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NAS KEY WEST
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STATEMENT OF BASIS FOR FORMER BOCA CHICA DICHLORODIPHENYLTRICHLOROETHANE MIXING AREA SOLID WASTE MANAGEMENT UNIT 2 NAS KEY WEST FL

7/12/1998

U S EPA REGION IV

STATEMENT OF BASIS

Naval Air Station
Key West, Florida

Facility/Unit Type:	Military Installation/ Former Boca Chica DDT Mixing Area (SWMU 2)
Contaminants:	Pesticides
Media:	Soil, Sediment, Surface Water, Groundwater, and Biota
Remedy:	Limited Action including Land Use Controls and Long-Term Monitoring

INTRODUCTION

The United States Environmental Protection Agency (EPA) issued the Hazardous and Solid Waste Amendments (HSWA) Corrective Action portion of the Resource Conservation and Recovery Act (RCRA) Permit (hereafter referred to as the "HSWA permit") to Naval Air Station Key West, Florida (NAS Key West) pursuant to Section 3004 (u) and 3004 (v) of RCRA. The permit was issued on July 31, 1990 and required NAS Key West to complete a further investigation to determine the nature and extent of contamination from a Solid Waste Management Unit (SWMU), the Former Boca Chica DDT Mixing Area known as SWMU 2.

The purpose of this Statement of Basis is several-fold. The Statement of Basis identifies the proposed remedy for NAS Key West and explains the rationale for the preference; describes all remedies evaluated as part of the Corrective Measures Study (CMS); solicits public review and comment on all remedial alternatives, including those not previously studied; and provides information as to how the public can be involved in the remedy selection process. The Statement of Basis provides a summary of past work at NAS Key West, both of the investigation and the evaluation of remedies. The document provides key highlights of the RCRA Facility Investigation (RFI) and CMS Report, but should not be used as a substitute for these documents. Additional details regarding the facility, the investigation conducted under the RFI and the evaluation of the remedial alternatives may be found in the RFI and CMS Reports. These documents are kept as part of the administrative record and the information repository. Refer to the Public Participation section for their location.

The public is encouraged to comment on the remedial alternatives in the CMS Report or on additional remedies as appropriate. EPA wishes to emphasize that the proposed remedy is the initial recommendation of the Agency. Changes to the proposed remedy, or a change from the proposed remedy to another alternative, may be made if public comments or additional data indicate that such a change would result in a more appropriate solution.

PROPOSED REMEDY

As discussed above, the proposed remedy represents the EPA's initial recommendation of a remedial alternative for SWMU 2. The proposed remedy is a "limited action" that includes land use controls (limited site access), annual media sampling and biennial biomonitoring over a 10-year period to determine the effectiveness of the soil interim removal action performed at the site.

The total estimated capital cost and annual operation and maintenance costs for the remedy are $1,600 and $13,500 to $54,000 per year, respectively. The total costs for the life of the project is estimated at $220,000.

FACILITY BACKGROUND

The U.S. Navy owns 4,670 acres on Boca Chica Key in Monroe County, Florida as part of NAS Key West. Currently, Boca Chica Key is the location of an active military airstrip and the facilities that support the airstrip. Adjacent properties are zoned for residential use.

In 1988, a RCRA Facility Assessment (RFA) was conducted at NAS Key West. Based on the results of the RFA, an RFI was recommended at SWMU 2, Former Boca Chica DDT Mixing Area.

SWMU 2 is located in the central portion of Boca Chica Key (Figure 1). The unit is within an active air strip and completely surrounded by runways and taxiways. SWMU 2 consists of the former location of Building 915 and its surrounding area, which was used for the storage and mixing of pesticides (Figure 2). Two aboveground tanks on concrete foundations were located to the west of the building. Mixing operations for DDT were conducted at this location from the mid-1940s to the early 1970s. Building 915 was demolished in 1982 and the site is a vacant, sparsely-vegetated lot covering approximately 0.25 acre. The unit is on the northern edge of a manmade ditch that drains to a lagoon. The ditch receives surface-water runoff from the vicinity of SWMU 2 and the area north of the site. There are no surface-water connections from the ditch and lagoon to nearby marine waters.

