concentrations of contaminants in both surface and subsurface soils, dermal absorption and incidental ingestion of soils were not evaluated for current land uses. A residential scenario, using the mean concentrations of contaminants in soil, was used as a worst-case estimate of future exposures through dermal absorption and inadvertent ingestion.

2.2.2.2 Human Health Risk Characterization. Based on the restricted access to this site, direct contact exposure to contaminated soils is considered unlikely. In addition, contaminant concentrations in surface soils are below levels considered to present a public health risk.

Lifetime residential exposure to mean contaminant concentrations in soils at Site 12 results in insignificant noncarcinogenic risks. The total estimated site Hazard Index (HI) was below 1 for both children (HI=0.609) and adults (HI=0.166) (E.C. Jordan Co., 1991; Appendix O). No carcinogenic risks are posed by the contaminants identified at Site 12.

2.2.3 Summary of Environmental Risk Assessment: Site 12

Contaminant concentrations in surface and subsurface soils at Site 12 were within background concentrations previously described (E.C. Jordan Co., 1990c) and are not expected to adversely impact environmental receptors. The additional data gathered during the October 1990 sampling round does not alter the conclusions of the assessment in the Ecological Risk Assessment (E.C. Jordan Co., 1990c).

2.3 DEVELOPMENT OF REMEDIAL ACTION OBJECTIVES

Remedial action objectives are clean-up goals addressing the nature and distribution of contamination and the potential for human and environmental exposures.

2.3.1 Remedial Action Objectives: Sites 5 and 6

The baseline human health and environmental risk assessments for Sites 5 and 6 do not indicate a significant risk from current exposure to asbestos. The potential for increased future risks remains if any asbestos is uncovered by activities at the sites. Therefore, the remedial action objectives address human health risks based on future potential exposure. The major exposure route of concern for asbestos is inhalation. Currently, there is no risk at Site 6 because no asbestos is exposed. The potential remains that asbestos at the sites could be uncovered in the future, creating a potential for inhalation of asbestos dust. Therefore, the remedial action objective at Site 6 will be to prevent future potential risks of exposure to airborne asbestos.

2.3.2 Remedial Action Objectives: Site 12

The baseline risk assessments do not indicate a risk to either human health or the environment. No future risks are anticipated at Site 12 unless future site activities further contaminate the site. Therefore, remedial action objectives and Target Clean-up Levels for site-related contaminants are not necessary for this site. This site is eliminated from further consideration in this report. A No Action alternative is appropriate for this site.

2.3.3 General Response Actions

Based on the remedial action objective, general response actions were developed to address asbestos contamination at Sites 5 and 6. These general response actions will be used to help identify and screen technologies as well as to develop alternatives. General response actions outline the basic remediation methods that will be developed in this report. The general response actions developed for Sites 5 and 6 were based on combinations of the general response actions suggested in USEPA's "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" (USEPA, 1988). The following five general response actions were identified:

- No Action/Minimal Action
- Containment
- Excavation and Treatment
- Excavation and Disposal

3.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Section 120 of CERCLA provides guidelines for the remediation of hazardous constituents released from federal facilities. CERCLA requires that each department, agency, and instrumentality of the U.S. (i.e., federal facility), including the executive, legislative, and judicial branches of government, be subject to and comply with CERCLA, both procedurally and substantively, in the same manner and to the same extent as any nongovernmental entity. All guidelines, rules, regulations, and criteria carried out under CERCLA (including the NCP) are applicable to federal facilities. Federal facilities must comply with the cleanup standards set forth in Section 121, including complying with federal and state ARARs.

Under Executive Order 12580 (Superfund Implementation), USEPA was delegated the authority to select the extent of remedy at federal facilities on the NPL. Section 2701 of CERCLA (the Environmental Restoration Program [ERP]) authorizes the Secretary of Defense to carry out a program of environmental restoration at facilities under his jurisdiction. Program activities must be carried out consistently with Section 120 of CERCLA, in consultation with the Administrator of USEPA. Program goals include (1) identification, (2) investigation, (3) research and development, and (4) cleanup of

contamination from hazardous substances, pollutants, and contaminants. The ERP consists of three main components: (1) the Department of Energy ERP; (2) the Defense Environmental Restoration Program (DERP), for remediation of formerly owned federal facilities, administered by the U.S. Army Corps of Engineers (USACE); and (3) the IR Program for active and inactive Army, Navy, and Air Force installations.

As discussed, NAS Brunswick is an active Naval base being investigated under the IR Program section of the ERP. The IR Program has developed a remedial program that parallels the USEPA RI/FS process in following sites from discovery through remedial action. The Draft Final RI and Phase I FS reports presented the chemical-, action-, and location-specific ARARs for the nine original sites at NAS Brunswick (E.C. Jordan Co., 1990c and E.C. Jordan Co., 1990b). The Draft Supplemental RI included the ARARs for Sites 5, 6, and 12 and the nine original sites. In this section, only those ARARs specific to Sites 5, 6, and 12 are listed. The Draft Final RI and FS and Draft Supplemental RI are referenced for additional ARAR information (E.C. Jordan Co., 1990c, 1990b and 1991).

3.1 DEFINITION OF ARARS

To properly consider ARARs and, more importantly, to clarify their function in the RI/FS and remedial response processes, the NCP defines two ARAR components: (1) applicable requirements, and (2) relevant and appropriate requirements. These definitions were revised to incorporate applicable portions of SARA, and are discussed in the following paragraphs.

Applicable requirements are those clean-up standards, standards of control, or other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site. An example of an applicable requirement is the use of Maximum Contaminant Levels (MCLs) for a site where groundwater contamination enters a public water supply.

Relevant and appropriate requirements are those clean-up standards, standards of control, or other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that (while not legally applicable to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site) address problems or situations sufficiently similar to those encountered at

the CERCLA site that their use is well-suited to the particular site. The term "relevant" is included so requirements initially screened out as non-applicable (because of jurisdictional restrictions) can be reconsidered. If a requirement is determined relevant and appropriate, it is applied in the same manner as an applicable regulation. For example, MCLs would be relevant and appropriate requirements at a site where groundwater contamination could affect a potential (rather than an actual) drinking water source. Relevant and appropriate requirements should be given the same weight for consideration as applicable requirements.

Other requirements to be considered (TBCs) are federal and state nonpromulgated advisories or guidance that are not legally binding and do not have the status of potential ARARs. However, if there are no specific ARARs for a chemical or site condition, or if existing ARARs are not deemed sufficiently protective, then TBCs should be identified and used to ensure public health and environmental protection.

3.2 APPROACH TO ARARS IDENTIFICATION

Under the description of ARARs in the NCP and SARA, state and federal environmental requirements must be considered that are:

- chemical-specific (i.e., govern the extent of site remediation)
- location-specific (i.e., pertain to existing site features)
- action-specific (i.e., pertain to proposed site remedies and govern implementation of the selected site remedy)

Chemical-specific ARARs are usually health- or risk-based standards limiting the concentration of a chemical found in or discharged to the environment. They govern the extent of site remediation by providing either actual clean-up levels, or the basis for calculating such levels. For example, groundwater standards may provide the necessary clean-up goals for sites with contaminated groundwater at NAS Brunswick. Chemical-specific ARARs for the site may also be used to indicate acceptable levels of discharge in determining treatment and disposal requirements, and to assess the effectiveness of future remedial alternatives. Table 3-1 is a synopsis of potential chemical-specific ARARs for

TABLE 3-1
PRELIMINARY CHEMICAL-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE RI/FS
GROUNDWATER/SURFACE WATER				
Federal	SDWA - MCLs (40 CFR 141.11 - 141.16)	Relevant and Appropriate	Maximum Contaminant Levels (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 - MCLGs (40 CFR 141.50 - 141.51)	Relevant and Appropriate	MCLGs are health-based criteria that are to be considered for drinking water sources as a result of SARA. These goals 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.
	RCRA - Subpart F Groundwater Protection Standards, Alternate Concentration Limits (40 CFR 264.94)	Relevant and Appropriate	This requirement outlines standards, in addition to background concentrations and MCLs, to be used in establishing clean-up levels for remediating groundwater contamination.	These requirements may be relevant and appropriate if certain conditions relating to transport and exposure are met. Procedures for developing alternate concentration limits are outlined in RCRA Subpart F, Section 264.94.
	Federal Ambient Water Quality Criteria (AWQC)	Relevant and Appropriate	Federal AWQC are health-based criteria developed for carcinogenic and noncarcinogenic compounds and parameters. AWQC for the protection of public health provide levels for exposure both from drinking the water and consuming aquatic organisms, and from consuming fish alone. Remedial actions involving contaminated surface water or groundwater must consider the uses of the water and the circumstances of the release or threatened release; this determines the relevance and appropriateness.	This requirement will be complied with when determining clean-up levels or potential discharge limits for treated groundwater.
Federal Guidance and Criteria To Be Considered	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 are used to characterize risks due to noncarcinogens in various media.

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(Continued)

TABLE 3-1
PRELIMINARY CHEMICAL-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE RI/FS
	USEPA Carcinogen Assessment Group Carcinogenic Potency Factors (CPFs)	To Be Considered	Carcinogenic effects present the most up-to-date information on cancer risk potency derived from USEPA's Carcinogen Assessment Group.	USEPA CPFs are used to compute the individual incremental cancer risk resulting from exposure to certain compounds.
State	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 MEGs 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 will be used to set clean-up levels.
	Maine Regulations Relating to Water Quality Criteria for Toxic Pollutants (MEDEP Regs, Chapter 584)	Applicable	This rule limits the concentrations of certain materials allowed in Maine waters to prevent the occurrence of pollutants in toxic amounts as required by state and federal law. Except if naturally occurring, ambient levels of toxic pollutants shall not exceed the Clean Water Act AWQC. Where AWQC do not exist, the Board of Environmental Protection shall adopt site-specific numerical criteria.	These standards will be attained when determining clean-up levels or potential discharge limits.

(Continued)

TABLE 3-1
PRELIMINARY CHEMICAL-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE RI/FS
AIR				
Federal	Clean Air Act - National Primary and Secondary Ambient Air Quality Standards (40 CFR 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.	Particulate standards for matter less than 10 microns is 150 $\mu g/m^3$, 24-hour average concentration.
	National Emission Standards for Hazardous Air Pollutants (NESHAPs) (40 CFR Part 61)	Relevant and Appropriate	NESHAPs are promulgated for emissions of particular air pollutants from specific sources. NESHAPs are generally not applicable to Superfund Activities because CERCLA sites do not usually contain one of the specific source categories regulated; however, they may be relevant and appropriate and should be considered during the FS.	The NESHAP requirements for notification, emission limits, and personnel training for the handling and disposal of asbestos (Subpart M) are relevant and appropriate to proposed alternatives for Sites 5, 6, and 12.
State	Establishment of Air Quality Regions (38 MRSA Section 583; MEDEP Regs. 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 Regs, Chapter 110)	Applicable	This Chapter establishes ambient air quality standards that are maximum levels of a particular pollutant that is permitted in the ambient air.	The standard for particulate matter is 150 $\mu g/m^3$, 24-hour concentration. Maximum hydrocarbon concentration for a 3-hour period is 160 $\mu g/m^3$.

NOTES:

ACL = Alternate Concentration Limit
AWQC = Ambient Water Quality Criteria
CAG = Carcinogen Assessment Group
CMR = Code of Maine Rules
CPF = Carcinogenic Potency Factor
FS = Feasibility Study
MCL = Maximum Contaminant Level
MCLG = Maximum Contaminant Level Goal
MEG = Maximum Exposure Guidelines
MEDEP = Maine Department of Environmental Protection
NESHAP = National Emission Standards for Hazardous Air Pollutants
RCRA = Resource Conservation and Recovery Act
RfD = Reference Dose
SARA = Superfund Amendments and Reauthorization Act
SDWA = Safe Drinking Water Act
USEPA = U.S. Environmental Protection Agency
ppm = parts per million

Sites 5, 6, and 12. Table 3-2 compares contaminants identified at Sites 5, 6, and 12 with the corresponding regulatory limits.

Location-specific ARARs govern natural site features (e.g., wetlands, floodplains, and sensitive ecosystems) and man-made features (e.g., existing landfills, disposal areas, and places of historical or archeological significance). These ARARs generally restrict the concentration of hazardous substances or the conduct of activities based solely on the site's particular characteristics or location. Table 3-3 is a synopsis of potential location-specific standards by location, environmental statute, and regulation.

Action-specific ARARs are usually technology- or activity-based limitations controlling actions at hazardous waste sites. As remedial alternatives are developed, action-specific ARARs (pertaining to proposed site remedies) provide a basis for assessing feasibility and effectiveness. Table 3-4 is a synopsis of potential action-specific ARARs. During the screening and detailed analysis of remedial alternatives, the alternatives will be evaluated for compliance with the specific standards of each ARAR.

TABLE 3-2
CHEMICAL-SPECIFIC ARARS FOR
CONTAMINANTS DETECTED AT SITES 5, 6 AND 12

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

CHEMICAL	MCL[1] (µg/L)	MCLG[1] (µg/L)
Asbestos	7 MFL	7 MFL
Manganese	--	--
Mercury	2	2
Nitrate/Nitrite	10	10

NOTES:

-- = No value is available.
MCL = Maximum Contaminant Level (Federal Register January 30, 1991).
MCLG = Maximum Contaminant Level Goal (Federal Register January 30, 1991).
MFL = Million fibers per liter, with fiber lengths > 10 microns.
1 = Final MCLGs and MCLs become effective July 1992.
* = Insufficient data to develop criteria. Value given is the Lowest Observed Effect Level.
µg/L = micrograms per liter

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TABLE 3-3
POTENTIAL LOCATION-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE RI/FS
WETLANDS				
Federal	CWA Section 404	Applicable	Section 404 of the CWA regulates the discharge of dredged or fill material into U.S. waters, including wetlands. The purpose of Section 404 is to ensure that proposed discharges are evaluated with respect to impact on the aquatic ecosystem. If a remedial alternative involves dredged or fill material discharge to a wetland, a permit must be obtained from the U.S. Army Corps of Engineers.	During the identification, screening, and evaluation of alternatives, the effects on wetlands are evaluated.
	Guidelines for Specification of Disposal Sites for Dredged or Fill Materials (40 CFR 230)	Applicable	These guidelines maintain that no dredged or fill material discharge will be permitted if there is a practicable alternative with less impact to the aquatic ecosystem. Discharge will also not be permitted unless steps are taken to minimize potential adverse impacts, or if it will cause or contribute to significant degradation of U.S. waters.	If a remedial alternative involves discharging dredged or fill material to a wetland, potential short- or long-term effects must be determined, based on various physical, chemical, and biological parameters. Effects on human use characteristics such as aesthetics and recreation also need to be addressed.
	Fish and Wildlife Coordination Act (16 U.S.C. 661)	Applicable	This act requires that any federal agency proposing to modify a body of water must consult with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and other related state agencies.	Notification is not required for actions taken on-site at a CERCLA site. However, actions will be taken to minimize impacts to wetlands.

