Department of the Navy
Proposed Plan for OU-7
Soil Cover and Land Use Controls for Sites 6 and 7

Naval Air Warfare Center
Warminster, Pennsylvania **FEBRUARY 2000**

NAVY ANNOUNCES PROPOSED PLAN

The Department of the Navy has completed a Remedial Investigation (RI) and a Feasibility Study Report (FS) for Operable Unit 7 (OU-7) addressing soil associated with Sites 6 and 7 at the Naval Air Warfare Center (NAWC or "Site") in Warminster, Pennsylvania. This RI / FS has been completed as part of the Navy's Installation Restoration Program (IRP) and the Superfund Remedial Program.

The purpose of the RI was to evaluate the nature and extent of any contamination associated with Sites 6 and 7 at NAWC. The FS evaluates the alternatives for eliminating unacceptable risks identified in the RI. This Proposed Plan summarizes the findings of the FS report and proposes that a two foot vegetated soil cover be placed and / or maintained over site wide soils. It also proposes the preparation and implementation of institutional controls to prevent the use of the property for non-recreational uses, to impose excavation restrictions on the property and to ensure maintenance of the two foot soil cover. This Proposed Plan also discusses other alternatives and provides a rationale for this proposal. In addition, the Proposed Plan explains how the public can participate in the decision-making process and provides addresses and telephone numbers for the appropriate Navy contacts.

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

This document is issued by the Navy, the lead agency for IRP and Superfund activities at the Site, and by EPA, the support agency for Superfund actions. The Navy and EPA will issue a final decision regarding the disposition of Sites 6 and 7 (OU-7) after the public comment period has ended and the comments submitted during this time have been reviewed and considered.

The Navy is issuing this Proposed Plan as part of its public participation responsibilities under Sections 113 (k), 117(a), and 121(f) of the **Comprehensive Environmental Response, Compensation, and Liability Act** (CERCLA, commonly referred to as the Superfund Law), as amended by the Superfund Amendments and Reauthorization Act. This document summarizes information that can be found in greater detail in the **Remedial Investigation** (RI) report and the **Feasibility Study** (FS) for OU-7 and other Site documents contained in the **administrative record** file for this Site. The Navy invites the public to review these and to comment on the Proposed Plan during the comment period. The administrative record file, which supports this Proposed Plan, is available for review at the Caretaker Site Office trailer, 860 Flamingo Alley, Warminster, Pennsylvania 18974 (215) 441-7634 Hours; Monday Friday, 9 a.m. - 4 p.m. or at the Bucks County Library 150 South Pine Street Doylestown, Pennsylvania 18901 (215) 348-9081 Hours: Monday - Thursday, 9 a.m. - 9 p.m. Friday, 9 a.m. - 6 p.m. Saturday, 9 a m. - 5 p.m.

A final decision regarding the disposition of Sites 6 and 7 will be documented in a Record of Decision (ROD) which will be issued after all public comments are considered. The ROD will be placed in the administrative record file for review by the public.

This is the fifth Proposed Plan issued by the Navy for the Site. The first Proposed Plan was

issued on April 26, 1993, and addressed Operable Unit 1 (OU-1), which included contaminated groundwater in overburden and shallow bedrock attributable to Area A and Area B at NAWC. Subsequent to the issuance of the Proposed Plan for OU-1, the Navy and EPA conducted a Superfund Removal Action, providing water treatment system and public water connections to residences in the vicinity of NAWC. This Removal Action was designated as Operable Unit 2 (OU-2). Due to the time-critical nature of this Removal Action, a Proposed Plan was not issued for OU-2. The second Proposed Plan was issued on August 19, 1994, and addressed Operable Unit 3 (OU-3), which included contaminated groundwater attributable to Area C at NAWC. Since the issuance of the Proposed Plan and subsequent Records of Decisions for OU-1 and OU-3, a groundwater treatment plant has been constructed within Area A and the cleanup of contaminated groundwater attributable to both Area A and Area C has begun. The third Proposed Plan was issued on June 5, 1997, and addressed contaminated groundwater attributable to Area D at NAWC, or Operable Unit 4 (OU-4). A Record of Decision for OU-4 was issued and cleanup of contaminated groundwater attributable to Area D has also been initiated. The fourth Proposed Plan was issued on August 20, 1999, and addressed soil, sediment and surface water associated with Site 8, or Operable Unit 5 (OU-5). A Record of Decision for OU-5 was issued on September 30, 1999.

