

**Proposed Plan  
Operable Unit 2 (OU-2)  
Site 19**

**Naval Weapons Station Earle  
Colts Neck, New Jersey**



**Northern Division  
Naval Facilities Engineering Command**

**March 1997**



**Brown & Root Environmental**  
A Division of Halliburton NUS Corporation

# Department of the Navy



## Proposed Remedial Action Plan for OU-2

Naval Weapons Station (NWS) Earle  
Colts Neck, New Jersey

March 1997

### NAVY ANNOUNCES PROPOSED REMEDIAL ACTION PLAN

This Proposed Plan summarizes the findings of the Operable Unit Two (OU-2) **feasibility study (FS)** report, identifies the clean-up alternative preferred by the Navy and the United States Environmental Protection Agency (EPA), and explains the reasons for this preference. In addition, this Proposed Plan explains how the public can participate in the decision-making process and provides addresses for the appropriate Navy contacts.

The Department of the Navy has completed an FS for OU-2, addressing contamination associated with Site 19 at Naval Weapons Station (NWS) Earle in Colts Neck, New Jersey.

The FS also includes OU-1 (Sites 4 and 5) and OU-3 (Site 26); however, separate Proposed Plans address the remediation of these operable units.

The FS was completed as part of the Navy's Installation Restoration Program (IRP) and the Superfund Remedial Program. The purpose of the FS was to evaluate the clean-up alternatives available for Sites 4, 5, 19, and 26.

### PUBLIC PARTICIPATION IS ENCOURAGED

This Proposed Plan is issued by the Navy, the lead agency for the IRP and Superfund activities at the NWS Earle facility, and by EPA, the support agency for Superfund activities. The public is encouraged to comment on this Proposed Plan; procedures for public comment are discussed at the end of this Plan. After the public comment period has ended and after any comments have been reviewed and considered, the Navy and EPA will select a remedy for Site 19.

NOTE: A glossary of relevant technical and regulatory terms is provided at the end of this Proposed Plan. These terms are initially indicated in **boldface** within the Proposed Plan.

### NAVY'S RESPONSIBILITY

The Navy is issuing this Proposed Plan as part of its public participation responsibilities under the Superfund law and, in particular, Sections 113(k), 117(a), and 121(f) of the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)**, commonly referred to as Superfund) as amended by the Superfund Amendments and Reauthorization Act (SARA).

This document summarizes information that can be found in greater detail in the FS report for OU-2 and the **remedial investigation** (RI) report for NWS Earle, as well as other site documents contained in the **Administrative Record** file for this site. The Navy invites the public to review the available materials and to comment on this Proposed Plan during the public comment period.

The Administrative Record file is available at the

Monmouth County Library, Eastern Branch  
Route 35, Shrewsbury, NJ

#### **PUBLIC MEETING DATE**

A public meeting to discuss this Proposed Plan will be held on April 24, 1997 at 7:00 PM at the Colts Neck Courthouse. The meeting date will also be published in the *Asbury Park Press*.

The Navy, with EPA, may modify the preferred alternative or select another remedy presented in this Proposed Plan for OU-2 based on new information obtained from public comments. **The public is encouraged to review and comment on all the alternatives identified here.**

#### **SITE BACKGROUND**

NWS Earle is located in Monmouth County, New Jersey, approximately 47 miles south of New York City. The station consists of two areas, the 10,248-acre Main Base (Mainside area), located inland, and the 706-acre Waterfront area (see Figure 1). The two areas are connected by a Navy-controlled right-of-way.

Commissioned in 1943, the facility's primary mission is to supply ammunition to the naval fleet. An estimated 2,500 people either work or live at the NWS Earle station.

The Mainside area is located in Colts Neck Township, which has a population of approximately 6,500 people. The surrounding area includes agricultural land, vacant land, and low-density housing. The Mainside area consists of a large, undeveloped portion associated with ordnance operations, production, and storage; this portion is encumbered by explosive safety quantity distance arcs. Other land use in the Mainside area consists of residences, offices, workshops, warehouses, recreational space, open space, and undeveloped land.

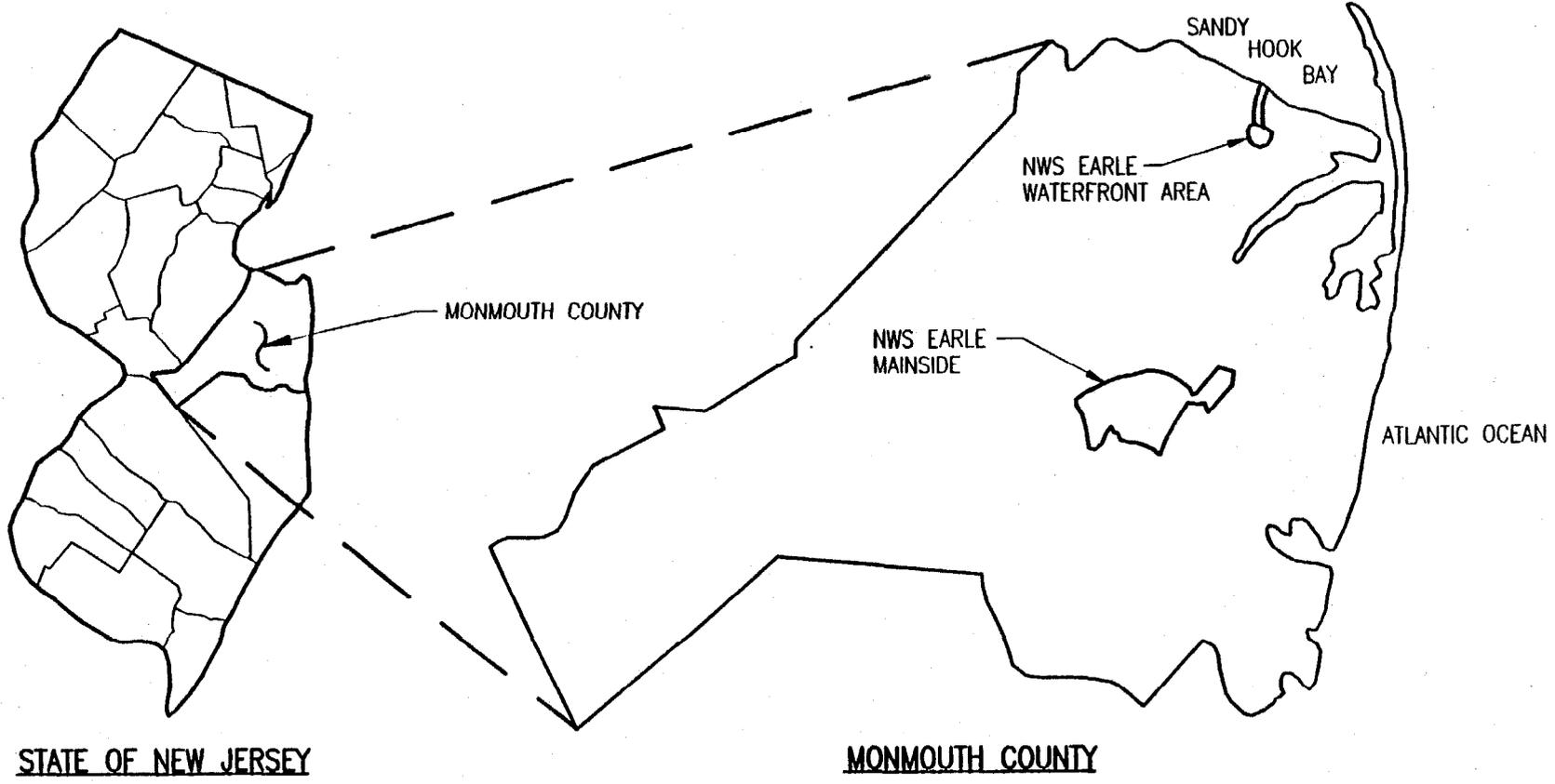
The Waterfront area is located in Middletown Township, which has a population of approximately 68,200 people.