(continued)

TABLE 3-3
POTENTIAL LOCATION-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE RI/FS
FLOODPLAINS				
Federal Regulatory Requirements	RCRA - Location Standards (40 CFR 264.18)	Relevant and Appropriate	A facility located in a 100-year floodplain must be designed, constructed, operated, and maintained to prevent washout of any hazardous wastes by a 100-year flood.	The impact of hazardous constituents on the affected surface waters must be considered during remedial actions.
WETLANDS/FLOODPLAINS				
	40 CFR Part 6, Appendix A	Applicable	Sets forth USEPA policy for carrying out the provisions of the Wetland Executive Order (EO 11990) and Floodplains Executive Order (EO 11988). Under this order, federal agencies are required to minimize the destruction, loss, or degradation of wetlands, and preserve and enhance natural and beneficial values of wetlands; and minimize potential harm to or within floodplains and to avoid the long- and short-term adverse impact with modifications to floodplains.	This requirement will be considered during the development of alternatives. If no pratical alternative exists, potential harm must be minimized and action taken to restore the natural and beneficial values of the wetland or floodplain.
State	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 for any action taken within 100 feet of a wetland or stream.
	Maine Hazardous Waste Management Rules (MEDEP Regs, Chapters 800-802, 850, 851, 853-857)	Applicable	These regulations correspond to and supplement RCRA hazardous waste requirements and outline the criteria for the siting of a new facility. No portion of the site may be located within a wetland or within 300 feet of any 100-year floodplain.	These rules will be addressed if the construction of an on-site treatment facility is proposed that would handle hazardous waste.

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(continued)

TABLE 3-3
POTENTIAL LOCATION-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE RI/FS
	Maine Natural Resources Protection Act (MEDEP Regs, Chapter 305), (38 MRSA, Section 480)	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				
Federal	Endangered Species Applicable Act	Applicable	This act requires action to avoid jeopardizing the continued existence of listed endangered or threatened species or notification of their habitat.	Endangered or threatened species in the site area will be identified. Activities must not impact such species.
State	Maine Site Location of Development Law and Regulations (38 MRSA Sections 481-490; MEDEP Regs, Chapters 371-377)	Applicable	This act and regulations govern the 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 to consider this law and regulation. A permit will not be required if the activity is on-site.
	Maine Solid Waste Management Rules: Landfill Disposal Facilities (38 MRSA, Section 1301 *et seq.*; MEDEP Regs, Chapters 400-406	Applicable	These regulations outline landfill siting requirements including minimum distances to aquifers, bedrock, and geologic faults.	The standards outlined in this requirement will be incorporated into the design of any remedial alternative proposing construction of a land disposal facility.
	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.

(continued)

TABLE 3-3
POTENTIAL LOCATION-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE RI/FS
OTHER NATURAL RESOURCES (continued)				
	Maine Inland Fisheries and Wildlife Laws and Regulations (12 MRSA Section 7751)	Applicable	The State of Maine has authority to research, list, and protect any species deemed endangered or threatened. These species are listed as either endangered or threatened in the state regulations. The Maine Department of Inland Fisheries and Wildlife has also developed the following administrative categories for species not considered endangered or threatened but considered important for research and further evaluation: Maine Watch List, Special Concern List, and Indeterminate Category. The Bureau determines appropriate use(s) of various habitats on a case-by-case basis. The Maine lists may differ from the federal lists of endangered species.	Endangered or threatened species in the site area will be identified. Activities must not impact an endangered or threatened species.
State Guidance and Criteria to be Considered	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:
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
CFR = Code of Federal Regulations
CWA = Clean Water Act
MEDEP = Maine Department of Environmental Protection
NEPA = National Environmental Policy Act
RCRA = Resource Conservation and Recovery Act
RI/FS = Remedial Investigation/Feasibility Study
USEPA = U.S. Environmental Protection Agency

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TABLE 3-4
POTENTIAL ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE RREQUIREMENTS

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

REQUIREMENT	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE RI/FS
Federal		
RCRA - General Facility Standards (40 CFR 264.10-264.18)	General facility requirements outline general waste analysis, security measures, inspections, and training requirements.	Any facilities will be constructed, fenced, posted, and operated in accordance with this requirement. All workers will be properly trained.
RCRA - Preparedness and Prevention (40 CFR 264.30-264.37)	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 public health or the environment.	Safety and communication equipment will be installed at the site; local authorities will be familiarized with site operations.
RCRA - Contingency Plan and Emergency Procedures (40 CFR 264.50-264.56)	This regulation outlines the requirements for emergency procedures to be used following explosions, fires, etc.	Plans will be developed and implemented during site work including installation of monitoring wells, and implementation of site remedies. Copies of the plans will be kept on-site.
RCRA - Releases from Solid Waste Management Units (40 CFR 274.90-264.109)	This regulation details groundwater monitoring requirements for hazardous waste treatment facilities. The regulation outlines general groundwater monitoring standards, as well as standards for detection monitoring, compliance monitoring, and corrective action monitoring.	General groundwater monitoring standards should be addressed as part of any proposed alternative. The need for any of the specific monitoring programs will depend on whether source materials are removed, treated, or left in place.
RCRA - Closure and Post-closure (40 CFR 264.110-264.120)	This regulation details the general requirements for closure and post-closure of hazardous waste facilities, including the 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.
RCRA - Waste Piles (40 CFR 264.250-264.269)	This regulation details procedures, operating requirements, and closure and post-closure for waste piles. If removal or decontamination of all contaminated subsoils is not possible, closure and post-closure requirements for landfills must be attained.	According to RCRA, waste piles used for treatment or storage of noncontainerized accumulation of solid, non-flowing hazardous waste may comply with either the waste pile or landfill requirements. The temporary storage of solid waste on-site, therefore, must comply with one or the other subpart.

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(Continued)

TABLE 3-4
POTENTIAL ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE RREQUIREMENTS

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

REQUIREMENT	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE RI/FS
RCRA - Landfills (40 CFR 264.300-264.339)	This regulation details the design, operation, monitoring, inspection, recordkeeping, closure, and permit requirements for a RCRA landfill. Two liners must be installed to prevent groundwater contamination. A leachate collection system must be placed above and between the liner systems.	Disposal of contaminated materials from NAS Brunswick must be to a facility that complies with all relevant and appropriate RCRA landfill regulations, including closure and post-closure.
RCRA - Incinerators (40 CFR 264.340-264.599)	This regulation specifies the performance standards, operating requirements, monitoring, inspection, and closure guidelines of any incinerator burning hazardous waste.	On-site thermal treatment must comply with the appropriate requirements specified in this subpart of RCRA.
RCRA Regulations for Land Treatment (40 CFR 264.270-283)	These regulations specify the proper operation, monitoring, and closure for RCRA land treatment systems. Land treatment must continue through closure and post-closure to assure that degradation of hazardous constituents continues.	These requirements will be incorporated into alternatives proposing on-site land treatment.
RCRA - Miscellaneous Units (40 CFR 264.600-264.999)	These standards are applicable to miscellaneous units not previously defined under existing RCRA regulations for treatment, storage, and disposal units. Subpart X outlines performance requirements that miscellaneous units be designed, constructed, operated, and maintained to prevent releases to the subsurface, groundwater, surface water, and wetlands that may have adverse effects on human health and the environment.	The design of proposed treatment alternatives, not specifically regulated under other subparts of RCRA, will address the means of preventing the release of hazardous constituents and prevent further impact on the environment.
RCRA Regulations on LDRs (40 CFR 268)	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 wastes and the remedial action must constitute "placement" in order for the land disposal restrictions to be considered applicable. For each hazardous waste, the LDRs specify either a treatment technology or a concentration level, the waste must be treated with disposal in a RCRA Subtitle C permitted facility.	If it is determined that hazardous materials located at NAS Brunswick are considered wastes subject to the LDRs, the hazardous materials will be handled and treated in compliance with these regulations.

(Continued)

TABLE 3-4
POTENTIAL ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE RREQUIREMENTS

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

REQUIREMENT	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE RI/FS
OSHA - General Industry Standards (29 CFR Part 1910)	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 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)	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 would be followed during on-site activities.
OSHA - Recordkeeping, Reporting, and Related Regulations (29 CFR 1904)	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.
CWA - NPDES Regulations (40 CFR Parts 122, 125)	This requirement implements the NPDES program that specifies the applicable effluent standards, monitoring requirements, and standard and special conditions for direct discharge.	Both on- and off-site discharges from CERCLA sites to surface waters are required to meet the CWA NPDES requirements, including discharge limitations,monitoring requirements, and best management practices. Permits will be required for discharges.
CWA - Pretreatment Standards for POTW Discharge (40 CFR Part 403)	This regulation specifies pretreatment standards for discharges to a POTW. If treated groundwater is discharged to a POTW, the POTW must have mechanisms available to meet the requirements of the National Pretreatment Program - Introduction of Pollutants which cause pass through or interference are prohibited. Discharges must also comply with any local POTW regulations. If hazardous waste is discharged to the POTW, the POTW may be subject to RCRA permit-by-rule.	If treated groundwater is discharged to a POTW, the discharge must meet all discharge limitations imposed by the POTW.

(Continued)

TABLE 3-4
POTENTIAL ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE RREQUIREMENTS

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

REQUIREMENT	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE RI/FS
CWA - Permits for Dredged and Fill Material (Section 404)	This regulation outlines requirements for discharges of dredged or fill material. Under this requirement, no activity that impacts a wetland shall be permitted if a practicable alternative with less impact on the wetland is available. If there is no other practicable alternative, impacts must be mitigated.	During the identification, screening, and evaluation of alternatives, the effects on wetlands must be evaluated.
CAA - National Ambient Air Quality Standards (40 CFR Part 50)	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 $\mu g/m^3$ and the annual arithmetic mean of 50 $\mu g/m^3$ by dust suppressants, if necessary.
RCRA - Standards Applicable to Generators of Hazardous Waste (40 CFR Part 262)	This requirement sets standards for generators of hazardous waste that address (1) accumulating waste, (2) preparing hazardous waste for shipment, and (3) preparing the uniform hazardous waste manifest. These requirements are integrated with DOT regulations.	If any alternative proposes shipping wastes off-site, the material must be shipped in proper containers that are accurately marked and labeled, and the transporter must display proper placards. All waste shipments must be accompanied by an appropriate manifest.
DOT Rules for Transportation of Hazardous Materials (49 CFR Parts 107, 171.1-172.558)	This regulation outlines procedures for the packaging, labeling, manifesting, and transporting of hazardous materials.	Contaminated materials will be packaged, manifested, and transported to a licensed off-site disposal facility in compliance with these regulations.
CWA - Regulations on Disposal Site Determinations Under the CWA (40 CFR 231)	These regulations apply to all existing, proposed, or potential disposal sites for discharges of dredged or fill material into U.S. waters, which include wetlands.	The dredged or fill material should not be discharged unless it can be demonstrated that such a discharge will not have an unacceptable impact on the wetlands.
U.S. Army Corps of Engineers Permit Program Regulations (33 CFR 320-330)	These regulations prescribe the statutory authorities, and general and special policies and procedures applicable to the review of applications for Department of Army permits for controlling certain permits for controlling certain activities in U.S. waters; this includes discharge of dredged or fill material.	Dredging and filling of the wetlands must be shown to cause minimal adverse impacts, a less environmentally damaging alternative does not exist, and the project is in the overall public interest to obtain a Department of Army permit.

(Continued)

TABLE 3-4
POTENTIAL ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE RREQUIREMENTS

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

REQUIREMENT	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE RI/FS
NESHAP - Asbestos Removal (40 CFR Part 61 Subpart M)	This regulation describes the minimum standards, procedures, or actions taken or used for removal, enclosure, or encapsulation of asbestos-containing material or the renovation, demolition, maintenance or repair of facilities with asbestos-containing materials.	The asbestos material may be required to conform to the inactive waste disposal site regulations, including a soil cover, fencing, and warning signs.
AHERA - Asbestos Regulations for Schools, Training, and Transportation (40 CFR Part 763)	This regulation requires school districts to identify any and all asbestos-containing materials in their facilities and to develop management plans to control or eliminate asbestos-containing material. Standards are also specified for protection of construction workers, training requirements, and transportation and disposal of asbestos.	Although these regulations are specific to schools, these regulations may apply. Workers who are in contact with asbestos material may be required to conform to training requirements. Management plans are to be submitted to the state.
State		
Maine Landfill Disposal Regulations (MEDEP Regs Chapter 401)	These regulations outline the permitting requirements for waste disposal by landfill. Closure and post-closure maintenance requirements are specified in this chapter.	Design of a cover system would have to meet minimum standards and specifications (401.7[c]). Institutional controls would need to include providing appropriate record information to the Registry of Deeds (401.7[f]).
Management, Testing, and Disposal of Special Wastes (MEDEP Regs, Chapter 404)	Section 405.4 sets forth requirements that apply to the storage and disposal of asbestos wastes.	These requirements apply to alternatives that propose removing wastes or leaving the wastes in place. Site restrictions and monitoring requirements would need to be included in these types of alternatives.
Maine Rules to Control the Subsurface Discharge of Pollutants Well Injection (MEDEP Regs, Chapter 543)	This regulation prohibits the injection of hazardous waste into or above water-bearing formations via a new Class IV well. The subsurface discharge into or through a Class IV well that would cause or allow the movement of fluid into an underground source of drinking water that may result in a violation of any Maine Primary Drinking Water Standard, or which may otherwise adversely affect public health, is prohibited.	The groundwater must be treated to a target clean-up level less than or equal to the by Maine MEGs to be recharged to the aquifer.

(Continued)

TABLE 3-4
POTENTIAL ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE RREQUIREMENTS

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

REQUIREMENT	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE RI/FS
Maine Hazardous Waste Management Rules (MEDEP Regs, Chapters 800-802, 850, 851, 853-857)	The rules provide a comprehensive program for handling, storage, and recordkeeping at hazardous waste facilities. They supplement the RCRA regulations.	Because these requirements supplement RCRA hazardous waste regulations, they must also be considered.
Maine Incinerator Particulate Emission Standard (38 MRSA Section 600; MEDEP Regs, Chapter 104)	Establishes a limitation on the amount of particulate matter allowed to be emitted from each of several categories and sizes of incinerators, and a limitation on the capacity of emissions from all incinerators.	The thermal treatment technology must comply with the applicable emission standard.
Maine Emission License Regulations (38 MRSA Sections 585, 590; MEDEP Regs, Chapter 115)	These regulations specify (1) who must obtain an air emissions license, (2) the information the applicant must submit, and (3) the standards and criteria with which the applicant must comply. An exemption for air emissions licenses is provided for general process sources or equipment where emissions are less than 100 pounds per day (without control equipment), unless the source is subject to the Hazardous Air Pollutants pursuant to 38 MRSA Section 585-B.	Permits are not required for on-site actions. However, air standards will be met.
Maine Growth Offset Regulations (38 MRSA, Section 590; MEDEP Regs, Chapter 113)	These apply to new licenses in non-attainment areas. They require Reasonably Available Control Technology (RACT) or better for the base case emission, and offset reductions from other facilities.	RACT will be considered for air treatment if applicable.
Maine Water Pollution Control Law: Conditions of Licenses (38 MRSA, Section 414-A)	Regulates the discharge of any pollutants. Specifies that the discharge, either by itself or in combination with other discharges, will not lower the quality of any classified body of water below such classification. The discharge will be subject to effluent limitations that require application of the best practicable treatment.	The effluent water from on-site activities should receive the best practicable treatment before discharge.