SITE BACKGROUND

NAWC is a 824-acre facility located in Warminster Township, Northampton Township and Ivyland Borough, Bucks County, Pennsylvania (see Figure 1 for Site Location Map). As a result of the Base Realignment and Closure Act (BRAC), NAWC ceased operations on 30 September 1996. The majority of NAWC, including Sites 6 and 7, is being transferred to

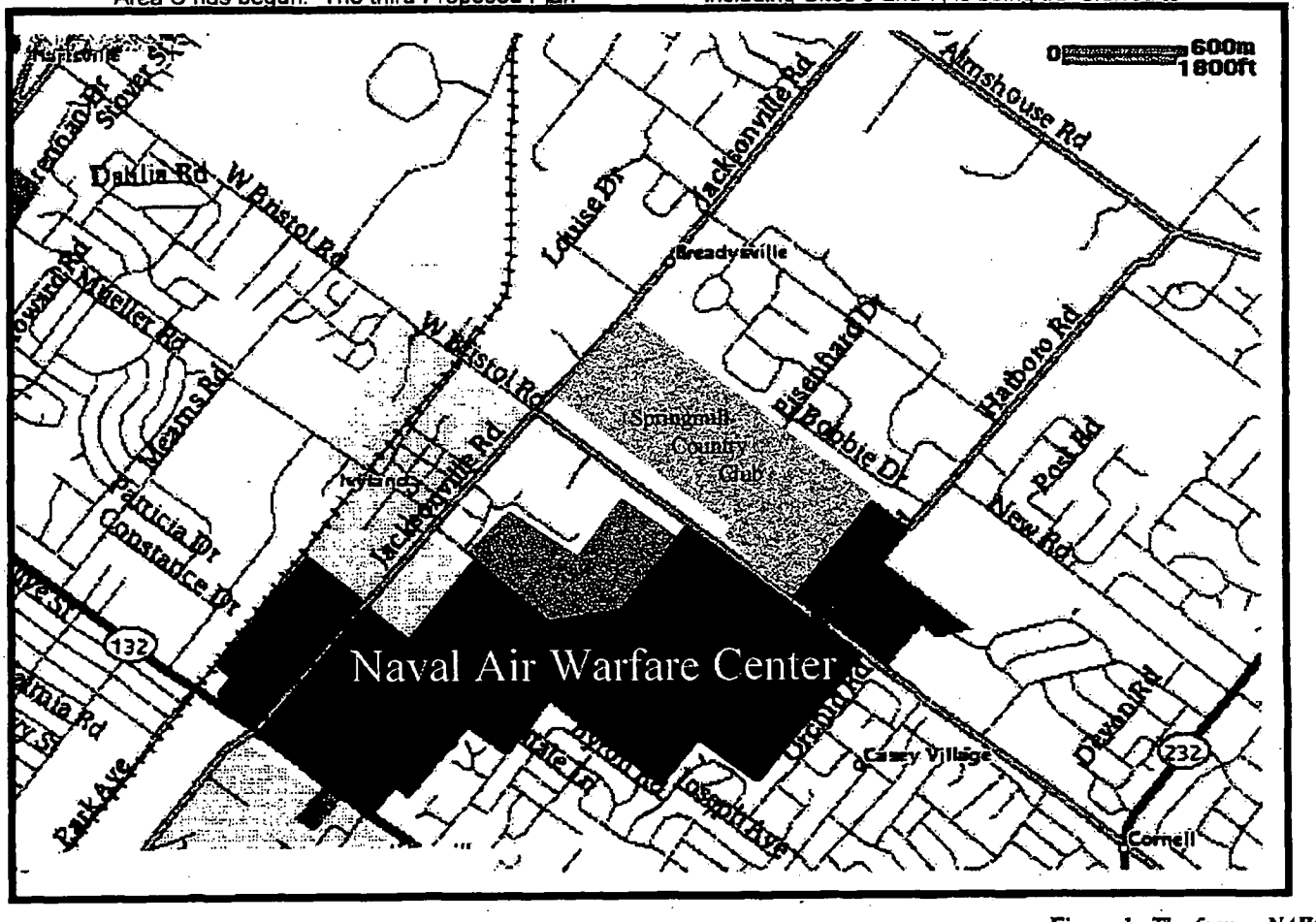

Figure 1. The former NAWC,

the private sector.