In Spring 1996, an Interim Remedial Action (IRA) was conducted at SWMU 2. The remediation was performed to prevent the further migration of pesticide contaminants from soil and sediment into other media (i.e., surface water and groundwater), and the biota at the site. The remedial action consisted of blocking water flow into the ditch, suction-dredging all sediments from the ditch, and excavating the contaminated soil around the ditch. The water in the ditch was cleaned by repeated filtration. The removals were performed down to bedrock or approximately 1 foot deep in the soils and 1 to 1.5 feet below ground surface in the ditch. Approximately 1,950 cubic yards of contaminated soil and sediment were removed from the excavated area. Clean fill replaced the excavated soil to match the surrounding grade. The ditch was left as bare limestone. Confirmation sampling of soil and surface water was performed to determine the effectiveness of the removal.

Media sampling at SWMU 2 was conducted to characterize constituent types and distributions. Sampling was performed in 1986,

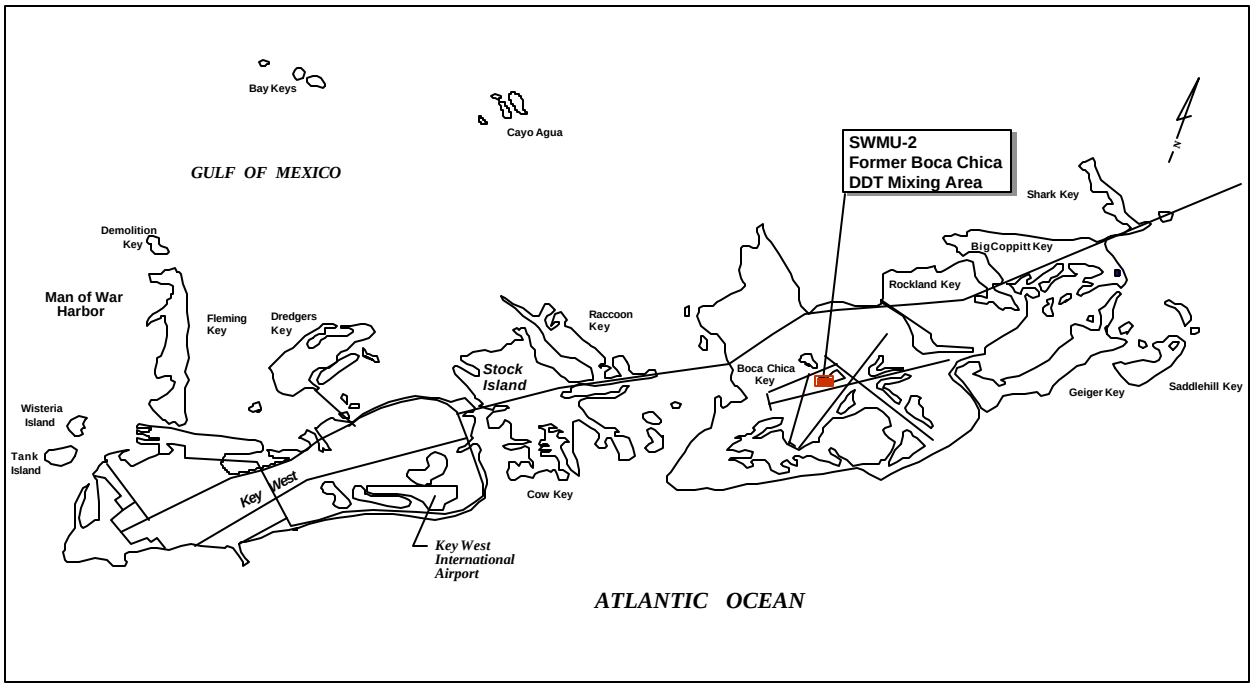

Figure 1. NAS Key West SWMU 2 Former Boca Chica DDT Mixing Area.