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(Continued)

TABLE 3-4
POTENTIAL ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE RREQUIREMENTS

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

REQUIREMENT	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE RI/FS
Maine Water Pollution Control Law: Certain Deposits and Discharges Prohibited (38 MRSA, Chapter 3, Article 2, Section 420)	No person, firm, corporation, or other legal entity shall place, deposit, discharge, or spill mercury or toxic or hazardous substances, either directly or indirectly, into the inland ground or surface waters, tidal waters, on the ice, or on the banks thereof, so that the same may flow or be washed into such waters, or in such manner that the drainage therefrom may flow into such waters.	Best Management Practices will be used when handling wastes.
Maine Asbestos Abatement Regulations (MEDEP Regs, Chapter 136)	These regulations define the requirements for the licensing of asbestos abatement contractors, workers, project supervisors, evaluation specialists, design consultants, and the training courses for each of these job categories. These regulations also specify the minimum work practice requirements for asbestos abatement contractors.	These requirements will be adhered to for work at locations where asbestos is or may be present.
State Guidance and Criteria to be Considered		
MEDEP, Bureau of Water Quality Control, Policy Number 10, "The Discharge of Hazardous Substances to Groundwaters of the State"	The Board will deny applications for waste discharge licenses for the discharge to groundwaters of substances designated by the Board to be hazardous when such substances are present in concentrations exceeding groundwater levels which occur naturally in the area. Exemption may be granted if the groundwater is treated to reduce the concentrations of pollutants discharged to below the level considered safe for drinking water.	At least the minimum level of groundwater treatment would be required to provide adequate protection of if no other means of disposal is feasible.

NOTES:

AHERA - Asbestos Hazard Emergency Response Act
CAA - Clean Air Act
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act
CFR - Code of Federal Regulations
CWA - Clean Water Act
DA - Department of the Army
DOT - Department of Transportation (U.S.)
LDRs - Land Disposal Restrictions
MCL - Maximum Contaminant Level
MEDEP - Maine Department of Environmental Protection
MEG - Maximum Exposure Guidelines
NAS - Naval Air Station
NESHAP - National Emission Standards for Hazardous Air Pollutants
NPDES - National Pollutant Discharge Elimination System
OSHA - Occupational Safety and Health Administration
POTW - publicly owned treatment works

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(Continued)

TABLE 3-4
POTENTIAL ACTION-SPECIFIC ARARS

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

RACT	=	Reasonably Available Control Technology
RI/FS	=	Remedial Investigation/Feasibility Study
RCRA	=	Resource Conservation and Recovery Act
$\mu g/m^3$	=	micrograms per cubic meter
VOCs	=	volatile organic compounds

4.0 IDENTIFICATION AND SCREENING OF TECHNOLOGIES

This section identifies technologies and process options that address the preliminary remedial action objectives and general response actions discussed in Section 2.0. The technologies and processes considered effective and implementable are normally screened based on the criteria of site- and waste-limiting characteristics to produce an inventory of suitable technologies and process options that can be assembled into complete remedial alternatives. Because of the nature of the contaminants and response objectives, only a limited number of technologies were identified.

4.1 TECHNOLOGY IDENTIFICATION

Technologies and process options were identified based on a review of literature, vendor information, performance data, and experience in developing other FSs under CERCLA. Of these technologies, 12 were determined potentially applicable to attaining the preliminary remedial response objective.

Table 4-1 provides descriptions of and comments on soil and asbestos technologies assigned to one of four possible response categories: No Action/Minimal Action, Containment, Excavation/Treatment, Excavation/Disposal. These response categories are in accordance with the general response actions identified in Subsection 2.3.3.

Other technologies known as ancillary actions may also be necessary for remediation. Ancillary actions are support technologies for containment, treatment, or disposal actions. For example, physical screening to remove large objects may be necessary to assure maximum treatment efficiency. Ancillary actions are not included in Table 4-1, but are described in Section 5.0 where remedial alternatives are developed.

4.2 TECHNOLOGY SCREENING

The purpose of technology screening is to reduce the number of potentially applicable technologies of process options carried forward to alternatives development. Process options are evaluated based on site- and waste-limiting characteristics that may influence their effectiveness, implementability, and cost as described in the RI/FS guidance (USEPA, 1988). Emphasis is also placed on preserving a range of technologies that fall into different response action categories.

TABLE 4-1
IDENTIFICATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

GENERAL RESPONSE ACTION	TECHNOLOGY	PROCESS OPTION	DESCRIPTION
No Action/ Minimal Actions	No Action	None	No action taken to reduce risk.
	Access Restrictions	Fencing/Sign Posting	Restrict site access with a chain-link fence. Post warning signs.
		Institutional Controls	Initiate land use restrictions to prohibit public use or development of the site.
	Monitoring	Site Inspection	Implement a site inspection program to monitor site conditions and identify maintenance requirements.
		Soil Sampling	Sample and analyze soil
		Groundwater Sampling	Sample and analyze groundwater
Containment	Capping	Soil Cover	Place topsoil and vegetative cover over area of concern to reduce potential for dermal contact risks.
		Low Permeability Cap	Place a low-permeability material (e.g., clay, asphalt, synthetic membrane) over area of concern to reduce potential for dermal contact risks and precipitation infiltration.
Excavation/Treatment	In Situ Treatment	In Situ Vitrification	Treat contaminated materials on-site by heating soils and asbetos to convert into glass.
		In Situ Solidification	Soil is mixed with a setting agent in situ to form a solidified mass in which contaminants are encapsulated.
	Excavation	Excavation	Physically remove contaminated soil and buried materials (by bulldozer or backhoe)
	Treatment	Vitrification	Treat contaminated materials off-site by heating to convert asbestos materials into glass.
		Solidification	Soil and asbestos are excavated and mixed with a setting agent to form a hard product in which contaminants are encapsulated.
Excavation/Disposal	Excavation	Excavation	Physically remove contaminated soil and buried materials (by bulldozer or backhoe)
	Land Disposal	Off-Site Land Disposal	Dispose of materials and soil in an off-site landfill.
		On-Site Land Disposal	Dispose of materials and soil in an on-site landfill.

Because of the nature of asbestos and the response objectives, a low number of technologies were identified that would be applicable to Sites 5 and 6. Asbestos is a relatively insoluble material composed of minerals, many conventional technologies ordinarily considered for contaminated soil sites are not applicable for asbestos wastes.

Table 4-2 presents the technology screening step for Sites 5 and 6 at NAS Brunswick. Technologies judged not effective or implementable were eliminated from further consideration. The technologies remaining after screening were subsequently used to develop remedial alternatives in Section 5.0. Table 4-2 identifies those technologies retained for use in alternatives development.

TABLE 4-2
SCREENING OF REMEDIAL TECHNOLOGIES

SUPPLEMENTAL FEASABILITY STUDY
NAS BRUNSWICK

PROCESS OPTION	ADVANTAGES	DISADVANTAGES	STATUS
No Action	- No cost	- Contaminants remain on-site - Potential for exposure is not reduced	Retained
Fencing/Sign Posting	- Restricts access to the site - Inexpensive	- Contaminants remain on-site	Retained
Institutional Controls	- Reduces the risk of contaminant exposure by restricting future use of the site - Inexpensive	- Contaminants remain on-site	Retained
Site Inspection	- Extent and magnitude of contamination can be monitored	- Contaminants remain on-site	Retained
Soil Sampling	- Would detect presence of asbestos in soils	- Expensive for non-essential information	Eliminated
Groundwater Sampling	- Would detect presence of asbestos in groundwater.	- Expensive for non-essential information - Asbestos does not migrate effectively in groundwater	Eliminated
Soil Cover	- Reduces potential for dermal contact exposure - Reduces the transport of asbestos by air or surface waters - Relatively low cost	- Contaminants remain on-site	Retained
Low Permeability Cap	- Reduces potential for dermal contact exposure - Reduces the transport of asbestos by air or surface waters - Reduces infiltration of rain	- Contaminants remain on-site - Higher costs than soil cover	Retained
In Situ Vitrification	- Traps or destroys asbestos in vitrified product - Excavation is not required	- Difficulty in controling temperatures can lead to incomplete destruction of asbestos - Not a demonstrated treatment method - Large metal objects is soil could short circuit the melt - Treatment cost are high	Eliminated

TABLE 4-2
(continued)
SCREENING OF REMEDIAL TECHNOLOGIES
SUPPLEMENTAL FEASABILITY STUDY
NAS BRUNSWICK

PROCESS OPTION	ADVANTAGES	DISADVANTAGES	STATUS
In Situ Solidification	- Traps asbestos in solidified product - Excavation is not required	- Asbestos is not destroyed - Not a demonstrated treatment method - Large metal objects is soil could prevent complete solidification - Treatment cost are high	Eliminated
Excavation	- Asbestos is removed from the subsurface	- Extensive health and safety precautions would be necessary	Retained
Vitrification	- Asbestos is completely destroyed - Only demonstrated treatment that destroys asbestos	- Excavation is required - Treatment cost are high - Extensive health and safety precautions would be necessary	Retained
Solidification	- Reduces the mobility of asbestos - The solidification process is a simple and well-developed technology	- Excavation is required - Solidification product would still require disposal as an asbestos containing waste	Eliminated
Excavation	- Asbestos is removed from the subsurface	- Extensive health and safety precautions would be necessary	Retained
Off-Site Land Disposal	- Asbestos is removed from the site - Mobility of asbestos in the landfill is reduced	- Excavation of soils is required - Landfill fees may be expensive - Liability associated with the wastes are not eliminated - Extensive health and safety precautions would be necessary	Retained
On-Site Land Disposal	- Mobility of asbestos in the landfill is reduced	- Disposal would require licensing the landfill as an abestos landfill - Extensive health and safety precautions would be necessary	Eliminated

5.0 DEVELOPMENT OF REMEDIAL ACTION ALTERNATIVES

In this section, the technically feasible technologies from Section 4.0 are combined to form remedial action alternatives developed to attain the remedial action objectives discussed in Section 2.0. In developing these alternatives, the following requirements for a remedy were considered:

- The alternative would adequately protect public health and the environment.
- The alternative could attain chemical-specific ARARs and could be implemented in a manner consistent with location- and action-specific ARARs.
- The alternative would use permanent treatment technologies when practicable.
- The alternative would be capable of achieving a remedy in a cost-effective manner, considering short- and long-term costs.

- The alternative would permanently and significantly reduce the mobility, toxicity, or volume of hazardous substances to the maximum extent possible through treatment.

Alternatives were developed for Sites 5 and 6. These sites are combined in this section of the FS because the same waste characteristics, response objective and ARARs govern the development of remedial action alternatives. The same set of alternatives will be applicable to each site. However, in the Detailed Evaluation of Alternatives FS and during the remedial action decision process, the sites will be considered separately.

Treatment technologies were combined to form a range of feasible alternatives from No Action to permanent Treatment. The alternatives described in the following subsections include necessary ancillary technologies.

5.1 SITES 5 AND 6

As discussed in Subsection 2.1, Sites 5 and 6 are contaminated with materials containing asbestos, which are a result of disposal of wastes from demolished buildings. Site 5 contains an estimated 14 asbestos-lined pipes at a maximum depth of 10 feet (Roy F. Weston, Inc.,

1983). It is unknown how much of the surrounding soils may have become contaminated with asbestos, but given the immobility of asbestos in soils it is expected that only the soils immediately surrounding the pipes will contain asbestos fibers. The extent of asbestos containing materials disposed of at Site 6 is unknown.

A range of alternatives was developed to address the response objectives identified in Section 2.0 for Sites 5 and 6. Alternative 5,6-A is No Action, Alternative 5,6-B is Minimal Action, Alternative 5,6-C is a Soil Cover, Alternative 5,6-D is a Low-Permeability Cap, Alternative 5,6-E is Excavation/Vitrification Treatment, and Alternative 5,6-F is Excavation/Off-Site Disposal. Key components of each alternative are summarized in Table 5-1. Each alternative is described in detail in the following subsections.

5.1.1 Alternative 5,6-A: No Action

Alternative 5,6-A involves no actions at the asbestos disposal sites. This alternative does nothing to change any potential for future public health and environmental risks of exposure to contaminants. In addition to being considered as an alternative, the No Action Alternative serves as a baseline to compare the other alternatives with.

TABLE 5-1
CORRECTIVE ACTION ALTERNATIVES FOR SITES 5 AND 6

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

Medium	Technology	ALTERNATIVE A	B	C	D	E	F
SOURCE	Minimal Action						
	Fencing/Sign Posting		X	X	X		
	Deed Restrictions		X	X	X		
	Environmental Monitoring		X	X	X		
	Containment						
	Soil Cover			X			
	Capping				X		
	Collection						
	Excavation					X	X
	Treatment						
	Vitrification					X	
	Disposal						
	Off-Site Landfill					X	X

5.1.2 Alternative 5,6-B: Minimal Action

This alternative involves the implementation of actions restricting access to the asbestos disposal sites. The sites would be fenced to prevent unauthorized entry. Warning signs placed around the site would inform people of the presence of asbestos. Notations would be made on the facility's deeds or any other instrument that normally would be examined during a title search. These notations would state the presence of asbestos, and include a survey plot of the location. Each action would be conducted in accordance with regulations in the National Emission Standards for Hazardous Air Pollutants (40 CFR 61.153). The Minimal Action Alternative would also include routine inspections to identify changes in site characteristics and maintenance requirements.

5.1.3 Alternative 5,6-C: Soil Cover

Alternative 5,6-C would cover the disposal sites with a 6-inch layer of soil with reseeding to (41 CFR 61) promote vegetative growth. A 6-inch soil cover was chosen based on the NESHAP regulations. Addition of the soil would require clearing and leveling the site. The layer would prevent physical contact between any asbestos materials and the public or the environment, reducing the possibility of exposure. Signs posted at the site would indicate

the presence of asbestos, fences would restrict site access, and land use restrictions would limit future activity at the site.

5.1.4 Alternative 5,6-D: Capping

Alternative 5,6-D involves constructing a low-permeability cap over the disposal site. This would require clearing and grading the sites in preparation for construction of a clay layer. The clay would be covered with a layer of loam, and be reseeded to establish a vegetative cover. This cover would reduce the possibility of contact and inhalation exposure risks and prevent the infiltration of water into the site through the surface. Signs posted at the site would indicate the presence of asbestos, fences would restrict site access, and land use restrictions would limit future activity at the site.

5.1.5 Alternative 5,6-E: Excavation/Vitrification Treatment

For this alternative, the asbestos disposal site would be excavated to remove all materials and soils containing asbestos. These excavated materials would then be bagged and transported to an off-site treatment facility. A vitrification treatment process known as Vitrifix, an emerging alternate treatment technology for treatment of asbestos has been developed and demonstrated to the USEPA for treatment of asbestos. The asbestos,

converted to glass in the process, would be completely destroyed. The glass product would then be disposed of as solid waste or used to make other glass products. The site would be backfilled with clean soil. Currently, there are no Vitrifix treatment units in commercial operation, but Silco Recycling Ltd. expects to begin operation and testing of a treatment plant in Rochester, New York. Other similar treatment processes are being developed but have not been demonstrated. Currently, Vitrifix is the only viable treatment alternative for asbestos.

