STATEMENT OF BASIS FOR FORMER BOCA CHICA OPEN DISPOSAL AREA SOLID WASTE MANAGEMENT UNIT 1 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 Open Disposal Area (SWMU 1)
Contaminants:	Metals
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 Open Disposal Area known as SWMU 1.

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, of both the investigation and of 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 1. 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 $0 and $13,000 to $78,000 per year, respectively. The total costs for the life of the project is estimated at $277,000.

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 1, Former Boca Chica Open Disposal Area.

SWMU 1 is located on the southeastern portion of Boca Chica Key, between Stone Road and the mangrove swamp along Geiger Creek and the Atlantic Ocean (Figure 1) to the south of Building 1004 (Figure 2). The site was the location of open disposal and open burning of general refuse and waste associated with aircraft maintenance activities from the 1942 to the mid-1960s. The list of possible wastes it received includes waste oil, hydraulic fluid, paint thinner and solvents. An estimated 2,600 tons of waste were disposed of or burned each year. The area of waste disposal and burning (approximately 4 acres) is indicated by debris present near the eastern edge of the site.

In Spring 1996, an Interim Removal Action (IRA) was performed to remove lead-contaminated soil and sediment. The remediation was performed to prevent the further migration of lead into uncontaminated soil, sediment and other media (i.e., surface water and groundwater) and the biota at the site. Approximately 6,300 cubic yards of soil and sediment were removed and disposed. The excavation was backfilled with stone and sand to one foot below grade to retain surface water and promote the natural revegetation of the site with mangroves. Confirmation sampling of soil and surface water was performed to determine the effectiveness of the removal. As a result of the IRA, lead no longer appears to be widespread in soil and sediment. All remaining contamination is in the vicinity of the former open disposal area within the boundary of NAS Key West.

Media sampling at SWMU 1 was conducted to characterize constituent types and distributions. Sampling was performed in 1986, 1990, 1993, and 1996 during a series of remedial investigations. The sampling activities in each investigation were tailored to SWMU 1 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 1.

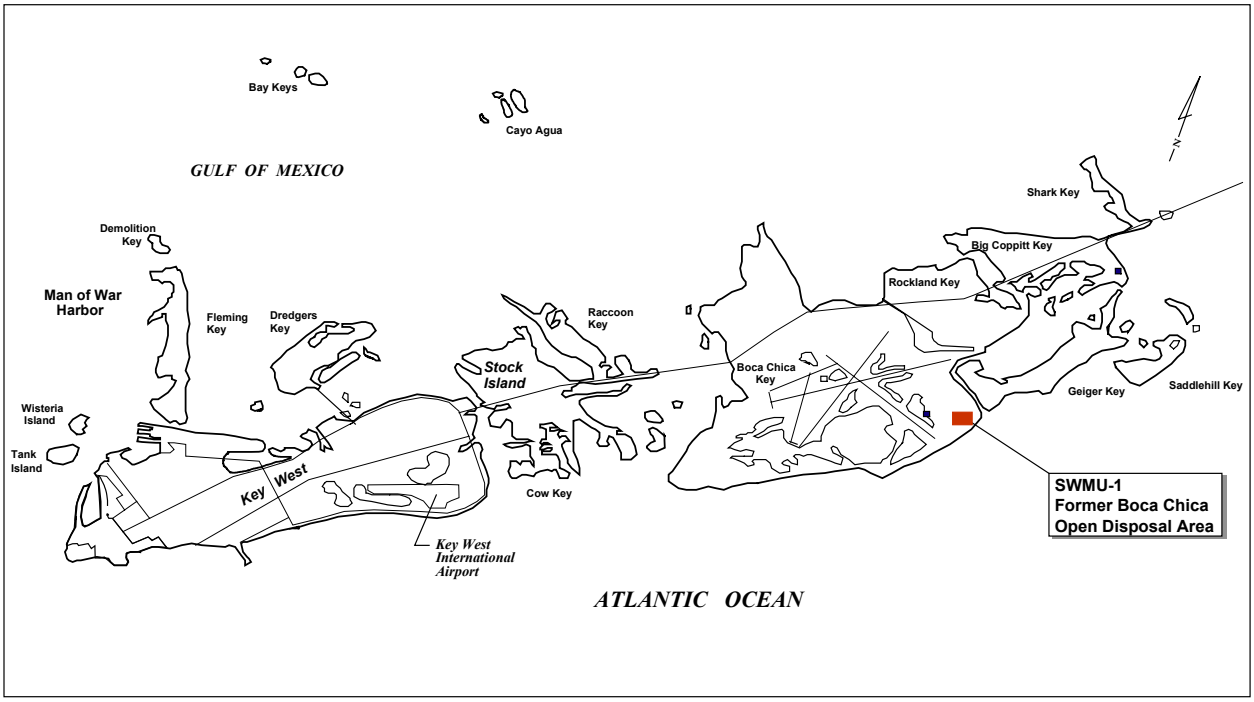

Figure 1. NAS Key West SWMU 1 Former Boca Chica Open Disposal Area.