The facility lies in a populated suburban area surrounded by private homes, various commercial and industrial activities, and a golf course. On-site areas include various buildings and other complexes connected by paved roads, the runway and ramp area, mowed fields, and a small wooded area.

Commissioned in 1944, the facility's main function was research, development, testing, and evaluation for naval aircraft systems. NAWC also conducted studies in anti-submarine warfare systems and software development. Historically, wastes were generated during aircraft maintenance and repair, pest control, fire-fighting training, machine and plating shop operations, spray painting and various materials research and testing activities in laboratories. These wastes included paints, solvents, sludges from industrial wastewater treatment, and waste oils that were disposed in several pits, trenches, and landfills throughout the facility property. NAWC was listed on the Superfund **National Priorities List** in 1989. This list includes sites where uncontrolled hazardous substance releases present the most significant potential threats to human health and the environment. Areas reported by the Navy to have been potentially used for disposal of hazardous substances include eight locations covering more than 7 acres. These locations include the following:

Three waste disposal pits (sites 1, 3, and 6)

Two sludge disposal pit areas (sites 2 and 7)

Two landfills (sites 4 and 5)

One Fire Training Area (site 8)

Site 6 was reportedly used for disposal activities from 1960 to 1980. The site reportedly received unknown quantities of waste paints, solvents, oil, flammable wastes, grease trap waste, and demolition debris. These materials were reportedly disposed in pits excavated by backhoe through general dumping and backfilling though out the area.