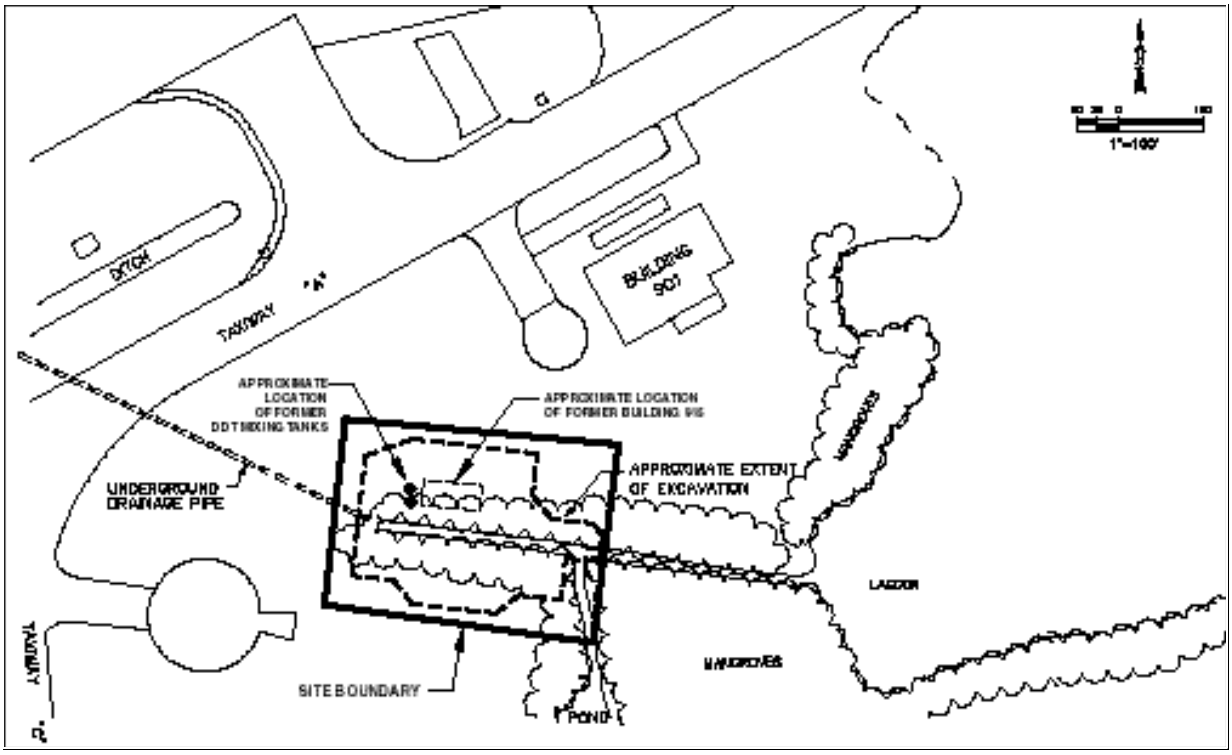

Figure 2. Site Location Map of the SWMU 2 Former Boca Chica DDT Mixing Area.

1990, 1993, 1995, and 1996 during a series of remedial investigations. The sampling activities in each investigation were tailored to SWMU 2 based on known site activities and existing data. In 1996, the soil IRA delineation and post-excavation sampling provided additional data for the evaluation of SWMU 2.

Pesticides and metals were the only compounds that exceeded applicable or relevant and appropriate requirements and screening action levels (ARARs and SALs) in soil at SWMU 2. The pesticide 4,4'-DDE exceeded the most conservative ARARs or SALs with the greatest frequency. The presence of significant concentrations of 4,4'-DDE indicates that 4,4'-DDT has been in the soil and undergoing biotransformation for some time. Several subsurface samples obtained during the RFI/RI indicate that pesticide contamination is limited predominantly to surface soil.

Metals, including aluminum, arsenic, beryllium, and chromium, exceeded their associated ARAR/SALs in several soil samples from throughout the site; however, there was no obvious focal point for the contamination.

Pesticides were the most common contaminants in sediment, with 4,4'-DDT and its degradation products detected in every sample analyzed. Other pesticides detected in the vicinity of the excavation included dieldrin, endosulfan 1, endrin, and delta-BHC. Some isolated metal contamination (arsenic and lead) was found. In addition, small amounts of volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) also were detected, but only the compound bis(2-ethylhexyl)phthalate (a common laboratory contaminant) was detected in excess of ARAR/SALs.

Consistent with results from the other media at the site, pesticides and metals were the most common surface water contaminants, but the surface water contamination appeared isolated since most pesticides and metals were found only in a single sample. Pesticides detected included 4,4'-DDD, 4,4'-DDT, beta-BHC, and heptachlor. Beta-BHC was detected below the ARAR/SALs. Of the metals detected in surface water samples, aluminum, antimony, beryllium, lead, mercury, and tin exceeded the most restrictive ARARs. The only

contaminants detected outside the IRA excavation area were antimony and tin.

