2/1/05-01657

Proposed Plan
Site 18: Building 476 Discharge Area
Naval Weapons Station Yorktown
Yorktown, Virginia

February 2005

This Proposed Plan presents the preferred remedial alternative for addressing soil, groundwater, surface water, and sediment at Site 18, Building 476 Discharge Area, at Naval Weapons Station (WPNSTA) Yorktown, Virginia, and provides the rationale for this preference. The location of the site is shown on Figure 1.

This document is issued jointly by the U.S. Department of the Navy (Navy), the lead agency for site activities, and the U.S. Environmental Protection Agency (USEPA) Region III, in consultation with the Virginia Department of Environmental Quality (VDEQ), the support agencies. The Navy and USEPA, in conjunction with VDEQ, will make a final decision on the remedial approach for media at Site 18 after reviewing and considering all information submitted during the 30-day public comment period. Because these agencies may decide to modify the preferred remedial alternative or select another response action based upon new information or public comments, the public is encouraged to review and comment on the remedial alternative presented in this Proposed Plan.

The Navy is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This Proposed Plan summarizes information detailed in the Site 18 Round Two Remedial Investigation (RI) report and other documents contained in the Administrative Record file for WPNSTA Yorktown. The administrative record file is available for public review at the Virgil I. Grissom Public Library in Newport News, Virginia. The Navy, USEPA, and VDEQ encourage the public to review these documents to better understand Site 18 and other Superfund activities that have been conducted at WPNSTA Yorktown.

This Proposed Plan for Site 18 provides an overview of the status of the site and is divided into the following sections:

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

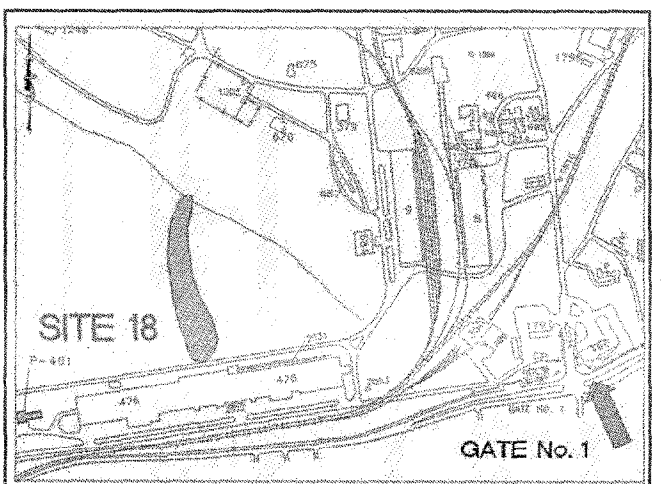

Figure 1 – Vicinity of Site 18

1.0 Site Description And Background

Site 18 is a one-quarter mile long, drainage ditch located north of Building 476 in the southeastern area of the installation along a small tributary leading to Lee Pond (Figure 2). This area was in use from the 1940s to the 1960s. The discharge into the ditch reportedly contained battery acid waste, consisting of hydrochloric acid or calcium hydroxide and dissolved metals such as lead, cadmium, nickel, and antimony. An estimated 100 to 200 pounds of metals may have been discharged. Battery acid waste no longer discharges from Building 476 into this drainage way. Figure 3 depicts an aerial photograph of Site 18. Currently, Site 18 is a drainageway that appears to be a natural stream in some areas and an excavated trench in others. From the amount of erosion present in portions of the drainageway, a good deal of water appears to flow through the area during storms.