Site 19 is located in the Mainside area (Figure 2). A brief description of this site follows.

#### **Site 19: Paint Chip and Sludge Disposal Area**

Paint chips and sludges from an ordnance maintenance area were disposed from the early 1940s until the early 1960s in a topographic depression near Building S-34 (Figure 3). Paint slurries and solvent residues were also discharged into an open drainage swale. The site is a 300-foot circular area; half is paved with asphalt and half is covered by gravel. The depression is 50 feet in diameter, with a depth ranging from 5 to 10 feet. The drainage swale runs from the depression to a small stream in the wetlands adjacent to the site. The paved portion of the site is currently used to train Navy forklift operators.

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STATE OF NEW JERSEY

MONMOUTH COUNTY

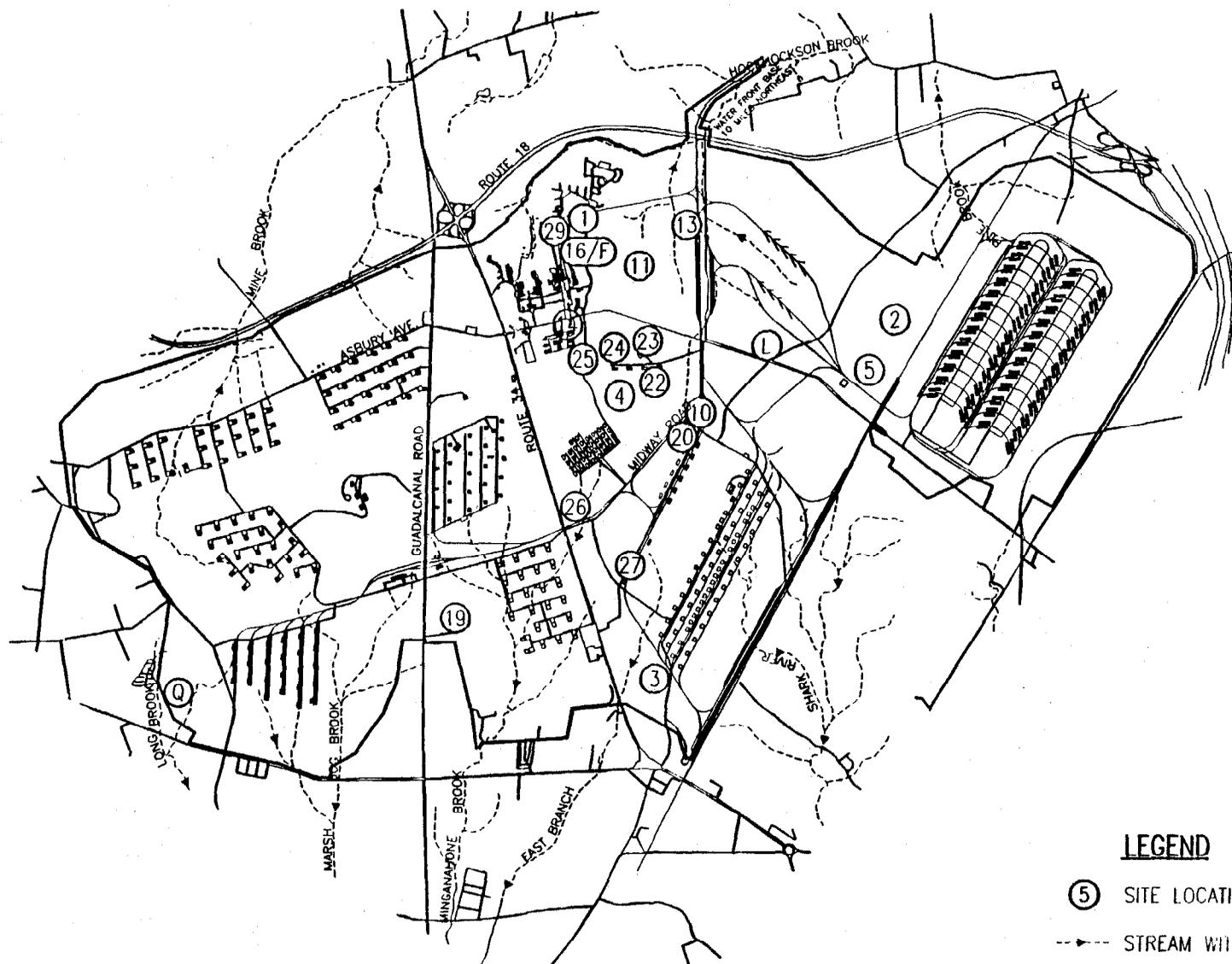
DRAWN BY	DATE
MRM	1/7/97
CHECKED BY	DATE
RET	1/7/97
COST/SCHED.-AREA	
SCALE	
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**REGIONAL SITE MAP**  
**NAVAL WEAPONS STATION EARLE**  
**COLTS NECK, NEW JERSEY**

