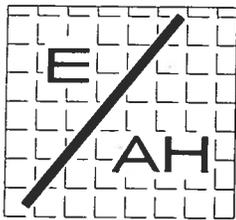


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FINAL PROPOSED PLAN AND RECORDS OF DECISION OPERABLE UNIT 10 WITH  
TRANSMITTAL NAS PENSACOLA FL  
2/16/1996  
ENSAFE/ALLEN AND HOSHALL



# EnSafe / Allen & Hoshall

a joint venture for professional services

5720 Summer Trees Dr. Suite 8 Memphis, TN 38134  
(901) 383-9115 Fax (901) 383-1743

February 16, 1996

Commanding Officer  
Attn: Mr. Bill Hill, Code 1851  
SOUTHNAVFACENGCOM  
2155 Eagle Drive, P.O. Box 190010  
North Charleston, South Carolina 29419-9010

Subject: Delivery of Report  
CTO-083, Proposed Plan and RODs  
Operable Unit 10 Proposed Plan

Reference: Contract # N62467-89-D-0318, CLEAN II

Dear Mr. Hill:

EnSafe/Allen & Hoshall is pleased to submit two copies of the Final Proposed Plan for Operable Unit 10 at the Naval Air Station Pensacola in Pensacola, Florida.

If you should have any questions or need any additional information regarding the report, please do not hesitate to call me.

Sincerely,

EnSafe/Allen & Hoshall

Allison L. Dennen  
*Task Order Manager*

Enclosure: Final Proposed Plan, Operable Unit 10, NAS Pensacola

cc: Ms. Kimberly Reavis, Code 0233KR SOUTHNAVFACENGCOM without enclosure  
EnSafe/Allen & Hoshall CTO 083 file without enclosure  
EnSafe/Allen & Hoshall Pensacola file without enclosure  
EnSafe/Allen & Hoshall file without enclosure  
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Naval Air Station Pensacola  
Installation Restoration Program (IRP)

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This is the fifth in a series of fact sheets informing interested citizens about the environmental investigations and remedial actions at NAS Pensacola. Other fact sheets will be written at appropriate points in the program and in response to public interest. Distribution is coordinated through the Public Affairs Office at NAS Pensacola, (904) 452-2311.

**FACT SHEET 5: U.S. Navy Proposed Plan  
Operable Unit 10, Naval Air Station, Pensacola**

**INTRODUCTION**

The U.S. Navy, as the lead agency cleaning up Naval Air Station (NAS) Pensacola, is issuing this Proposed Plan for Operable Unit (OU) 10, the industrial wastewater treatment plant (IWTP) on Magazine Point, to provide an opportunity for public comment on cleanup alternatives. The Navy, in consultation with the U.S. Environmental Protection Agency (USEPA) and the Florida Department of Environmental Protection (FDEP), will not select a final alternative until public comment is considered.

The Navy issues this proposed plan as part of its public participation program as defined by federal law and to encourage community involvement in the remedial alternative selection. This plan provides background information on the site, describes the alternatives evaluated, and presents the preferred alternative and its rationale. Also, this plan outlines the public's role in helping the Navy make a final decision. Words that first appear in bold print are defined in the glossary, starting on page 8.

This plan summarizes information described in the *Final Remedial Investigation (RI) Report* and the *Final Focused Feasibility Study (FFS)* and other documents contained in the Administrative Record. The Record and Information Repositories for NAS Pensacola may be found at the following locations:

**NAS Pensacola Library**  
Building 633  
Hours of Operation:  
M-F 8 a.m. to 6 p.m.  
Sat 9:30 a.m. to 5 p.m.

**John C. Pace Library**  
University of West Florida  
Hours of Operation:  
M-Th 8 a.m. to 10 p.m.  
Fri 8 a.m. to 5 p.m.  
Sat 9 a.m. to 5 p.m.  
Sun 10 a.m. to 9 p.m.

**West Florida Regional Library**  
200 West Gregory Street  
Hours of Operation:  
T-Th 9 a.m. to 8 p.m.  
Fri, Sat 9 a.m. to 5 p.m.