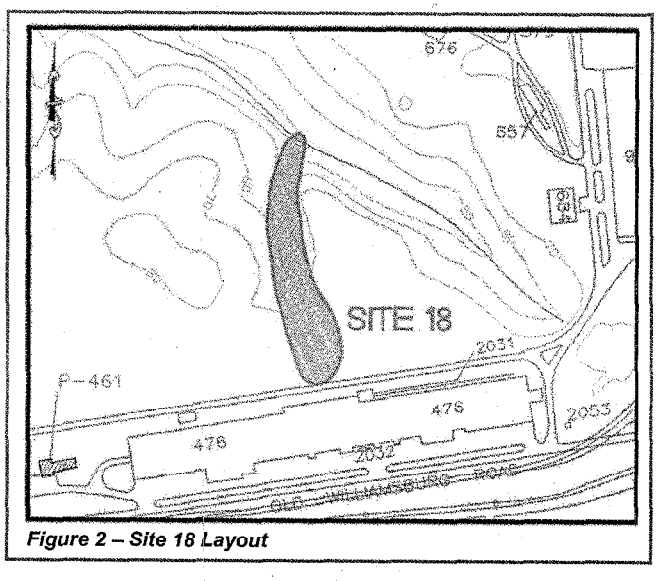

Figure 2 – Site 18 Layout

2.0 Site Characteristics

Site 18 is located within a wooded area behind Building 476 and includes a small intermittent drainage way that flows perpendicular from the building. The general topography slopes slightly into the wooded area north (behind) of Building 476. Surface water runoff is controlled by the small intermittent drainage way that also receives stormwater drainage from Building 476 and the surrounding area. This intermittent drainage way flows toward a larger, unnamed intermittent tributary that flows into a pond near the camping and picnic area and eventually into Lee Pond.

2.1 Summary of Studies and Investigations

Summaries of previous investigations are provided in the following subsections.

Initial Assessment Study (IAS)

In 1984, an IAS was conducted to identify and assess sites posing a potential threat to human health and/or the environment due to contamination from past operations. A total of 19 potentially contaminated sites were identified based on information from historical records, aerial photographs, field inspections, and personnel interviews. Each site was evaluated for the type of contamination, migration pathways, and potential receptors. The IAS concluded that 15 of the 19 sites, including Site 18, were of sufficient potential threat to human health or the environment to warrant a Confirmation Study.

Confirmation Study and RI Interim Report

Based on the recommendations in the IAS, a Confirmation Study was conducted at Site 18. Two rounds of data were obtained during the Confirmation Study, one in 1986 and one in 1989. Results of the two investigations were presented in the Draft RI Interim Report. This report was revised in 1991 to incorporate comments from the regulatory agencies. The RI Interim Report recommended that further RI activities be completed at 14 of the 15 sites identified during the IAS, including Site 18.

Round One RI

The Round One RI conducted at Site 18 in 1993 consisted of surface soil, groundwater, surface water, and sediment investigations. During the Round One RI, six surface soil samples, one groundwater sample, five surface water samples, and ten sediment samples were collected at Site 18. The soil samples contained arsenic and zinc at concentrations above Round One background levels at four sample locations, lead at two locations, and copper at three locations. Groundwater samples showed that no filtered samples contained inorganic concentrations that exceeded State or Federal criteria. Copper and zinc in surface water exceeded the State and Federal criteria, but not at the farthest downstream sampling point or in the branch northeast of Building 476. Sediment samples in the ditch also exceeded background inorganic concentrations for beryllium at only one location. Based on the results of the Round One RI, a human health and ecological risk assessment was recommended.

Habitat Evaluation Results

A habitat evaluation was conducted in 1995 at 15 sites at WPNSTA Yorktown including Site 18. The objectives of the study were to: identify potential aquatic and terrestrial receptors for the ecological risk assessment; identify habitats within the study areas; identify existing wetland areas and sensitive environments; and identify any endangered species in the study areas.

Round Two RI

During the Round Two RI conducted in 1997, additional data were collected to provide information necessary to characterize potential human health effects and ecological impacts resulting from previous site activities. Samples of surface and subsurface soil, groundwater, surface water, and sediment were collected. No organic contaminants were detection in the surface or subsurface soil, the groundwater, or the sediment. Inorganic contaminants were detected in the soil; no inorganic contaminants were detected in the filtered groundwater samples. The results of the Human Health Risk Assessment (HHRA) and the ecological risk assessment completed as part of the Round Two RI confirmed that there are no unacceptable human health or ecological risks at Site 18.

Figure 3 – Site 18 Aerial View

2.2 Current Condition

Based on site history, previous investigations, and findings from the RI, past activities at Site 18 have not impacted surface and subsurface soils, groundwater, surface water, and sediment. Detailed findings on the nature and extent of contamination at the site are presented in the Round Two RI.

