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NAS CECIL FIELD, FL
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PROPOSED PLAN FOR OPERABLE UNIT 9 (OU 9) SITE 36 AND SITE 37 NAS CECIL FIELD FL

9/1/2000

TETRA TECH NUS INC

INSTALLATION RESTORATION PROGRAM

September 2000

Proposed Plan for Operable Unit 9, Sites 36 and 37

Naval Air Station Cecil Field
Jacksonville, Florida

Facility Description

Naval Air Station (NAS) Cecil Field (see Figure 1) was established in 1941 and provided facilities, services, and material support for naval operations. It was added to the National Priorities List (NPL) in 1989. In July 1993, the Base Realignment and Closure (BRAC) Commission recommended the closure of the Air Station. On October 1, 1999, the base was closed and the majority of the flightline was transferred to the Jacksonville Port Authority and is now referred to as Cecil Commerce Center.

Site Description

Operable Unit 9 (OU9) consists of groundwater contamination identified at Sites 36 and 37. This Proposed Plan addresses the proposed remedy for groundwater contamination at OU9. See Figures 1 and 2 for the site locations and site maps. Site 36 consists of a groundwater plume contaminated with aromatic and chlorinated volatile organic compounds (VOCs) and is located south of the Control Tower, Building 82. Site 37 consists of a groundwater plume contaminated with aromatic VOCs, chlorinated VOCs, iron, and manganese and is located south of Hangars 13 and 14. The two plumes overlap and cover an area of about 67 acres. There is an area of contaminated soil near Hangar 14 that is being cleaned up under the Florida Department of Environmental Protection (FDEP) Petroleum Contaminated Site regulations. No other contaminated soil was identified at OU9.

Sites 36 and 37 are side by side and are located on the north side of the East-West Runway and south of Crossover Street (formerly Second Street). Buildings in this area were primarily associated with maintenance and service of aircraft. Roads, taxiways, runways, and aprons cover most of the area. A relatively large (about 22 acres) unpaved area lies between the two sites. There are also areas between runways and taxiways that are grass covered.

Most buildings at Site 36 were constructed from 1943 to 1968. Buildings at Site 37 were constructed from 1941 to 1982. Day Tank 2 operated from 1957 to 1996 and was dismantled in 1997. Three refueling systems were located to the south of Hangars 13 and 14. Two of these systems were built in the 1940s and were fed from the former storage tanks located near Day Tank 2. The third system, known as the East-West High Speed Refueling System, was built in the late 1950s and was fed from former Day Tank 2. No disposal facilities were located on the sites. The probable sources of contamination were tank leaks, pipeline leaks, spills, and poor housekeeping practices.