**COMMUNITY PARTICIPATION**

The U.S. Navy relies on public comments to ensure that the selected alternatives are fully understood and that community concerns have been considered. The U.S. Navy will be accepting written comments from February 19 to April 4, 1996, to encourage public participation in the selection process. The comment period includes a public meeting at which the Navy will present the RI report, FFS report, and Proposed Plan, answer questions, and receive comments from the public. The public meeting is scheduled for 7 p.m., Tuesday, February 27, 1996, at Pensacola Junior College, Building 3000, Warrington Campus. Comments will be summarized and responses provided in the responsiveness summary section of the Record of Decision (ROD). The public can send written comments to the following person, from whom they also can request additional information:

Commanding Officer  
NAS Pensacola, Code 00500  
Attn: Ron Joyner  
190 Radford Blvd.  
Pensacola, Florida 32508-5217

**DEPARTMENT OF THE NAVY**

COMMANDING OFFICER  
CODE 00B00  
NAS PENSACOLA  
190 RADFORD BLVD  
PENSACOLA FL 32508-5217

**OFFICIAL BUSINESS**





# PUBLIC COMMENT SHEET



Fold on dashed lines, staple, stamp and mail

Place  
Stamp

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_ Zip \_\_\_\_\_

**Commanding Officer  
NAS Pensacola, Code 00500  
Attn: Ron Joyner  
190 Radford Blvd  
Pensacola, Florida 32508-5217**

**SITE BACKGROUND**

NAS Pensacola was placed on USEPA's National Priorities List (NPL) in December 1989. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) governs cleanup for sites on the NPL. In addition, an environmental permit was issued in 1988 under the Resource Conservation and Recovery Act (RCRA). This permit ensures that ongoing activities are environmentally sound and that any spills or leaks of hazardous waste and/or constituents are investigated and cleaned up. The Federal Facilities Agreement (FFA), signed in October 1990, outlines NAS Pensacola's regulatory path through these complex federal laws.

OU 10 occupies approximately 26 acres on Magazine Point at NAS Pensacola, in Escambia County, Florida. OU 10 comprises three sources of contamination: the former Industrial Sludge Drying Beds (ISDBs) at Site 32, the former Wastewater Treatment Plant Ponds at Site 33, and miscellaneous IWTP-related sites at Site 35. Figure 1 shows the general site area and location.

Various facilities at Magazine Point have treated wastewater since 1941. The current wastewater treatment plant was constructed in 1948 to process primarily domestic wastewater. It was upgraded in 1971 to treat both industrial and domestic wastewater separately. Site 32, the drying beds, operated from 1971 until 1984 and was closed in 1989. Site 33, the three ponds, makes up the southern half of OU 10. These ponds operated from 1971 until 1988, when they were cleaned up and closed under the existing RCRA permit. Both Sites 32 and 33 are known sources of soil and groundwater contamination at OU 10.

A groundwater treatment system began in 1986 to comply with conditions in the Temporary Operating Permit (No. HT17-68087)

issued by the Florida Department of Environmental Regulation (now FDEP). The system installed in the shallowest portions of the underlying aquifer began operating in February 1987. Seven recovery wells along the north-south axis of Magazine Point capture chemical compounds from the former Surge Pond. Extracted groundwater is pretreated, then disposed of at the domestic treatment plant.

**SCOPE AND ROLE OF ACTION**

This Proposed Plan addresses long-term cleanup of soil and groundwater. The purpose of this Proposed Plan is to set forth the alternatives from which the Navy, with regulatory approval, will select a remedy to prevent future exposure to contamination at the site from soil and groundwater.