The groundwater results from 1996 were consistent with a trend of contaminant concentrations decreasing with time. Three pesticides were detected in the 1996 sampling. Only 4,4'-DDD and 4,4'-DDT were detected above the ARAR/SAL criteria. In 1996, thallium (a metal that had not been previously detected on the site) was the only other contaminant that exceeded the most restrictive ARAR/SAL criteria.

SUMMARY OF FACILITY RISKS

A Human Health Baseline Risk Assessment (BRA) and an Ecological Risk Assessment (ERA) were performed as part of the RFI report. The risk assessments for the RFI/RI activities at NAS Key West were conducted in accordance with guidance under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The RCRA sites at NAS Key West were evaluated for risk following CERCLA guidance at the request of EPA Region IV.

In the BRA, human health risk associated with the exposure to detected contaminants in soil, sediment, and surface water were estimated for each potential receptor. Although groundwater was sampled and analyzed, it was not considered a pathway of concern since the groundwater at this site meets the Florida Department of Environmental Protection (FDEP) criteria for a Class G-III nonpotable aquifer.

The potential receptors were based on current and future land uses. The current potential receptors identified for SWMU 2 include adolescent/adult trespasser, occupational worker, and site maintenance worker. Under the future land use scenario, the most likely potential receptor is an excavation worker. Also considered under the future land use scenario are a residential child and adult, although residential development of SWMU 2 is considered unlikely. Under the master plan for land use on NAS Key West, the future land use for the area where SWMU 2 is located is as a restricted-access military base, with future zoning to limit access at the site because it is near an active airstrip. The full BRA is in the Supplemental RFI/RI Report.

The contaminants of potential concern (COPCs) were selected within a medium, based on comparison of the detected concentrations to risk-based screening levels. The selected COPCs represent those chemicals at SWMU 2 that are expected to contribute significantly to one or more of the exposure pathways selected for risk estimation. The BRA identified antimony, beryllium, lead, and 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, delta-BHC, endosulfan sulfate, and endrin ketone as COPCs in surface soil. Iron and 4,4'-DDD, 4,4'-DDE, 4,4'-DDT and delta-BHC were identified as COPCs in sediment, and antimony, lead, and 4,4'-DDD, 4,4'-DDT, aldrin, beta-BHC and heptachlor were identified as COPCs in surface water. Since compounds were identified as COPCs, carcinogenic and noncarcinogenic risks for the five current and future use scenarios were modeled. Conservative risk-based screening level values were used to model exposure pathways for sediment and surface water. This often results in the selection of COPCs that do not contribute significantly to the quantitative risk.

The SWMU 2 BRA identified three risk scenarios exceeding the one in one million excess cancer threshold. The principal constituents contributing to the cancer risk are 4,4'-DDD and 4,4'-DDT in surface water and sediment. However, the uncertainty analysis indicates that the estimate of the cancer risk associated with 4,4'-DDD and 4,4'-DDT for three receptors (current adolescent or adult trespasser, future resident) is very conservative. The BRA did not identify any noncarcinogenic risk.

The ERA was conducted to evaluate the possibility that aquatic and terrestrial ecological receptors may be at risk from site-related contaminants. The ERA was based on laboratory analyses of groundwater, surface water, sediment, and soil samples; and laboratory analyses of fish and vegetation.

The ERA concluded that there are potential risks to aquatic and piscivorous (fish-eating) receptors from 4,4'-DDT and its degradation products in surface water and sediment. However, the great majority of the contaminated sediment was removed during the IRA in the Spring 1996. Because the source of the pesticides has been removed from SWMU 2, long-term biomonitoring of pesticides in fish would be appropriate to ensure that concentrations decrease over time.

SCOPE OF THE CORRECTIVE ACTION

For SWMU 2 at NAS Key West, the RFI Report data indicate that the IRA performed at the site may not have reduced the threat to human health and the environment to acceptable levels in accordance with the NAS Key West HSWA permit. Therefore, because of the borderline human health risk and the substantiated ecological risk a CMS was recommended for the SWMU 2.