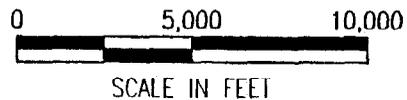
CONTRACT NO.	OWNER NO.
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO.	REV.
FIGURE 1	



**LEGEND**

⑤ SITE LOCATION

--- STREAM WITH FLOW DIRECTION



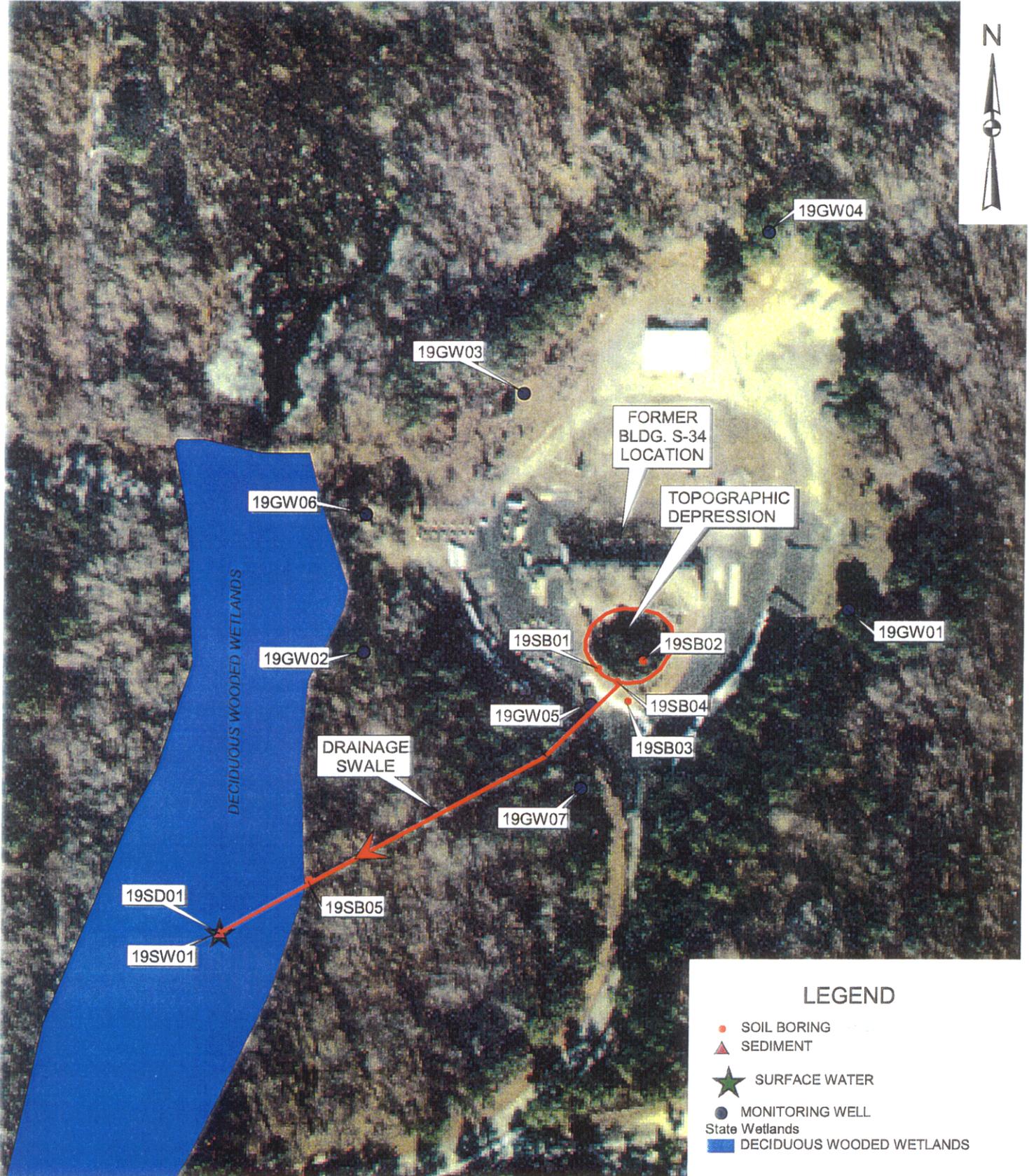
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MRM	1/7/97
CHECKED BY	DATE
RET	1/7/97
COST/SCHED.-AREA	
SCALE	
1" = 5000'	



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**MAINSIDE SITE LOCATIONS**  
**NAVAL WEAPONS STATION EARLE**  
**COLTS NECK, NEW JERSEY**

CONTRACT NO.	OWNER NO.
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO.	REV.
FIGURE 2	



**LEGEND**

- SOIL BORING
- ▲ SEDIMENT
- ★ SURFACE WATER
- MONITORING WELL
- State Wetlands
- DECIDUOUS WOODED WETLANDS

**SAMPLE LOCATIONS  
SITE 19 - PAINT CHIP AND SLUDGE DISPOSAL AREA**



**FIGURE 3**

  
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## **STUDIES AND RESULTS**

Potential hazardous substance releases at NWS Earle were addressed in an **Initial Assessment Study (IAS)** in 1982, a **Site Inspection Study (SI)** in 1986, and a Phase I RI in 1993. These were preliminary investigations to determine the number of sources, compile histories of waste-handling and disposal practices at the site, and acquire data on the types of contaminants present and potential human health and/or environmental receptors. The Phase I RI at Site 19 included the installation and sampling of monitoring wells, and collection of surface water and sediment samples.

In 1990, NWS Earle was placed on the **National Priorities List (NPL)**, which is a list of sites where uncontrolled hazardous substance releases may potentially present serious threats to human health and the environment. The sites at NWS Earle were subsequently addressed by Phase II RI activities to determine the nature and extent of contamination at these sites. Activities included installation and sampling of groundwater monitoring wells, surface water and sediment sampling, and surface and subsurface soil sampling. The Phase II RI was initiated in 1995 and completed in July 1996, when the final RI report was released. Results of all the investigations are discussed below.

### **IAS Results**

The IAS did not recommend further investigation at Site 19 because it was believed that impacted soils were removed in the early 1970s; however, the site was still included for further study.

### **SI Results**

The 1986 SI found elevated metals concentrations in surface soils within the topographic depression and near the beginning of the drainage swale. The maximum concentrations detected were cadmium (31,900 mg/kg), lead (1,560 mg/kg), and chromium (639 mg/kg).