3.0 Scope and Role of Proposed Plan

In 1975, the Department of Defense (DOD) began the Installation Restoration Program (IRP) at military facilities to identify, evaluate, and remediate DOD-related environmental contamination resulting from activities that involved hazardous and toxic materials. In 1976, the Resource Conservation and Recovery Act (RCRA) was passed by Congress to address human health and environmental issues related to the management and disposal practices of hazardous wastes. In 1980, Congress passed CERCLA, more commonly known as "Superfund," to investigate and remediate areas affected by past hazardous waste management practices. The CERCLA program is administered by the USEPA. The DOD's IRP was reauthorized in 1981 to include additional responsibilities and authorities specified by CERCLA. The present IRP is implemented pursuant to the Defense Environmental Restoration Program of 1986, and in accordance with CERCLA and all applicable, and relevant and appropriate, Federal and State laws. Additionally, the President of the United States has delegated certain CERCLA responsibilities to DOD with respect to the cleanup of facilities such as WPNSTA Yorktown, which are under the jurisdiction, custody, or control of DOD. In 1992, WPNSTA Yorktown was placed on USEPA's National Priorities List (NPL) of Superfund sites in accordance with Section 120(d)(1) of CERCLA. In accordance with 120(e) of CERCLA, a Federal Facilities Agreement (FFA) was entered into between the Navy and USEPA Region III in September 1994. WPNSTA Yorktown ensures that the environmental impacts associated with the past and present activities are thoroughly investigated and that appropriate remedial action is taken to protect the public heath, welfare, and environment through the implementation of the FFA.

Annual Site Management Plans have been developed since 1994 and provide the Navy with a management tool to organize, plan, and prioritize the remedial activities at WPNSTA Yorktown.

4.0 Summary of Site Risks

4.1 Human Health Risks

The public health risks associated with exposure to contaminated media within Site 18 were evaluated in a HHRA that was presented in the Round Two RI Report. The HHRA evaluated and assessed the potential public health risks that might result under current and potential

Table 1
What is Human Health Risk and How is it Calculated?

A human health risk assessment estimates the "baseline risk," an estimate of the likelihood of health problems occurring if no cleanup action were taken at a site. To estimate the baseline risk at a site, the Navy performed the following four-step process:

Step 1: Analyze Contamination
Step 2: Estimate Exposure
Step 3: Assess Potential Health Dangers
Step 4: Characterize Site Risk

In Step 1, the Navy looked at the concentrations of contaminants found at the site as well as past scientific studies on the effects these contaminants have had on people (or animals, when human studies are unavailable). Comparisons between site-specific concentrations and concentrations reported in past studies helped the Navy to determine which contaminants were most likely to pose the greatest threat to human health.

In Step 2, the Navy considered the different ways that people might be exposed to the contaminants identified in Step 1, the concentrations that people might be exposed to, the potential frequency (how often), and the length of exposure. Using this information, the Navy calculated a "reasonable maximum exposure" (RME) scenario that portrayed the highest level of human exposure that could reasonably be expected to occur.

In Step 3, the Navy used the information from Step 2 combined with the information on the toxicity of each chemical to assess potential health risks. The Navy considered two types of risk: (1) Cancer risk and (2) Noncancer risk. The Incremental Lifetime Cancer Risk (ILCR) was used to evaluate cancer risks and represented the probability of an individual developing cancer over a lifetime as a result of exposure to a chemical. The likelihood of any kind of cancer resulting from a contaminated site is generally expressed as an upper bound probability, for example, a "1 in 10,000 chance," which represents the addition of 1 additional cancer case in a population due to exposure to site contaminants. To assess cancer health risks, the Navy compared ILCRs with USEPA's recommended action range of 1 in 10,000 to 1 in 1,000,000. For noncancer health effects, the Navy calculated a "Hazard Index" (HI), or "threshold level" (measured usually as an HI of less than 1), below which noncancer health effects are no longer predicted.

In Step 4, the Navy determined whether site risks were great enough to cause health problems for people at or near the site. The results of the three previous steps were combined, evaluated, and summarized. The Navy added up the potential risks from the individual contaminants and exposure pathways and calculated a total site risk.

future land use scenarios. A summary of the HHRA process is presented in Table 1.

The HHRA evaluated the public health risks associated with exposure to contaminated media (soil, groundwater, surface water, and sediment) at the site based on contaminant data collected during the Round Two RI.

The HHRA considered the following categories for exposure to the chemicals of potential concern at Site 18:

- Current Adult Maintenance Workers
- Current On-Station Adolescent Recreational Users and Trespassers (7-15 years)
- Current On-Station Adult Recreational Users and Trespassers
- Future Adult Construction Workers
- Future Adult Industrial/Commercial Workers
- Future On-Station Young Child Residents (1-6 years)
- Future On-Station Adult Residents

The total site carcinogenic and noncarcinogenic risks estimated for all current and future receptors in the HHRA are presented in Table 2.