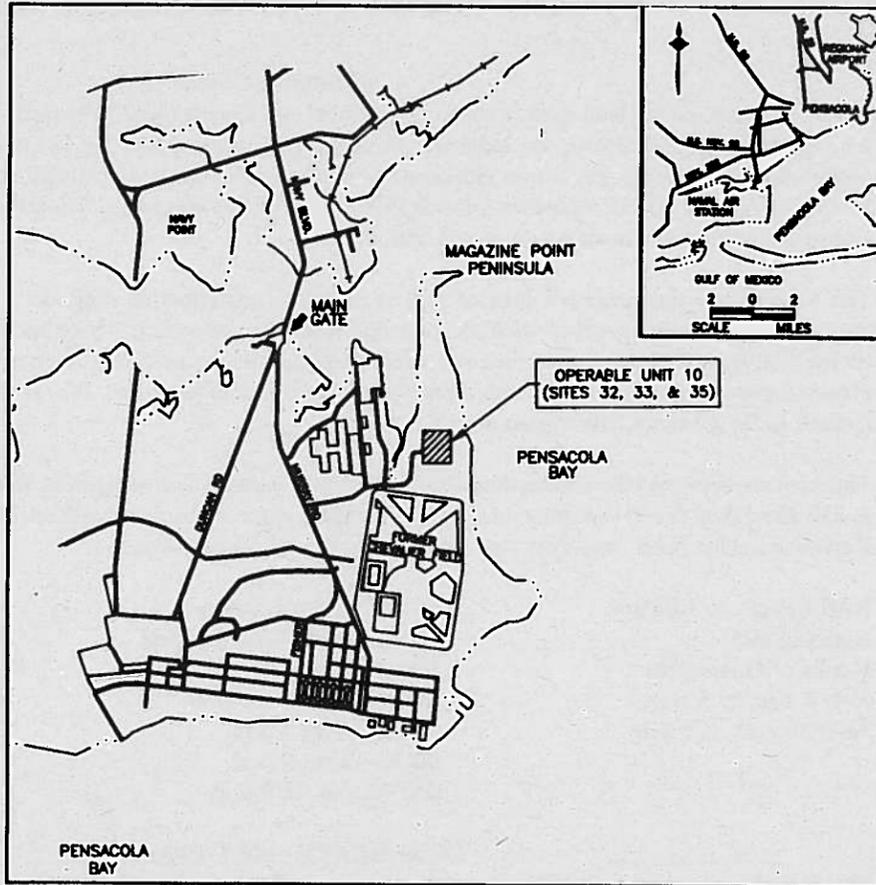


Figure 1 Site Map



**MAILING LIST ADDITIONS/CORRECTIONS**

If you would like your name and address placed or corrected on the mailing list for the Installation Restoration Program at NAS Pensacola, please complete this form and return to Michele Harrison, NAS Pensacola Public Affairs Office, 190 Radford Boulevard, Building 191, Code 00B00, Pensacola, Florida 32508-5217.

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

TELEPHONE: \_\_\_\_\_

analysis of the remedial investigation/feasibility study, and presents any waivers to clean up standards of Section 121(d)(4) that may be proposed. This may be prepared either as a fact sheet or as a separate document. In either case, it must actively solicit public review and comment on all alternatives under agency consideration.

**Record of Decision (ROD):** A public document that explains which cleanup alternative(s) will be used at NPL sites. The Record of Decision is based on information and technical analysis generated during the remedial investigation/feasibility study and consideration of public comments and community concerns.

**Remedial Action (RA):** The actual construction or implementation phase that follows the remedial design and the selected cleanup alternative at a site on the NPL.

**Remedial Investigation/Feasibility Study (RI/FS):** Investigation and analytical studies usually performed at the same time in an interactive process, and together referred to as the "RI/FS." They are intended to: (1) gather the data necessary to determine the type and extent of contamination at an NPL site; (2) establish criteria for cleaning up the site; (3) identify and screen cleanup alternatives for remedial action; and (4) analyze in detail the technology and costs of the alternatives.

**Remedial Response:** A long-term action that stops or substantially reduces a release or threatened release of hazardous substances that is serious, but does not pose an immediate threat to public health and/or the environment.

**Resource Conservation and Recovery Act (RCRA):** A federal law that established a regulatory system to track hazardous substances from the time of generation to disposal. The law requires safe and secure procedures to be used in treating, transporting, storing, and disposing of hazardous substances. RCRA is designed to prevent new, uncontrolled hazardous waste sites.

**Response Action:** As defined by Section 101(25) of CERCLA, means remove, removal, remedy, or remedial action, including enforcement activities related thereto.

**Responsiveness Summary:** A summary of oral and written public comments received by the lead agency during a comment period on key documents, and the response to these comments prepared by the lead agency. The responsiveness summary is a key part of the ROD, highlighting community concerns for USEPA decision-makers.

**Superfund:** The trust fund established by CERCLA which can be drawn upon to plan and conduct clean up of past hazardous waste disposal sites, and current releases or threats of releases of nonpetroleum products. Superfund is often divided into removal, remedial, and enforcement components.

**Superfund Amendments and Reauthorization Act (SARA):** The public law enacted on October 17, 1986, to reauthorize the funding provisions, and to amend the authorities and requirements of CERCLA and associated laws. Section 120 of SARA requires that all federal facilities "be subject to and comply with, this act in the same manner and to the same extent as any nongovernmental entity."

### Remedial Investigation Summary

Between December 1992 and October 1995, an environmental investigation was conducted. The final report identified soil contaminants. Areas with contaminants at higher levels appear to be isolated "hot spots" near the former IWTP units. The areas are designated as A, B, C and D on Figure 2.

The final report also identified contaminants in the site's groundwater. The RI indicates that the main area of groundwater contamination beneath Site 32 is outside the area of clean up of the existing groundwater treatment system. The approximate area of groundwater contamination is shown on Figure 2.

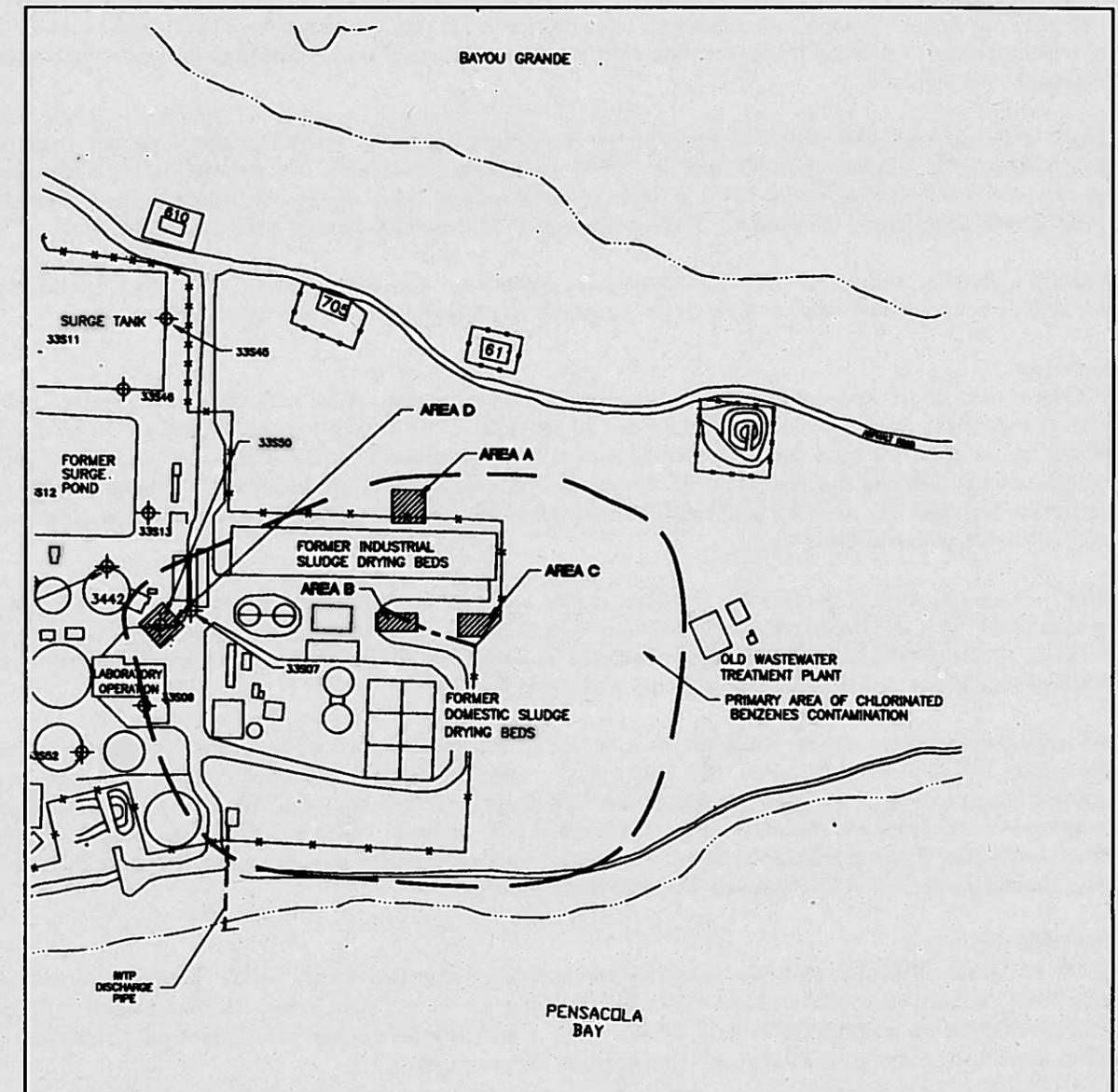


Figure 2 Areas of Concern

### Summary of Site Risks

#### Human Health

CERCLA directs that a **Baseline Risk Assessment (BRA)** be done to determine if an NPL site poses an unacceptable current or future human health or environmental threat **if no cleanup measures are taken**. This study provides a basis for determining whether cleanup is needed and what the cleanup levels should be. In the OU 10

BRA, the human health risk associated with exposure to contaminants in surface soil, groundwater, and sediments was assessed for current and future site workers under industrial land use, as well as for future site residents. This study can be found in the *Final Remedial Investigation Report*.