5.1.6 Alternative 5,6-F: Excavation/Off-Site Disposal

For this alternative, the asbestos disposal site would be excavated to remove all asbestos containing materials and soils. After excavation, the materials would be bagged and transported to an off-site landfill licensed to receive asbestos. The site would be backfilled with clean soils. There are two landfills about equally distant from NAS Brunswick that accept asbestos wastes. One landfill is located in Norridgewock, Maine. The other is in Rochester, New Hampshire.

6.0 SCREENING OF REMEDIAL ALTERNATIVES

6.1 SCREENING APPROACH

The remedial alternatives developed in Section 5.0 were screened based on the clean-up standards described in Section 121 of SARA and the NCP (40 CFR 300.430 [e]; March 8, 1990). The objective of this screening step is to eliminate from further consideration any alternatives with undesirable results regarding effectiveness, implementability, and costs, while still preserving a range of options. The evaluation criteria for each category (i.e., effectiveness, implementability, and cost) are described in the following subsections.

6.1.1 Effectiveness

Each alternative was judged for its ability to effectively protect public health and the environment by reducing the mobility, toxicity, or volume of contaminants through treatment. Short-term effectiveness involves reducing existing risks to the community and workers during implementation of remedial actions. The ability of an alternative to meet ARARs, as well as comply with other criteria, advisories, and guidelines, was also considered. The time required for the remedial alternative to achieve the desired result was

also considered, including the potential length of exposure to which the local populace may be subjected. The long-term effectiveness criterion addresses the magnitude of residual risk and long-term reliability associated with the alternative.

6.1.2 Implementability

Each alternative was evaluated in terms of implementability, including technical feasibility, administrative feasibility, and availability of treatment, storage, and disposal facilities. Each criterion was again divided into short- and long-term categories. Factors considered for short-term technical feasibility were the ability to construct the given technology, short-term reliability of the technology, and compliance with action-specific ARARs. Long-term technical feasibility factors considered the ease of undertaking additional remedial action (if necessary), the ability to monitor the effectiveness of the given remedy, and the ability to perform operation and maintenance functions. Administrative feasibility for implementing a given technology addressed the ability to obtain approvals from other agencies, the likelihood of favorable community response, the need to coordinate with other agencies, and the need to comply with location-specific ARARs.

The extent to which a given technology could be implemented also depended on the availability of treatment, storage, and disposal services and capacities, and the availability of

necessary equipment and specialties. Each alternative was evaluated for implementability using these criteria. However, not all the criteria were applied to every alternative because not all criteria are applicable to every alternative.

6.1.3 Cost

The final criterion for the initial screening of alternatives was the cost, including capital and operation and maintenance, of the given remedy. Detailed cost estimates were not developed at this stage because specific design parameters are not known. Costs at the screening stage will be discussed qualitatively; however, where unit or process costs are known, they are presented.

6.1.4 Alternative Evaluation

For each alternative, a matrix was developed highlighting the alternative's advantages and disadvantages with respect to effectiveness, implementability, and cost. The alternative evaluation matrix presents a clear, concise procedure for screening potential remedial action alternatives. Based on this matrix, a decision was made to either retain the alternative for detailed evaluation or eliminate it from further consideration.

6.2 SITES 5 AND 6

Six remedial alternatives were developed for Sites 5 and 6 to address the remedial action objectives in Section 2.0. The following alternatives were developed:

- Alternative 5,6-A: No Action
- Alternative 5,6-B: Minimal Action
- Alternative 5,6-C: Soil Cover
- Alternative 5,6-D: Capping
- Alternative 5,6-E: Extraction/Vitrifix
- Alternative 5,6-F: Extraction/Off-Site Landfill

6.2.1 Alternative 5, 6-A: No Action

The No Action Alternative would not include any remedial or institutional actions to treat asbestos; therefore, there would be no advantages in short- or long-term effectiveness. The alternative would provide no additional protection of human health and the environment. The asbestos would in no way be treated or contained.

Because this alternative requires no services or materials, implementation would be simple.

The only potential difficulty in implementing this alternative would be obtaining approval for an alternative that leaves the contaminated sites untouched.

There would be no capital or operational costs associated with this alternative; however, future remedial actions may be necessary.

Because this alternative would provide no additional protection of human health and the environment, and because it is very similar to the Minimal Action Alternative, the No Action Alternative was eliminated and was not carried forward to detailed analysis.

6.2.2 Alternative 5,6-B: Minimal Action

The Minimal Action Alternative would involve construction of fences, posting of warning signs, and implementation of institutional controls. This alternative would restrict site access, providing some protection of human health and the environment. Asbestos would remain on-site and no actions would be taken to reduce the mobility, toxicity, or volume of asbestos at the sites.

Construction of fences and implementation of deed restrictions could be implemented easily because services and materials for these actions are readily available. Approval could be

difficult to obtain because asbestos would remain on-site and may not meet closure regulations specified in 40 CFR Part 61.

There would be minimal capital and operational costs associated with this alternative; however, monitoring costs will continue to be incurred over the long-term. Potential for future remedial actions also remains.

The Minimal Action Alternative provides some additional protection of human health and the environment for a relatively low cost. This alternative was retained for detailed analysis.

6.2.3 Alternative 5,6-C: Soil Cover

The soil cover alternative involves construction of a soil cover over the asbestos disposal sites. The actions contained in the minimal action alternative would also be implemented. Restricting site access and construction of the soil cover would provide protection of human health and the environment. The soil cover would help prevent exposure and transport of asbestos in the air or surface waters. The alternative does not permanently reduce the mobility, toxicity or volume of asbestos.

Construction techniques and materials necessary for this alternative are well developed and available. It would be necessary to maintain the cover to ensure long-term protection and approval of closure with the 6-inch soil cover may be difficult to obtain because it does not comply with Maine closure requirements for asbestos disposal sites.

Costs for this alternative would not be high, although they would be greater than either the No Action Alternative or the Minimal Action Alternative. Long-term costs for cover maintenance would remain and potential for future remedial actions remains.

The soil cover alternative was eliminated from further consideration in a detailed analysis because it would not comply with State of Maine closure requirements for asbestos landfills.

6.2.4 Alternative 5,6-D: Capping

The Capping alternative is very similar to the soil cover alternative with the exception that a low permeability clay layer would be constructed over the site below the soil and vegetative covers. The cap would provide protection of human health and the environment and would restrict infiltration of precipitation into the disposal sites. The alternative would not permanently reduce mobility, toxicity, or volume.

Construction techniques necessary for this alternative are well developed and available. It would be necessary to maintain the cap to ensure long-term protection. It may be difficult to find clay material with the proper permeability within a short distance of the site.

Materials costs for constructing low-permeability caps are high. Long-term costs for cap maintenance would also be associated with this alternative and the potential for future remedial actions remains.

The Capping Alternative was retained for detailed analysis because it would be effective at meeting the response objective and would comply with regulations for asbestos landfills.

6.2.5 Alternative 5,6-E: Extraction/Vitrification

The Vitrification Alternative involves excavation of all asbestos materials and shipment for off-site vitrification treatment. This alternative would treat asbestos to reduce the mobility, toxicity, and volume and would provide long-term protection of human health and the environment. No treatment plant has been operated and therefore the effectiveness of this treatment alternative is not proven and likely to require more testing before commercial operation. Excavation of asbestos would temporarily increase asbestos transport and human exposure.

Although the vitrification treatment method has been demonstrated and is being developed, no commercial treatment plants are currently in operation and it is unclear when a plant will begin accepting asbestos wastes.

Cost associated with this alternative are likely to be high. The alternative involves excavation, long distance transportation, and treatment with a developing technology. Each of these components are expensive.

Because this treatment method is not proven and there are no commercially operating treatment plants, this alternative was not retained for detailed analysis.

6.2.6 Alternative 5,6-F: Extraction/Off-Site Landfill

The Off-Site Landfill Alternative involves excavation of asbestos materials and transport to an off-site landfill licensed to handle asbestos waste. This alternative would provide long-term protection of human health and the environment at NAS Brunswick. Some risk would remain at the off-site landfill.

Services and materials necessary to complete this alternative are available. There are two landfills within 100 miles of the site that accept asbestos wastes. Excavation would require extensive health and safety precautions.

Excavation, transport, and disposal fees are relatively high making capital costs for this alternative high. There would be no long-term monitoring costs and no potential for future remedial actions at NAS Brunswick. Liability for the asbestos disposed of in the landfill would remain.

Because the Off-Site Landfill Alternative provides long-term protection of human health and the environment with no potential for further remedial actions, it was retained for detailed analysis.

Tables 6-1 through 6-6 present the advantages and disadvantages of each alternative under the criteria of effectiveness, implementability, and cost. Based on these evaluations, a conclusion was made to retain an alternative for detailed analysis or eliminate it from further consideration.

TABLE 6-1
SCREENING OF ALTERNATIVE 5,6-A: NO ACTION

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

NO ACTION ALTERNATIVE		
EFFECTIVENESS	IMPLEMENTABILITY	COST
Advantages - None	Advantages - Most easily implemented - No services or materials needed	Advantages - No capital costs - No operational costs
Disadvantages - No additional protection of human health and the environment - Toxicity, mobility, and volume of contaminants is not reduced - Does not meet response objectives	Disadvantages - Approval from regulatory agencies may present difficulty, as actions that leave untreated contaminants are least preferred	Disadvantages - Potential for future remedial action costs - Potential for future risks to human health if area is inadvertently disturbed

CONCLUSION: This alternative does not provide additional protection of human health and the environment. It is also similar to the Minimal Action Alternative and, therefore, was not retained for detailed analysis of alternatives.

TABLE 6-2
SCREENING OF ALTERNATIVE 5,6-B: MINIMAL ACTION

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

MINIMAL ACTION ALTERNATIVE		
EFFECTIVENESS	IMPLEMENTABILITY	COST
Advantages - Site access would be limited, providing some additional protection of human health and the environment	Advantages - Easily implemented - Materials and construction services are available	Advantages - Minimal capital and operational costs
Disadvantages - Not fully protective of human health and the environment - Toxicity, mobility, and volume of contaminants is not reduced	Disadvantages - Approval from regulatory agencies may present difficulty, as actions that leave untreated contaminants are least preferred	Disadvantages - Potential for future remedial action costs - Will require long-term monitoring
CONCLUSION: This alternative was retained for detailed analysis because it provides some additional protection of human health and the environment at a low cost.		

TABLE 6-3
SCREENING OF ALTERNATIVE 5,6-C: SOIL COVER

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

SOIL COVER ALTERNATIVE		
EFFECTIVENESS	IMPLEMENTABILITY	COST
Advantages - Soil and vegetation would provide additional protection of human health and the environment	Advantages - Construction techniques and materials are well-developed and available	Advantages - Materials are less expensive than for low-permeability cap.
Disadvantages - Toxicity, mobility, and volume of contaminants is not reduced	Disadvantages - Approval from regulatory agencies may present difficulty, as actions that leave untreated contaminants are least preferred - Maintenance of the cover would be required to ensure integrity of the cover system	Disadvantages - Potential for future remedial action costs - Potential future costs for cover maintenance

CONCLUSION: The soil cover alternative was not retained for detailed analysis because it would not comply with State of Maine regulations for closure of asbestos landfills.

TABLE 6-4
SCREENING OF ALTERNATIVE 5,6-D: CAPPING

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

CAPPING ALTERNATIVE		
EFFECTIVENESS	IMPLEMENTABILITY	COST
Advantages - Cap would provide additional protection of human health and the environment	Advantages - Construction techniques and materials are well-developed and available	Advantages - None
Disadvantages - Toxicity, mobility, and volume of contaminants is not reduced	Disadvantages - Approval from regulatory agencies may present difficulty, as actions that leave untreated contaminants are least preferred - Maintenance of the cap would be required to ensure integrity of the capping system - Would require leveling of existing soil pile - Extensive permitting required for acquisition of clay for cap	Disadvantages - Potential for future remedial action costs - Potential future costs for cap maintenance - High materials costs

CONCLUSION: The Low-Permeability Cap Alternative was retained for detailed analysis because it provides protection of human health and the environment by reducing the potential for airborne asbestos in the future and it meets regulations for closure of asbestos landfills in Maine.

TABLE 6-5
SCREENING OF ALTERNATIVE 5,6-E: VITRIFICATION

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

VITRIFICATION ALTERNATIVE		
EFFECTIVENESS	IMPLEMENTABILITY	COST
Advantages - Provides long-term protection of human health and the environment - Treats asbestos to completely reduce toxicity, mobility, and volume	Advantages - Treatment process has been demonstrated to USEPA - Asbestos removal and abatement services are available	Advantages - No future remedial action or maintenance costs
Disadvantages - Mobility of asbestos and human exposure is increased during excavation	Disadvantages - No treatment plants currently in operation - Not a proven treatment method	Disadvantages - Capital cost are relatively high ($500 per ton for treatment)

CONCLUSION: This alternative was eliminated because no commercially operating plants currently exist, and the process has not been fully tested and proven.

TABLE 6-6
SCREENING OF ALTERNATIVE 5,6-F: OFF-SITE LANDFILL

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

OFF-SITE LANDFILL ALTERNATIVE		
EFFECTIVENESS	IMPLEMENTABILITY	COST
Advantages - Provides long-term protection of human health and the environment	Advantages - Asbestos disposal in landfills is a well developed procedure and capacity is available. - Asbestos removal and abatement services are available	Advantages - No future remedial action or maintenance costs
Disadvantages - Mobility of asbestos and human exposure is increased during excavation - Toxicity and volume of contaminants are not reduced	Disadvantages - Excavation would require extensive health and safety precautions.	Disadvantages - Capital costs are relatively high ($50 per cubic yard) - Liability for asbestos disposed of in the landfill remains.

CONCLUSION: This alternative was retained for detailed analysis because it provides complete long-term protection of human health and the environment at the asbestos sites.

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7.0 SUMMARY

Of the six alternatives developed for Sites 5 and 6 and screened in Section 6.0, three have been retained for detailed evaluation (see Table 7-1). These alternatives will be screened, using the nine evaluation criteria identified in the NCP (40 CFR 300.430[e]; March 8, 1990), to present decision-makers with relevant information to select a site remedy. This information will be presented in the Feasibility Study Report for NAS Brunswick scheduled to be released in July 1991.

As discussed in Section 2.0, no remedial action objectives were developed for Site 12. A No-Action alternative is appropriate for this site.

TABLE 7-1
SUMMARY OF ALTERNATIVE SCREENING

SUPPLEMENTAL FEASIBILITY STUDY
NAS BRUNSWICK

Alternative	Eliminated	Retained	Relabelled As
5,6-A: No Action	X		
5,6-B: Minimal Action		X	5-A: Minimal Action 6-A: Minimal Action
5,6-C: Soil Cover		X	5-B: Cover 6-B: Cover
5,6-D: Capping	X		
5,6-E: Excavation/Vitrification	X		
5,6-F: Excavation/Off-Site Disposal		X	5-C: Off-Site Disposal 6-C: Off-Site Disposal

ARAR	Applicable or Relevant and Appropriate Requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
FS	Feasibility Study
GPR	ground-penetrating radar
HI	Hazard Index
IAS	Initial Assessment Study
IR	Installation Restoration
MCL	Maximum Contaminant Level
NAS	Naval Air Station
NCP	National Contingency Plan
RI	Remedial Investigation
SARA	Superfund Amendments and Reauthorization Act
SFS	Supplemental Feasibility Study
TBC	(requirements) to be considered
USEPA	U.S. Environmental Protection Agency

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E.C. Jordan Co., 1990a. "Post-Screening Work Plan NAS Brunswick"; Portland, Maine; July 1990.