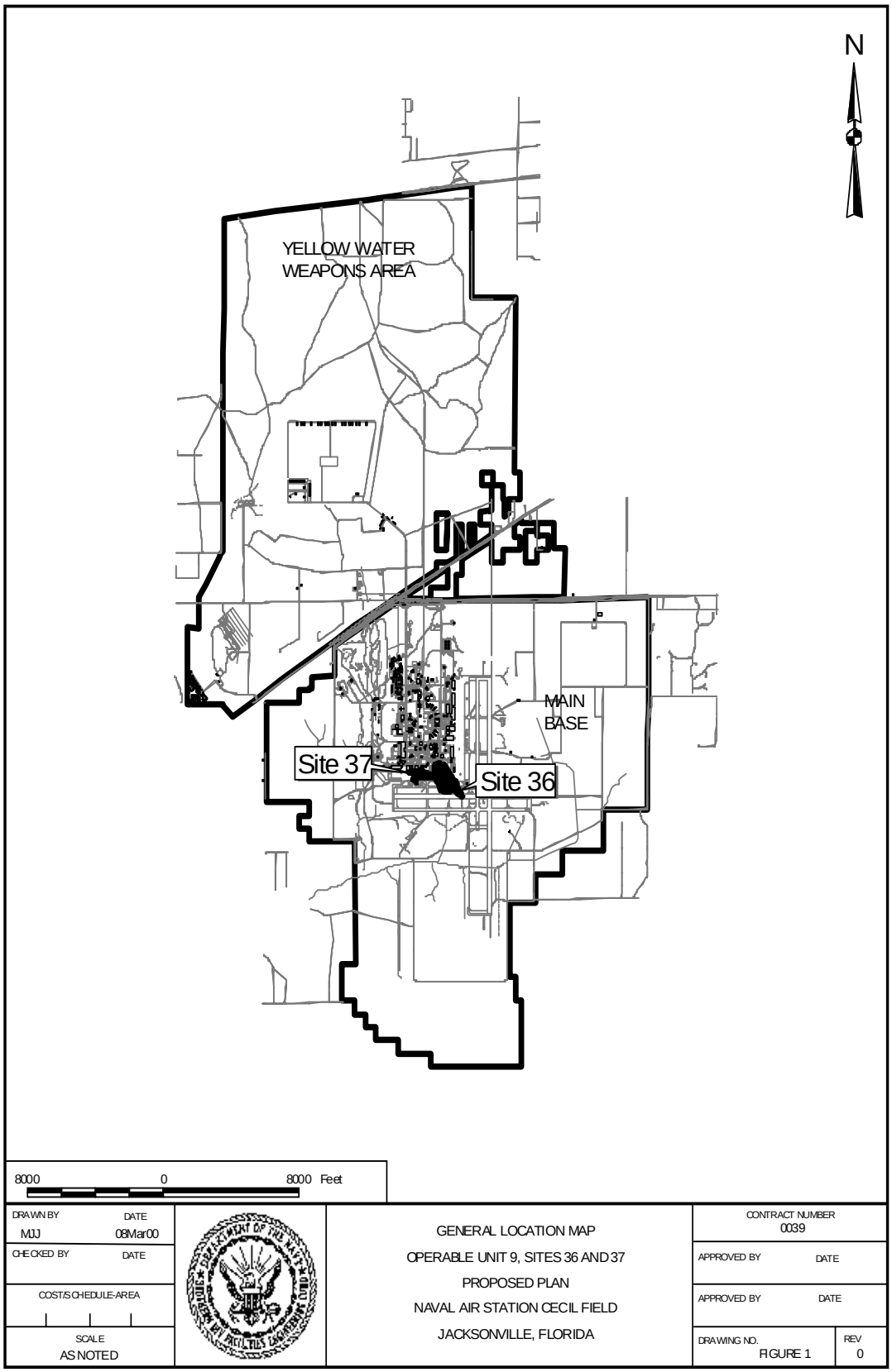
The Proposed Clean-Up Plan

For contaminated groundwater at Sites 36 and 37, the BCT proposes the following:

- Repair storm sewers to minimize the infiltration of contaminated groundwater into the storm sewers and into surface water.
- Install an air sparging/vapor extraction (AS/VE) system in the areas with the highest levels of contamination ("hot-spots").
- Use natural attenuation to remove the balance of the contaminants through biological and other natural processes.
- Implement institutional controls to prevent the use of groundwater from the surficial aquifer.
- Monitor the groundwater routinely to measure the progress of the remediation.
- Perform five-year reviews. If natural attenuation is demonstrated to be insufficient, another active remediation system may be implemented.

Approximately 2,100 cubic yards of contaminated soil will be excavated and disposed of offsite under the FDEP Petroleum Contaminated Site regulations.

In accordance with CERCLA Section 117, this document summarizes the NAS Cecil Field BCT clean-up proposal. For detailed information on the options evaluated for OU 9, Sites 36 and 37, consult the Operable Unit 9 and Sites 36 and 37 documents contained within the Administrative Record, which is available for review at the information repository located at Building 907, 13357 Lake Newman Street, Cecil Commerce Center, Jacksonville, Florida.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MAIN
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Site 36
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COST/SCHEDULE-AREA
SCALE
AS NOTED
GENERAL LOCATION MAP
OPERABLE UNIT 9, SITES 36 AND 37
PROPOSED PLAN
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
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FIGURE 1
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Site 37
Contaminated Soils
Site 36-37 Plume
Hot Spot No. 1
Hot Spot No. 2
Hot Spot No. 3
Site 37
Site 36
800
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SITE MAP
ALTERNATIVE 3B
OPERABLE UNIT 9, SITES 36 AND 37
PROPOSED PLAN
NAS CECIL FIELD
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FIGURE 2
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About This Document

In accordance with Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the law that established the Superfund program, and §300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), this document summarizes the Navy's proposal for site clean-up to help the public understand and comment on the proposed alternatives. This plan has been developed by the NAS Cecil Field BRAC Clean-up Team (BCT), which consists of representatives from the Navy, the U.S. Environmental Protection Agency (U.S. EPA), and the Florida Department of Environmental Protection (FDEP). The BCT, in consultation with the Restoration Advisory Board (RAB), will select a final remedy for OU 9, Sites 36 and 37, after all public comments have been addressed. One of the purposes of this plan is to solicit the public's views and comments on all the alternatives described. This plan highlights the key information from the remedial investigation/feasibility study (RI/FS), but is not a substitute for these documents. More complete information can be found in these reports and the Administrative Record. The Administrative Record is located at Building 907, 13357 Lake Newman Street, Cecil Commerce Center.

What do you think?

The Navy, as the lead agency, is accepting formal public comments on this proposal from September 11, 2000 to October 10, 2000. You don't have to be a technical expert to comment. If you have a concern or preference, the BCT wants to hear it before making a final decision on how to protect your community. To comment formally:

Offer oral comments during the comment portion of the public hearing, if such a hearing is requested (see page 12 for details).