A potentially unacceptable total site risk was identified for future adult construction workers. Future adult construction workers were evaluated for exposures to contaminants in subsurface soil at Site 18. Carcinogenic risks estimated for these workers were within USEPA's acceptable target range. However, the total site hazard index (HI) (2.0), used to measure noncarcinogenic risk, exceeded the target value of 1.0 because of ingestion of arsenic and iron in subsurface soil. Individual hazard quotient values estimated for arsenic and iron are less than 1.0. Since arsenic and iron target different organs,

Table 2
Summary of Total Site Human Health Risks

Receptors	Site 18	
	Total ILCR	Total HI
Current Adult Maintenance Workers	0.093 in 10,000	0.22
Current On-Station Adolescent Recreational Users and Trespassers	0.014 in 10,000	0.10
Current On-Station Adult Recreational Users and Trespassers	0.028 in 10,000	0.06
Future Adult Construction Workers(1)	0.039 in 10,000	2.0
Future Adult Industrial/Commercial Workers	0.0028 in 10,000	0.01
Future On-Station Child Residents (based on maximum exposure)	0.032 in 10,000	0.45
Future On-Station Adult Residents (based on maximum exposure)	0.018 in 10,000	0.08

Notes (see Table 1 for definitions):
ILCR = Incremental Lifetime Cancer Risks
HI = Noncancer Hazard Index
Shading indicates a risk level greater than the USEPA acceptable action range

(1) The total site HI exceeded 1.0 due to accidental ingestion of iron and arsenic in subsurface soil. Iron contributed 48.1% of the risk estimated for the ingestion pathway; while arsenic contributed 33.3% of the pathway risk. However, it should be noted that there were no individual hazard quotients that exceeded unity, and that iron and arsenic target different organs. Therefore, no adverse health effects are expected.

no real adverse health effects are expected for construction workers after exposure to subsurface soil.

Carcinogenic and noncarcinogenic risks estimated for all other receptors were less than, or within, the appropriate USEPA target risk criteria. Therefore, it can be concluded that no potentially unacceptable risks are associated with the environmental media investigated at Site 18.

4.2 Ecological Risks

The objective of the ecological risk assessment was to determine whether past site operations have adversely affected the ecological integrity of the terrestrial and aquatic community at Site 18. No chemicals were identified as risk drivers for Site 18. The ecological risk assessment concluded that levels of chemicals in site media do not pose an unacceptable risk to ecological receptor populations. This assessment is based on few detected exceedances of reference effects-based concentrations, on confirmation that there is no "dilution" of maximum concentrations requiring further investigations, and on comparisons of site conditions to reference areas.

5.0 Remedial Action Objectives

As part of the feasibility study process, risks identified in the remedial investigation are re-evaluated to establish remediation goals. Remediation goals are based on results of the human health and ecological risk assessments. If a site does not pose a risk to human health or the environment, remediation goals cannot be established.

Since there are no unacceptable risks to human health or the environment at Site 18, remediation goals were not developed.

6.0 Summary of Remedial Alternatives

The No Action remedial alternative is the only alternative considered for Site 18 because there is no unacceptable risk identified for this site. Under the No Action alternative, no action will be taken since no media were determined to pose an unacceptable risk to human health or the environment.

7.0 Evaluation of Remedial Alternatives

The National Contingency Plan outlines the approach for comparing remedial alternatives. Evaluation of the alternatives uses nine criteria (see the glossary on page 8 for a detailed explanation of each). These evaluation criteria are grouped as "threshold," "primary balancing," and "modifying." All alternatives are evaluated against threshold and primary balancing criteria, which are technical criteria based on environmental protection, cost, and engineering feasibility.

To be considered for selection as the remedial approach, an alternative must meet the following threshold criteria: (1) overall protection of human health and the environment and (2) compliance with applicable or relevant and appropriate requirements (ARARs) and selected to-be-considered criteria.

The primary balancing criteria are then considered to determine which alternative provides the best combination of attributes. The primary balancing criteria are: (1) long-term effectiveness and permanence; (2) reduction in toxicity, mobility, or volume through treatment; (3) short-term effectiveness; (4) ease of implementation; and (5) cost.

The preferred alternatives are then evaluated against the two modifying criteria: (1) acceptance by the State, and (2) acceptance by the community.

Since there are no unacceptable risks identified at Site 18, the No Action alternative will protect human health and the environment. There are no contaminants of concern for Site 18; therefore, chemical-specific ARARs do not apply. No location- or action-specific ARARs apply to this alternative either. The No Action alternative provides long-term effectiveness and permanence for Site 18. The No Action alternative will not include any reduction of toxicity, mobility, or volume of the contaminants through treatment. This alternative will have no short-term effects on human health and the environment associated with the handling, treatment, or transportation of hazardous substances because this alternative includes no remedial actions. Because this alternative does not include any remedial actions or institutional controls, there are no implementability concerns associated with this remedial alternative. There are no costs associated with the No Action remedial alternative for Site 18.