E.C. Jordan Co., 1990b. "Phase I Feasibility Study NAS Brunswick"; Portland, Maine; August 1990.

E.C. Jordan Co., 1990c. "Draft Final Remedial Investigation Report NAS Brunswick"; Portland, Maine; August 1990.

E.C. Jordan Co., 1991. "Draft Supplemental RI Report NAS Brunswick"; Portland, Maine; April 1991.

Keirn, Michael, 1990. Memorandum; E.C. Jordan Co.; Portland, Maine.

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

U.S. Environmental Protection Agency (USEPA), 1988. "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (Draft)"; USEPA Office of Emergency and Remedial Response, EPA 540/6-89/004; Washington, D.C.; October 1988.

RESPONSE TO REGULATORY COMMENTS:

DRAFT SUPPLEMENTAL STUDY SITES 5, 6, AND 12

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203-2211

June 3, 1991

Mr. James Shafer (Code 1421)
Northern Division
Naval Facilities Engineering Command
U.S. Naval Base, Bldg. 77 Low
Philadelphia, PA 19112-5094

Subj: U.S. EPA Comments
Draft Supplemental Feasibility Study
Sites 5, 6 and 12
Naval Air Station Brunswick
Brunswick, Maine

Dear Mr. Shafer:

The United States Environmental Protection Agency (EPA) has received and reviewed the document entitled "Draft Supplemental Feasibility Study, Sites 5, 6 and 12" dated April 1991, for the Naval Air Station Brunswick in Brunswick, Maine. EPA's comments are included in the attachment to this letter.

EPA requests that the Navy submit a comment by comment response, as well as incorporate the necessary changes into the Draft Final Supplemental Feasibility Study.

Pursuant to Section 6.7(e) the Navy shall submit the Draft Final Supplemental Feasibility Study within 45 days of the close of the comment period, or no later than July 22, 1991.

If you have any questions regarding the enclosed comments or would like to discuss the comments further, please me at (617)573-5785.

Sincerely,

Meghan F. Cassidy

Meghan F. Cassidy
Remedial Project Manager

Enclosures

cc: Eileen Curry/NASB
Mel Dickenson/E.C. Jordan
Ted Wolfe/ME DEP
Ann Johnson/SAIC
Mary Jane O'Donnell/US EPA
Bob DiBiccaro/US EPA
Richard Willey/US EPA
Jui-yu Hsieh/US EPA

ATTACHMENT I

The comments provided below pertain to the report entitled "Draft Supplemental Feasibility Study, Sites 5, 6 & 12" (April 1991). This report was submitted by the U.S. Department of the Navy for the Naval Air Station Brunswick in Brunswick, Maine. The report was prepared for the Navy by E.C. Jordan.

GENERAL COMMENTS

1. Any comments made by EPA regarding the Draft Supplemental Remedial Investigation Report which would change any of the information presented in the Supplemental Feasibility Study (FS) should be reflected in the revision of this document.

2. In the selection of the alternatives for detailed evaluation, an alternative incorporating in-situ vitrification should be considered. As indicated in the Draft Supplemental FS report, excavation of the wastes would require extensive health and safety precautions because of the asbestos that may be present in the wastes. Thus, an alternative that does not require excavation would be more attractive. Implementation of the in-situ vitrification technology for chemical wastes has made advances in recent years and in-situ vitrification was evaluated under the EPA SITE Program (the vendor was Geosafe Corp). Keeping in mind that vitrification is the only demonstrated technology for the treatment of asbestos, and that any remedial action at the site would not occur for at least a year or so (giving additional time for the development of the technology), the technology should be evaluated further.

SPECIFIC COMMENTS

Section 1.0 - Introduction

3. Page 1-2. Paragraph 1: Include some discussion of activities at Site 14 in this summary of work performed during the Post Screening field program.

Section 2.0 - Identification of Remedial Action Objectives and General Response Actions

4. Page 2-2, Paragraph 1: The last sentence is inconsistent with the rest of the paragraph. Apparently, the sites were used for disposal of asbestos-lined pipes and

rubble. The text however, indicates that the sites have not been used as a disposal facility. Does that mean that the sites have not been routinely used as a disposal facility for chemical and other wastes? The intent of the sentence should be clarified.

5. Page 2-2, Paragraph 2: Indicate when a soil cover was place on the site.

6. Page 2-2, Paragraph 3: This paragraph states that aircraft parts were disposed of at Site 6. This information was not included in the Supplemental RI Report. Indicate where this information was obtained and revise the Supplemental RI appropriately.

7. Page 2-2, Paragraph 3: Indicate what happened to the asbestos pipes that were protruding from the surface. Where these pipes removed, covered? When did this activity occur.

8. Page 2-2, Paragraph 3: Why is the Site 5 area posted with warning signs and yet Site 6, which this report states is more accessible, is not posted. The Navy should consider posting signs indicating the presence of asbestos at Site 6.

9. Page 2-7, Paragraph 2: Further discussion is needed in the text to support the statement "It is not possible to determine how much of the surrounding soils may have been contaminated by asbestos-covered pipe."

10. Page 2-7, Paragraph 3 and Page 2-8, Paragraph 4: Discuss whether asbestos is the only contaminant of concern at the sites.

11. Page 2-8, Paragraph 2: Indicate how the four surface soil sample locations were selected.

12. Page 2-10, Paragraph 2: This paragraph states that "construction debris (e.g., concrete blocks, asphalt rubble, and pipes) is scattered about the site and some may contain asbestos. This information was not included in the Supplemental RI Report. Indicate where this information was obtained and revise the Supplemental RI appropriately. Why wasn't any debris which may have contained asbestos sampled?

13. Page 2-10, Paragraph 3: Indicate how the surface soil sample locations were selected.

14. Page 2-10: Include a discussion regarding the installation and sampling of monitoring wells at Site 6.

15. Pages 2-10 through 2-13, Summary of Baseline Risk Assessment: In addition to the exposure assessment and risk characterization, the summary should also include compounds selected and a brief discussion of each compound's toxicity.

16. Page 2-11, Figure 2-5: The rationale for excluding Anomaly A from the "semicircular region" should be provided in the accompanying text. Language similar to that included in the Draft Supplemental RI would be helpful.

17. Page 2-12, Paragraph 2: Indicate in the depth to groundwater is <u>believed</u> to be 15 to 20 feet below ground surface.

18. Page 2-12, Paragraph 2: This paragraph states "In addition, at Site 5, the depth to groundwater is 15 to 20 feet below ground surface, eliminating mobilization of the asbestos from groundwater flow. Is this estimate of groundwater level representative of seasonal highs?

    What is the depth of the asbestos? Page 5-2 states that Site 5 contains an estimated 14 asbestos-lined pipes at a maximum depth of 10 feet. How was the maximum depth of the pipes determined?

19. Page 2-12, Paragraph 3: What is the depth of the asbestos at this site and how was the depth determined?

20. Page 2-12, Paragraph 3: This paragraph states that "there is a potential for future exposure to off-site receptors through ingestion of contaminated groundwater". However in previous sections it is stated that due to the depth of groundwater mobilization of asbestos to groundwater is eliminated. Clarify how off-site receptors might be impacted by Sites 5 and 6 in the future.

21. Page 2-14, Paragraph 2: Indicate whether Site 12 will continue to be used for explosive ordnance dump training in the future.

22. Page 2-14, Paragraph 3: Include the depth of the test pits, the number of samples taken from each, and the criteria used to select samples.

23. Page 2-14, Paragraph 3: Specify which inorganics were included in analyses of soil samples from Site 12.

24. Page 2-16, Paragraph 2: Indicate which metals were found at Site 12 and discuss their toxicity.

25. Page 2-16, Paragraph 2: According to Appendix O of the Draft Supplemental RI, the mean concentration of contaminants in soil was used for calculation to represent the average future residential scenario for Site 12. Therefore, the statement made here that maximum concentrations were used as the worst case scenario is not correct and must be revised.

26. Page 2-17, Paragraph 2: Change "maximum" to "mean" contaminant concentrations in soils at Site 12.

27. Page 2-18, Paragraph 2: Discuss what actions will be taken to minimize possible risk from surface debris at Site 6.

28. Page 2-18, Paragraph 2: The remedial action objectives are not sufficiently specific. Reference should be made to exposure routes and receptors and to the media involved. See discussion at page 4-7 of the Guidance for Conducting Remedial Investigations and Feasibility Studies (October 1988) and Table 4-1 of the guidance. A table similar to Table 4-1 of the guidance should be included.

29. Page 2-18, Paragraph 3: The document states that Site 12 was eliminated from further consideration because the baseline risk assessments did not indicate a risk to human health or the environment. In order for a No Action ROD to be developed, the no action alternative for Site 12 must be carried through the FS process, i.e., there should be appropriate discussion in Sections 4, 5 and 6 of the Supplemental FS, and later when the detailed analysis of alternatives is prepared. This must be done in order to provide sufficient information to form the basis for the No Action ROD.

30. Page 2-18, Paragraph 3: Discuss whether there is any potential for future human health or environmental risks from Site 12.

Section 3.0 - Applicable or Relevant and Appropriate Requirements

31. Page 3-5, Paragraph 1 and Page 3-9, Table 3-2:

- Table 3-2 does not include state regulatory limits as stated on page 3-5.

- Table 3-2 does not include all metals for Site 12.

32. Page 3-7, Table 3-1: The State Guidance section from Table 3-1 (page 3-4) of the Draft Final RI Report (referring to Maine Rules relating to testing of private water systems) was not included here. It should be added with a status of To Be Considered.

33. Page 3-8, Table 3-1: The Asbestos NESHAP (40 CFR Part 61, Subpart M) should be specifically referenced.

34. Page 3-14, Table 3-3: Town Ordinances and State Guidelines were included in the Draft Final RI Report (page 3-11, table 3-3), but are not included here. Why were they not included in this report under To Be Considered?

35. Page 3-15, Table 3-4: EPA will continue to review which RCRA requirements will or may be ARARs. Additional comments will be made as necessary in future deliverables.

36. Page 3-17, Table 3-4: Any off-site discharge to surface water must meet <u>both</u> administrative and substantive NPDES requirements. This should be stated in the "Consideration i the RI/FS" column.

37. Page 3-21, Table 3-4: It is not clear that Maine DEP Bureau of Water Quality Control Policy No. 10 is an ARAR, i.e., whether it meets the requirements of Section 300.400(g)(5) of the NCP. If it does, a citation as to where it is promulgated should be given.

Section 4.0 - Identification and Screening of Technologies

38. Tables 4-1 and 4-2: The tables use the terms "technology" and "process options" interchangeably, whereas these terms have different meanings in the RI/FS Guidance (see page 4-16 and 4-17 of the guidance).

39. Page 4-3: The RI/FS Guidance (page 4-16) provides that process options should be evaluated using the same criteria (effectiveness, implementability, and cost) that are used to screen alternatives prior to the detailed analysis. It should be stated in the text that this evaluation process was used.

40. Page 4-5, Table 4-2: In-situ solidification should be included in the screening of remedial technologies.

Section 5.0 - Development of Remedial Action Alternatives

41. Page 5-1, Bullet No. 5: Revise this statement to clarify that according to the NCP, remedies are evaluated regarding their ability to reduce mobility, toxicity, or volume through treatment (see page 8720 of the NCP).

42. Page 5-3, Paragraph 3: Explain what routine monitoring might entail.

43. Page 5-5, Paragraph 3: During the development of alternatives, the amount of material to be treated should be known. If the amount of asbestos-containing materials disposed of at the site is unknown, the effectiveness and implementability of excavation cannot be evaluated.

44. Page 5-5, Paragraph 2: Can the two landfills identified accept the volume of asbestos waste which might be excavated from Sites 5 and 6? What is the capacity of each of these landfills?

45. Page 5-6, Paragraph 2: To evaluate the effectiveness of Alternative 5,6-F, the amount of material requiring excavation should be known. See also comment No. 45 above.

Section 6.0 - Screening of Remedial Alternatives

46. Page 6-1, Paragraph 2: The first sentence of this paragraph should indicate that an alternative is judged for its ability to reduce mobility, toxicity, or volume through treatment.

47. Page 6-2, Paragraph 3: The last sentence of this paragraph states that some criteria not described were used in evaluating the implementability of each alternative. Discuss these additional criteria.

48. Page 6-3, Paragraph 1: It should be stated in the text that both capital and O & M costs were considered.

49. Page 6-6, Paragraph 2: Provide the rationale for assuming a 6-inch soil cover.

Appendix A

50. Pages A-1 through A-9: Responses to EPA and DEP comments are included in Appendix A. First, indicate clearly what document these comments pertain to. In addition, indicate in the Table of Contents that these responses are included in Appendix A.

RESPONSE TO USEPA COMMENTS

1. Changes made to the Draft Supplemental Remedial Investigation Report have been reflected in the revision of the Supplemental Feasibility Study.

2. Vitrification is the only demonstrated treatment method for asbestos; however this demonstrated treatment is an ex situ process. There are several problems or difficulties associated with in situ vitrification of asbestos at the disposal sites at NAS Brunswick. Typically, rubble disposal sites contain significant metal debris. This was verified at Sites 5 and 6 by the magnetometer survey. In situ vitrification is less effective where significant buried metal is present because electrical currents travel preferentially through the metallic objects, short circuiting the melt.

   To treat asbestos particles it is necessary to obtain temperatures greater than 1000 °C. The presence of metal debris at the disposal site would make it difficult to ensure that this temperature is reached throughout the sites. Verification of asbestos treatment would be difficult if not impossible without excavation of the site. If asbestos is not completely treated, then it would require closure under NESHAP and the Maine State regulations, even if untreated asbestos was encapsulated by vitrified soils.

   The considerations explained above contributed towards screening out the in situ treatment technology, with the major reason being that metallic objects buried at the site would not allow for effective vitrification.

3. Page 1-2, Paragraph 1: Discussion of Site 14 field activities has been added.

4. Page 2-2, Paragraph 2: The last sentence has been clarified to explain the sites have not been used for several years.

5. Page 2-2, Paragraph 2: A sentence was added indicating when the signs and cover are believed to have been installed.

6. Page 2-2, Paragraph 3: A reference to the Initial Assessment Study of NAS Brunswick was already included which indicates the source of the information. The Supplemental RI was amended to include this information.

7. Page 2-2, Paragraph 3: A sentence was added to Subsection 2.1.1.2 explaining that it is unknown what happened to the pipes because there are no records of any actions to remove or cover the pipes.

8. Page 2-2, Paragraph 3: Posting of warning signs at Site 6 is considered as part of any alternative developed in this document where asbestos would remain on-site except the no action alternative.

9. Page 2-7, Paragraph 2: Discussion and clarification has been added to the text.

10. Page 2-7, Paragraph 3 and Page 2-8 Paragraph 4: A discussion of the contaminants of concern for field investigations has been added to the text.