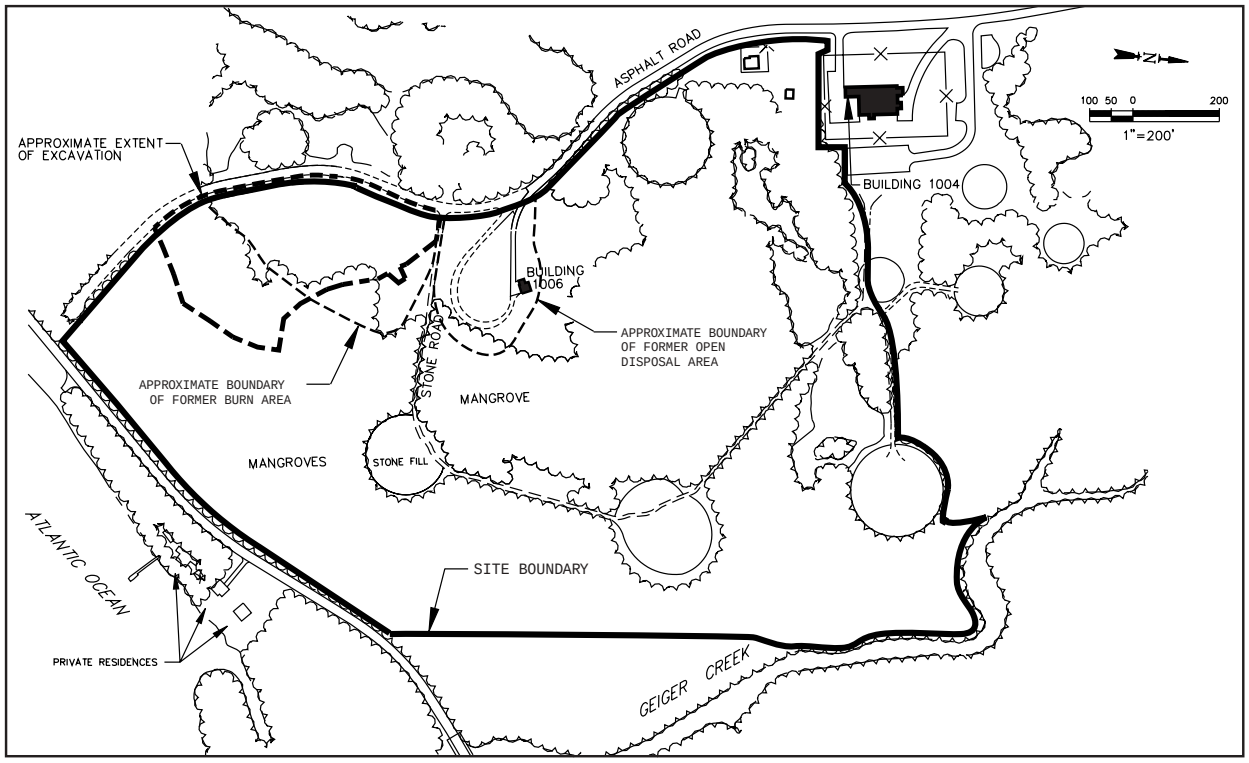

Figure 2. Site Location Map of the SWMU 1 Former Boca Chica Open Disposal Area.

Metals, semi-volatile organic compounds (SVOCs) and pesticides were found in the soil and sediment in excess of the most restrictive applicable or relevant and appropriate requirements (ARARs) and screening action levels (SALs). The metals found in soil include lead, chromium, copper, manganese and mercury. The SVOCs known as polynuclear aromatic hydrocarbons (PAHs) were found in excess of ARARs/SALs and are common constituents of asphalt and areas where burning might occur. The pesticides 4,4'-DDT and its biotransformation products 4,4'-DDD and 4,4'-DDE were detected in soil and sediment. The presence of the biotransformation products indicates that 4,4'-DDT has been in the soil and sediment for some time.

In addition metals were found to be significant surface water contaminants. Metals in the surface water were the same as those found in soil and sediment although the occurrences did not necessarily correlate geographically.

