



STATEMENT OF BASIS

**CONTRACTORS ROAD HEAVY EQUIPMENT AREA
SWMU GROUP C INCLUDING NOS. 15, 16, 31 AND 55
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA**



PURPOSE OF STATEMENT OF BASIS

This Statement of Basis (SB) has been developed to inform and give the public an opportunity to comment on a proposed remedy to address contamination at the Contractors Road Heavy Equipment Area (CRHEA)¹. A Kennedy Space Center (KSC) remediation team consisting of National Aeronautics and Space Administration (NASA), United States Environmental Protection Agency (EPA), and Florida Department of Environmental Protection (FDEP) has determined that the proposed remedy is cost effective and protective of human health and the environment. However, before implementing the proposed remedy, the KSC remediation team would like to give an opportunity for the public to comment on the proposed remedy. At any time during the public comment period, the public may comment as explained in the “How Do You Participate” section of this SB. After the end of the public comment period, the KSC remediation team will review all comments and issues raised in the comments and determine if there is a need to modify the proposed remedy before implementation.

WHY IS A REMEDY NEEDED?

The results of a Resource Conservation and

Recovery Act (RCRA) Facility Investigation (RFI) indicated that the polychlorinated biphenyls (PCBs) and volatile organic compounds (VOCs) listed in Table 1 are present in site soil and groundwater, respectively, and could potentially be harmful to human health.

HOW DO YOU PARTICIPATE?

The KSC remediation team solicits public review and comment on this SB before implementing the proposed remedy. The remedy for the CHREA will eventually be incorporated into the Hazardous and Solid Waste Amendments (HSWA) permit for the KSC. The public comment period for this SB and proposed remedy will begin

on the date of publication for notice of availability of the SB in major local newspapers of general circulation, and end

<p>The Proposed Remedy</p> <p>The proposed cleanup remedy for CHREA includes the following components:</p> <ul style="list-style-type: none"> • Natural attenuation of groundwater to remove contaminants through natural processes • Monitoring groundwater to document water quality and contaminant levels • Implementing institutional controls to prohibit residential use and prohibit the use of groundwater as a potable water supply

1. In accordance with RCRA §7004(b), this Statement of Basis summarizes the proposed remedy for NASA KSC Contractors Road Heavy Equipment Area (CRHEA). For detailed information on the site, consult the CRHEA RFI and CMS Reports, which are available for review at the information repository located at the NASA Document Library, North Brevard Library, 2121 South Hopkins Avenue, Titusville, FL 32780, telephone: (321) 264-5026.

45 days thereafter. If requested during the comment period, the KSC remediation team will hold a public meeting to respond to any oral comments or questions regarding the proposed remedy. To request a hearing or provide comments, contact the following person in writing within the 45-day comment period:

Mr. Timothy J. Bahr, P.G.
FDEP – Bureau of Waste Cleanup
2600 Blair Stone Road, MS 4535
Tallahassee, FL 32399-2400

The HSWA Permit, SB, and associated administrative file, including the RFI and CMS Reports, will be available to the public for viewing and copying at:

NASA Document Library
North Brevard Library
2121 South Hopkins Avenue
Titusville, FL 32780
Telephone: (321) 264-5026

To request further information, you may contact one of the following people:

Mr. Harold Williams
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FACILITY DESCRIPTION

NASA established the KSC as the primary launch site for the space program. These operations have involved the use of toxic and hazardous materials. Under the RCRA and applicable HSWA permit (Permit No. FL6800014585) issued by the FDEP and/or EPA, KSC was required to perform an investigation to determine the nature and extent of contamination from Solid Waste Management Unit (SWMU) Group C at the CRHEA (Figure 1).

SITE DESCRIPTION AND HISTORY

The CRHEA has been designated SWMU Group C. This SWMU encompasses the Printed Circuit Board Shop (PCBS-SWMU No. 31) and associated Acid Dump Site (SWMU No. 15); Sewage Treatment Plant (STP) No. 15 (SWMU No. 16); a polishing pond on the eastern edge of the SWMU boundary; a fenced area at the north end of the SWMU boundary where sandblasting and painting operations took place in the past; and Heavy Equipment Area buildings and parking areas south of the PCBS (SWMU No. 55). The CRHEA is a NASA-operated facility located at KSC on Contractors Road approximately one-half mile north of the intersection with Schwartz Road. The Heavy Equipment Area buildings and parking areas have been used for a variety of operations including heavy equipment storage and maintenance dating back to the construction of NASA's Vehicle Assembly Building (VAB), and for staging

of regulated and hazardous waste. Currently, the area is used for heavy equipment storage and maintenance. Hazardous wastes are no longer stored on site.