11. Page 2-10, Paragraph 2: Indications have been added to the text.

12. Page 2-10, Paragraph 2: This information is from the site survey conducted at Site 6. This information was added to the Supplemental RI. One location of asphalt rubble that was suspected to contain asbestos was sampled, but asbestos was not detected in the sample. Other debris did not appear to contain asbestos but was not sampled; therefore, it is possible that asbestos may be present among some of the debris.

13. Page 2-10, Paragraph 3: Indications have been added to the text.

14. Page 2-10: A discussion of well installation, sampling, results and conclusions has been added.

15. Page 2-10 through 2-13, Summary of baseline risk assessment: A description of asbestos and asbestos toxicity has been added to the text.

16. Page 2-11, Figure 2-5: The rationale for exclusion of Anomaly A has been added to the text.

17. Page 2-12, Paragraph 2: Text added as suggested.

18. Page 2-12, Paragraph 2: The estimate of the groundwater level is based on the hydrogeology of Sites 1, 2, and 3 which are in close proximity to Site 5. The seasonal fluctuation for this area is estimated to be 1 foot and is accounted for in the estimation of the depth to groundwater. The estimate of the depth of the asbestos is based on the description of the two trenches in which the asbestos pipes were disposed (Subsection 2.1).

19. Page 2-12, Paragraph 3: The depth of asbestos at Site 6 is unknown. Text was added.

20. Page 2-12, Paragraph 2: The potential for exposure due to ingestion of groundwater refers to evaluation of risk from VOCs, SVOCs, and inorganics. Asbestos was not a contaminant of concern for this exposure scenario.

21. Page 2-14, Paragraph 2: An indication has been added to the text. The site will continue to be used.

22. Page 2-14, Paragraph 3: This information was contained in the Supplemental RI and has been added to the Supplemental FS.

23. Page 2-14, Paragraph 3: This information was contained in the Supplemental RI and

has been added to the Supplemental FS.

24. Page 2-16, Paragraph 2: A discussion of the metals detected at Site 9 was included in the text, however, toxicity information was not included because metals were not included as contaminants of concern.

25. Page 2-16, Paragraph 2: The statement has been revised.

26. Page 2-17, Paragraph 2: The change has been made.

27. Page 2-18, Paragraph 2: Actions to minimize risk are part of the alternatives developed later in the report.

28. Page 2-18, Paragraph 2: The remedial action objectives for Sites 5 and 6 have been changed to be specific to exposure routes and media of concern. The tables in Section 4.0 have been changed to include information similar to Table 4-1 of the guidance.

29. Page 2-18, Paragraph 3: Sections 4, 5, and 6 deal with the development and screening of remedial alternatives. Based on the discussion in Section 2.0 it was stated that solely a no action alternative was appropriate for Site 12; therefore, development and screening of alternatives is inappropriate. The Site will be considered further in the Feasibility Study Report for NAS Brunswick.

30. Page 2-18, Paragraph 3: Currently no risk has been identified at Site 12. No future risk is anticipated unless future activities at the site change the parameters used in the risk assessment. Text was added.

31. Page 3-5, Paragraph 1 and Page 3-9, Table 3-2: The reference to state regulatory limits will be deleted. Maine MCLs are consistent with federal MCLs. Maine MEGs are criteria and are only relevant and appropriate for those compounds and contaminants for which there are no other promulgated standards. The approach to setting target clean-up levels for all sites at NAS Brunswick has been to use federal MCLs, MCLGs, or a risk-based approach; therefore Maine MEGs will not be included in Table 3-2.

32. Page 3-7, Table 3-1: Maine Rules Relating to Testing of Private Water Systems are included in the reference to Maine Drinking Water Rules (10-144A CMR Chapters 231-233) in Table 3-1, under state requirements pertaining to groundwater. No change required.

33. Page 3-8, Table 3-1: The Asbestos NESHAP will be referenced under "Consideration in the RI/FS".

34. Page 3-14, Table 3-3: Town Ordinance and State Guidelines will be included in this table.

35. Page 3-15, Table 3-4: This table will be not be revised until EPA makes any further comments regarding whether RCRA requirements are ARARs. No changes required.

36. Page 3-17, Table 3-4: Consideration of NPDES requirements in the RI/FS will be revised to reflect this comment.

37. Page 3-21, Table 3-4: The Maine Bureau of Water Quality, Policy No. 10 will be referenced as state guidance and criteria to be considered.

38. Tables 4-1 and 4-2: The tables have been changed to accurately represent theses terms.

39. Page 4-3: The text has been revised to state the use of this evaluation process.

40. Page 4-5, Table 4-2: In situ solidification has been added to the tables.

41. Page 5-1, Bullet No. 5: Text was added to clarify

42. Page 5-3, Paragraph 3: The reference to routine monitoring was changed to routine inspections to identify changes in site characteristics and maintenance requirements.

43. Page 5-5, Paragraph 3: The amount of asbestos containing materials is known for Site 5. Although the amount of asbestos material contained at site 6 is unknown, the extent of the disposal site can be determined by the magnetometer survey. This data allows estimation of volumes of excavation. Because asbestos is immobile and likely to be concentrated in pockets throughout the disposal site, identifying the amount of asbestos containing materials at the site more accurately would probably require excavation.

44. Page 5-6, Paragraph 2: Capacity of the landfills will be addressed in the detailed analysis of alternatives presented in the Feasibility Study Report scheduled to be released in July 1991.

45. Page 5-6, Paragraph 2: See response to comment No. 43 above.

46. Page 6-1, Paragraph 2: Text was added as suggested.

47. Page 6-2, Paragraph 3: Upon review of the criteria used to evaluate the alternatives, all criteria were described in the text. The sentence has been removed from the text.

48. Page 6-3, Paragraph 1: Text added to clarify both capital and O&M costs are included.

49. Page 6-6 Paragraph 2: The rationale for a 6-inch soil cover was added to the description of the alternative in Subsection 5.1.3.

50. Pages A-1 through A-9: The responses to comments included in this report in Attachment 1 were clarified.

STATE OF MAINE
Department of Environmental Protection

MAIN OFFICE
MAIL ADDRESS

JOHN R. MCKERNAN, JR.

DEAN C. MARRIOTT

June 7, 1991

Mr. James Shafer
Department of the Navy, Northern Division
Naval Facilities Engineering Command
Building 77-L
Philadelphia Naval Shipyard
Philadelphia, PA 19112-5094

Re: Naval Air Station Brunswick, Draft Supplemental Feasibility Study Sites 5, 6, and 12, April, 1991, by E.C. Jordan Co.

Dear Mr. Shafer:

The Maine Department of Environmental Protection (MEDEP) has completed its review of the Draft Supplemental Feasibility Study Sites 5, 6, and 12, which was submitted to the DEP by E.C. Jordan Co. on April 23, 1991 on behalf of the U.S. Department of the Navy for the Naval Air Station Brunswick (NASB) Site.

The MEDEP does not approve of the report as presented for the reasons outlined in this correspondence. The Department requests that the Department's comments be reviewed and incorporated into a second draft version of the document.

Following review of this report, the MEDEP has become concerned that the RI process may not have been sufficiently completed at Sites 5 & 6 to allow for the proper development of a Feasibility Study for these sites. The Department wishes to avoid a situation in which the schedule agreed to early this year drives the review process to such an extent that possible data gaps are not recognized. The Department believes that a discussion of this matter is warranted.

General Comments:

It appears that the remedial alternatives were developed without a clear definition of the problem associated with sites 5 and 6. The extent of the investigation has been mostly limited to a review of the sites' history. The EM and GPR work at sites 5 and 6 appear to be somewhat inconclusive. Soil sampling appears to be limited to surficial sampling. No soil borings or test pitting were

conducted to detail the extent and depth of asbestos containing material or possibly other soil contaminants. The MEDEP believes that the lack of more detailed information may have impacted the assessment of alternative options, including the effectiveness, implementability and/or cost of these alternatives. Consequently, undesirable alternatives may have been carried forward or preferable alternatives may have been eliminated.

The MEDEP recommends that before proceeding to the Focused Feasibility Study, consideration must be given to the limited amount of information currently available and whether this information is sufficient to adequately address the alternatives under consideration. It also appears that the current information will not meet the needs of the reporting requirements outlined under MEDEP Solid Waste Management Regulations, Chapter 401.7 (F).

The following ARAR's concerning landfilled asbestos material and landfill closure must be considered. These ARAR's provide additional detailed information and expand upon information provided in MEDEP correspondence to NORDIV dated April 9, 1990:

38 MRSA Chapter 13: Waste Management

Subchapter 1, Maine Hazardous Waste, Septage, and Solid Waste Management Act, Section 1301 et. seq.: Sets forth the authority to identify and regulate hazardous waste.

Chapter 400-406, Solid Waste Management Rules: (5-24-89) These rules apply to the siting, operation and closing of solid waste disposal facilities. (Action, Chemical, and Location Specific)

Chapter 401, Landfill Disposal Facilities: (5-24-89) This chapter establishes the rules of the Board and the Department for disposal by landfilling of special wastes. Requirements are specified for closure of the facility and post closure maintenance. (Action Specific)

Chapter 401.7 (C), Minimum Standards and Specifications for Final Cover: This subchapter specifies the extent, permeability, allowable slopes and cover systems for secure landfills. The cover system requires a minimum of 2 feet of suitable material or a geonet covered with a layer of suitable medium for supporting vegetative growth. (Action Specific)

Chapter 401.7 (F), Permanent Record: This subchapter provides the requirement to prepare and record specific information in the Registry of Deeds, including the extent and depth of waste material and the location

coordinates of asbestos containing waste materials. (Action Specific)

Chapter 405.4, Storage, Transport, and Disposal of Asbestos Containing Material: The requirements of this subchapter shall apply to the storage and disposal of any asbestos-containing material and asbestos-containing wastes including the installation and maintenance of signs and fencing.

The MEDEP prefers alternatives that meet long-term remedial objectives that result in the permanent reduction of the level of contamination and that attain overall protection of human health and the environment as well as achieve chemical, location, and action specific ARAR's outlined in the RI/FS process.

Specific Comments:

Page	Section	Comments

2-10, section 2.1.1.2, Site 6: The GPR survey identified two major anomalies at Site 6 and identified a semicircular area across the site. Figure 2-5 outlined the area but did not include anomaly A in this designated area.

2-12, section 2.1.2.1, Exposure Assessment: If Site 6 is an area with easy access by children, base security or other base personnel must have some knowledge of the frequency at which children play there. In order to adequately assess exposure, this information must be obtained or estimated. Discussion must be included regarding possible future disturbance to the site with the possible results of such exposure.

2-13, section 2.1.2.2, Human Health Risk Characterization: The potential risk of exposure to asbestos during construction or excavation must be addressed. Additional subsurface samples should be collected in order to gather the necessary information.

2-18, section 2.3.1, Remedial Action Objectives Sites 5 & 6: The statement that "the objectives will be to reduce the potential for contact with asbestos..." seems to prematurely screen out a removal/treatment alternative.

3-7, table 3-1, Maine Drinking Water Rules: Maximum Exposure Guidelines (MEG's) are set by the Department of Human Services and are defined as levels considered safe in drinking water. The MEDEP has enforced MEG's as clean-up levels in orders under State law. The State does not consider groundwater cleanup levels set above MEG's as protective of human health if the groundwater in question is to be considered as drinking water. 38 M.R.S.A., Chapter 3,

Section 470 (identified in this report as an applicable requirement) classifies groundwater as GW-A. This means that groundwater must be safe to drink. The State considers groundwater safe to drink if it meets the MEG.

3-8, Table 3-1, Maine Ambient Air Quality Standards: In addition to particulate emissions, Chapter 110 also limits concentrations of hydrocarbon and VOC emissions.

3-11, Table 3-1, Maine Natural Resources Protection Act: Although permits will not be required of activities conducted on site, substantive permit requirements must be met.

3-12, Table 3-1: To be classified as GWA, groundwater must meet MEG's. MEG's are "to be considered". MEG's must be utilized when MCL's are not available. List MEG's as TBC's.

3-12, Table 3-1: Substantive permit requirements must be met.

3-20, Table 3-1, Maine Ambient Air Quality Standards: Concentrations of hydrocarbon and VOC emissions are also limited.

3-21, section 3.2, Table 3-4 Potential Action Specific ARAR's: This table must contain reference to action specific State ARAR's applicable to asbestos waste landfill closures. These ARAR's have been identified in previous correspondence as well as the general comments of this letter.

4-2, table 4-1, Identification of Remedial Technologies: This table does not adequately allow a comparison between alternatives since the alternatives do not appear to be compared to the same criteria (ie. protection of human health, compliance with ARAR's, reduction of toxicity, cost, etc.). A summary as presented in Table 4-1 of the Draft Focused Feasibility Study: Sites 1 & 3 will be more useful. The liability issue may be an important criteria by which to compare alternatives. The reasoning to retain or eliminate alternatives in Table 4-2 is unclear.

5-2, section 5.1, Sites 5 & 6: The statement that at Site 5 "it is unknown how much of the surrounding soils may have become contaminated with asbestos..." and "the extent of asbestos-containing materials disposed of at Site 6 is unknown" points to a developing MEDEP concern that the FS process at these sites has progressed too rapidly and that additional characterization of these sites is necessary before adequate remedial alternatives can be considered.

5-5, section 5.1.3, Alternative 5, 6-C Soil Cover: As described, this alternative will not meet the needs of MEDEP Regulations, Chapter 401.7 (F) or 405.4.

5-6, section 5.1.5, Alternative 5,6-E Excavation/Vitritication Treatment: This alternative was eliminated because no commercial plants are in operation yet, it is stated that Siclo Recycling Ltd. is beginning operations in the summer of 1991.

6-2, section 6.1.2, Implementability: Unless the remedial alternatives are reviewed utilizing the same criteria, an effective comparison cannot be made.

6-6, section 6.2.3, Alternative 5,6-C Soil Cover: Specific methods to restrict site access must be mentioned. Reference should be made to the risk of exposure during possible future excavations. A 6 inch soil cover will not be adequate to meet Maine requirements for closure.

6-7, section 6.2.4, Alternative 5,6-D Capping: Specific methods to restrict site access must be mentioned. References should be made to risk exposure during possible future excavations.

6-11, Table 6-1 to 6-6: The limitations and short comings of this screening process due to the inconsistent application of criteria do not allow for the proper comparison of alternative effectiveness, implementability, and cost. It is not clear how the conclusion for each alternative was reached.

A-1, Attachment 1: Identify the specific correspondence to which these responses apply.

If you have any concerns or questions regarding these comments, please contact me at (207) 289-2651.

Sincerely,

Ted Wolfe

Ted Wolfe
Division of Site Investigation and Remediation
Bureau of Hazardous Materials and Solid Waste Control

cc: Michael Barden, MEDEP
Sam Butcher, Harpswell Representative
Meghan Cassidy, EPA
Eileen Curry, NASB
Mel Dickenson, E.C. Jordan/ABB Environmental
Donald Gerrish, Town of Brunswick
Fred Lavalle, MEDEP
Loukie Lofchie, BACSE
Denise Messier, ME DEP
Susan Weddle, Community Representative

RESPONSE TO STATE DEP COMMENTS

1. General Comment, Insufficient Investigation: The disposal of asbestos pipes at Site 5 was documented and the amount of information for that site is considered adequate. It is recognized that the amount and exact location of asbestos at Site 6 is unknown. The horizontal extent of the disposal site can be determined from the geophysical survey conducted, and it is believed that this provides enough information to proceed with development and evaluation of alternatives. Because asbestos is immobile and likely to be concentrated in pockets throughout the disposal site, identifying the amount of asbestos containing materials at the site would probably require excavation.