Send written comments, postmarked no later than October 10, 2000, to

Commander
Department of the Navy
Southern Division
Naval Facilities Engineering Command
Attn: Scott Glass, P.E. (Code 18B12)
2155 Eagle Drive
North Charleston, SC 29406
Tel: 843-820-5587

E-mail comments by October 10, 2000 to

email: glasssa@efdsouth.navfac.navy.mil

History of Sites 36 and 37

- **1940s to 1990s:** The Base is developed. Most of the buildings were constructed between 1941 and 1982. The North-South and East-West Runways were built in the 1950s. Day Tank 2 was operated from 1957 to 1996 and was dismantled in 1997. The South Fuel Farm (SFF) was operated in the 1940s and 1950s. Three refueling systems were located to the south of Hangars 13 and 14. Two of these systems were built in the 1940's and were fed from the former SFF located near Day Tank 2. The third system, known as the East-West High Speed Refueling System, was built in the late 1950s and was fed from the former Day Tank 2.
- **1990 to 1994:** A Contamination Assessment (CA) was performed at the SFF. The report was issued in July 1992. All tanks in the SFF were removed in 1994.
- **November 1994:** An Environmental Baseline Survey Report identified buildings in the vicinity of the sites and identified potential sources of contamination, but no samples were collected as part of this survey.
- **March 1995 to January 1996:** A supplemental assessment of the SFF was performed. In January 1996, a CA Report Addendum was issued for the SFF.
- **October 1996 to August 1997:** A Remedial Action Plan (RAP) was submitted for the SFF. Free-product was also detected in a well south (downgradient) of Day Tank 2. Day Tank 2 was taken out of operation. A free-product recovery action at Day Tank 2 using shallow trenches was performed. Day Tank 2 was demolished in August 1997.
- **1996:** Flightline area direct push technology (DPT) borings and groundwater sampling were performed as part of the flightline area study. These samples showed the presence of volatile organic compounds (VOCs).
- **July 1997 through April 1998:** A Site Assessment study was performed for Day Tank 2. DPTs were used to identify the plume and to position 20 monitoring wells in the Day Tank 2 plume. A benzene, toluene, ethylbenzene, and xylenes (BTEX) plume and a free-product plume were identified. Trichloroethene (TCE) was detected in four wells.
- **September 1997 to June 1998:** DPT borings were advanced near Hangars 13 and 14, and samples showed the general extent of VOC contamination. Wells were installed south of Hangars 13 and 14 between the hangars and taxiway. Groundwater samples showed the presence of BTEX and chlorinated solvents.
- **November 1998 to January 1999:** A Remedial Investigation (RI) was completed to characterize the nature of contamination. VOCs were found in groundwater at concentrations potentially harmful to human health and the environment. Iron and manganese were present in concentrations greater than background.
- **March 2000:** The Feasibility Study (FS) was completed. The FS addressed groundwater at the two sites.

Why is Clean-up Needed?

The Navy's studies of OU 9, Sites 36 and 37, have resulted in the following conclusions:

- As a result of past operations and activities, several chemicals have been identified in the groundwater at Sites 36 and 37 that could be potentially harmful to human health.
- Several chemicals remain in the groundwater that could be potentially harmful to human health if this water were used for drinking or showering purposes in the future. The main contributors to human health risk have been identified as VOCs. Iron and manganese are also present at concentrations greater than background.

A Closer Look at the BRAC Clean-up Team's Proposal

The components of the preferred alternative for groundwater at Sites 36 and 37 are as follows:

1. Sewer Repairs

Damaged sections of storm sewer located beneath the water table in the contaminant plume at Site 36 would be repaired in place by insertion of a plastic liner or sleeve. The focal point of these repairs would be the storm sewers located approximately 500 feet southwest of Building 72 at Site 36.

2. Air Sparging/Vapor Extraction (AS/VE) Treatment of Contaminant "Hot-Spots"

Compressed air would be forced into the groundwater at three of the most highly contaminated areas ("hot-spots"). Two "hot-spots" are in Site 36 and one is in Site 37. At Site 36, a total of 55 injection wells are proposed. At Site 37, a total of 90 air sparging wells are proposed. The sparging will result in the volatilization of VOCs that would be drawn out by the vacuum action of a series of vapor extraction wells. Iron and manganese should also be oxidized to less soluble forms. At Site 36, 80 vapor extraction wells are proposed, and at Site 37, 141 vapor extraction wells are proposed. The extracted vapor would be collected and passed through activated carbon prior to release to the atmosphere. Periodically, the activated carbon would be replaced and the spent activated carbon would be disposed of offsite.

3. Natural Attenuation

Natural attenuation would rely on naturally occurring processes within the aquifer, such as biological degradation, dispersion, and adsorption, to significantly reduce the concentrations of BTEX and chlorinated VOCs.

4. Institutional Controls

Institutional controls would include prohibition of groundwater use from the surficial aquifer. These controls would eliminate or reduce pathways of exposure to contaminants at the site. A Land Use Control Implementation Plan (LUCIP), including deed restrictions, would be prepared and implemented to ensure that, prior to any future development at Sites 36 and 37, adequate measures would be taken to minimize adverse human health and environmental effects. In particular, land use controls and deed restrictions would prevent utilization of the groundwater in the surficial aquifer.