### **Phase I RI Results**

During the Phase I RI, groundwater samples showed metals, and shallow soils (0-2 feet) showed low levels of two **volatile organic compounds (VOCs)**, methylene chloride and acetone, and metals. VOC detections were believed to be laboratory contaminants and not actually site related. Lead was found at a concentration of up to 12,600 mg/kg in the upper 2 feet of soil in the surface depression, and up to 379 mg/kg in the drainage swale. Cadmium was found at a concentration of up to 33.7 mg/kg in the upper 2 feet of soil in the topographic depression.

### **Phase II RI Results**

The results of the Phase II RI, which was conducted to determine whether contamination in surface soil/sediments had leached to subsurface soils, showed deeper subsurface soil sample metals concentrations were not at a level above applicable screening criteria. The absence of site related VOCs in subsurface soils was also confirmed.

The presence of metals (antimony, arsenic, cadmium, thallium, zinc) in groundwater was confirmed. In general, exceedances of metals compounds of concern were found in MW19-07, which is directly downgradient of the topographic depression. Table 1 summarizes the results of samples taken from groundwater

**TABLE 1  
SITE 19 GROUNDWATER**

	Maximum Exceedance	Frequency of Exceedance	ARARs and TBCs			Data Exceeding ARARs					
			Maximum Contaminant Level (MCL) (ug/L)	Drinking Water Health Advisory (Lowest Criterion Shown)	NJDEP Groundwater Quality Standard (ug/L)	19GW01 1995 RI 7/24/95	19GW02 1995 RI 7/25/95	19GW04 1995 RI 7/24/95	19GW05 1995 RI 7/25/95	19GW06 1995 RI 7/25/95	19GW07 1995 RI 8/11/95
<b>INORGANICS (UG/L)</b>											
ALUMINUM	9610	6 / 6	-	-	200	3890	1690 J	1210	9610 J	360 J	7670 J
ANTIMONY	7	1 / 6	6	3 a	20						7
ARSENIC	27	1 / 6	50	-	8						27
CADMIUM	8	1 / 6	5	5 e	4						8
IRON	4880	6 / 6	-	-	300	1980	3200	4880	794	950	3040
LEAD	17	1 / 6	1.5	-	10						17
MANGANESE	185	2 / 6	-	-	50				185	56	
THALLIUM	29	1 / 6	2	0.4 a	10						29 J

J = Value is estimated because the concentration is below the laboratory contract quantitation limit or because of data validation quality control criteria.

a = The listed health advisory criterion, lifetime adult, is equal to the most stringent of the EPA health advisories for this chemical

e = The listed health advisory criterion, long term child, is equal to the most stringent of the EPA health advisories for this chemical.

compared to applicable standards. Three compounds slightly exceed the federal standard, and others also exceed state guidelines.

### Groundwater Modeling

Computer modeling estimated that Site 19 groundwater metal concentrations would gradually diminish over a long period of time, assuming source removal and control measures would be implemented. The model indicated that metals concentration at the nearest potential discharge point, a stream located approximately 500 feet downgradient (west) of the site, would be well below either the state standard or background levels. The maximum distance from Site 19 where metals concentration in groundwater would remain above applicable regulatory standards or background levels, was estimated to be 191 feet by the model.

In summary, results of investigations at Site 19 indicate that:

- Metals contamination at levels above regulatory standards in Site 19 soils appear to be limited to the topographic depression and the drainage swale shallow surface soil and sediment.
- No organic compounds were found in groundwater at levels above regulatory standards.
- Metals are found in groundwater at concentrations slightly above regulatory standards near the downgradient end of the topographic depression.

## **SUMMARY OF SITE RISKS**

As part of the Phase II RI, a human health risk assessment and an ecological risk assessment were performed.

### Human Health Risks

The human health risk assessment estimated the potential risks to human health posed by exposure to contaminated groundwater, surface water and sediment, and surface and subsurface soils at the site. To assess these risks, the exposure scenarios listed below were assumed:

- Ingestion of groundwater as a drinking water source.
- Inhalation of contaminants in groundwater (i.e., volatile compounds emitted during showering).
- Dermal exposure to contaminants in groundwater (i.e., showering, hand washing, bathing).
- Dermal contact from contaminated soils.
- Inhalation of contaminants in soil (i.e., fugitive dusts).
- Incidental ingestion of contaminated soils.
- Incidental ingestion of surface water and sediment.
- Dermal contact with contaminated surface water or sediment.

These scenarios were applied to various site use categories, including current industrial use, future industrial use, future lifetime resident, and future recreational child.

Potential human health risks were categorized as **carcinogenic** or **noncarcinogenic**. A hypothetical carcinogenic risk increase from exposure should ideally fall below a risk range of  $1 \times 10^{-6}$  (an increase of one case of cancer for one million people exposed) to  $1 \times 10^{-4}$  (an increase of one case of cancer per 10,000 people exposed).

Noncarcinogenic risks were estimated using **Hazard Indices (HI)**, where an HI exceeding one is considered an unacceptable health risk.

In addition, results were compared to applicable federal and/or state standards such as federal Maximum Contaminant Levels (MCLs) for drinking water, New Jersey Department of Environmental Protection (NJDEP) **Groundwater Quality Standards (GWQS)**, or other published lists of reference values.

A baseline human health risk assessment was conducted for Site 19. Cancer risks associated with future residential exposure to groundwater in excess of the acceptable target risk range were determined for Site 19. The primary contaminant contributing to this risk was arsenic (via ingestion of groundwater). Noncarcinogenic HIs exceeded 1.0 for the future industrial and future residential exposure scenarios. Thallium and arsenic were the primary contaminants contributing to this risk (also via ingestion of groundwater).

Contaminants exceeding groundwater standards included aluminum, antimony, arsenic, cadmium, iron, lead, manganese, and thallium. It should be noted that most exceedances were found at one well (MW19-07) directly adjacent to the area of concern.

### Ecological Risks

The ecological risk assessment estimated the risk posed to ecological receptors, such as aquatic and terrestrial biota, from contamination at Site 19.

Sampling results indicate that high concentrations of contaminants, primarily metals, have migrated from the site to the drainage ditch that leads to a tributary of Mingamahone Brook and adjacent wetlands. Sediment concentrations of lead, chromium, cadmium and zinc in the surface depression and drainage ditch are well above ecological screening toxicity values. In addition, although extensive migration of contaminants in groundwater has not occurred, groundwater discharges into the wetlands, thereby providing a potential exposure pathway.