EPA considers that HSWA Corrective Action has various options for implementing remedies based on site conditions. Regardless of site conditions, media cleanup standards for unrestricted use are set (i.e., ARARs/SALs and industrial or residential health-based concentrations). However, EPA recognizes that such media cleanup standards might be the ultimate goal of HSWA Corrective Action; actual real-time cleanup objectives should consider actual site conditions and reasonably anticipated future use. Considering these, EPA acknowledged that Corrective Action could be implemented with the Navy addressing risks of the current and reasonably anticipated future exposure. This Corrective Action would be qualified to indicate that unrestricted use of the environmental media in question should not occur. Such an option is being implemented at NAS Key West.

SUMMARY OF ALTERNATIVES

The evaluation of the four corrective measures alternatives was conducted in accordance with the EPA Final RCRA Corrective Action Plan Guidance:

1. No Action. By law this alternative must be considered to provide a baseline to compare to the other alternatives. This alternative would not address the remaining soil, sediment, surface water, and groundwater contamination at SWMU 2. This action would involve no cost.

2. Limited Action - Land Use Controls and Long-Term Monitoring. Land use controls involve options to reduce or eliminate pathways of exposure to hazardous substances at the site. Limited action is based on the assumption that SWMU 2 would continue to be owned by the Navy. The Base would be a secured Federal facility with perimeter fencing and continued access restrictions. Land use controls would consist of maintaining records of the SWMU 2 contamination in the NAS Key West Master Plan and a memorandum of agreement (MOA) for land use control. The MOA will be signed by FDEP, EPA , and the Navy. Groundwater, surface water, and sediment samples would be collected and analyzed quarterly for the first year and annually for the next nine years to assess the effectiveness of the IRA and determine the need for any future actions. In addition, warning signs would be posted to indicate to trespassers that a potential health threat was present. A site review would be conducted every five years to determine if any change to land use controls or further actions would be required. This alternative would not reduce the volume, mobility, or toxicity of the contaminants, but reduce human exposure to the contaminated area. The cost of this alternative would be $220,000, including 10 years of monitoring.

3. Removal, Treatment, and Disposal of Contaminated Soil to Industrial Remedial Goals Options (RGOs) and Contaminated Sediment to Ecological Effect Range-Median (ER-M) Values; Treatment of Surface Water; Land Use Controls. Five major components compose this alternative: (1) removal of contaminated soil, (2) removal of contaminated sediment, (3) transport of contaminated soils and sediments for off-site treatment and/or disposal, (4) on-site treatment of associated surface waters, and (5) land use controls. All contaminated soil and sediment in excess of the FDEP RGOs and sediments with contaminant concentrations in excess of ecological ER-M values would be removed from the site, thereby eliminating potential exposure of both human and ecological receptors. Approximately 140 cubic yards of soil and 470 cubic yards of sediment would be excavated based on current estimates. Surface water (237,000 gallons) would require on-site carbon treatment. Land use controls (limited site access, site development restrictions, and educational programs) would be established to eliminate or reduce pathways of exposure from the remaining soil, sediment, and surface water at the site to human and ecological receptors. The same long-term monitoring and site review would be performed, as described in Alternative 2, to ensure protection of the environment. The total cost to implement this alternative would be $1,220,500.

4. Removal, Treatment, and Disposal of Contaminated Soil and Sediment to the Most Stringent RGOs and; Treatment of Surface Water; Land Use Controls. The five major components to this alternative are the same as those in the previous alternative. (1) removal of contaminated soil, (2) removal of contaminated sediment, (3) transport of contaminated soils and sediments for off-site treatment and/or disposal, (4) on-site treatment of associated surface waters, and (5) land use controls. All contaminated soil and sediment in excess of the FDEP most stringent RGOs would be removed from the site, thereby eliminating potential exposure of both human and ecological receptors. Approximately 4,400 cubic yards of soil and 470 cubic yards of sediment (same as Alternative 3) would be excavated, based on current estimates. The soil and sediment would be transported off-site to an approved RCRA TSDF. Surface water (237,000 gallons) would require on-site carbon treatment (same as Alternative 3). Land use controls (limited site access) would be established to eliminate or reduce pathways from the remaining contaminants at the site. Alternative 4 would remove the potential for further releases that could pose a threat to human health and the environment by excavation and disposal of the source. This alternative would provide for long-term reliability and effectiveness. Confirmation sampling would take place to ensure that the contamination has been removed from the site. The cost for this alternative would be $6,350,500.