The PCBS facility has been used for manufacturing printed circuit boards, silk screening, plating, and laminating road signs. Spent chemicals from the circuit board process were temporarily stored in an underground storage tank (UST) located immediately east of the PCBS. The UST ruptured during removal on August 7, 1990 and a subsequent report referred to the location as the Acid Dump Site. Printed circuit board rinsate water and equipment cooling water was discharged to a hole or drum in a wetland area immediately east of STP No. 15. Printed circuit board manufacturing operations have been discontinued; however, some "closed-loop" plating operations are ongoing. A hazardous waste staging area structure that currently is only used for non-regulated waste is located adjacent to the PCBS building K6-1996.

The STP No. 15 and Polishing Pond were used for treatment of domestic wastewater from the PCBS building and the office building north of the PCBS. Wastewater was reportedly discharged to STP No. 15 from November 1971 until July 1986 when domestic wastes that this unit would have treated were redirected to STP No. 4, which serves the VAB area. From July 1986 to October 1996, STP No. 15 served as a grease treatment plant, where grease collected from grease traps was brought for biological treatment. In October 1996 STP No. 15 was abandoned.

Investigations conducted at the site include:

- November 1994: NASA's Base Operations Contractor conducted a

preliminary assessment of the CRHEA. Metals and polynuclear aromatic hydrocarbons (PAHs) were detected in some soil samples. Metals and chlorinated solvents were detected in some groundwater samples.

- August 1996: A CRHEA Interim Measures Report including results of soil, sediment, and surface water sample analyses was submitted to NASA prior to a planned paving project at the area. Metals were detected in concentrations exceeding NASA's Screening Criteria Levels of Concern in some soil and sediment samples. No interim measures were deemed necessary and no paving was completed.
- March 1995 through March 1999: An RFI was conducted. Samples of surface and subsurface soil, sediment, surface water, and groundwater were collected and analyzed. Results of these analyses were used to determine potential increased human health and ecological risks. The human health risk assessment indicated that groundwater containing VOCs would result in an unacceptable increased human health risk if the groundwater was used as a source of drinking water. Two metals (iron and aluminum) also were detected above secondary drinking water standards. Soil samples collected from within the fenced area at the north end of the site contained PCBs above risk-based criteria. One soil sample had chromium and one soil sample had thallium detected at concentrations exceeding background and FDEP's residential soil cleanup target levels (SCTLs, Chapter 62-777 F.A.C).
- June 1999: An additional intermediate-depth and deep well were installed for long term monitoring of VOCs.

- 2000 to 2001; Groundwater samples were collected to monitor the natural attenuation of VOCs. Analytes detected above groundwater cleanup target levels are listed in Table 1.

SUMMARY OF SITE RISK

As part of the RFI activities, a Human Health Risk Assessment (HHRA) was performed in accordance with KSC's remediation team-developed Risk Assessment Decision Process Document for KSC, Florida. The HHRA was performed in accordance with EPA guidance (RAGS, EPA 1989 and subsequent EPA Region 4 Guidance). An ecological risk assessment (ERA) was performed in accordance with the EPA's "Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments" dated 1997.

Chemicals of Concern (COCs) identified for human health during the RFI and supplemental sampling activities that are above EPA/FDEP cleanup target levels include:

- Groundwater: Chlorinated VOCs.
- Soil: PCBs, thallium and chromium

The HHRA showed the estimated excess lifetime cancer risk for the hypothetical future child resident exposed to soil to be about 2 in a million and future adult resident exposed to groundwater to be 6 in 1,000, which is above EPA's acceptable range of 1 in a million to 1 in 10,000 and FDEP risk goal of one in a million. The main contaminant contributing to cancer risk is PCBs in soil and vinyl chloride in groundwater.

The ERA Step 3 of EPA's eight-step process did not identify any unacceptable ecological

risks.

WHAT ARE THE REMEDY OBJECTIVES AND LEVELS?