### **REMEDIAL ACTION OBJECTIVES (RAOs)**

The overall objective for the remedy at Site 19 is to protect human health and the environment. Based on the baseline human health risk assessment, the ecological risk assessment, and the RI results, RAOs were developed to address contaminated environmental media (sediment, and groundwater) present at NWS Earle Site 19. These RAOs are presented below.

#### **Protection of Human Health RAO**

To address the potential threats posed by contaminated soils/sediments at Site 19, (the surface depression and drainage ditch), the RAO to protect human health is to prevent human exposure to contaminated sediments. The groundwater RAO for protection of human health is to prevent human exposure to

contaminated groundwater (the area immediately adjacent to well MW19-07).

### Protection of Environment RAO

The RAO for protection of the environment is to minimize contaminant migration into groundwater and adjacent wetlands and restore the aquifer to applicable standards.

### Alternatives Development and Screening

The purpose of the alternative development and screening process is to assemble an appropriate range of possible remedial options to achieve the RAOs identified for the site. In this process, technically feasible technologies are combined to form remedial alternatives that provide varying levels of risk reduction that comply with federal (EPA) and state NJDEP guidelines for site remediation.

The following eight criteria, as established by the **National Contingency Plan (NCP)**, were used for the detailed analysis of alternatives:

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

The other evaluation criteria, community acceptance, will be addressed in the Record of Decision following the receipt of comments

during the public comment period, after the Proposed Plan has been presented to the public.

Engineering technologies capable of eliminating the unacceptable risks associated with exposure to site-related soils, sediments, or groundwater were identified, and those alternatives determined to best meet RAOs after screening were evaluated in detail. Table 3 presents the considered alternatives and the results of screening.

### Detailed Summary of Alternatives

Summaries of the remedial alternatives that passed the screening step for Site 19 are presented in the following sections.

#### Alternative 1: No Action

The no-action alternative was developed as a baseline to which other alternatives may be compared, as required by the NCP. No remedial actions would be taken to protect human health or the environment. The purpose of this alternative is to evaluate the overall human health and environmental protection provided by the site in its present state. Periodic reviews of site conditions and long-term monitoring of groundwater, surface water, and sediments would be activities conducted under this alternative.

No capital costs are associated with the no-action alternative. The average annual O&M cost for long-term monitoring is \$16,200, and 5-year reviews are \$15,500 per event. Over a 30-year period, the net present-worth cost is \$234,000 (a discount rate of 7 percent was used in all alternative cost calculations).

**TABLE 2**  
**SITE 19 - SCREENING OF REMEDIAL ALTERNATIVES**  
**FEASIBILITY STUDY**  
**NWS EARLE, COLTS NECK, NEW JERSEY**

	<b>ALTERNATIVE</b>	<b>EFFECTIVENESS</b>	<b>IMPLEMENTABILITY</b>	<b>COST</b>	<b>COMMENTS</b>
1	No Action: (long-term monitoring, 5-year reviews)	Provides no additional protection of human health or the environment. Does not reduce potential for human exposure to contaminants in soils, sediment, or groundwater. Does not reduce contaminant migration in the environment. No reduction in toxicity, mobility, or volume of contaminants.	Readily implementable. No technical or administrative difficulties.	Capital: none O&M: low	<u>Retained</u> as baseline alternative in accordance with NCP.
2	Limited Action (Institutional controls, access restrictions, long-term monitoring, 5-year reviews)	Provides little added protection of human health through fencing and institutional controls. Groundwater use would be restricted. Does not reduce contaminant migration to the environment. No reduction in toxicity, mobility, or volume of contaminants.	Readily implementable. No technical or administrative difficulties.	Capital: low O&M: low	Relative to Alt. 1, provides minimal additional protectiveness for additional cost. <u>Eliminated</u> .
3	Soils Consolidation, Capping, Institutional Controls, and Long-Term Monitoring	Protects human health and the environment by containing contaminated soils and sediments within the topographic depression, preventing direct contact and reducing contaminant migration to the environment. Groundwater use would be restricted. No reduction of toxicity or volume of contaminants. Groundwater contaminants will naturally attenuate over time.	Readily implementable. No technical or administrative difficulties. Personnel and materials necessary to implement alternative are widely available.	Capital: moderate O&M: moderate	Provides the same degree of protection as Alt. 5, but because it does not result in clean closure of Site 19, it requires long-term operation, maintenance, and monitoring. Also likely to be more expensive than Alt. 5. <u>Eliminated</u> .

**TABLE 2**  
**SITE 19 - SCREENING OF REMEDIAL ALTERNATIVES**  
**FEASIBILITY STUDY**  
**NWS EARLE, COLTS NECK, NEW JERSEY**  
**PAGE 2 OF 2**

	ALTERNATIVE	EFFECTIVENESS	IMPLEMENTABILITY	COST	COMMENTS
4	Excavation, On-Site Solidification, On-Site Disposal, and Long-Term Monitoring	Protects human health and the environment by immobilizing soil contaminants, preventing direct contact, and minimizing contaminant migration to the environment. Groundwater use would be restricted. Groundwater contaminants will naturally attenuate over time.	Readily implementable. Specialized treatment equipment is required but is available from several vendors. No technical or administrative difficulties. Personnel and materials necessary to implement alternative are widely available.	Capital: moderate O&M: moderate	<u>Retained</u> as representative treatment alternative.
5 A	Excavation and Off-Base Disposal	Protects human health and the environment by excavating contaminated soils and sediments and transporting them off-base for disposal in a RCRA landfill. Groundwater use would be restricted. Groundwater contaminants will naturally attenuate over time. No reduction of toxicity or volume of contaminants.	Readily implementable. Adequate landfill capacity exists for disposal of the small volume of contaminated materials from Site 19.	Capital: low O&M: low	Alternative would result in clean closure of Site 19 and would expedite its reuse. <u>Retained.</u>
5 B	Excavation and On-Base Disposal	Protects human health and the environment by excavating contaminated soils and sediments and transporting them for consolidation in an existing on-base landfill that is being capped under a separate remedial action. Groundwater use would be restricted. Groundwater contaminants will naturally attenuate over time. No reduction of toxicity or volume of contaminants.	Readily implementable if capping is the selected alternative at the Site 4 landfill. The small volume of contaminated materials from Site 19 would be used to assist in achieving the proper grades for the final cap. The small volume of soils from Site 19 would not be expected to significantly alter the cost or design of the proposed landfill cap.	Capital: low O&M: low	Alternative would result in clean closure of Site 19 and would expedite its reuse. <u>Retained.</u>