2. General Comment, Maine ARARs for landfill closures: The Maine ARARs concerning landfilled asbestos material have been considered.

3. Page 2-10, Subsection 2.1.1.2, Site 6: Anomaly A is due to dumpsters stored at the site; therefore, it is not part of the outlined semicircular area. The text has been adjusted.

4. Page 2-12, Subsection 2.1.2.1, Exposure Assessment: Site 6 is not located near any residential or recreational area; therefore, exposure by children is considered to be infrequent.

5. Page 2-13, Subsection 2.1.2.2, Human Health Risk Characterization: The potential risk of exposure during construction or excavation activities is not included. Because asbestos was not detected there is no analytical data on the potential exposure concentration. Therefore it is not possible to estimate future potential risks. Additional subsurface samples will not be collected. This has been discussed with the DEP.

6. Page 2-18, Subsection 2.3.1, Remedial Action Objectives Sites 5 &6: The remedial action objective has been changed to address the minimization of the potential for generation of airborne asbestos in the future.

7. Page 3-7, Table 3-1, Maine Drinking Water Rules: Maine MEGs are criteria and are only relevant and appropriate for those compounds and contaminants for which there are no other promulgated standards. The approach, that has been consistently used, for setting target clean-up levels for all sites at NAS Brunswick has been to use federal MCLs, MCLGs, or a risk-based approach. No revision will be made to the Maine Drinking Water Rule reference in Table 3-1.

8. Page 3-8, Table 3-1, Maine Ambient Air Quality Standards: "Consideration in the RI/FS" will be revised to reflect this comment.

9. Page 3-11, Table 3-1, Maine Natural Resources Protection Act: "Consideration in

the RI/FS" will be revised to reflect this comment.

10. Page 3-12, Table 3-1: The discussion of MEG's, which states that MEG's are not promulgated standards (i.e., to be considered) is presented in the previous reference to Maine Drinking Water Rules, Page 3-7, Table 3-1.

11. Page 3-20, Table 3-1, Maine Ambient Air Quality Standards: "Requirement Synopsis" will be revised to reflect this comment.

12. Page 3-21, Subsection 3.2, Table 3-4, Potential Action Specific ARARs: Table 3-4 will be reviewed for completeness with regard to referencing Maine asbestos waste landfill closure regulations and requirements. Any ARARs, not currently listed, will be added.

13. Page 4-2, Table 4-1, Identification of Remedial Technologies: This document does not include a detailed analysis of alternatives. The detailed analysis will be included in the Feasibility Study Report for NAS Brunswick as described in Section 7.0 of the Supplemental FS.

14. Page 5-2, Subsection 5.1, Sites 5 & 6: See response to comment No. 1.

15. Page 5-5, Subsection 5.1.3, Alternative 5, 6-C Soil Cover: It is recognized that the soil cover alternative will not meet the Maine ARARs. The alternatives will remain as they are but the capping alternative, which does meet Maine ARARs will be retained for detailed analysis instead of the soil cover.

16. Page 5-6, Subsection 5.1.5, Alternative 5,6-E: Silco Recycling Ltd. does intend to begin operation of a plant. They are now behind schedule. The treatment method is not proven and will most likely require testing before accepting asbestos wastes. At this time the treatment method is not developed enough to be evaluated in a detailed analysis. Jordan will continue to monitor the progress of this technology.

17. Page 6-2, Subsection 6.1.2, Implementability: The statement that not all criteria were applied to every alternative was included because not every criteria is applicable to all the alternatives. This has been clarified in the text.

18. Page 6-6, Subsection 6.2.3, Alternative 5,6-C Soil Cover: A fence and land use restrictions would be included with this alternative. Text was added to Subsection 5.1.3 to highlight this. It is recognized that a 6-inch cover does not meet Maine requirements (see Comment No. 15).

19. Page 6-7, Subsection 6.2.4, Alternative 5,6-D Capping: Site restriction methods have been added to the text in Subsection 5.1.4. Excavation at the sites would not be allowed under land use restrictions.

20. Page 6-11, Table 6-1 to 6-6: The screening process used is consistent with USEPA

guidance for the screening of alternatives. Further evaluations of the alternatives will be made in the Feasibility Study Report for NAS Brunswick, scheduled for July 1991. The conclusions of the screening on each table have been revised.

21. Page A-1, Attachment 1: Clarification of what these responses apply to has been added.

P. O. Box 297
Brunswick, ME 04011
May 1, 1991

Captain H. M. Wilson
Commanding Officer
Naval Air Station Brunswick
Brunswick, ME 04011-5000

Re: Comments on Draft Supplemental Feasibility Study, Sites 5, 6, and 12.

Dear Captain Wilson:

Sites 5 and 6. I think that the options chosen for further study are appropriate. There are a few things I don't understand. Is there any estimate of the total volume of material involved? How deep is the asbestos? (This pertains to the possibility of adding soil cover.) What is the likelihood of frost action moving the larger pieces up through the surface?

Site 12. I assume that the site is still used for demolition. Is there anything to be said for conducting the demolition in such a way as to minimize future problems? If this site is closed, should not some sort of grading be done to minimize the hazards?

Sincerely,

S. S. Butcher

Samuel S. Butcher

cc: James Shafer

DRAFT SUPPLEMENTAL FEASIBILITY STUDY TRC COMMENTS
DR. SAMUEL S. BUTCHER

1. The total estimate of material involved has been estimated for Site 5, but is poorly understood for Site 6. The estimate for Site 5 is developed from the IAS report that describes a total of approximately 14 asbestos covered pipes. No volume estimates are available for Site 6. The two trenches at Site 5 are 7 to 10 feet deep, with approximately two feet of soil cover above. Information concerning depth to wastes at Site 6 is not known. Frost action is not believed to be a viable mechanism for moving the asbestos pipes at Site 5 due to the depth of placement. Although the actual depth of potentially buried asbestos at Site 6 is not known, the frost depth is approximately three to four feet. Disposal areas at NAS Brunswick have typically been observed to be well below the frost limit.

2. Based on the findings at Site 12, little if any contamination is attributed to the current EOD activities. Only low levels of mercury and nitrates are observed in the surface soils, and the risk assessment did not indicate present or future risks. If the site is closed the Navy may consider grading and seeding the site to stabilize the soils to erosion.

RESPONSE TO REGULATORY COMMENTS:

DRAFT FINAL PHASE 1 FEASIBILITY STUDY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203-2211

October 16, 1990

Mr. James Shafer (Code 1421)
Northern Division,
Naval Facilities Engineering Command
U.S. Naval Base, Bldg. 77 Low
Philadelphia, PA 19112-5094

Subject: U.S. EPA Comments
Draft Final Phase I Feasibility Study
Development and Screening of
Alternatives
Naval Air Station Brunswick
Brunswick, Maine

Dear Mr. Shafer:

The United States Environmental Protection Agency (EPA) has received and reviewed the document entitled "Draft Final Phase I Feasibility Study, Development and Screening of Alternatives", dated August 1990 for the Naval Air Station Brunswick in Brunswick, Maine. EPA's comments are included with this letter in Attachment I.

EPA would like to point out that should results of any ongoing field work indicate the need to re-evaluate certain alternatives in light of new information.

The Navy should prepare a response to these comments and either incorporate the responses in the final report or attach both the comments and responses to the final report.

If you have any questions or would like to discuss these comments further, please contact me at (617)573-5785.

Sincerely,

Meghan F. Cassidy

Meghan F. Cassidy
Remedial Project Manager

cc: Ted Wolfe/Maine DEP
Cmdr. Ron Terry/NASB
Mel Dickenson/EC Jordan
Ann Johnson/SAIC

PRINTED ON RECYCLED PAPER

ATTACHMENT I

The comments provided below refer to the report entitled "Draft Final, Feasibility Study, Development and Screening of Alternatives" (August 1990). This report was submitted by the U.S. Department of the Navy for the Naval Air Station Brunswick, Brunswick, Maine.

SECTION 2.0 IDENTIFICATION OF REMEDIAL ACTION OBJECTIVES AND GENERAL RESPONSE ACTIONS

1) Page 2-1, Paragraph 3: The description of target risk levels presented here does not accurately reflect the revised National Contingency Plan (NCP) which clearly states that 10^{-6} should be used as the point of departure for determining risk-based cleanup levels. The point of departure represents a level from which analysis of alternatives should begin, regardless of the circumstances. An addendum to this report must be submitted which includes the use of 10^{-6} as the point of departure and indicates which, if any, of the target risk levels and/or target clean-up levels are no longer valid.

2) Page 2-5, Paragraph 3: It should be clarified that sufficient data has not been presented to justify the statement that all of the groundwater beneath Sites 1 and 3 is discharging to Mere Brook.

3) Page 2-6, Table 2-1: Based on the RfD of 0.02 mg/kg/day and a Hazard Index of 1, the cleanup level for nickel in groundwater should be 700 ppb. The cleanup level listed in this table (as well as in Table 2-3) is actually based on a Hazard Index of 0.2.

4) Page 2-6, Table 2-1: It is assumed that in instances where a Maine MEG was chosen as the rationale for a target clean up level it is due to the fact that the MEG is more stringent. It should be mentioned in the text why a MEG is chosen in each instance.

5) Tables 2-2 and 2-3: How was the clean up level of 1 ppm for mercury in soil derived? If it is for protection of terrestrial organisms, why is it based on the risk level for protection of public health?

6) Table 2-3: A response objective for soil should be included in this table. The objective should reduce the source of groundwater contamination to enhance and expedite groundwater clean up to the degree practical.

7) Page 2-7, Paragraph 2: It should be noted that a cap system for Sites 1 and 3 has not been approved by EPA.

8) Page 2-12, Paragraph 4: As stated in this paragraph, "contaminant impacts to the Mere Brook area must be evaluated based on the total ecosystem ..." Therefore, further discussion regarding the necessity to address leachate seeps at Site 2 are warranted.

9) Page 2-12, Paragraph 3: EPA has not concurred with the concept that "remedial actions are not required at Site 2."

10) Page 2-15, Paragraph 1: Provide the basis for the statement "It is doubtful that the groundwater contamination is attributed to the historic acid/caustic pit; it is most likely due to current activities at Building 584 or from sources farther upgradient of the site." Include discussions regarding the nature of ongoing activities at Building 584 which might be contaminating the groundwater and further details regarding possible upgradient sources.

11) Page 2-21, Paragraph 5: Note that to date, EPA has not concurred on a No-Action Record of Decision for Site 7.

12) Page 2-24, Paragraph 5: This paragraph indicates that groundwater flow beneath Site 8 is to the north-northwest. Based on information presented in the Remedial Investigation Report, this statement is incorrect. Clarify this statement and revise the text appropriately.

13) Page 2-26, Table 2-6: Aluminum was included (with surface water clean up levels) in this table in the draft version of the report. Revise the table as presented here to include aluminum with a target clean up level of 87 ppb. Also, include a reference for the aluminum clean up level in the revised table.

14) Page 2-27, Table 2-7: It would be more helpful to provide the equations and parameters for the calculation of the clean up level for total PAHs in soil at Site 8. Is it based on the CPF of benzo(a)pyrene and the exposure factors for surface soils at Site 8?

    Provide a comparision showing how the PAH clean-up levels were calculated for Sites 8 and 9. Further evaluation of the 18 ppm clean up level is needed.

15) Page 2-29, Paragraph 3: It must be made clear that there was not sufficient data presented in the RI report to confirm that all of the groundwater beneath Site 9 is discharging to the stream.

16) Page 2-31, Paragraph 4: Provide further information on how the presence of DDT in stream sediments of the northern and southern drainages will affect the stream habitat, both short and long term.

17) Page 2-32, Paragraph 2: DDT cannot be discounted as a possible site related contaminant since it was used historically at the base and low levels of DDT have been detected in Site 9 soil samples.

18) Page 2-36, Table 2-10: Include remedial response objectives for PAH contaminated surface soils around the picnic area.

3.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

19) Page 3-6, Table 3-2: This table continues to need revisions as indicated in EPA's comments on the draft screening report. A revised table is attached. The primary revisions are also outlined below.

- o MCLs for arsenic, cadmium, chromium and mercury are from the National Interim Drinking Water Regulations.
- o The proposed MCL for lead is from the Federal Register, August 1988.
- o MCLs for 1,1,1-trichloroethane, trichloroethene, vinyl chloride and benzene are from the Federal Register, July 1987.

20) Explain why iron and zinc were removed from this table during revision of the draft screening report. These compounds should remain on the table.

21) More extensive comments regarding ARARs are included with EPA's comments on the Draft Final Remedial Investigation Report which were forwarded to the Navy with a letter dated October 17, 1990. All comments made on the ARAR section of the RI report are also applicable to this section.

4.0 IDENTIFICATION AND SCREENING OF TECHNOLOGIES

22) Page 4-15, Table 4-2: Indicate for which sites off-site incineration is being retained.

23) Page 4-17, Table 4-2: Provide further information on which technologies are considered more economical and as equally effective as vitrification.

5.0 DEVELOPMENT OF REMEDIAL ACTION ALTERNATIVES

24) Page 5-8: An alternative which combines source containment (ie., cap), groundwater extraction and treatment, as well as leachate collection and treatment must be developed and evaluated.

25) Page 5-15, Paragraph 2: Provide justification for not selecting a barrier such as a slurry wall or grout curtain as a containment option, as was done for Sites 1 and 3.

26) Page 5-22, Alternative 8-C: This alternative would require the incorporation of deed restrictions since the waste would be left in place and further development of the land could impact the effectiveness of the remedy.

27) Page 5-23, Paragraph 1: If the solidified material were replaced on-site with a soil cover, deed restrictions and some component of monitoring would be necessary to prevent any future disturbance of the cap.

28) Page 5-23, Section 5.4: Explain why none of the alternatives examined for Site 9 include remediation of surface soils contaminated with PAHs which were identified to pose a risk to public health.

29) Page 5-23, Section 5.4: Since none of the alternatives developed for Site 9 include action for the source areas located under the barracks, the Record of Decision (ROD) must call for further investigation and remedial action if warranted (through a new or amended ROD) if the buildings are ever removed.

30) Page 5-25, Alternative 9-C: Additional sampling to locate the source area would be required in order to implement this alternative.

31) Page 5-28, Alternative 9-F: Additional sampling to locate the source area would be required in order to implement this alternative.

32) Explain how effective each of the soil treatment alternatives would be in treating PAHs in the surface soil.