The remedial action objectives (RAO) are to: (1) protect humans from exposure to groundwater by (a) preventing its use as a drinking water source in the shallow aquifer where contaminant concentrations are higher than cleanup target levels, and (b) to achieve groundwater cleanup; and (2) protect humans from exposure to soil by limiting access where concentrations exceed residential risk-based criteria and are above background concentrations. Table 1 lists the COCs above cleanup target levels at the CRHEA. The groundwater data are based on a complete round of samples collected in April 2001. The first column lists the chemical name, the second column lists the range of concentrations detected in groundwater and soil present at CRHEA, and the last column presents the FDEP/EPA cleanup target level to be achieved at the site.

Table 1

Site-Related Chemicals of Concern (COCs)	Range of Detections	Site-Specific Cleanup Level ^{2/}
Groundwater (ug/l) ¹		
Cis-1,2-Dichloroethene	7.8 - 505	70
Trichloroethene	3	3
Vinyl Chloride	0.64 to 44.5	1
Soil (mg/kg)		
PCBs	0.016 - 3.2 ^{3/}	2.1/2.1
Chromium	1.1 - 318	210/420
Thallium	0.30 - 1.8	0.5/14.3

1. Samples collected April 2001.
2. Florida Administrative Code 62-777. Groundwater cleanup target levels and soil cleanup target levels for residential/ industrial exposure except thallium, which is EPA risk-based concentration (no SCTL).
3. An average PCB concentration of 1.34 was computed as the 95% upper confidence limit.

REMEDIAL ALTERNATIVES FOR THE CRHEA

Because of the very low level of groundwater contamination and isolated nature and level of the soil contamination, only one remedy was considered for the CRHEA:

- Land use controls (LUCs) and natural attenuation with long-term groundwater monitoring

Land Use Controls and Natural Attenuation with Long-Term Monitoring:

Natural processes such as biological degradation, dispersion, advection, and adsorption will reduce COC concentrations to cleanup levels over time. Groundwater would be regularly sampled and analyzed to monitor and document the decrease in contaminant concentrations. Data collected during the RFI indicated that biodegradation will likely reduce contaminant concentrations below cleanup levels within five years. In the long term, this alternative will meet the RAOs for groundwater and will also allow reevaluation to determine if the remedy is working and provide an opportunity for change, if necessary. In addition, institutional LUCs would be implemented to limit access to the site by individuals other than industrial workers and to prevent the use of groundwater as a

drinking water source. NASA, EPA and the FDEP have entered into a Memorandum of Agreement (MOA) that outlines how institutional controls will be managed at NASA². The MOA requires periodic site inspection, condition certification and agency notification. The soil and groundwater use control areas are shown on Figures 2 and 3.

EVALUATION OF REMEDY

The selected remedy was evaluated to determine if it will comply with EPA's four threshold, and five balancing criteria for corrective measures. The four threshold criteria are:

- overall protection of human health and the environment;
- attain media cleanup standards;
- control the sources of releases; and
- comply with standards for management of wastes.

The five balancing criteria are:

- long term reliability and effectiveness;
- reduction in the toxicity, mobility or volume of wastes;
- short term effectiveness;
- implementability; and
- cost.

2. By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspection, condition certification and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

Long term groundwater monitoring and LUCs meet the threshold criteria and were determined to be the best overall approach with respect to the balancing criteria.

WHAT IMPACTS WOULD THE REMEDY HAVE ON THE LOCAL COMMUNITY?

There would be no impacts to the local community because groundwater is not used for potable water in the vicinity of the site. LUCs and natural attenuation with long-term monitoring include administrative actions to prohibit residential exposure and the use of groundwater until cleanup target levels are achieved.

WHY DOES THE KSC REMEDIATION TEAM RECOMMEND THIS REMEDY?

The team recommends the proposed remedy because the natural attenuation processes occurring at the site are sufficient for the removal of low concentrations of VOCs. The long-term monitoring will be used to monitor and document reduction in contaminant concentrations to target cleanup levels. The institutional controls will also prevent exposure to contaminants prior to the cleanup levels being achieved. The proposed remedy meets EPA's threshold and balancing criteria for corrective measures.

NEXT STEPS

The KSC Remediation Team will review all comments on this SB to determine if the proposed remedy needs to be modified before implementing and before incorporating the proposed remedy into KSC's HSWA permit. If the proposed remedy is determined to be appropriate for

implementation, then a Land Use Control Implementation Plan will be developed to incorporate the institutional controls at this site.