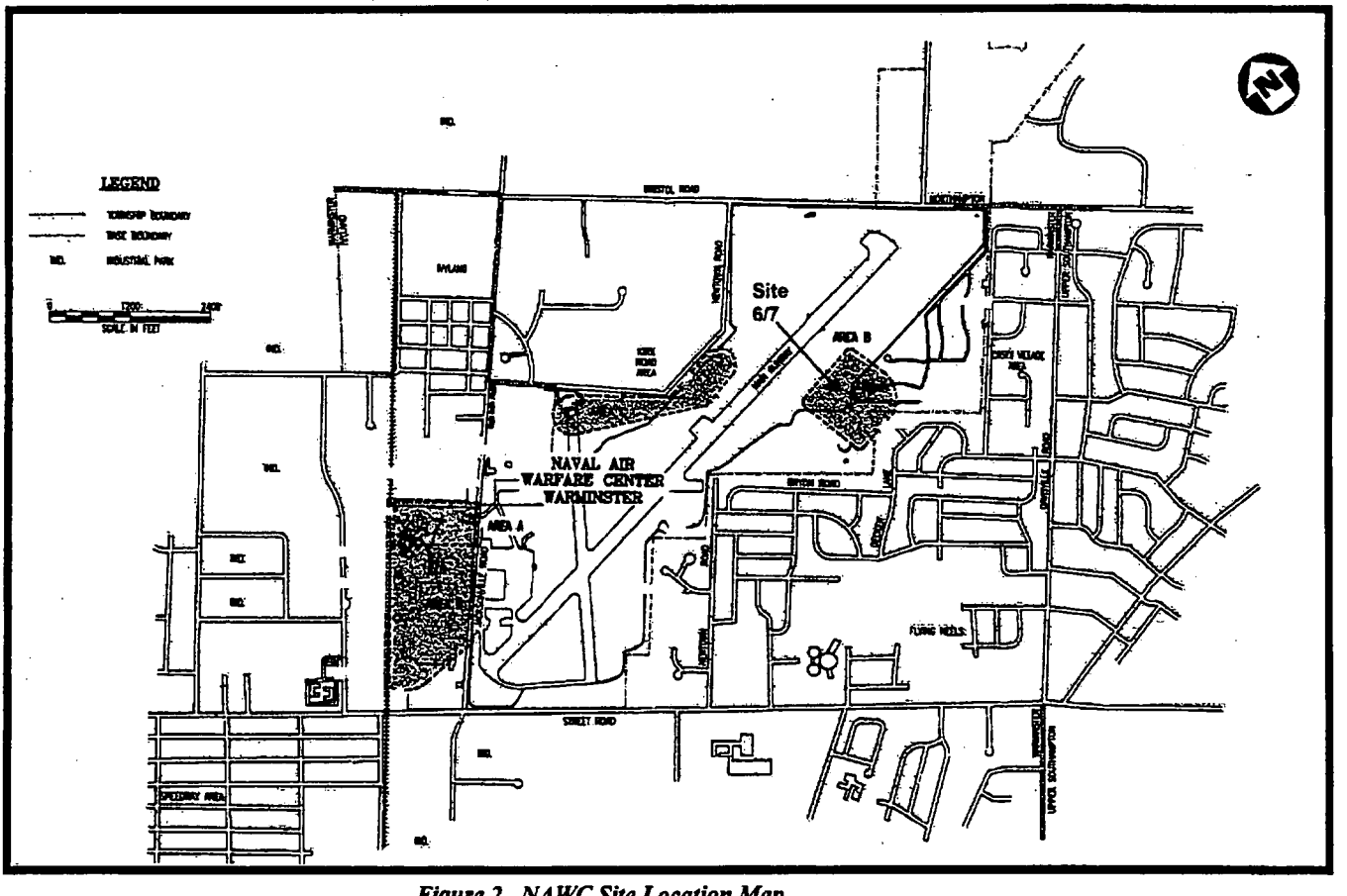

Figure 2. NAWC Site Location Map

Site 7 reportedly consisted of two disposal trenches that were used from 1950 to 1955 to receive sludge from the waste water treatment plant. The trenches were reportedly 100 feet long by 12 feet wide and 8 feet deep. The estimated potential capacity of each trench is 356 cubic yards. The trenches were reportedly backfilled with fill after each dumping episode. Upon site closure in 1955, the trenches were covered with 2 feet of soil, graded and seeded.

To date, potential and known hazardous substance releases at NAWC Warminster have been addressed under CERCLA by an RI, which has been conducted in three phases. The Phase I RI was initiated in late 1988 and was completed on September 11,1990, with the release of the Phase I (or Stage 1) RI report. Phase I involved mapping **volatile organic compounds** (VOCs) in soil gas and detecting buried materials through electromagnetic surveys. The eight waste disposal locations were also investigated through soil borings and installation and sampling of groundwater monitoring wells. Test pits were excavated, nearby wells were inventoried, and a bedrock fracture-trace analysis was conducted.
The Phase II RI began at the end of 1991 and included installing additional monitoring wells, sampling and analyzing groundwater, and evaluating aquifer characteristics by performing hydraulic tests. Both the Phase I and Phase II RI investigated the nature and extent of groundwater contamination within the vicinity of Sites 1, 2, and 3 (Area A), Sites 5, 6, and 7 (Area B) and Sites 4 and 8 (Area C). See Figure 2 for an area layout of the former NAWC.

In 1993, the Navy began work on a Phase III RI which included further investigation of the natur and extent of contaminated groundwater attributable to Areas A, B and C, as well as potentially contaminated soils, buried wastes and surface water associated with these areas. Based on the RI findings, the conditions at Sites 6 and 7 warranted a removal action. Although the current industrial land use at the site restricts access by the general public, the planned reuse calls for open space and recreational land use in the vicinity of the site. Removal actions were initiated at Sites 6 and 7 in May 1997 and were completed in September 1997. The primary objective of the subject action was to remove soils / waste known to present a threat to groundwater quality. Actions included the excavation and off-site disposal of about 3,698 tons of soil and debris from three discrete excavations and the removal of construction debris and concrete from the surface area.