8.0 THE PREFERRED REMEDIAL ALTERNATIVE

No Action is the preferred alternative because Site 18 poses no unacceptable risk to human health or the environment.

9.0 COMMUNITY PARTICIPATION

A community relations program is being conducted through the on-going IRP for WPNSTA Yorktown. Public input is important and is a key element in the decision-making process. Nearby residents and other interested parties are strongly encouraged to use the comment period to relay questions and concerns they may have about the proposed remedial alternative for Site 18. The Navy will summarize and respond to public comments in a Responsiveness Summary that will become part of the official Record of Decision (ROD).

This Proposed Plan fulfills the public participation requirements of CERCLA Section 117(a), which specifies that the lead agency (the Navy) must publish a plan outlining remedial alternatives evaluated for the site and identify the preferred alternative. All documents referenced in this Proposed Plan are available for public review in the Administrative Record (see "Available Information" below).

As part of the ongoing IRP at WPNSTA Yorktown, the Navy has routinely held meetings of the Restoration Advisory Board (RAB), which is a standing group of Navy, regulatory, and community representatives. The mission of the RAB includes informing the local community of the Navy's ongoing and planned remedial activities associated with the IRP. The RAB meetings have included discussions on the status of remedial activities at Site 18. These meetings are open to the public and are held about every six months.

9.1 Public Comment Period

The public comment period for the Proposed Plan gives the public an opportunity to provide input regarding the planned process for remediating contamination at Site 18. The public comment period will begin on February 13, 2005 and will end on March 14, 2005 for this Proposed Plan for Site 18. A public meeting will be held on February 16, 2005 from 7:30 to 8:30 pm at the Charles E. Brown Park Community Building, Old Williamsburg Road (Route 238), Lackey, Virginia. All interested parties are encouraged to attend the meeting to learn more about the remedial alternative developed for the site. The meeting will provide an additional opportunity for the public to submit comments on the Proposed Plan to the Navy.

During the comment period, interested parties may submit written comments concerning this Proposed Plan to any of the following individuals:

Commanding Officer
Naval Facilities Engineering Command, Mid-Atlantic
9742 Maryland Avenue
Building N-26, Room 3208
Norfolk, Virginia 23511-3095
Attn: Remedial Project Manager, Ms. Linda Cole, P.E.
(757) 322-4734

Commander, Atlantic Division
Naval Facilities Engineering Command
6506 Hampton Boulevard
Norfolk, Virginia 23508-1278
Attn: Public Affairs Officer, Mr. John E. Peters
(757) 322-8005

Remedial Project Manager
USEPA, Region III (3HSI3)
1650 Arch Street
Philadelphia, Pennsylvania 19103
Attn: Mr. Greyson Franklin
(215) 814-2333

Virginia Department of Environmental Quality
Federal Facilities Program
629 East Main Street, 4th Floor
Richmond, Virginia 23240-0009
Attn: Mr. Stephen Mihalko
(804) 698-4202

Comments on the Proposed Plan must be postmarked no later than March 14, 2005. Based on comments or new information, the Navy may modify the preferred alternative outlined in the Proposed Plan.

For your convenience, page 10 of this document may be used to provide comments to the Navy. Use of this form to submit comments is not mandatory.

9.2 Record of Decision

After the public comment period, the Navy and USEPA, in consultation with VDEQ, will determine whether the Proposed Plan should be modified based on the comments received. These modifications, if required, will be made by the Navy and USEPA, and will be reviewed by VDEQ. If the modifications substantially change the proposed remedy, additional public comments may be solicited. If not, then the USEPA and the Navy will prepare and sign a ROD. However, final concurrence with the alternative will be provided following review of all comments received during the public comment period. The ROD will detail the remedial actions chosen for the site and will include the Navy's responses to comments received during the public comment period.

9.3 Information Repositories

The Administrative Record for Site 18 is available to the community at the following location:

Virgil I. Grissom Public Library
366 Deshazor Drive
Newport News, Virginia 23506
(757) 369-3190

9.4 Mailing List

If you are not currently on the mailing list and would like to receive future publications pertaining to Site 18, please complete the requested information and mail this form to:

Commander, Atlantic Division
Naval Facilities Engineering Command
6506 Hampton Boulevard
Norfolk, Virginia 23508-1278
Attn: Public Affairs Officer, Mr. John E. Peters

Glossary

ARARs: Applicable or Relevant and Appropriate Standards, Limitations, Criteria, and Requirements; these are Federal or State environmental rules and regulations.