A risk level is determined for potential cancer-causing chemicals based on how much of the chemical is present and its strength as a cancer-causing agent. The risk range USEPA set for protection of human health is represented as  $10^{-4}$  for industrial areas to  $10^{-6}$  for residential areas. This range would mean an increased chance of no more than one additional case of cancer in 10,000 people ( $10^{-4}$ ) to one in 1 million ( $10^{-6}$ ). The State of Florida considers less than  $10^{-6}$  acceptable. Chemicals producing other harmful effects were compared with reference doses (highest levels not causing harmful effects) to calculate a Hazard Quotient (HQ). An HQ above 1 indicates if cleanup may be needed to reduce potential exposure to a safe level. For groundwater, onsite contaminant levels are also compared with state and federal drinking water standards. Cleanup levels are then established based on health-based levels as explained above or state and federal drinking water standards where they exist to determine the amount of cleanup necessary at an NPL site.

Under industrial land use, estimated exposure for current and potential future workers does not result in unacceptable risks. Under residential land use, which is unlikely for this site, two materials in the surface soil present an unacceptable risk above  $10^{-6}$  to a future potential resident child. Several chemicals in site soil exceed Florida levels that protect groundwater. These levels were used to develop cleanup goals for the site.

There is a potential unacceptable risk from exposure to groundwater for future site residents. The risk estimated for unlikely potential residential use exceeds the acceptable risk threshold of  $10^{-6}$  and the HQ of 1.

#### Ecological

Ecological risk also was assessed for the actual or potential effects of contamination at OU 10 to ecological receptors such as plants and animals. This assessment focused on both land at OU 10, and contamination in groundwater that travels to nearby surface water bodies. Potential impacts to wetlands near OU 10 and the southern drainage ditch will be evaluated during the Site 41, NAS Pensacola Wetlands remedial investigation. Potential impacts to Pensacola Bay (Site 42) and Bayou Grande (Site 40) from groundwater contaminants will be assessed during remedial investigations at those sites.

Risk from the soil north of the IWTP is limited to metals in the surface soil. Risk associated with levels present is most likely minimal. Because the IWTP is industrial and there is considerable human activity, wildlife habitat is absent. Contact with soil would be limited to animals traveling across the area only. Therefore, the contaminant levels present do not present an unacceptable risk to the environment.

An initial groundwater study was conducted to evaluate if ecological effects occur from contaminated groundwater discharging into surface water bodies. The only organic compound detected in shallow groundwater which may possibly impact ecological receptors in surface water was dieldrin. Metals that could potentially effect ecological receptors include: cadmium, chromium, lead, mercury, and zinc. Harmful effects to surface water receptors, based on the levels present, are considered unlikely. All of the contaminants will be studied further during the Pensacola Bay, Bayou Grande, and NAS Pensacola Wetlands investigations.

#### Remedial Objectives

If OU 10 remains industrial, no further action for soil is required to protect human health. However, to address an unlikely potential residential land use at OU 10, cleanup goals for soil have been established to protect future residents. These are presented in Table 1 below. Table 1 also includes cleanup goals representing contaminant levels in soil that protect groundwater, and cleanup goals for groundwater.

**Baseline Risk Assessment:** A study conducted as a supplement to a remedial investigation to determine the nature and extent of contamination at an NPL site and the risks posed to public health and/or the environment.

**Cleanup:** Actions taken to deal with a release or threatened release of hazardous substances that could affect public health and/or the environment. The noun "cleanup" is often used broadly to describe various response actions or phases of remedial responses such as Remedial Investigation/Feasibility Study.

**Comment period:** A time for the public to review and comment on various documents and actions taken, either by the Department of Defense installation or the USEPA. For example, a comment period is provided when USEPA proposes to add sites to the National Priorities List. A minimum 45-day comment period is held to allow community members to review the Administrative Record and review and comment on the Proposed Plan.

**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 special tax that goes into a trust fund, commonly known as "Superfund," to investigate and clean up abandoned or uncontrolled hazardous waste sites.

Under the program the USEPA can either:

- Pay for site cleanup when parties responsible for the contamination cannot be located or are unwilling or unable to perform the work.
- Take legal action to force parties responsible for site contamination to clean up the site or pay back the federal government for the cost of the cleanup.

**Feasibility Study:** See Remedial Investigation/Feasibility Study.

**Groundwater:** Water beneath the earth's surface that fills pores between materials such as sand, soil, or gravel. In aquifers, groundwater occurs in quantities sufficient for drinking water, irrigation, and other uses.

**Hazardous Substances:** Any material that poses a threat to public health and/or the environment. Typical hazardous substances are materials that are toxic, corrosive, ignitable, explosive, or chemically reactive.