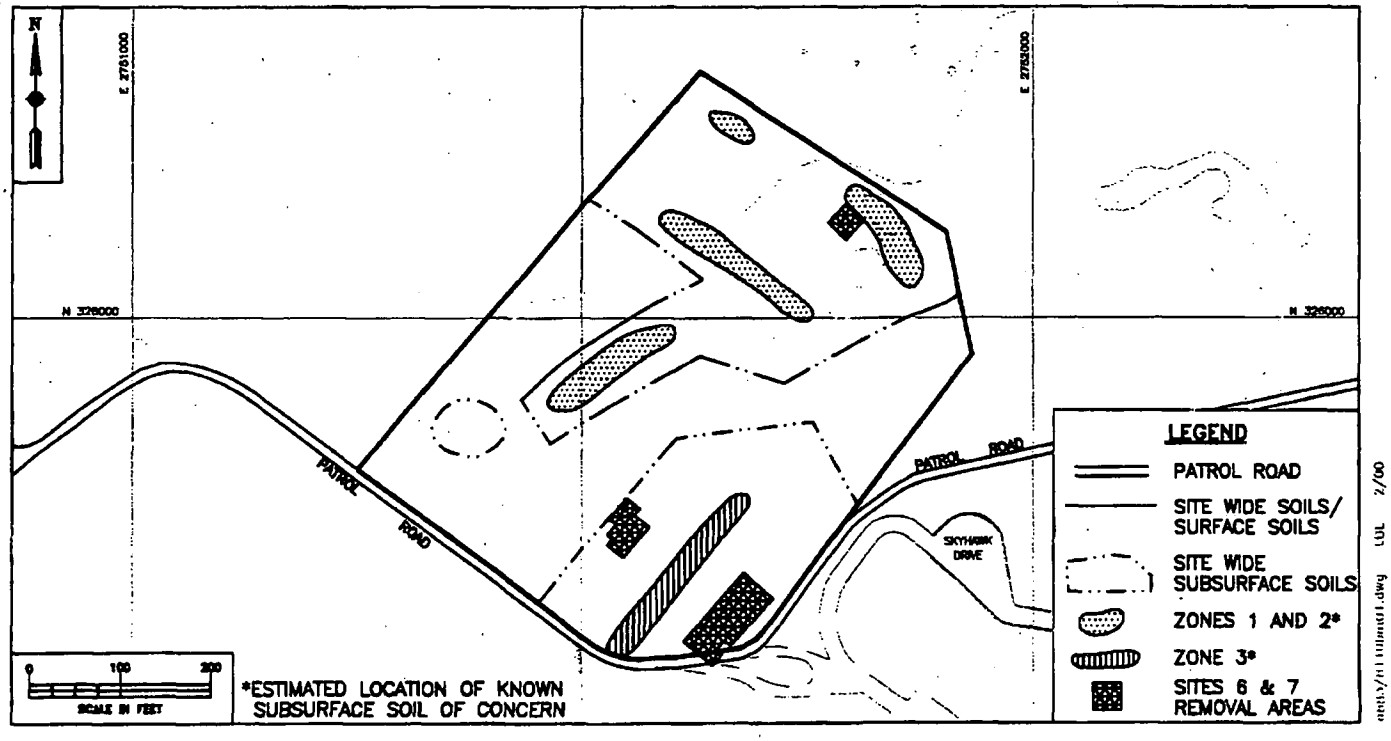

Figure 3. Location Map for Sites 6 and 7

Samples from the excavated areas were collected according to Pennsylvania Department of Environmental Protection (PADEP) criteria and guidelines and were analyzed in accordance with the approved removal action plan. Sample results were reported to representatives of the United States Environmental Protection Agency (EPA), PADEP, and the Navy for review and action. Areas that were found to contain contaminant levels in excess of the clean-up goals, established according to federal and PADEP risk-based recreational and groundwater protection criteria, were excavated and sampled until sample results from the area indicated that no contaminants remained above clean-up goals.

The primary findings of the RI with regard to site conditions after completion of removal actions are summarized below.

- Disposal activities occurred over an area of approximately five acres. While discrete disposal locations such as pits or trenches were found within the site, materials related to disposal activities, including waste, residuals associated with waste and/or fill materials, were found throughout the 5-acre site.

- While not highly elevated, site-wide surface soils contain certain metals above background concentrations. Elevated metals in surface soils, which were apparent, include chromium and thallium. Organic compounds were not detected at significant concentrations or frequency in surface soils.

- Site-wide surface soils also contained elevated levels of metals apparently related to disposal activities, including chromium, thallium, cadmium, iron and lead. Again, no organic compounds were detected at significant concentrations or frequency. Elevated levels of trichloroethylene (TCE), tetrachloroethylene (PCE), and polychlorinated biphenyls (PCBs) detected prior to removal actions were removed by these response actions.