**Alternative 4: Excavation, On-Site Solidification, On-Site Disposal, and Long-Term Monitoring**

Alternative 4 employs soil treatment to limit exposure to hazardous substances and minimize migration of contaminants to groundwater and the adjacent wetlands. Contaminants in site groundwater would naturally attenuate over time through precipitation, adsorption, dilution, and dispersion after leaching of contaminants from site soils and sediments is abated. Under this alternative, the contaminated sediments and soils from the drainage ditch and the topographic depression (approximately 260 cubic yards) would be excavated and treated by solidification to immobilize metals in a stable matrix. Treated soils would be placed in the topographic depression upgradient of the swale. The depression would be backfilled with clean fill, graded level with the surrounding paved surface, and closed with an asphalt cover to form a treated-soil containment cell. Access restrictions would be enacted to limit future uses of the site that may result in intrusion into the treated-soil cell. Access restrictions would also prohibit the use of untreated groundwater for drinking water.

Long-term, periodic monitoring of groundwater, surface water, and sediments would be conducted to assess contaminant status and potential threats to human health and the environment. Site conditions and risks would be reviewed every 5 years since wastes would be left in place.

Because site groundwater does not meet New Jersey GWQS, a **classification exception area (CEA)** pursuant to New Jersey Administrative Code (N.J.A.C) 7:9-6 would be established in the area immediately adjacent and downgradient to

well MW19-07 to provide the state official notice that the constituent standards would not be met for a specified duration and to ensure that use of untreated groundwater in the affected area would be suspended until standards are achieved.

The capital costs for Alternative 4 total \$491,000. The average annual O&M costs are \$21,600, and 5-year reviews cost \$15,500 per event. Over a 30-year period, the net present-worth cost is \$793,000.

**Alternative 5: Excavation and Disposal**

Under Alternative 5, all contaminated soils and sediments (approximately 260 cubic yards) would be excavated and either sent off base for disposal (Alternative 5A) or consolidated onto Site 4 - an on-base, non-hazardous landfill (Alternative 5B) prior to capping. Only non-hazardous soils would be considered for consolidation onto Site 4. Site 19 soils would no longer pose threats to groundwater or the adjacent wetlands.

Once the source of contamination is removed, contaminants in site groundwater would naturally attenuate over time through precipitation, adsorption, dilution, and dispersion. Institutional controls would be enacted to prohibit the use of untreated contaminated groundwater for drinking water until GWQS are met.

Long-term, periodic monitoring of groundwater, surface water, and sediments would be conducted to assess contaminant status and potential threats to human health and the environment. Site conditions and risks would be reviewed every 5 years until standards are met.

Because site groundwater does not meet New Jersey GWQS, a CEA pursuant to N.J.A.C 7:9-6 would be established in the area immediately adjacent to well MW19-07 to provide the state official notice that the constituent standards would not be met for a specified duration and to ensure that use of untreated groundwater in the affected area would be suspended until standards are achieved.

#### Cost

##### Alternative 5A

The estimated capital costs for Alternative 5A total \$375,000. The average annual O&M costs are \$21,600, and 5-year reviews cost \$15,500 per event. Over a 30-year period, the estimated net present-worth cost is \$677,000.

##### Alternative 5B

The estimated capital costs for Alternative 5B total \$153,000. The average annual O&M costs are \$21,600, and 5-year reviews cost \$15,500 per event. Over a 30-year period, the estimated net present-worth cost is \$455,000.

### **EVALUATION of ALTERNATIVES**

The remedial alternatives were compared to one another based on the seven selection criteria to identify differences among the alternatives and discuss how site contaminant threats are addressed. Public comments on this Proposed Plan will help address the two remaining criteria: state and community acceptance.

#### Analysis

A glossary of evaluation criteria is provided at the end of this Proposed Plan.

#### Overall Protection

Alternatives 4 and 5 would be protective of human health and the environment. Because no actions are conducted, Alternative 1 would not reduce human health or ecological risk and would not reduce contaminant migration to the environment.

Alternatives 4 and 5 reduce the potential for direct contact with contaminated materials. By reducing or preventing leaching of contaminants from site soils and sediments, both alternatives minimize contaminant migration into the environment.

By excavating and transporting contaminated materials off site, Alternative 5 results in permanent protection of health and the environment at Site 19. However, because the soils and sediments are not treated, the potential long-term risks and long-term monitoring considerations are transferred to another location: to an off-base landfill under Alternative 5A and to an on-base or off-base landfill (for hazardous waste) under Alternative 5B.

In contrast, Alternative 4 incorporates treatment that immobilizes contaminants. The solidification technology has been widely demonstrated and would be expected to provide long-term protection, but monitoring would be required to ensure the continued effectiveness and permanence of this alternative.

Both Alternatives 4 and 5 include institutional controls that would provide assurance that untreated contaminated groundwater is not used as a potable water source in the future; Alternative 1 would not include any institutional controls to protect future users of site groundwater.

### Compliance with ARARs

Alternative 1 would not comply with state ARARs for attainment of groundwater quality criteria or include a provision to seek a temporary exemption.

Implementation of Alternatives 4 and 5 would comply with all ARARs identified in the FS. Alternatives 4 and 5 would eventually meet GWQC through source removal and natural attenuation and both include a provision to seek a temporary exemption (CEA) from these requirements until the GWQS are achieved.

Compliance with location-specific ARARs would be the same under Alternatives 4 and 5. The potential effects on wetlands, floodplains, water bodies, and other sensitive receptors would be identified during the design of each alternative and all necessary measures would be taken to comply with the federal and state location-specific ARARs identified in the FS.

Alternative 4 would be constructed and operated in accordance with federal and state hazardous waste facility regulations if excavated soils and sediments are determined to be hazardous wastes.

Alternative 5 would be conducted in accordance with RCRA hazardous waste generator and transporter requirements and New Jersey labeling, records, and transportation requirements if excavated soils and sediments are determined to be hazardous wastes.

Both Alternative 4 and Alternative 5 would be implemented in compliance with RCRA Land Disposal Restrictions (LDRs).

### Long-Term Effectiveness and Permanence

Only Alternatives 4 and 5 offer long-term protection of human health and the environment. Since no remedial actions would occur under Alternative 1 to treat, contain, or remove contaminated soils and sediments, the current and future threats to human health and the environment from direct exposure to these media would remain, and contaminant migration to groundwater would continue. Because no institutional controls would be implemented to prohibit use of untreated contaminated groundwater, the risk to potential future users of the groundwater would remain unchanged.