**Information Repository:** A file containing information, technical reports, and reference documents regarding an NPL site. Information repositories for NAS Pensacola are at the West Florida Regional Library, 200 W. Gregory Street, Pensacola, Florida; The John C. Pace Library, University of West Florida; and the NAS Pensacola Library, Building 633, Naval Air Station, Pensacola, Florida.

**Leachability Study:** An investigation performed on soil to check the level of soluble chemicals released when the soil is contacted by a percolating fluid such as rain water.

**Metals:** Metals are naturally occurring elements in the earth and are characterized by their luster and ability to conduct heat and electricity. Barium, beryllium, chromium, lead, and nickel are examples of metals. Exposure to some metals, such as lead, can have a toxic effect on tissues, while other metals such as iron and zinc are essential to the metabolism of animals and humans.

**National Priorities List (NPL):** The USEPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial response using money from the trust fund.

**Operable Unit (OU):** Term used to identify each of a number of separate activities undertaken as part of a NPL site cleanup. A typical operable unit might be removal of drums and tanks from the surface of a site. Several operable units can be used during the course of a site cleanup.

**Proposed Plan:** A public participation requirement of SARA in which the lead agency summarizes for the public the preferred cleanup strategy, and the rationale for the preference, reviews the alternatives presented in the detailed

will be met by modifying the RCRA permit to those levels. Alternative 3 meets the requirements by limiting leachability and Alternative 4 meets the standards by removing the soil and replacing it with clean fill.

**Long-Term Effectiveness and Permanence**

Alternative 4 would provide effective and permanent restoration of the soil by removing the contaminated areas. Alternative 3 would also be effective and permanent by capping the areas identified. It would require long-term cover maintenance to ensure continued effectiveness. Alternative 2 uses institutional controls to ensure that the area remains industrial and would not pose a risk under residential land use and that the RCRA recovery system is modified to contain the contaminated groundwater. Although this alternative would require additional time to meet the cleanup goals, it would be effective from a long-term standpoint. A leachability study of the soil would ensure that groundwater is protected from contaminants detected in the soil. Alternative 1 is not effective or permanent.

**Treatment to Reduce Toxicity, Mobility, or Volume**

Toxicity, mobility, and volume are reduced under Alternative 4 by removing the soil. Alternative 3 reduces mobility and toxicity by preventing rainwater from coming in contact with the contaminated soil. Contaminant levels in groundwater would likely reduce over time. Alternative 2 will verify whether soil is impacting groundwater. If groundwater will not be impacted by the soil, natural processes should reduce existing contamination. Alternative 2 also requires the RCRA process to contain and treat contaminated groundwater.

**Short-Term Effectiveness**

Alternative 2 is expected to have the greatest short-term effectiveness because its implementation presents little risk to workers, the community, and the environment. Alternatives 3 and 4 also are effective in the short-term. Capping the contaminated soil or removing it may impose risks by disturbing the contamination there; however, it is not expected to pose unacceptable short-term environmental or health hazards which could not be controlled.

**Implementability**

Alternatives 1 and 2 are the simplest to implement. Alternative 3 is the most difficult to implement and requires periodic maintenance to ensure that it provides reliable protection. Alternative 4 requires additional testing for disposal of the material.

**Cost**

Alternative 1 is the least expensive, but is not protective. Alternative 2 is inexpensive and is fully protective. Alternatives 3 and 4 attain the same protectiveness at a much higher cost.

**State Acceptance**

The state has been involved in the RCRA and previous CERCLA activities. The Navy will obtain concurrence from Florida on the selected alternative.

**Community Acceptance**

The community's acceptance will be assessed following the public comment period.

**PREFERRED ALTERNATIVE**

Based on the comparison of the alternatives in the FFS, the Navy has identified Alternative 2 as its preferred course of action for remediating soil and groundwater at OU 10, with Alternative 4 as a contingency remedy if the leachability analysis indicates groundwater is at risk. Alternative 2 will reduce risk from soil to the potential resident by designating the area as industrial on the Base Master Plan. Groundwater would be treated by modifying the existing RCRA groundwater treatment system. This alternative would be protective, cost-effective, and would attain all federal and state requirements. However, the Navy will select a final remedy only after considering public comments and seeking Florida and USEPA concurrence.

**GLOSSARY**

This glossary defines terms used in this proposed plan describing CERCLA activities. The definitions apply specifically to this proposed plan and may have other meanings when used in different circumstances.