The primary groundwater contaminants appeared to be vinyl chloride and thallium. During the 1990 and 1993 investigations widespread metal contamination was observed, however this could not be duplicated during the 1996 sampling event.

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 1 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 1 is considered unlikely. Under the master plan for land use on NAS Key West, the future land use for the area where SWMU 1 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 1 that are expected to contribute to one or more of the exposure pathways selected for risk estimation. The BRA identified several SVOCs (primarily PAHs including benzo(a)pyrene), pesticides (4,4'-DDD, 4,4'-DDE, 4,4'-DDT), a polychlorinated biphenyl (PCB; Aroclor-1260) and metals (including arsenic, beryllium, lead, iron and mercury) as COPCs in soil at SWMU 1. The COPCs for sediment were a subgroup of the SVOCs and metals including arsenic, beryllium, copper, and lead. The surface water COPCs included pesticides (chlorobenzilate, kepone, isodrin and endrin aldehyde) and the metals (beryllium, cadmium, copper, lead and mercury). Since compounds were identified as COPCs, carcinogenic and noncarcinogenic risks for the five future and current use scenarios were modeled.

The SWMU 1 BRA identified four risk scenarios exceeding the one in one million excess cancer threshold. The risk for the hypothetical future resident exceeds one in ten thousand excess cancer(s). The constituents contributing to these cancer risks are Aroclor-1260 in surface soil and benzo(a)pyrene and arsenic in surface soil and sediment. Benzo(a)pyrene was the principal COPC contributing to the cancer risks.

The BRA identified a noncarcinogenic risk for the hypothetical future resident six times greater than the acceptable hazard index value of 1.0. The constituents contributing to this risk were metals (iron, arsenic, cadmium and mercury). Iron in surface soil was the primary noncarcinogenic risk source. However, there is a high uncertainty associated with the iron dose to a human receptor. The elevated levels of iron can be attributed to the iron disposed at the site in the past.

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 potential risks from ingestion of soil by terrestrial receptors and bioaccumulation through food items by piscivores are marginal and several factors can mitigate these risks. Lead appeared to be accumulating to some degree in the tissues of a few fish, but most of the lead-contaminated soil and sediment have been removed. Because contaminant concentrations in surface water and sediment were relatively high, the IRA was done to decrease significant future contaminant bioavailability to aquatic receptors, piscivorous (fish-eating) and terrestrial receptors. Most of the remaining elevated concentrations of soil contaminants were detected north of the gravel road in the northern portion SWMU 1. This is a relatively small area, separated from the mangrove swamp by the road. The recommended continued biomonitoring of SWMU 1 ecological receptors will ensure that the removal action at the site was sufficient to mitigate the marginal ecological risk. The ERA concluded that potential risk to terrestrial and aquatic receptors at SWMU 1 will decrease over time.

SCOPE OF THE CORRECTIVE ACTION

For SWMU 1 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, a CMS was recommended for SWMU 1.

EPA considers that HSWA Corrective Action has various options for implementing remedies based on site conditions. Regardless of the 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 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 1. This action would involve no cost.

2. Limited Action - Land Use Controls and Long-Term Monitoring. This alternative would rely on land use controls to limit site access, thereby eliminating or reducing exposure pathways, and on monitoring the effectiveness of the IRA. This alternative is based on the assumption that SWMU 1 would continue to be owned by the Navy. The Base would be a secured Federal facility with perimeter fencing and access restrictions. Land use controls would consist of maintaining records of the SWMU 1 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. Total cost for this alternative is $277,000, including 10 years of monitoring.

3. Removal, Treatment, and Disposal of Contaminated Soil to Industrial Remedial Goals Options (RGOs); and Land Use Controls. This alternative would consist of three major components: (1) removal of contaminated soil, (2) transport of contaminated soils offsite for treatment and disposal, and (3) land use controls. Approximately 500 cubic yards of soil contaminated in excess of the FDEP Industrial RGOs would be removed from the site, based on current estimates. The soil would be transported off-site to an approved RCRA treatment, storage, and disposal facility (TSDF). Institutional controls (limited site access, site development restrictions, and educational programs) would be established to eliminate or reduce pathways of exposure from the remaining soil and sediment at the site to human and ecological receptors. In addition, annual groundwater, sediment, and surface water monitoring and biennial biomonitoring of ecological receptors would be conducted to reassess the nature and extent of site contaminants. Alternative 3 is estimated to cost $1,056,300, including 10 years of monitoring.