5. Monitoring

Monitoring would consist of regularly collecting and analyzing groundwater samples from within the contaminant plume to assess natural attenuation and downgradient of the leading edge of the plume to evaluate contaminant migration. Plume migration would also be monitored by the routine sampling and analysis of a series of wells (sentinel wells) installed 400 feet downgradient of the plume.

If the benzene concentration in any of the sentinel wells is greater than the FDEP primary standard listed in Florida Administrative Code (FAC) 62-550 of 1 ug/L, the following steps will be taken.

1. The well will be resampled to confirm the results.
2. If the results are confirmed, the groundwater plume will be modeled using a site-specific groundwater model.
3. If the new modeling results indicate that contamination migration will be a concern, then an active contingency remedy will be developed.

6. Five-Year Reviews

Reviews would be performed every five years to evaluate site status, assess the continued adequacy of remedial activities, and determine whether further action is necessary.

7. Contingency Remedy

If during implementation of the proposed remedy it is determined that this remedy no longer adequately protects human health or the environment, or if the plume has migrated to the sentinel wells, additional active remedial measures will be implemented. The objective of the additional actions would be to prevent further plume migration. An evaluation of potential remedial actions will be conducted to select the most appropriate remedial solution as the contingency remedy.

Summary of Site Risks

The Human Health Risk Assessment was conducted as a Preliminary Risk Evaluation (PRE), which is a screening level evaluation of potential risks from exposure to site constituents by human receptors. As a screening level assessment, a PRE is a very health-protective method. Because of the use of maximum concentrations and conservative exposure

assumptions, a PRE is almost always more protective than a baseline risk assessment of the same site. This PRE indicated that exposure to groundwater could potentially result in adverse health effects.

At both Site 36 and Site 37, contaminants were detected in groundwater at concentrations which would result in unacceptable human health risks. If groundwater were used as a drinking water source and used for showering, it would result in an incremental cancer risk in excess of the U. S. EPA acceptable range of 1 in one million to 1 in 10,000. Main contributors to these risks are benzene, tetrachloroethene (PCE), and trichloroethene (TCE) at Site 36, and benzene, toluene, 1,1-dichloroethene (DCE), 1,1,2-trichloroethane (TCA), and 1,2-dichloroethane (DCA) at Site 37. Currently, the groundwater is not used a source of water for drinking or showering.

Because Sites 36 and 37 lack suitable habitat for wildlife and the soil exposure pathway is negligible (most areas are paved over), this exposure route was not investigated for ecological receptors.

Use of ARARs in Evaluation Process

Applicable or relevant and appropriate requirements (ARARs) are federal and state environmental requirements used to evaluate the appropriate extent of site clean-up, scope and formulate remedial alternatives, and control the implementation and operation of a selected remedial action. Potential chemical-, location-, and action-specific ARARs are defined in the NAS Cecil Field General Information Report (GIR). Each alternative has been evaluated to determine its compliance with ARARs. Chemical-, location-, and action-specific ARARs that apply to OU 9 are discussed in Section 2.0 and Section 5.0 of the FS, found in the Administrative Record.

What are the Clean-up Objectives and Levels?

Using the information gathered during the site investigations and the results of the PRE, the following remedial action objectives (RAOs) were established for OU 9, Sites 36 and 37 for groundwater:

- Prevent unacceptable risks from human exposure to contaminated groundwater at Sites 36 and 37
- Prevent contamination migration from groundwater to surface water at Site 36

Table 1 shows the chemicals of concern and the target cleanup levels.

Groundwater Clean-up Alternatives

No Action

Groundwater Alternative 1: No Action

Evaluation of the no action alternative is required by law as a basis for comparison with the other alternatives. No remedial action would be taken to reduce risks to human health and the environment. Concentrations of contaminants in the groundwater might eventually be reduced to clean-up levels through natural attenuation processes, but no monitoring would be performed to quantify this reduction. Mechanisms would not be in place to determine whether the alternative would comply with the ARARs or achieve the RAOs.

Limited Action

Groundwater Alternative 2: Sewer Repairs, Natural Attenuation, Institutional Controls, and Monitoring

Sewer repairs would consist of sleeving or lining damaged sections of sewer lines located beneath the water table in the contaminant plume at Site 36 to prevent the migration of contaminated groundwater to surface water through these sewer lines. Natural processes, such as biological degradation, dispersion, advection, and adsorption would reduce the concentration of groundwater contaminants to clean-up levels. Natural attenuation would consist of implementing a long-term groundwater sampling and analysis program to evaluate the reduction in the concentrations of groundwater COCs through naturally-occurring processes. Monitoring will also evaluate the migration of contaminants. Additional monitoring wells (sentinel wells) would be installed 400 feet downgradient of the leading edge of the plume to verify that contaminants are not migrating to a degree that would require additional active remediation measures. Institutional controls would consist of preventing use of the groundwater for drinking purposes until PRGs have been met. Progress reviews would be conducted every five years to determine the continued adequacy of the remedy. If it is determined that natural attenuation no longer adequately protects human health and the environment, additional active remedial measures will be evaluated and implemented. In the long term, this alternative would comply with the RAOs and ARARs.