Alternatives 4 and 5 would both reduce human and ecological risks due to direct exposure to site contaminants by eliminating the potential for exposure. Alternative 4 would achieve long-term protection by immobilizing contaminants and disposing of treated soils in an on-site containment cell. Monitoring would ensure the long-term effectiveness and permanence of treatment. Alternative 5 would achieve long-term protection by excavating and disposing of soils either offsite or at an on-base landfill. The action would permanently reduce risks at Site 19, but contaminant mobility in the environment would not be reduced. The requirement for long-term monitoring would be transferred to the disposal location.

Long-term risks due to ingestion of site groundwater would be reduced under Alternatives 4 and 5 by reducing contaminant leaching into groundwater and by implementing institutional controls to prohibit use of untreated, contaminated groundwater until ARARs are met. Alternative 1 would not include any measures to reduce these risks.

### Reduction of Toxicity, Mobility, or Volume Through Treatment

Only Alternative 4 would reduce the mobility of soil/sediment contaminants through treatment. Because neither Alternative 1 nor Alternative 5 includes soil/sediment treatment, neither would reduce the toxicity, mobility, or volume through treatment.

With source removal, natural attenuation would reduce the toxicity, mobility, and volume of contaminated groundwater over time under Alternatives 4 and 5.

### Short-Term Effectiveness

The short-term effectiveness of the three alternatives would be similar since the use of appropriate engineering controls and personal protective equipment (PPE) would be expected to minimize adverse impacts to Base residents and personnel, the local community, and workers during implementation.

Long-term monitoring, the only on-site activity proposed under Alternative 1, would provide little opportunity for short-term impact to the local community or the environment.

Alternatives 4 and 5 would present a greater opportunity for short-term impacts to human health and the environment due to excavation and handling of contaminated soils and sediments. Alternative 5A would present the greatest opportunity for short-term impact, as it includes off-Base transport of contaminated soils/sediments. In all cases, short-term risks posed to Base personnel, site workers, and the environment under either alternative would be mitigated through use of engineering controls and appropriate PPE. No permanent adverse impacts to the human

health or the environment are anticipated to result from implementation of Alternatives 4 or 5.

### Implementability

Each of the alternatives would be implementable. Alternative 1 is the most easily implemented since the only activities proposed are long-term monitoring and 5-year reviews.

Alternative 5A would be the next easiest to implement because it involves only excavation and off-site transport and disposal. A number of companies with the trained personnel, equipment, and materials to perform excavation, disposal, and long-term monitoring are available. Sufficient commercial landfill capacity is available to handle the small volume of contaminated materials (approximately 260 cubic yards) that would require off-base disposal under Alternative 5A. Under Alternative 5B, sufficient area exists at the Site 4 landfill to accommodate the small volume of materials from Site 19 (should they be found to be non-hazardous) without altering the cap design or material requirements.

Alternative 4 would be somewhat more difficult to implement because it would require mobilization and operation of an on-site treatment system. However, solidification is a well-demonstrated technology employing relatively common equipment and materials, and several vendors are available that could provide the necessary equipment, materials, and services.

If additional actions are warranted, they could be easily implemented under Alternatives 1 and 5. Under Alternative 4, additional actions could be implemented; however, excavation and removal of the solidified materials may be required.

## Cost

Alternative 1, no action, would cost the least to implement and Alternative 4 would cost the most to implement. Alternative 5A costs more to implement than Alternative 5B.

No capital costs are associated with the no-action alternative. The average annual O&M cost for long-term monitoring is \$16,200 and 5-year reviews are \$15,500 per event. Over a 30-year period, the net present-worth cost is \$234,000.

The capital costs for Alternative 4 total \$491,000. The average annual O&M costs are \$21,600, and 5-year reviews cost \$15,500 per event. Over a 30-year period, the net present-worth cost is \$793,000.

The capital costs for Alternative 5A total \$375,000. The average annual O&M costs are \$21,600, and 5-year reviews cost \$15,500 per event. Over a 30-year period, the net present-worth cost is \$677,000.

The capital costs for Alternative 5B total \$153,000. The average annual O&M costs are \$21,600, and 5-year reviews cost \$15,500 per event. Over a 30-year period, the net present-worth cost is \$455,000. These costs do not include those for offsite disposal of any material determined to be hazardous

## State and Community Acceptance

The state of New Jersey supports the preferred alternative. Community acceptance of the preferred alternative will be evaluated at the conclusion of the public comment period and will be described in the **Record of Decision (ROD)**.

## **PREFERRED ALTERNATIVE SUMMARY**

The Navy, with the support of EPA, in consultation with NJDEP has selected Alternative 5A: Excavation and Off-Base Disposal as the preferred alternative for remediation of contaminated sediments and soils and prevention of further leaching of metals to groundwater. This alternative would reduce unacceptable human health risks and threats to ecological receptors in the vicinity by removing the metals-laden sediments and contaminated soil for consolidation/disposal off site at a permitted hazardous waste disposal facility if excavated material is found to be hazardous.

Implementation of Alternative 5 would comply with all ARARs identified in the FS. The preferred alternative is believed to provide the best balance of protection among the alternatives with respect to response criteria. GWQS would eventually be met through natural attenuation and a provision is included to seek a CEA in the area immediately adjacent and downgradient of the site to protect potential receptors until the GWQS are achieved. Additional groundwater monitoring wells would be installed downgradient of MW19-07 to evaluate the protectiveness of the remedy.

Based on available information, the Navy and EPA believe the preferred alternative would be protective of human health and the environment, would be cost effective, and would be in compliance with all statutory requirements of EPA, the state, and the local community.

## **THE COMMUNITY ROLE IN THE SELECTION PROCESS**

**The Navy solicits written comments from the community on the preferred alternative for**

**OU-2 and the other alternatives for OU-2 identified in this Proposed Plan.** The Navy has set a public comment period from March 21, 1997 through April 30, 1997, to encourage public participation in the remedy selection process for OU-2.

The Navy will hold a public meeting during the comment period. At the public meeting, the Navy, along with the EPA, will present the RI/FS reports and the Proposed Plan, answer questions, and solicit both oral and written questions. **The public meeting is scheduled for 7:00 p.m. on April 24, 1997 and will be held at the Colts Neck Courthouse.**

Comments received during the public comment period will be summarized and responses provided in the Responsiveness Summary section of the ROD. The ROD is the document that will present the Navy's selection of the remedy for OU-2.