33) An analysis of alternatives to surface water discharge following treatment of extracted groundwater must be included for all sites where groundwater treatment is possible

TABLE 3-2
CHEMICAL-SPECIFIC ARARS FOR
SURFACE WATER AND GROUNDWATER CONTAMINANTS

NAS BRUNSWICK
PHASE I FEASIBILITY STUDY

CHEMICAL	FINAL MCL (µg/l)	PROPOSED MCL (µg/L)	FINAL MCLG (µg/L)	PROPOSED MCLG (µg/L)	MAINE MEG (µg/L)	EPA AWQC (µg/L)
Aluminum	—	—	—	—	1,430	~~87~~
Arsenic	50 N	—	0 T	—	30	~~48~~
Cadmium	10 N	5	—	5	5	1.1+
Chromium (total)	50 N	100	—	100	5	11b
Lead	50 N	5	•	0	20	3.2+
Manganese	—	—	—	—	—	—
Mercury	2 N	2	—	2	2	0.012
Nickel	—	—	—	—	150	160
Sodium	—	—	—	—	—	110+
Zinc	—	—	—	—	—	—
Benzene	5 **	—	0 **	—	5	—
Chlorobenzene	—	100	—	100	—	50*
1,1-Dichloroethane	—	—	—	—	5	20,000*
1,1-Dichloroethylene	7 **	—	7 **	—	7	—
1,2-Dichloroethylene	—	(trans)100;70(cis)	—	(trans)100;70(cis)	70(both)	—
Ethylbenzene	—	700	—	700	700	—
Methylene Chloride	—	—	—	—	—	—
Naphthalene	—	—	—	—	—	620*
1,1,1-Trichloroethane	200 **	—	200 **	—	200	—
Trichloroethylene	5 **	—	0 **	—	5	21,900*
Tetrachloroethylene	—	5	—	0	3	840 **
Toluene	—	2,000	—	2,000	2,000	—
Vinyl Chloride	2 **	—	0 **	—	0.15	—
Xylene	—	10,000	—	10,000	600	—

NOTES:

— = No value is available.
MCL = Maximum Contaminant Level, ~~published in Federal Register, May 22, 1989~~
MEG = Maine Maximum Exposure Guidelines (May 30, 1990)
(p) = ~~Proposed MCLs or MCLGs, published in Federal Register, May 22, 1989~~
AWQC = Ambient Water Quality Criteria - Chronic Values for Freshwater; USEPA, 1986. 1988 Table
MCLG = Maximum Contaminant Level Goal, ~~published in~~
• = Insufficient data to develop criteria. Value given is the Lowest Observed Effect Level.
+ = Hardness-dependent criteria (100 mg/L used).
a. = Value for arsenic V.
b. = Value for chromium VI.
T. = Tentative
N. = NIPDWR, National Interim Primary drinking water Regulation
** = published in Federal Register July 8 '87

PMCL = proposed MCL
PMCLG = proposed MCLG
proposed MCL and MCLG for lead are published in Reg. 1991
proposed MCL and MCLG for the other chem. are published in May 91

USEPA COMMENTS

SECTION 2.0 REMEDIAL ACTION OBJECTIVES AND GENERAL RESPONSE ACTIONS

(1) Page 2-1: The Detailed Evaluation of Alternative for all sites will include a discussion of the revised NCP and the point of departure of 10^{-6}. Where appropriate, revised Target Clean-up Levels will be calculated to reflect the 10^{-6} risk level.

(2) Page 2-5: The discussion of groundwater flow beneath Mere Brook (Sites 1 and 3) will state that the "shallow groundwater discharges to Mere Brook".

(3) Page 2-6: The Target Clean-up Level for nickel will be revised and set at 100 μg/L based on the proposed MCL for this compound.

(4) Page 2-6: The Target Clean-up Levels proposed for groundwater beneath Sites 1 and 3 will be set at the final or proposed MCLs or MCLGs or risk based levels. MEGs will not be used as Target Clean-up Levels.

(5) Table 2-2 and 2-3: The Target Clean-up Level of 1 ppm mercury was based on the protection of terrestrial organisms and calculated using bioaccumulation factors and toxicity information. The title of Table 2-2 is "Environmental Target Clean-up Levels for Sites 1 and 3" and Table 2-3 is "Remedial Action Objectives and Target Clean-up Levels For Sites 1 and 3".

(6) Table 2-3: Response objectives specific to soils at Sites 1 and 3 are not necessary since contaminant concentrations in this medium were below levels considered to present human health risks. However, source control remedial actions have been developed and will be evaluated in the Focused Feasibility Study (FFS) for Sites 1 and 3. The purpose of these source control actions are to enhance groundwater remediation.

(7) Page 2-7: The text will be clarified. The proposed cap design is based on EPA approved guidance. The specific cap for Sites 1 and 3 has not been approved by EPA.

(8) Page 2-12: Remedial response action and clean-up levels for Site 2 will be discussed is a separate FS. Site 2 is no longer being considered as part of Sites 1 and 3.

(9) Page 2-12: Site 2 is being evaluated in a separate FS and the remedial response actions and clean-up levels for this site will be presented and discussed in this report.

(10) Page 2-15: Additional groundwater data collected as part of the Post-Screening Workplan will be used to support this statement. More detailed discussion of groundwater flow and contamination in the area of Sites 4 and 13 is presented in the Draft Supplemental RI.

(11) Page 2-21: Jordan and the Navy recognize that, to date, EPA does not concur with a No-Action ROD for Site 7.

(12) Page 2-24: Additional hydrologic information at Site 8 was collected as part of the Post-Screening Work Plan. A discussion of these data are presented in the Draft Supplemental RI and will be included in the FFS for Site 8.

(13) Page 2-16: Iron, aluminum, zinc, lead, and cyanide were detected in the tributary draining the western portion of Site 8. However, elevated levels (i.e., greater than the respective AWQC) of these compounds were also detected in upstream and off-base sampling locations. There was no consistent trend in the concentrations of these contaminants, and their presence in the surface water was related to nonpoint source

discharges and background levels. Although Target Clean-up Levels were developed for these compounds, remedial response actions are not developed for surface water remediation.

(14) Page 2-27: The equation and exposure parameters used to develop Target Cleanup Levels will be presented in the FFS for Site 8 and Site 9.

(15) Page 2-29: Additional data was collected as part of the Post-Screening Work Plan. This information was presented in the Draft Supplemental RI and will be included as part of the Detailed Evaluation of Alternatives for Site 9.

(16) Page 2-31: The impact of DDT on stream sediments will be discussed in the Detailed Evaluation of Alternatives for Site 9.

(17) Page 2-12: The presence of DDT at Site 9 is considered to be related to the historical basewide use of pesticides and not historical disposal activities. DDT will be reevaluated as a contaminant of concern for this site.

(18) Page 2-36: Response objectives for PAH-contaminated soils was inadvertently omitted and will be included as part of the Detailed Evaluation of Alternatives for Site 9.

SECTION 3.0 ARARS

(19) Page 3-6: These changes have been incorporated into the Draft Supplemental RI and will be included in all Focused Feasibility Studies for NAS Brunswick.

(20) This was an inadvertent omission and will be corrected.

(21) Jordan has responded to all comments regarding ARARs and included the necessary changes in the Draft Supplemental RI report. These changes will be included in the Focused Feasibility Study reports for NAS Brunswick.

SECTION 4.0 IDENTIFICATION AND SCREENING OF TECHNOLOGY

(22) Page 4-15: Off-site incineration was retained for Sites 4, 11, and 13 (soil incineration) and Sites 1 and 3 (source waste incineration).

(23) Page 4-17: Other technologies considered more economical and equally effective as vitrification include soil thermal aeration, solidification, and excavation.

SECTION 5.0 DEVELOPMENT OF REMEDIAL ACTION ALTERNATIVES

(24) Page 5-8: Alternative 1,2,3-D Cap/Groundwater Extraction/Treatment is considered to be effective at eliminating leachate. Therefore, leachate collection and treatment would not be necessary. The effectiveness of this alternative at eliminating leachate will be addressed in the FFS for Site 1 and 3.

(25) Page 5-15: A slurry wall was not considered to be cost-effective at containing the source area at Site 11. Because of the relatively small area and volume of soil contamination, other technologies, such as vacuum extraction, excavation and thermal soil aeration were considered to be more economical and equally effective at reducing the contaminant contribution to groundwater as a slurry wall.

(26) Page 5-22: The deed restrictions that would be required as part of this alternative will be discussed in the FFS for Site 8.

(27) Page 5-23: The deed restrictions that would be required as part of this alternative will be discussed in the FFS for Site 8.

(28) Page 5-23: This was an inadvertent omission and will addressed in the FFS for Site 9. Additional data collected as part of the Post-Screening Work Plan will be reviewed and may result in changes to the proposed remedial action strategies for this site. This will be addressed in the FFS for Site 9.

(29) Page 5-23: Additional data collected as part of the Post-Screening Work Plan suggest that an old leachfield/septic system is the source area for contamination observed at Site 9. This information was presented in the Draft Supplemental RI and will be included in the FFS for Site 9.

(30) Page 5-25: This has been addressed in the Post-Screening Work Plan. Data collected as part of this field program was presented in the Draft Supplemental RI.

(31) Page 5-28: See response to comment 30.

(32) The effectiveness of each technology on treating PAH contamination will be presented in the Detailed Evaluation of Alternatives for Site 9.

(33) The discharge of treated groundwater will be discussed in detail in the FFS for Site 9. Options in addition to surface water discharge will be presented.

STATE OF MAINE
Department of Environmental Protection

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JOHN R. McKERNAN, JR.
GOVERNOR

DEAN C. MARRIOTT
COMMISSIONER

September 28, 1990

Mr. James Shafer
Department of the Navy, Northern Division
Naval Facilities Engineering Command
Building 77-L
Philadelphia Naval Shipyard
Philadelphia, PA 19112-5094

Re: Naval Air Station Brunswick, Draft Final Phase I Feasibility Study Development and Screening of Alternatives, February 1990, by E.C. Jordan Co.

Dear Mr. Shafer:

The Maine Department of Environmental Protection (DEP) has completed its review of the Draft Final Phase I Feasibility Study Development and Screening of Alternatives, which was submitted to the DEP by E.C. Jordan Co. on August 9, 1990 on behalf of the U.S. Department of the Navy for the Naval Air Station Brunswick (NASB) Site.

The DEP conditionally approves of the alternatives presented in this report provided that the following comments are addressed:

General Comments:

The DEP requires ground water target clean up levels based on Maine Maximum Exposure Guideline Standards (MEG's). Soil clean up standards are set on a site by site basis based on risk assessments approved by the Department. The DEP has set PAH target levels as low as 1 ppm at sites where residential development was considered a future possibility. In instances where basewide contamination by particular contaminants is known to occur, the Navy should be prepared to compare proposed target clean up levels to known background levels.

When considering remedial alternatives, any action that is both financially and technically feasible which will provide a permanent solution and reduce or eliminate the need for deed restrictions, long term monitoring, and periodic reviews should be given preference.

Specific Comments:

Page	Section	Comments
2-6	table 2-1	Utilize the MEG of 50 ppb for Chromium and 0.15 ppb for Vinyl chloride rather than the MCL.
2-8	sec. 2.1.4	E.C. Jordan states that other non-point sources up gradient of Sites 1 & 3 are contributing to elevated iron and zinc levels in the Mere Brook system and that specific remedial action at these sites would not provide a permanent remedy. However, the DEP believes that Mere Brook would benefit from any remediation action that helped to reduce the overall impact on the system even if Ambient Water Quality Criteria (AWQC) are not achievable.
2-12	sec. 2.2.4	The Mere Brook ecosystem is being considered for mercury impact, therefore all possible steps should be taken to reduce mercury contamination from all known leachate sources.
2-18	table 2-4	Utilize MEG's for tetrachloroethane and cadmium rather that MCL's.
2-24	sec. 2.5.2	The DEP believes that the proposed 18 ppm PAH target clean up level for Site 8 is high, if based on a future scenario allowing free access. Such access would involve repetitive exposure by children. Consequently, if the current proposed alternatives cannot attain a lower target level, other alternatives will need to be developed and included for review.
5-2	sec. 5.1	Site 2 has been retained for remedial action alternatives. Continued monitoring of the three known leachate seeps was proposed as part of the action alternative. Based on the unexplained results from Lt-202 during the Round III sampling routine and on the presence of elevated concentrations of metals such as chromium, cobalt, lead and vanadium noted in Site 2 leachate seeps, the DEP requests that steps be taken to explain the presence of these contaminants and that steps be taken to provide possible remedial alternatives to reduce the leaching of the seep contaminants during periods of high runoff.
5-10	sec. 5.2	Any remedial action at Sites 4, 11, 13 should include both a source removal and active groundwater treatment. A permanent remediation will eliminate the need for continued actions.
6-44	sec. 6.5	The DEP suggests that a combination of source removal and groundwater treatment, such as a combination of alternatives 9C (Source Removal/Thermal Soil Aeration) and 9D (Groundwater Extraction/Treatment) be

developed for Site 9. Utilizing only 9C will require waiting for a natural flushing process to cleanse the groundwater aquifer at this site. Alternative 9D would treat groundwater but will do nothing to correct continued contamination from source areas.

If you have any concerns or questions regarding these comments, please contact me at (207) 289-2651.

Sincerely,

Ted Wolfe

Ted Wolfe
Division of Licensing and Enforcement
Bureau of Oil and Hazardous Materials Control

cc: Meghan Cassidy, EPA
Mel Dickenson, E.C. Jordan/ABB Environmental
Donald Gerrish, Town of Brunswick
Fred Lavalle, ME DEP
Loukie Lofchie, BACSE
Denise Messier, ME DEP
Cmdr. Ronald Terry, NASB
Susan Weddle, Community Representative

A:NASBALT2

STATE OF MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION COMMENTS

General Comments: The proposed groundwater Target Clean-up Levels are set at the proposed or final MCL, MCLG, or risk-based level, consistent with the NCP and ARARs. Soil target clean-up levels will be developed on a site-by-site basis using appropriate exposure scenarios and risk-based methodologies.

Alternatives that are financially and technically feasible and provide a permanent solution to the remedial action objectives at each site will be identified, and consistent with the NCP, be given preference.

Page 2-6: Final and proposed MCLs and MCLGs are being proposed as the Target Clean-up Levels for groundwater remediation at NAS Brunswick.

Page 2-8: As stated in the text, groundwater remediation and/or leachate collection and treatment will provide a benefit to the Mere Brook ecosystem by reducing the impact of contaminant discharge to the Brook.

Page 2-12: Mercury contamination at Site 2 is being re-evaluated and will be discussed in the Supplemental FS Report.

Page 2-18: Same response as to comment 2-6.

Page 2-24: The Target Clean-up Level for PAHs at Site 8 was reevaluated based on the revised NCP. A discussion of the exposure assumptions and methodology used to derive the clean-up level will be presented in the FFS for Site 8.

Page 5-2: The distribution and magnitude of contamination and remedial action objectives for Site 2 are being reevaluated and will be discussed in the Supplemental FS Report.

Page 5-10: The remedial alternatives developed for Sites 4, 11, and 13 include source removal or treatment options. However, to provide a range of alternatives, a groundwater treatment without any source removal or treatment actions will also be evaluated.

Page 6-44: Additional data at Site 9 was collected as part of the Post-Screening Work Plan and suggests that a septic system/leachfield may be the source area of contamination. This information was presented in the Draft Supplemental RI report, and will be used to develop appropriate response actions and remedial alternatives. A source removal and groundwater

treatment alternative will be evaluated and presented in the Supplemental FS report.