EVALUATION OF THE PROPOSED REMEDY AND ALTERNATIVES

The proposed remedy is Alternative 2 - Limited Action that consists of land use controls and long-term monitoring. Four criteria and five other factors were used to evaluate this and the other remedial alternatives. These criteria and factors are:

- Protection of Human Health and the Environment
- Media Clean-up Standards
- Source control
- Waste Management Standards
- Long-term Reliability and Effectiveness
- Reduction in Toxicity, Mobility, or Volume
- Short-term Effectiveness
- Implementability
- Cost

The table on the following page depicts the evaluation of the remedial alternatives in the CMS Report.

The preferred remedy for SWMU 2 is Alternative 2 – Limited Action. The major components of the alternative are land use controls (i.e., limited site access, site development restrictions, and educational programs) and monitoring of media and biota. SMWU 2 is within the active airstrip (surrounded by runways and taxiways) within an active military base. No change in site usage is planned for the foreseeable future. This alternative would include sediment, surface water and groundwater sampling and biomonitoring to determine the effectiveness of the IRA and would provide for 5-year reviews of the monitoring data. The monitoring data will be evaluated in accordance with the NAS Key West Master Plan and the MOA signed by the FDEP, EPA, and the Navy. If the planned usage of the site changes to a residential-use scenario, a new CMS would be conducted. If the IRA is not found to be protective of the environment, then Alternatives 3 or 4 would be reconsidered.

PUBLIC PARTICIPATION

To make a final decision and incorporate a remedy into the RCRA permit, EPA is soliciting public review and comment on this Statement of Basis for the proposed remedy to SWMU 2 at NAS Key West. The regulations under 40 CFR 270.42(c)(2) require a 60-day comment period for a permit modification request made by the permittee under RCRA. EPA has undertaken the lead role on this request initiated by the U.S. Navy (the permittee). The comment period will begin on Sunday, July 12, 1998 which is the date of publication of the public notice in *The Citizen* newspaper, and will end on Saturday September 12, 1998.

EVALUATION OF THE REMEDIAL ALTERNATIVES FOR SWMU 2

Alternative 1	Alternative 2	Alternative 3	Alternative 4
Protection of Human Health and the Environment			
Would not be protective of human health and would not monitor the risks to the environment.	Would be protective of human health and would monitor the extent of contamination in the environment.	This alternative would be protective of human health and the environment by removing some contaminated soil and sediment and treat surface water.	Soil contaminated above RGOs and sediment would be removed and surface water treated which would be protective of human health and the environment.
Media Clean-up Standards			
Would comply with media clean-up standards.	Same as Alternative 1.	Would achieve industrial soil clean-up and sediment and surface-water media clean-up standards.	Would achieve most stringent soil, and sediment, and surface-water media clean-up standards.
Source Control			
No new source control would be implemented.	Same as Alternative 1 but would monitor the effect of the IRA on sediment and surface-water contaminant concentrations.	The contaminated soil (the primary source) in excess of the Industrial RGOs and sediment in excess of ER-M values would be removed, treated, and disposed off-site and surface water would be treated.	The soil contaminated in excess of most stringent RGOs (the balance of the primary source) and sediment would be removed, treated, and disposed off-site and surface water would be treated.
Waste Management Standards			
No standards applicable as no waste would be generated.	Same as Alternative 1.	Would comply with all applicable waste management standards during implementation.	Same as Alternative 3.
Long-term Reliability and Effectiveness			
No controls would be in place, residual contamination and existing risks would remain.	Limited site access would provide control. The effectiveness of the IRA would be measured with long-term monitoring with five-year reviews to determine need for further action.	Long-term effectiveness of this alternative which removes some of the primary source and the sediment is easily measured with long-term monitoring to assess the decrease of contamination concentrations in the environment.	This alternative would be very effective in the long-term by removing the contaminated soil, which is the balance of the primary source, and sediment and treating surface water.
Reduction in Toxicity, Mobility, or Volume through Treatment			
This alternative involves no treatment to reduce toxicity, mobility, or volume of the contaminated media.	Same as Alternative 1.	This alternative involves treatment of soil, sediment, and surface water to reduce toxicity, mobility, and volume of the waste.	This alternative involves treatment of the soil, sediment, and surface water to reduce toxicity, mobility, and volume of the waste.