**Table 1**  
Cleanup Goals for Soil and Groundwater

Contaminant	Frequency of Detection	Detected Concentration		Background	Cleanup Goal (µg/kg)
		Mean of Detects	Max		
<b>Soil</b>					
Benzo(a)pyrene	14/84	6,200	6,200	N/A	1,300 <sup>a</sup>
Dibenz(a,h)anthracene	7/84	1,400	1,400	N/A	1,300 <sup>a</sup>
Chlorobenzene	5/84	700	700	N/A	600 <sup>b</sup>
1,2-Dichlorobenzene	5/84	17,000	22,000	N/A	5,800 <sup>b</sup>
1,3-Dichlorobenzene	5/84	3,925	4,600	N/A	400 <sup>b</sup>
1,4-Dichlorobenzene	5/84	7,400	12,000	N/A	900 <sup>b</sup>
Naphthalene	4/84	12,467	26,000	N/A	100 <sup>b</sup>
<b>Groundwater</b>					
1,2-Dichlorobenzene	11/27	284	1,200	N/A	600 <sup>c</sup>
1,3-Dichlorobenzene	7/27	218	700	N/A	10 <sup>d</sup>
1,4-Dichlorobenzene	11/27	171	700	N/A	75 <sup>e</sup>
Aluminum	27/27	4,940	33,600	3,882.76	200 <sup>d</sup>
Benzene	1/27	3	3	N/A	1 <sup>e</sup>
Bis(2-ethylhexyl)phthalate	1/27	88	88	N/A	6 <sup>e</sup>
Cadmium	1/27	20	20	3.4	5 <sup>e</sup>
Chlorobenzene	15/27	60	340	N/A	100 <sup>e</sup>
Hexachloroethane	1/27	2	3	N/A	10 <sup>e</sup>
Manganese	27/27	113	501	21.92	50 <sup>d</sup>
Tetrachloroethene	3/27	67	190	N/A	3 <sup>e</sup>
Vinyl chloride	1/27	15	15	N/A	1 <sup>e</sup>

**Notes:**

- a — Calculated value based on an acceptable risk or a Hazard Quotient of 1 assuming combined ingestion and skin contact with the soil. It is assumed that a resident child eats 200 milligrams per day of soil and has 2,000 square centimeters of exposed skin and is exposed for 350 days a year for six years and weighs 33 pounds (15 kilograms).
- b — Exceedance of Florida leachability value protective of groundwater to below the drinking water standards.
- c — Florida Primary Drinking Water Standard or Maximum Contaminant Level, whichever is lower.
- d — Florida Secondary Drinking Water Standard or Secondary Maximum Contaminant Level, whichever is lower.
- e — Florida Guidance Concentration based on carcinogenicity.
- N/A — Not applicable

**Scope of Remedial Actions**

**Soil** — The soil compounds identified in Table 1 were found in three locations near Site 32 and one location at Site 35, as Figure 2 shows. Table 2 lists remedial objectives developed from the analysis of soil cleanup goals described above. Cleanup levels for soil are either calculated values based on an acceptable risk or a Hazard Quotient of 1 assuming combined ingestion and skin contact with the surface soil, or Florida leachability values protective of groundwater for subsurface soil. Florida leachability levels are used because they are lower than USEPA levels.

Table 2  
OU 10 — Soil Remedial Objectives

Objective	Location	Contaminated Media	
		Estimated Volume (CY)	Rationale
Eliminate human health risk above 1x10 <sup>-6</sup> for residential land use.	West of the closed ISDBs (Area A)	185	Benzo(a)pyrene and dibenz(a,h)anthracene above risk levels (ARAR).
Protect groundwater from leachable compounds.	Swale (Area B)	130	Chlorinated benzenes and naphthalene above cleanup goals
	Swale (Area C)	270	
	North of operations building (Area D)	370	

Note:  
CY = Cubic yards  
ARAR = applicable or relevant and appropriate requirement

**Groundwater** — Cleanup goals for contaminants in groundwater are their federal or state drinking water standards, whichever is lower. Background (groundwater not contaminated by the site) levels for metals may actually be higher than established drinking water standards. Contamination does not have to be cleaned up to below background levels.

**SUMMARY OF ALTERNATIVES**

This section presents four remedial alternatives identified in the OU 10 FFS for cleaning up soil and groundwater at this site; for a detailed analysis of these alternatives, please refer to the OU 10 *Final Focused Feasibility Study*.

**Alternative 1: No Action**

The National Oil and Hazardous Substances Contingency Plan requires a "no-action" alternative be considered to serve as a baseline against which other alternatives are compared. In the no-action alternative, no remedial actions will be taken to contain, remove, or treat soil. The RCRA groundwater treatment system is operating and will continue to operate in accordance with the RCRA permit. No cost is associated with this alternative.