- Concentrations of metals in subsurface soils were higher within three zones, identified as Zones 1,2 and 3, which apparently included the remains of discrete pits or trenches used for the disposal of waste.

- Volatile organic compounds (VOCs) detected in groundwater in the area were not detected at levels which exceed groundwater protection criteria. This data suggests that response actions have met the objective of removing soils known to present threat to groundwater quality.

SUMMARY OF SITE RISKS

As part of the RI, a risk assessment was conducted with available data to estimate the potential risks to human heath posed by soils associated with Sites 6 and 7 after the removal action. To assess these risks, hypothetical exposure scenarios under residential and recreational use were calculated.

Potential human health risks are categorized as **carcinogenic or noncarcinogenic.** A hypothetical carcinogenic risk increase from exposure should not exceed a risk range from 1×10^{-6} (an increase of one case of cancer for one million people exposed) to 1×10^{-4} (one additional case per 10,000 people exposed). Noncarcinogenic risks are estimated utilizing Hazard Indices (HI), where an HI exceeding one is considered an unacceptable health risk.

Analytical results for surface soils and subsurface soils were evaluated according to the latest EPA risk assessment protocols to estimate risks associated with the recreational use planned for the property. While not reasonably anticipated, risks were also estimated for potential residential land use.

Under recreational land use, site wide surface soils were estimated to present a carcinogenic risk of 2.0×10^{-6}, while Hazard Indices for non-carcinogenic risks were less than 1. In each case, no unacceptable risk was identified.

While exposure to subsurface soils is not currently occurring, an evaluation was conducted to estimate the risk presented by subsurface soils in the event that these soils are displaced to the surface during recreational use of the property. In this case, the total carcinogenic risk presented by site wide subsurface soils for recreational use was 1.0×10^{-5}, which is within the acceptable range. For non-carcinogenic risk, the Hazard Index for chromium in site wide subsurface soils was estimated to range from 1.0 to 4.2. As a result, non-carcinogenic risks associated with site wide

subsurface soils are considered unacceptable. Risks associated with subsurface soils within Zones 1, 2, and 3 were also estimated. The total carcinogenic risk for each zone was acceptable. With regard to non-carcinogenic risks, all three zones had Hazard Indices in exceedance of 1, with the highest risk in Zone 3. As a result, non-carcinogenic risks for each zone were estimated to be unacceptable.

Assuming residential land use, the risks were generally similar to those associated with recreational land use with two primary exceptions. Both carcinogenic and non-carcinogenic risks associated with surface soils were estimated to be unacceptable. In this case the Hazard Index for chromium was estimated at 6.47, while the Hazard Index for thallium was estimated at 1.22. In addition, with regard to subsurface soils, thallium and iron were also found to present an unacceptable noncarcinogenic risk.

In summary, site wide subsurface soils present an unacceptable risk under the planned recreational use if these soils are excavated or brought to the surface by other means. In addition, while residential use is not reasonably anticipated, site wide surface soils would present an unacceptable risk under this use scenario.

Based on the findings above, actual or threatened releases of hazardous substances from Sites 6 and 7 at NAWC Warminster, if not addressed by a response action, may present potential or actual threats to public health welfare and environment.

REMEDIAL ACTION OBJECTIVES

The NAWC Reuse Plan issued by the FLRA and approved by local municipalities identifies the planned use of property occupied by Sites 6 and 7 as recreational. The objective of the remedial action is to eliminate unacceptable risks associated with potential exposure to site wide subsurface soils under this reasonably anticipated land use. In addition, institutional controls should be implemented to ensure the property is not used for residential purposes to eliminate unacceptable risk, which would be posed by surface soils under this potential use.

Below is a summary of remedial alternatives developed to meet these objectives. (Note: The NCP and CERCLA require that Alternative 1, No Action, also be considered).

SUMMARY OF ALTERNATIVES

Alternative 1: No Action
Under this alternative, no action would be undertaken to prevent exposure to subsurface contamination. This alternative would also include no monitoring by the Navy.

Alternative 2: Vegetated Soil Cover, Institutional Controls, and Monitoring
This alternative would include the placement and/or maintenance of two feet of vegetated soil cover. In addition, institutional controls would be prepared and implemented to prevent the use of property for non-recreational uses, to establish excavation restrictions, and ensure maintenance of the soil cover. Deed and use restrictions would be prepared and recorded for the property at the time of transfer. Monitoring would be performed to ensure the cover is maintained and the controls implemented as planned. Every five years, a formal review of site conditions would be conducted because residual waste materials would remain on-site.