4. Removal, Treatment, and Disposal of Contaminated Soil to the Most Stringent RGOs and Contaminated Sediment to Ecological Effect Range-Median (ER-M) Values and; Land Use Controls. This alternative would consist of four major components: (1) removal of contaminated soil, (2) removal of contaminated sediment, (3) transport of contaminated soil and sediment for offsite treatment and disposal, and (4) land use controls. All contaminated soil and sediment in excess of the FDEP Residential 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 5,100 cubic yards of soil and 14,000 cubic yards of sediment would

be excavated, based on current estimates. The soil and sediment would be transported off-site to an approved RCRA facility. Land use controls (limited site access) would be established to eliminate or reduce pathways from the remaining contaminants at the site. Sampling would confirm source removal from SWMU 1. The costs for Alternative 4 is $5,972,500, including four years of biennial monitoring.

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 are 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 following table depicts the evaluation of the remedial alternatives in the CMS Report.

The preferred remedy for SWMU 1 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. SWMU 1 is within the boundary of an active airstrip on the military base. No change in site usage is planned for the foreseeable future. The IRA conducted in the spring of 1996 removed the majority of the contaminated soil and sediment. 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

EVALUATION OF REMEDIAL ALTERNATIVES FOR SWMU 1

Alternative 1	Alternative 2	Alternative 3	Alternative 4
Protection of Human Health and the Environment			
Would not be protective of potential future residents and ecological receptors.	Would be protective of human health and would monitor the impact to ecological receptors.	Protective of human health and the environment by removing the remaining contaminated soil and monitoring the remaining site contamination.	Contaminated soil and sediment would be removed which would be protective of human health and the environment.
Media Clean-up Standards			
Would not comply with media clean-up standards.	Same as Alternative 1.	Would achieve FDEP industrial RGOs, but not ecological RGOs.	Would achieve soil and sediment media clean-up standards.
Source Control			
No new source control would be implemented.	Same as Alternative 1, but the effect of the IRA on groundwater, sediment, and surface water would be monitored.	The primary source (i.e., those soils contaminated in excess of the FDEP Industrial RGOs) would be removed.	All soil and sediment contaminated in excess of the RGOs, including the balance of the primary source, would be removed.
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.

EVALUATION OF REMEDIAL ALTERNATIVES FOR SWMU 1 (Continued)

Alternative 1	Alternative 2	Alternative 3	Alternative 4
Long-term Reliability and Effectiveness			
No controls would be in place; residual contamination and existing risks would remain.	Limited site access would provide some control. The effectiveness of the IRA would be measured with long-term monitoring with five-year reviews to determine need for further action.	The long-term effectiveness of this alternative, which removes the balance of the primary source would be measured with long-term monitoring to assess the decrease of contaminant concentrations in the environment.	This alternative would be effective in the long-term by removing the remaining contaminated soil and sediment.
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 may involve treatment/disposal of soil to reduce toxicity, mobility, and volume of the waste.	This alternative may involve treatment/disposal of the soil and sediment to reduce toxicity, mobility, and volume of the waste.
Short-term Effectiveness			
This alternative does not reduce risk of exposure to contamination, but 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.	Community, site worker, and ecological risks during removal, transport, and disposal of the soil would be minimal. Negative impact to ecological habitat (mangrove swamp).	Community, site worker, and ecological risks during removal, transport, and disposal of the soil and sediment would be minimal. 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.	Excavation contractors are readily available and the remediation technologies are well proven. Mangrove swamps would have to be destroyed.	Same as Alternative 3.
Cost (Total Present Worth)			
$0.00	$277,000	$1,056,300	$5,972,500

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 Industrial RGOs; Land Use Controls; 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; Land Use Controls; and Long-Term Monitoring.

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.

Other alternatives would require the destruction of significant areas of uncontaminated mangrove swamp to gain access to the remaining contaminated soil and sediment. Additionally, considering that the IRA was conducted at a significant cost to remove the majority of contamination, the costs associated with the removal/treatment/disposal alternatives are prohibitive when compared to the overall protectiveness of human health and the environment gained from these alternatives.

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 1 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.

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 also will address the proposed remedies for SWMUs 2, 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 1 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 (SWMUs 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 Open Disposal Area (SWMU 1)
Naval Air Station
Key West, Florida

Your comments on the SWMU 1 proposed remedy:

Does this Statement of Basis provide adequate information regarding the proposed remedy for SWMU 1?

☐ 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:

Name _____

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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 Open Disposal Area (SWMU 1)

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Martha Berry
Remedial Project Manager
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