**Alternative 2: Institutional Controls**

This alternative would zone the OU 10 area for industrial use only on the Base Master Plan and prohibit Magazine Point from being used for residential use. A leachability study will be conducted to demonstrate whether contaminants found in soil above Florida levels are contributing significantly to groundwater contamination onsite. The leachability study will be conducted during the Remedial Design/Remedial Action period after the ROD is issued. This alternative eliminates the risk to potential child residents by not allowing the site to be residential. If the leachability study demonstrates that groundwater is being impacted by contaminants in soil, Alternative 4 would be the contingency remedy. In addition, the Navy will meet the RCRA requirements by modifying the existing recovery system to contain the contaminated groundwater. Because the RCRA system is operating and can be modified to meet the remedial goals for groundwater at the site, no other alternatives for groundwater are evaluated. Costs for groundwater treatment, therefore, are not included in this estimate. The cost of this alternative is estimated at \$100,000. Assuming a 30% contingency, total direct and indirect costs are \$130,000.

**Alternative 3: Capping**

In the capping alternative, all four areas will be capped with asphalt. The caps will reduce the risk of contact with contaminated soil and reduce the quantity of leachate generated when rainwater filters through contaminated soil. The present cost of this alternative is estimated at \$185,000, assuming 30 years of maintenance.

**Alternative 4: Excavation with Offsite Disposal**

In the excavation and offsite disposal alternative, soil exceeding cleanup goals will be removed from OU 10 and disposed at an approved Subtitle D landfill to remove all current and future threats to human health and the environment posed by soil contamination. Soil would be sampled at the extent of the excavation to verify that soil

remaining meets the cleanup goals. The excavation would be refilled with clean soil. The present cost of this alternative is estimated at \$90,000, excluding dewatering; dewatering will cost approximately \$10,000 per week. Indirect costs, including engineering services/report preparation cost, and contingencies (30%), are expected to increase the Alternative 4 total project costs to \$247,000. Operating, maintaining, and sampling costs will not be required under this alternative.

**COMPARISON OF ALTERNATIVES**

The Navy evaluated each alternative by the criteria shown below to determine which would best reduce risk posed by OU 10.

**Criteria for Evaluating Remedial Alternatives**

In selecting a preferred cleanup alternative, the Navy uses the following criteria to evaluate each of the alternatives developed in the Feasibility Study (FS). The first two criteria are essential and must be met before an alternative is considered further. The next five are used to further evaluate all options that meet the first two criteria. The final two criteria are used to further evaluate the Navy's proposed plan after the public comment period has ended and comments from the community, USEPA, and FDEP have been received. All nine criteria are explained in more detail here.

- Overall Protection of Human Health and the Environment** — Assesses degree to which alternative eliminates, reduces, or controls health and environmental threats through treatment, engineering methods, or institutional controls.
- Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** — Assesses compliance with federal/state requirements.
- Cost** — Weighing of benefits of a remedy against the cost of implementation.
- Implementability** — Refers to the technical feasibility and administrative ease of a remedy.
- Short-Term Effectiveness** — Length of time for remedy to achieve protection and potential impact of construction and implementation of the remedy.
- Long-Term Effectiveness and Performance** — Degree to which a remedy can maintain protection of health and environment once cleanup goals have been met.
- Reduction of Toxicity, Mobility, or Volume Through Treatment** — Refers to expected performance of the treatment technologies to lessen harmful nature, movement, or amount of contaminants.
- State Acceptance** — Consideration of state's opinion of the preferred alternatives.
- Community Acceptance** — Consideration of public comments on the Proposed Plan.

**Overall Protection of Human Health and the Environment**

Alternative 1 would not treat or monitor the site and, therefore, would not protect human health and the environment. Alternative 2 would designate the area for industrial use only, which would prohibit Magazine Point from being used for residential use. In addition, a leachability study would be conducted to assess whether site soil contaminants are causing groundwater contaminant levels to exceed drinking water standards. If threats to groundwater are identified, the soil may be removed. After the RCRA system is modified, this alternative will be effective in protecting human health and the environment. Alternative 3 would limit both leaching and the risk to human health by covering the areas with asphalt. Alternative 4 would remove the soil and replace it with clean fill. Alternative 4 provides the most immediate protection of human health and the environment.

**Compliance with Federal/State ARARs**

The applicable or relevant and appropriate requirements that apply include chemical-, location-, and action-specific state and federal standards. Alternative 1 does not meet these standards for the protection of human health or groundwater because exceedances of the cleanup goals exist. Alternative 2 protects human health by restricting land use and provides a mechanism to check that groundwater is protected from soil contaminants. Groundwater ARARs