Alternative 3: Focused Excavation, Off-Site Treatment/Disposal, Vegetated Soil Cover, Institutional Controls, and Monitoring
In addition to the components of Alternative 2, this alternative would include the excavation of known materials of concern in Zones 1 and 2, off-site treatment / disposal of this material, and backfilling of these zones. The institutional controls for excavated areas would be limited to any necessary for maintenance of the soil cover over remaining subsurface soils of concern. Monitoring and 5-year reviews would be required for this alternative.

Alternative 4: Expanded Excavation, Off-Site Treatment/Disposal, Vegetated Soil Cover, Institutional Controls, and Monitoring
This alternative is similar to Alternative 3 but also includes the excavation and off-site treatment / disposal of known subsurface materials of concern in Zone 3, off-site treatment / disposal of this material, and backfilling of these zones. The institutional controls for excavated areas would be limited to any necessary for maintenance of the soil cover over remaining subsurface soils of concern. Monitoring and 5-year reviews would be

required for this alternative.

Alternative 5: Complete Excavation and Off-Site Treatment/Disposal This alternative would include the excavation and removal of site wide surface and subsurface soils / materials as necessary to be protective of recreational as well as residential land use. All excavated soils / materials would be treated and / or disposed offsite. Excavated areas would be backfilled and grasses, shrubs and trees reestablished. Because all materials of concern would be removed from the site, no protective soil cover, institutional controls, monitoring or five-year review would be required.

EVALUATION OF ALTERNATIVES

Each alternative was evaluated using seven of the nine criteria specified in the NCP and the previously referenced EPA guidance. These criteria include overall protection of human health and the environment; compliance with applicable or relevant and appropriate requirements (ARARs); long-term effectiveness and permanence; reduction of toxicity, mobility or volume through treatment; short-term effectiveness; implementability; and cost. The other two criteria, state acceptance and community acceptance, will be applied and evaluated by the Navy after comments are received on the Proposed Plan and in public meetings. In addition to the individual alternative evaluation, a comparative evaluation applying the same criteria among all the alternatives was completed. The purpose of the comparative evaluation was to identify the positive and negative attributes of each alternative to assist decision-makers in selecting a final remedial action.

In general, with the exception of Alternative 1, all alternatives are protective of human health and the environment under the anticipated recreational land use. While residential use of the property is not planned, Alternative 5 would be protective in the case of this use, as well. Alternatives 2 through 5 comply with and can be implemented in accordance with ARARs. Alternative 5 requires extensive excavation, off-site transportation and disposal, and backfilling. Implementation of this alternative would require close coordination with appropriate agencies to maintain compliance with ARARs.

Alternatives 2 through 4 all can be effective over the long-term if institutional controls are enforced and the cover maintained (See discussion below on implementability). Alternatives 3 and 4 may be considered to provide additional levels of permanence by removing known wastes of concern. However, alternatives 2,3 and 4 all include a permanent soil cover and institutional controls as part of the protective long-term remedy. Alternative 5 (complete removal of all residual wastes) provides the highest level of long-term effectiveness and permanence. The long-term effectiveness and permanence of Alternatives 2, 3 and 4 are dependent on the adequate enforcement of controls and the performance of maintenance.

Alternatives 3,4, and 5 may include some reduction of toxicity, mobility, or volume through treatment. However, the amount of treatment that may be required is unknown.

Each of the alternatives can be implemented to provide for protection under the short-term effectiveness criteria. Alternative 2 poses the fewest and the most manageable potential short-term risks to workers, the environment and the community and would reach the remedial action objectives in the shortest time frame. Alternatives 3 and 4 could be accomplished in a similar time frame to that of Alternative 2, but would present increased short-term risks to site workers and would include increased truck traffic through the community. Alternative 5 presents the greatest short-term risk to the environment. The impact on wildlife and the environment by the removal of all trees and vegetation during excavation under this alternative would be significant. Implementation of Alternative 5 would also require additional truck traffic through the local community during excavation and backfilling stages.