To send written comments or to obtain further information contact

Commanding Officer  
Naval Weapons Station Earle  
Code 043  
201 Highway 34 South  
Colts Neck, New Jersey 07722-5014

For further information, contact John Kolicus,  
Remedial Project Manager

Phone: (610) 595-0567 ext. 157

**Please note that all comments must be submitted and postmarked on or before April 30, 1997.**

## GLOSSARY OF EVALUATION CRITERIA

**Overall Protection** addresses whether remedies are protective of human health and the environment. A remedy is protective if it adequately eliminates, reduces, or controls all current and potential site risks posed through each exposure pathway at the site.

**Compliance with ARARs** is one of the statutory requirements for remedy selection. However, CERCLA allows selecting a remedy that will not attain ARARs if certain conditions exist. One condition is if the remedy is an interim measure and the final remedy will attain ARARs upon completion.

**Long-Term Effectiveness and Permanence** refers to the magnitude of residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time.

**Reduction of Toxicity, Mobility, or Volume** addresses remedies that employ treatment as a principal element by ensuring that the relative performance of the treatment technologies will be assessed. This criterion examines the magnitude, significance, and irreversibility of reductions.

**Cost** includes capital costs and annual operation and maintenance costs incurred over the life of the remedial action.

**Short-Term Effectiveness** refers to the short-term impacts of the remedy on the neighboring community, workers, or surrounding environment. This includes potential threats to human health and the environment associated with the removal, treatment, and transportation of hazardous substances.

**Implementability** is the technical and administrative feasibility of a remedy, as well as the availability of materials and services needed to implement the selected solution.

**State Acceptance** indicates whether the state concurs with, opposes, or has no comment on the preferred remedy. Formal state comments usually will not be received until the state has reviewed the FS report and draft Proposed Plan.

**Community Acceptance** will be addressed in the ROD following a review of community comments received on the RI/FS reports and the Proposed Plan.

## TERMS USED IN THE PROPOSED PLAN

**1,2-Dichloroethene (1,2-DCE):** Common volatile organic solvent formerly used for cleaning, degreasing or other uses in commerce and industry.

**Applicable or Relevant and Appropriate Requirements (ARARs):** The federal and state requirements that a selected remedy must attain. These requirements may vary among sites and remedial activities.

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

**Carcinogenic:** A type of risk resulting from exposure to chemicals that may cause cancer in one or more organs.

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

**Feasibility Study (FS):** Report identifying and evaluating alternatives for addressing the contamination present at a site or group of sites.

**Groundwater Quality Standards (GWQS):** New Jersey promulgated groundwater quality requirements, N.J.A.C. 7:9-6.

**Hazard Index (HI):** The sum of chemical-specific Hazard Quotients. A Hazard Index of greater than 1 is associated with an increased level of concern about adverse non-cancer health effects.

**Hazard Quotient (HQ):** A comparison of the level of exposure to a substance in contact with the body per unit time to a chemical-specific Reference Dose to evaluate potential non-cancer health effects. Exceedence of a Hazard Quotient of 1 is associated with an increased level of concern about adverse non-cancer health effects.

**Initial Assessment Study (IAS):** Preliminary investigation usually consisting of review of available data and information of a site, interviews, and a non-sampling site visit to observe areas of potential waste disposal and migration pathways.

**Land Disposal Restrictions (LDRs):** A set of EPA-prescribed limit concentrations with associated treatment standards regulating disposal in landfills.

**Maximum Contaminant Level (MCL):** EPA-published (promulgated as law) maximum concentration level for compounds found in water in a public water supply system.

**Noncarcinogenic:** A type of risk resulting from the exposure to chemicals that may cause systemic human health effects.

**National Contingency Plan (NCP):** The National Contingency Plan is the basis for the nationwide environmental restoration program known as Superfund and is administered by EPA under the direction of the U.S. Congress.

**National Priorities List (NPL):** EPA's list of the nation's top priority hazardous substance disposal facilities that may be eligible to receive federal money for response under CERCLA.

**Presumptive Remedy:** Preferred technologies for common categories of sites based on historical patterns of remedy selection and EPA's scientific and engineering evaluation of performance data on technology implementation. Presumptive remedies ensure the consistent selection of remedial actions.

**RCRA Subtitle D facility:** Municipal-type waste disposal facility (landfill) regulated by the Resource Conservation and Recovery Act (RCRA).

**Record of Decision (ROD):** A legal document that describes the remedy selected for a Superfund facility, why the remedial actions were chosen and others not, how much they are expected to cost, and how the public responded.

**Reference Dose (RD):** An estimate with an uncertainty spanning an order of magnitude or greater of a daily exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of deleterious effects during a portion of a lifetime.

**Remedial Action Objective (RAO):** An objective selected in the FS, against which all potential remedial actions are judged.

**Remedial Investigation (RI):** Study that determines the nature and extent of contamination at a site.

**Site Inspection (SI):** Sampling investigation with the goal of identifying potential sources of contamination, types of contaminants, and potential migration of contaminants. The SI is conducted prior to the RI.

**Semivolatile Organic Compounds (SVOCs):** Organic chemicals [e.g., phthalates or polycyclic aromatic hydrocarbons (PAHs)] that do not readily evaporate under atmospheric conditions.

**Target Compound List/Target Analyte List (TCL/TAL):** List of routine organic compounds (TCL) or metals (TAL) included in the EPA Contract Laboratory Program.

**Toxicity Characteristic Leaching Procedure (TCLP):** Analytical test prescribed by EPA to determine potential leachate toxicity in materials; commonly used to determine the suitability of a waste for disposal in a landfill.

**Trichloroethene (TCE):** Common volatile organic solvent formerly used for cleaning, degreasing or other uses in commerce and industry.

**Volatile Organic Compounds (VOCs):** Organic liquids [e.g., vinyl chloride or trichloroethylene (TCE)] that readily evaporate under atmospheric conditions.

## FOR FURTHER INFORMATION

### MAILING LIST

If you did not receive this Proposed Plan in the mail and wish to be placed on the mailing list for future information pertaining to this site, please fill out, detach, and mail this form to:

Commanding Officer  
Naval Weapons Station Earle  
Code 043  
201 Highway 34 South  
Colts Neck, New Jersey 07722-5014

Name: \_\_\_\_\_

Affiliation: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Phone: ( ) \_\_\_\_\_