Treatment

Groundwater Alternative 3A: Sewer Repairs, In-situ Biological Treatment of Contaminant "Hot-Spots", Natural Attenuation, Institutional Controls, and Monitoring

This alternative would consist of accelerating the natural attenuation of groundwater COCs by first remediating the three contaminant "Hot-Spots" by in-situ biological treatment with the injection of oxygen-releasing compounds (ORC) and hydrogen-releasing compounds (HRC) by direct push technology (DPT). Sewer repairs and institutional controls would be the same as for Groundwater Alternative 2. Monitoring would also be the same as for Groundwater Alternative 2 with additional groundwater sampling and analysis to evaluate the progress of the "Hot-Spot" bioremediation. In the long-term, this alternative would comply with the RAOs and ARARs.

TABLE 1

Chemicals of Concern in Groundwater Sites 36 and 37, micrograms per liter (µg/L) NAS Cecil Field		
Site-Specific Chemicals of Concern (COCs)	**Range of Detections**	**Site-Specific Clean-up Level**
Volatile Organic Compounds		
1,1,2-Trichloroethane	53.7 - 56.2	5(2)
1,1-Dichloroethane	1.1 - 772	70(1)
1,1-Dichloroethene	1.4 - 3640	7(2)
1,2-Dichloroethane	35.6 - 36.6	3(2)
Benzene	0.87 - 7340	1(2)
Cis-1,2-dichloroethene	0.93 - 104	70(2)
Ethylbenzene	1.8 - 946	30(2)
Tetrachloroethene	0.16 - 17.7	3(2)
Toluene	0.93 - 6290	40(2)
Trichloroethene	1.1 - 128	3(2)
Vinyl Choloride	27 - 27.4	1(2)
Xylenes	2.6 - 4780	20(2)
Semivolatile Organic Compounds		
1-Methylnaphthalene	2.36 - 47.1	20(1)
2-Methylnaphthalene	7.01 - 67.1	20(1)
Naphthalene	6.42 - 202	20(1)
2-Methylphenol	11	5(1)
3&4-Methylphenol	4.3 - 34.2	4(1)
Inorganics		
Iron	332 - 25,100	7,760(3)
Manganese	3.1 - 218	150(3)

NOTES:
(1) Criteria from Florida Administrative Code (FAC) 62-777 Groundwater Clean-up Target Levels.
(2) Criteria from FAC 62-550, Drinking Water Standards.
(3) Site-specific background criteria.

Groundwater Alternative 3B: Sewer Repairs, Air Sparging, Vapor Extraction Treatment of Contaminant "Hot-Spots", Natural Attenuation, Institutional Controls, and Monitoring

This alternative would consist of accelerating the natural attenuation of groundwater COCs by first remediating the three contaminant "Hot-Spots" by in-situ air sparging/vapor extraction (AS/VE). An AS/VE system in each "Hot-Spot" would volatilize COCs from the groundwater and remove these volatilized COCs with vapor-phase GAC adsorption. Sewer repairs and institutional controls would be the same as for Groundwater Alternative 2. Monitoring would also be the same as for Groundwater Alternative 2 with additional groundwater sampling and analysis to evaluate the progress of the AS/VE treatment of the "Hot-Spots." In the long-term, this alternative would comply with the RAOs and ARARs.

Groundwater Alternative 3C: Sewer Repairs, AS/VE Treatment of Contaminant "Hot-Spots" and "Fringes", Natural Attenuation, Institutional Controls, and Monitoring

This alternative would be identical to Groundwater Alternative 3B except that, in order to further accelerate the natural attenuation process, four AS/VE systems would be installed and operated instead of three and the overall area actively remediated by these systems would be significantly larger (1,787,000 ft^2 instead of 266,000 ft^2), as it would include not only the contaminant "Hot-Spots" but the "Fringes" as well. In the long-term, this alternative would comply with the RAOs and ARARs.

Groundwater Alternative 3D: Sewer Repairs, AS/VE Treatment of Contaminant "Hot-Spots" and "Extended Fringes", Natural Attenuation, Institutional Controls, and Monitoring

This alternative would be identical to Groundwater Alternative 3C except that, in order to even further accelerate the natural attenuation process, the four AS/VE systems would actively remediate a larger area (2,126,000 ft^2 instead of 1,787,000 ft^2) including the contaminant "Hot-Spots" and "Extended Fringes." In the long term, this alternative would comply with the RAOs and ARARs.

Groundwater Alternative 4A: Sewer Repairs; Extraction, On-Site Treatment, and Surface Discharge of Contaminant "Hot-Spots" Groundwater; Natural Attenuation; Institutional Controls; and Monitoring

This alternative would consist of accelerating natural attenuation by first remediating the contaminant "Hot-Spots" through groundwater extraction with four pumping wells at the rate of 30 gallons per minute (gpm). The extracted groundwater would be treated by air stripping to volatilize COCs prior to discharge to surface water. The exhaust gas of the air stripper would be treated by vapor-phase GAC adsorption to remove the volatilized COCs prior to venting to atmosphere. Sewer repairs and institutional controls would be the same as for Groundwater Alternative 2. Monitoring would also be the same as for Groundwater Alternative 2 with additional groundwater sampling and analysis to evaluate the progress of the extraction and treatment of the "Hot-Spots" groundwater. In the long-term, this alternative would comply with the RAOs and ARARs.

Groundwater Alternative 4B: Sewer Repairs; Long-Term Whole-Plume Extraction, On-Site Treatment, and Surface Discharge; Institutional Controls; and Monitoring

This alternative would consist of remediating the entire contaminant plume through groundwater extraction with six new pumping wells at the rate of 60 gpm. As with Groundwater Alternative 4A, the extracted groundwater would be treated by air stripping to volatilize COCs prior to discharge to surface water, and the exhaust gas of the air stripper would be treated by vapor-phase GAC adsorption prior to venting to the atmosphere. Sewer repairs and institutional controls would be the same as for Groundwater Alternative 2. Monitoring would also be the same as for Groundwater Alternative 2 with additional groundwater sampling and analysis to evaluate the progress of the groundwater extraction and treatment. In the long term, this alternative would comply with the RAOs and ARARs.

Groundwater Alternative 4C: Sewer Repairs; Mid-Term Whole-Plume Extraction, On-Site Treatment, and Surface Discharge; Institutional Controls; and Monitoring

This alternative would be identical to Groundwater Alternative 4B except that, in order to accelerate remediation, groundwater would be extracted from 38 new pumping wells at the rate of 200 gpm. As with Groundwater Alternatives 4A and 4B, the extracted groundwater would be treated by air stripping to volatilize COCs prior to discharge to surface water, and the exhaust gas of the air stripper would be treated by vapor-phase GAC adsorption prior to venting to the atmosphere. Sewer repairs and institutional controls would be the same as for Groundwater Alternative 2. Monitoring would also be the same as for Groundwater Alternative 2 with additional groundwater sampling and analysis to evaluate the progress of the groundwater extraction and treatment. In the long term, this alternative would comply with the RAOs and ARARs.

Groundwater Alternative 4D: Sewer Repairs; Short-Term Whole-Plume Extraction, On-Site Treatment, and Surface Discharge; Institutional Controls; and Monitoring

This alternative would be identical to Groundwater Alternative 4C except that, in order to further accelerate remediation, groundwater would be extracted from 69 new pumping wells at the rate of 300 gpm. As with Groundwater Alternatives 4A, 4B, and 4C, the extracted groundwater would be treated by air stripping to volatilize COCs prior to discharge to surface water and the exhaust gas of the air stripper would be treated by vapor-phase GAC adsorption prior to venting to the atmosphere. Sewer repairs and institutional controls would be the same as for Groundwater Alternative 2. Monitoring would also be the same as for Groundwater Alternative 2 with additional groundwater sampling and analysis to evaluate the progress of the groundwater extraction and treatment. In the long term, this alternative would comply with the RAOs and ARARs.

Clean-up Alternatives for OU 9, Sites 36 and 37

The OU 9 FS report presents the options that the BCT considered for clean-up of Sites 36 and 37. These options, referred to as "Clean-up Alternatives," are different combinations of plans to restrict access and to contain, remove, or treat contamination in order to protect public health and the environment.

During the upcoming public comment period, the BCT welcomes your comments on the proposed clean-up plan and on the other technical approaches that the team evaluated. These clean-up alternatives are summarized in Table 2. Please consult the OU 9 FS report for more detailed information.

Based on information currently available, the preferred alternative for groundwater, Alternative 3B, provides the best balance of trade-offs among the other alternatives with respect to the evaluation criteria.

TABLE 2

Comparison of Groundwater Clean-up Alternatives[1] OU 9 Sites 36 and 37 – NAS Cecil Field											
Nine Criteria[1]	**1 No Action**	**2 Natural Attenuation**	**3A ORC/HRC Hot-Spots + Nat. Att.**	**3B * AS/VE Hot-Spots + Nat. Att.**	**3C AS/VE Hot-Spots and fringes + Nat. Att.**	**3D AS/VE Hot-Spots and extended fringes + Nat. Att.**	**4A Pump and treat Hot-Spots + Nat. Att.**	**4B Pump and treat whole plume, long-term**	**4C Pump and treat whole plume, mid-term**	**4B Pump and treat whole plume, short-term**	**5 Permeable Reactive Barrier + Nat. Att.**
Protects human health and environment	**X[2]**	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Meets federal and state requirements	**X[2]**	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Provides long-term protection and permanence	**X**	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reduces toxicity, mobility, or volume through treatment	**X**	**X**	✓	✓	✓	✓	✓	✓	✓	✓	✓
Provides short-term protection	**X**	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Implementability	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
State acceptance	**TO BE DETERMINED AFTER PUBLIC COMMENT PERIOD AND DISCUSSED IN THE RECORD OF DECISION**										
Community acceptance	**TO BE DETERMINED AFTER PUBLIC COMMENT PERIOD AND DISCUSSED IN THE RECORD OF DECISION**										
Cost, $ (present worth)	**0**	**1,013,000**	**4,581,000**	**3,717,000**	**9,671,000**	**10,911,000**	**2,848,000**	**3,537,000**	**4,734,000**	**5,873,000**	**9,182,000**
Time to reach clean-up goals, years	**(2)**	**29 - 105**	**28 - 92**	**24 - 92**	**12 - 50**	**8 - 30**	**33 - 105**	**30 - 96**	**30 - 50**	**20 - 30**	**29 - 105**

NOTES:
X : Does NOT meet criterion ✓: Meets criterion * : Preferred Alternative
Nat. Att. = Natural Attenuation

(1) Remedial alternatives are examined with respect to nine criteria set forth by CERCLA and factors described in the EPA RI/FS Guidance Manual.
(2) Mechanisms would not be in place to determine whether the alternative would comply with ARARs or achieve the RAO.

Groundwater Alternative 5: Sewer Repairs, Permeable Reactive Barrier, Natural Attenuation, Institutional Controls, and Monitoring

This alternative would consist of installing a Permeable Reactive Barrier (PRB) in the path of the groundwater contaminant plume to intercept and remove COCs from groundwater prior to migration to surface water. As in Groundwater Alternative 2, natural attenuation would also significantly contribute to the overall remediation process. Sewer repairs, institutional controls, and monitoring would be the same as for Groundwater Alternative 2. In the long term, this alternative would comply with the RAOs and ARARs.

What impacts would the groundwater clean-up have on the local community?

- Alternatives that involve the treatment and handling of groundwater (Groundwater Alternatives 3B, 3C, 3D, 4A, 4B, 4C, and 4D) would pose a risk to treatment system workers.
- Alternatives that involve the handling of groundwater during construction (Groundwater Alternatives 3A, 3B, 3C, 3D, 4A, 4B, 4C, and 4D) would pose a risk to construction workers.
- Alternatives that involve the transportation of treatment residue for off-site disposal (Groundwater Alternatives 3B, 3C, 3D, 4A, 4B, 4C, and 4D) would pose a risk to nearby communities. However, measures would be taken to minimize and control these risks.
- Alternatives that do not immediately achieve clean-up levels (Groundwater Alternatives 2, 3A, 3B, 3C, 3D, 4A, 4B, 4C, 4D and 5) include administrative action to limit the use of groundwater from the surficial aquifer until clean-up levels have been reached.
- Alternatives that involve on-site treatment and/or site construction activities (Groundwater Alternatives 3A, 3B, 3C, 3D, 4A, 4B, 4C, 4D, and 5) will occupy the site. This would restrict use and/or development of site for the duration of the clean-up.
- The no action alternative would not prevent exposure to site contaminants, resulting in unacceptable human health risks if residential development occurs and groundwater from the surficial aquifer is used as a source of drinking water.

Table 2 summarizes the comparison of the groundwater alternatives.

Why Does the BCT Recommend this Proposed Plan?

This remedy is recommended for the following reasons:

Groundwater

- AS/VE technology has been implemented at other sites at Cecil Field and at other bases. The technology is well demonstrated. Therefore, Groundwater Alternative 3B is the preferred alternative.
- The costs of Groundwater Alternatives 3C, 3D, and 5 were prohibitive and therefore could not be recommended.
- Alternatives that include some level of treatment that can provide a degree of contaminant removal in a short period of time are preferable. Therefore, Groundwater Alternative 2 was eliminated.
- Groundwater Alternative 3A would need to be implemented in several stages. The exact chemical dosages and number of doses cannot be predicted well, so there is a high level of uncertainty in the final cost of this alternative. The alternative requires an extensive drilling program that would interfere with activities and development of the sites. Therefore, Alternative 3A was eliminated.
- The pump and treat alternatives (Groundwater Alternatives 4A, 4B, 4C and 4D) require long term operation (18 to 80 years) of the treatment systems. This includes maintenance and monitoring of the treatment plants and limitations to the full development of the sites for an extended period of time. The long periods of operation do not make these alternatives favorable. Therefore, these alternatives were eliminated.

The U.S. EPA (as a support agency) concurs with the preferred alternative.

The Navy expects that the preferred alternative satisfies the statutory requirements in CERCLA Section 121(b), which states that the selected alternative be protective of human health and the environment, comply with ARARs, be cost-effective, utilize permanent solutions and alternative treatment technologies to the maximum extent practicable, and satisfy the statutory preference for treatment as a principle element. The preferred alternative also meets the evaluation criteria set forth by CERCLA, as shown on Table 2.

Next Steps:

The BCT will review all comments and prepare the Record of Decision (ROD) describing the chosen clean-up plan. The ROD, which includes a summary of responses to public comments, will then be made available to the public at the Information Repository at Building 907, 13357 Lake Newman Street, Cecil Commerce Center, Jacksonville, Florida. The BCT will also announce its decision through the local news media and the community mailing list.

Acronyms:

ARAR	Applicable or Relevant and Appropriate Requirements
AS/VE	Air Sparging/Vapor Extraction
BCT	BRAC Clean-up Team
BRAC	Base Realignment and Closure
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
CA	Contamination Assessment
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	Chemical of Concern
DCA	Dichloroethane
DCE	Dichloroethene
DPT	Direct Push Technology
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FS	Feasibility Study
GAC	Granular Activated Carbon
GIR	General Information Report
gpm	Gallons per Minute
HRC	Hydrogen-releasing Compounds
LTTD	Low-Temperature Thermal Desorption
LUCIP	Land Use Control Implementation Plan
NAS	Naval Air Station
NPL	National Priorities List
ORC	Oxygen-releasing Compounds
OU	Operable Unit
PAH	Polycyclic Aromatic Hydrocarbon
PCE	Tetrachloroethene (also known as perchloroethene)
PRB	Permeable Reactive Barrier
PRE	Preliminary Risk Evaluation
PRG	Preliminary Remedial Action Goals
RAB	Restoration Advisory Board
RAO	Remedial Action Objective
RAP	Remedial Action Plan
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SFF	South Fuel Farm
TCA	Trichloroethane
TCE	Trichloroethene
U.S. EPA	United States Department of Environmental Protection
VOC	Volatile Organic Compound
µg/kg	Microgram per Kilogram
µg/L	Microgram per Liter

What's a Formal Comment?

Formal comments are used to improve the clean-up proposal. During the 30-day formal comment period, the BCT will accept formal written comments and hold a hearing, if requested, to accept formal verbal comments.

To make a formal comment, you need to present your views during the public hearing or submit a written comment during the comment period. A request for a public hearing to present your formal comments must be made in writing. The request must be postmarked no later than October 10, 2000. Written comments and requests for a public hearing should be sent to

Commander
Department of the Navy
Southern Division
Naval Facilities Engineering Command
Attn: Mr. Scott Glass, P.E. (Code 18B12)
2155 Eagle Drive
North Charleston, SC 29406

Federal regulations require the BCT to distinguish between "formal" and "informal" comments. While the BCT uses both your comments and Restoration Advisory Board (RAB) comments throughout site investigation and clean-up activities, the team is only required to respond in writing to formal comments on the Proposed Plan. If a public hearing is requested, there will be no verbal response to your comments during the formal hearing portion of the meeting. Once the formal hearing portion of the public meeting is closed, the BCT may respond to informal questions.

The BCT will review the transcript of all formal comments received at the hearing and all written comments received during the formal comment period before making a final clean-up decision. They will then prepare a written response to all formal comments. The transcript of formal comments and the BCT's written responses will then be issued in a document called a Responsiveness Summary when the team releases the final ROD.

For More Detailed Information

To help the public understand and comment on the proposal for the site, this publication summarizes a number of reports and studies. All the technical and public information publications prepared to date for the site are available at the following information repository:

Building 907
13357 Lake Newman Street
Cecil Commerce Center
Jacksonville, Florida 32252
904-573-0336

Use This Space to Write Your Comments
or to be added to the mailing list

The BCT wants your written comments on the options under consideration for dealing with the contamination at Operable Unit 9, Sites 36 and 37. You can use the form below to send written comments. If you have questions about how to comment, please call Scott Glass at (843) 820-5587. This form is provided for your convenience. Please mail this form or additional sheets of written comments, postmarked no later than October 10, 2000, to

Commander
Department of the Navy
Southern Division
Naval Facilities Engineering Command
Attn: Scott Glass, P.E. (Code 18B12)
2155 Eagle Drive
North Charleston, SC 29406
email: glasssa@efdsouth.navfac.navy.mil

(Attach sheets as needed)

Comment submitted by: _____

Mailing list additions, deletions, or changes

If you did not receive this through the mail or would like to

- ☐ be added to the site mailing list
- ☐ note a change of address
- ☐ be deleted from the mailing list
- ☐ obtain additional information concerning the RAB

Name: _____
Address: _____
_____
_____

please check the appropriate box and fill in the correct address information above.

Naval Air Station Cecil Field
Operable Unit 9, Sites 36 and 37
Public Comment Sheet (continued)

Fold, staple, stamp, and mail ----------

Place
Stamp
Here

Commander

Department of the Navy

Southern Division

Naval Facilities Engineering Command

Attn: Scott Glass, P.E. (Code 18B12)

2155 Eagle Drive

North Charleston, SC 29406