Alternatives 2, 3 and 4 all include the placement and / or maintenance of a vegetated two-foot soil cover over site wide subsurface soils and institutional controls to prohibit residential use, control excavation, and maintain the vegetated soil cover. The institutional controls under these alternatives would be the same with one exception. Since known wastes of concern would be excavated under Alternatives 3 and 4, the controls for the areas of waste removal would be limited to any controls necessary to maintain a soil cover over remaining subsurface

soils of concern. Generally, the placement / maintenance of the cover and institutional controls under Alternatives 2, 3 and 4 appear to be equally implementable. Due to the very extensive removal and fill operations required under Alternative 5, the implementability of this alternative could be complex and a timely completion uncertain. The cost comparison is listed in Table 1.

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
$0	$225,429	$1,362,429	$1,973,429	$10,636,544

Table 1. Present Worth of Remediation Alternatives.

OU-7.

SUMMARY OF THE PREFERRED ALTERNATIVE

Based on a comparative evaluation of the alternatives, Alternative 2 is the preferred alternative for the site. This alternative effectively limits exposure to subsurface soils and is protective of human health and environment. This would be accomplished by placing / maintaining a vegetated, two-foot soil cover over the soils of interest, implementing land use controls, and monitoring the site as necessary to ensure the cover is maintained and the controls implemented as planned. Monitoring would ensure that the remedy is effective over the long term. While Alternatives 3 and 4 would include the removal of known soil / wastes of concern, a site wide cover and site wide institutional controls would still be required under these alternatives. Given the additional costs associated with these alternatives, the benefit of the removal would appear to be minimal. While no cover or controls would be required under Alternative 5, the extensive removal and fill operations present significant implementability concerns and would result in substantially higher costs.

THE COMMUNITY ROLE IN THE SELECTION PROCESS

The Navy solicits written comments from the community on the preferred alternative for OU-7 and the other alternates for OU-7 identified in this Proposed Plan. The Navy has set a public comment period from February 16, 2000 through March 17, 2000 to encourage public participation in the remedy selection process for

A public meeting has been scheduled for Wednesday evening, March 1st, at 7:00 p.m. in the North American Technology Center 2nd floor conference room, located at 626 Jacksonville Road. Comments from the public meeting and proposed plan will be summarized and responses will be provided in the Responsiveness Summary section of the ROD. The ROD is the document that will present the selected remedy. To obtain further information, contact Mr. Tom Ames, BRAC Environmental Coordinator, at 215-441-1112, or send written comments to:

Mr. Tom Ames
Caretaker Site Office
P.O. Box 2609
Warminster, PA 18974-0061

Please note that all comments must be submitted and postmarked on or before March 17, 2000.

GLOSSARY

Administrative Record – Section 113K of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA) requires the establishment of an administrative record which forms the basis for the selection of a response action. The administrative record should include the final documents which are a part of the Department of the Navy's (DON's) decision making process.

Carcinogenic – Cancer producing.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) – A federal law passed in 1980 and modified by the Superfund Amendments and Reauthorization Act (SARA) of 1986. The Acts 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 this program, EPA either can pay for a clean up when parties responsible for the contamination cannot be located or are unwilling or unable to perform the work; or can take legal action to force the parties responsible for site contamination to clean up the sit or pay back the federal government for the cost of the cleanup.

National Priorities List (NPL) – EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action, under Superfund. A site must be on NPL to receive money from the Trust Fund for remedial action. The list is based primarily on the score a site receives from the Hazard Ranking System. EPA is required to update the NPL at least once a year.

Remedial Investigation / Feasibility Study (RI / FS) – An in-depth study designed to gather the data necessary to determine the nature and extent of contamination at a Superfund site; establish criteria for cleaning up the site; Identify preliminary alternatives for remedial actions; support the technical and cost analyses of the alternatives. The remedial investigation is usually done with the feasibility study. Together they are usually referred to as the RI / FS.

Volatile Organic Compound (VOC) – Any organic compound which participates in atmospheric photochemical reactions except for those designated by the EPA Administrator as having negligible photochemical reactivity.

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

Mr. Thomas C. Ames
BRAC Environmental Coordinator
Caretaker Site Office
P.O. Box 2609
Warminster, Pennsylvania 18974-0061

Name _____ Affiliation _____

Address _____ Phone ( ) _____

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