EVALUATION OF THE REMEDIAL ALTERNATIVES FOR SWMU 2 (Continued)

Alternative 1	Alternative 2	Alternative 3	Alternative 4
Short-term Effectiveness			
This alternative does not reduce risk of exposure to contamination and would not pose any new risk during implementation.	This alternative reduces risk of exposure through land use controls and would pose only minimal risk during long-term monitoring.	Negative impact to ecological habitat (mangrove swamp).	Negative impact to ecological habitat (mangrove swamp).
Implementability			
Readily implementable since no action would occur.	Easily implementable as site is located within active military air strip where rules can be strictly enforced.	No difficulties are anticipated. Excavation contractors are readily available and the remediation technologies are well proven.	Same as Alternative 3.
Cost (Total Present Worth)			
$0.00	$219,768	$1,220,502	$6,350,432

Alternative 1 - No Action.
Alternative 2 - Limited Action: Land Use Controls and Long-Term Monitoring.
Alternative 3 - Remove, Treat, and Dispose of Soil Contaminated at Concentrations Greater Than FDEP RGOs and Sediment Contaminated at Concentrations Greater Than ER-M Sediment Guideline Values; Treat Associated Surface Water; and Long-Term Monitoring.
Alternative 4 - Remove, Treat, and Dispose of Contaminated Soil and Sediment at Concentrations Greater Than the Most Stringent Soil and Sediment RGOs; Treat Associated Surface Water; and Long-Term Monitoring.

The Statement of Basis and the associated administrative file, including the RFI and CMS Reports, may be viewed and copied at the EPA Regional Office in Atlanta, Georgia between the hours of 8:00 am and 4:30 pm, Monday through Friday, except legal holidays. Additional copies of the RFI and CMS Report, and Statement of Basis will be available for public review at the information repository in the Local and State History Department at the Monroe County Library, 700 Fleming Street, Key West, Florida (Phone 305-292-3595).

Further, EPA has determined there is sufficient need to hold a public meeting. The meeting will occur at 7:00 pm on Monday, July 27, 1998, at the Holiday Inn Beachside, N. Roosevelt Blvd., Key West, Florida. For directions to the public meeting call Phillip Williams at 305-293-2061. At the meeting, the proposed remedy will be discussed and questions answered. The public meeting will also address the proposed remedies for SWMUs 1,3 and 4 at NAS Key West. To request information about the public meeting or comment period, to obtain more information concerning this Statement of Basis, or to submit written comments contact: Martha Berry, Remedial Project Manager, U.S. Environmental Protection Agency, 61 Forsyth Street, SW, Atlanta, GA 30303-3104 (Phone: 404-562-8533; Fax: 404-562-8518). All comments must be postmarked no later than Saturday, September 12, 1998.

NEXT STEPS

Following the 60-day public comment period, EPA will issue a final decision on the RCRA permit modification request. The RCRA permit modification will detail the remedy chosen for SWMU 2 and will include responses to oral and written comments received during the public comment period in the Responsiveness Summary. Upon receipt of all of the Statement of Basis documents for the NAS Key West SWMUs (SWMU 1, 2, 3, 4, 5, 7, and 9), EPA will develop and issue the draft permit modification.

When the EPA makes a final decision to modify the permit, notice will be given to the Navy and each person who has submitted written comments or requested notice of the final decision. The final permit decision shall become effective 30 days after the service of notice of the decision unless a later date is specified or review is requested under 40 CFR 124.19. If no comments are received requesting a change in the draft permit, the final permit modification shall become effective immediately upon issuance.

CONTACT PERSON

EPA

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STATEMENT OF BASIS
Former Boca Chica DDT Mixing Area (SWMU 2)
Naval Air Station
Key West, Florida

Your comments on the SWMU 2 proposed remedy:

Does this Statement of Basis provide adequate information regarding the proposed remedy for SWMU 2?

☐ Yes ☐ No

If not, what other information would you like? Do you have any other comments on the actions taking place?

If you have additional comments include, on separate page. Note the Statement of Basis you are commenting on.

If you received this statement of basis in the mail, you are on the mailing list. If you did not receive this newsletter in the mail but would like to be included on the mailing list, please complete the following:

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Fold this page in half so that the address on the back is visible, staple or tape closed, stamp, and mail.

Comments on Statement of Basis
Former Boca Chica DDT Mixing Area (SWMU 2)

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Martha Berry
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