Carcinogenic Risk: Cancer risks are expressed as a number reflecting the increased chance that a person will develop cancer if exposed to chemicals or substances. For example, USEPA's acceptable risk range for Superfund sites is 1×10^{-4} to 1×10^{-6}, meaning there is one additional chance in ten thousand (1×10^{-4}) to one additional chance in one million (1×10^{-6}) that a person will develop cancer if exposed to a site that is not remediated.

CERCLA: Comprehensive Environmental Response, Compensation and Liability Act (42 U.S.C. 9601-9675). A Federal law, commonly referred to as the Superfund Program, passed in 1980 that provides for cleanup and emergency response in connection with numerous existing inactive hazardous waste disposal sites that endanger public health and safety of the environment.

Feasibility Study: Analysis of the practicability of a proposal. The feasibility study usually recommends selection of a cost-effective alternative.

Groundwater: Subsurface water that occurs in soils and geologic formations that are fully saturated.

HHRA: Baseline Human Health Risk Assessment. An evaluation of the risk posed to human health should remedial activities not be implemented.

HI: Hazard Index. A number indicative of noncarcinogenic health effects that is the ratio of the existing level of exposure to an acceptable level of exposure. A value equal to or less than one indicates that the human population is not likely to experience adverse effects.

ILCR: Incremental Lifetime Cancer Risk. The incremental probability of an individual developing cancer over a lifetime as a result of exposure to a chemical.

Media: Soil, groundwater, surface water, or sediment at the site.

NCP: National Oil and Hazardous Substances Contingency Plan. Provides the organizational structure and procedures for preparing for and responding to discharges of oil and releases of hazardous substances, pollutants, and contaminants.

Nine Evaluation Criteria:

- Overall Protection of Human Health and the Environment: Addresses whether a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

- Compliance with ARARs: Addresses whether a remedy will meet all of the ARARs of other Federal and State laws and/or justifies a waiver.

- Long-Term Effectiveness and Permanence: The expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.

- Reduction in Toxicity, Mobility, or Volume through Treatment: The anticipated performance of the treatment technologies a remedy may employ.

- Short-Term Effectiveness: The period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until cleanup goals are achieved.

- Implementability: The technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement an option.

- Cost: Estimated capital, operation and maintenance, and present-worth costs.

- State Acceptance: State support agency comments on the Proposed Plan.

- Community Acceptance: The public's general response to the alternatives described in the Proposed Plan and the RI and Feasibility Study Reports. The specific responses to the public comments are addressed in the Responsiveness Summary section of the Record of Decision.

NPL: National Priorities List. A list, developed by USEPA, of uncontrolled hazardous substances release sites in the United States that are considered priorities for long-term remedial evaluation and response.

Proposed Plan: A document that presents a proposed cleanup alternative and requests public input regarding the proposed alternative.

Public Comment Period: The time allowed for the members of an affected community to express views and concerns regarding an action proposed to be taken by USEPA, such as a rulemaking, permit, or Superfund remedy selection.

RAOs: Remedial Action Objectives. Objectives of remedial actions which are developed based on contaminated media, contaminants of concern, potential receptors and exposure scenarios, human health and ecological risk assessment, and attainment of regulatory cleanup levels, if any exist.

Remedial Action: Implementation of plans and specifications, developed as part of the design, to remediate a site.

RI: Remedial Investigation. A study of a facility that supports the selection of a remedy for a site where hazardous substances have been disposed. The RI identifies the nature and extent of contamination at the facility.

ROD: Record of Decision. A legal document that describes the cleanup action or remedy selected for a site, the basis for the choice of that remedy, and public comment on alternative remedies.

Site: The facility and any other areas in close proximity to the facility where a hazardous substance, hazardous waste, hazardous constituent, pollutant, or contaminant from the facility has been deposited, stored, disposed of, or placed or has migrated or otherwise come to be located.

USEPA: United States Environmental Protection Agency.

VDEQ: Virginia Department of Environmental Quality

Commander, Atlantic Division
Naval Facilities Engineering Command
6506 Hampton Boulevard
Norfolk, Virginia 23508-1278
Attention: Public Affairs Officer, Mr. John E. Peters

Name

Address

Affiliation

Phone ( )

Please print or type comments here: