

STATEMENT OF BASIS



**GENERAL SERVICES ADMINISTRATION (GSA)
RECLAMATION YARD SWMU 10
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 General Services Administration (GSA) Reclamation Yard¹. 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 provide the public an opportunity 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 prior to implementation.

WHY IS A REMEDY NEEDED?

The results of the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) indicated that several volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs); and polychlorinated biphenyls (PCBs) listed in Table 1 are present in groundwater, which could be potentially harmful to human health if this water was used for human consumption now or in the future. In addition, the results of the RFI indicated that PCBs listed in Table 2 are present in surface soil which could potentially be harmful to human health.

<p>The Cleanup Remedy</p> <p>The proposed cleanup remedy for the GSA Reclamation Yard includes the following components:</p> <ul style="list-style-type: none"> ▪ Dewatering, soil excavation, and in situ chemical oxidation. ▪ Monitoring natural attenuation of groundwater. ▪ Implementation of institutional controls to prohibit the use of groundwater as a potable water supply and prevent residential exposure to site surface soils.

1. In accordance with RCRA §7004(b), this Statement of Basis summarizes the proposed remedy for the NASA General Services Administration (GSA) Reclamation Yard. For detailed information on the site, consult the GSA Reclamation Yard RFI and CMS Reports, which are available for review at the information repository located at the North Brevard Library, 2121 South Hopkins Avenue, Titusville, FL 32780, telephone: (321) 264-5026.

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 GSA Reclamation Yard will eventually be incorporated into the Hazardous and Solid Waste Amendments (HSWA) Permit for 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 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. John R. Armstrong, 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 Report, 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
Remediation Program Manager
Environmental Program Office
Mail Code: TA-C3
Kennedy Space Center, FL 32899
E-mail: harold.g.williams@nasa.gov
Telephone: (321) 867-8411

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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) No. 10, the GSA Reclamation Yard.

SITE DESCRIPTION AND HISTORY

The GSA Reclamation Yard is a NASA-operated facility that was constructed in the late 1960s to facilitate the recycling of a variety of equipment and chemicals used by the KSC. The facility includes a former hazardous materials building and several storage warehouses and sheds, and comprises an area of approximately 7 acres. Past and current operations at the GSA Reclamation Yard include the storage of office equipment, air conditioners, transformers, batteries, lawn mowers, paints,

solvents, pesticides, oils, and adhesives. Solvents are no longer stored onsite. The site location and facility map are included as Figures 1 and 2, respectively. Investigations conducted at the site include:

- 1990: A RCRA Facility Investigation Report was completed by the Base Operations Contractor (BOC). VOCs were identified in groundwater above regulatory criteria. Metals were identified in soil and surface water above regulatory criteria.
- 1998: A RCRA Facility Investigation was conducted. Groundwater, soil, surface water, and swale soil samples were collected. Results of these analyses were used to evaluate potential risks to human health and ecological receptors. The Human Health Risk Assessment (HHRA) indicated that groundwater containing VOCs, chlorobenzenes, and PCBs would result in an unacceptable human health risk if the groundwater was used as a source of drinking water. Also, the HHRA indicated that elevated PCBs in soils would pose an unacceptable risk to human health receptors. The ecological risk assessment (ERA) indicated that elevated PCB concentrations would result in an unacceptable risk to ecological receptors.
- 2003: An Interim Measure (IM) soil excavation was performed to remove exposed PCB-contaminated soil that posed an unacceptable risk to the current industrial worker and ecological receptors.
- 2003: Additional groundwater and soil sampling was performed. VOCs were

identified in groundwater above regulatory criteria. PCBs were identified in soil and groundwater above regulatory criteria.

SUMMARY OF SITE RISK

As part of the RFI activities, risk assessments were completed in accordance with KSC's Remediation Team Risk Assessment Decision Process Document (DPD). The ERA was performed in accordance with the eight-step process described in 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 included VOCs and chlorobenzenes in groundwater and PCBs in soil and groundwater. For a complete list of COCs in groundwater and soil see Tables 1 and 2, respectively. VOCs and chlorobenzenes were identified as COCs in groundwater for the future industrial worker, construction worker, adult resident, and child resident. PCBs were identified as a COC in soil for the current industrial worker and adolescent trespasser and the future industrial worker, construction worker, adult resident, and child resident. Cancer and non-cancer risks from potential exposure to groundwater were not estimated for current receptors, as exposure pathways from groundwater currently do not exist at the site.

The HHRA showed that cancer and non-cancer risks would be unacceptable for future use of groundwater for drinking water. The main contaminants contributing to the cancer risk were VOCs and PCBs.

The main contaminant contributing to the non-cancer risk was 1,2,4-trichlorobenzene.

The HHRA also showed that cancer and non-cancer risks to future residents potentially exposed to soil are unacceptable. The main contaminant contributing to both cancer and non-cancer risks were PCBs.

WHAT ARE THE REMEDY OBJECTIVES AND LEVELS?

The remedial action objectives (RAO) are to: (1) protect humans from exposure to groundwater by preventing its use as a drinking water source in the shallow aquifer where contaminant concentrations are higher than FDEP/EPA cleanup target levels, and by implementing groundwater cleanup; (2) protect humans from exposure to soil by removing soil where concentrations exceed site specific cleanup levels. Table 1 lists the COCs present in groundwater at the GSA Reclamation Yard. The first column lists the chemical name, the second column lists the range of concentrations in groundwater detected at the GSA Reclamation Yard during the RFI, and the last column presents the FDEP/EPA cleanup target level to be achieved at the site. Table 2 lists the COCs present in soil at the GSA Reclamation Yard. Cleanup target levels are shown for site-specific cleanup levels.

Table 1

Site-Related Chemicals of Concern (COCs)	Range of Detections ¹ (µg/L)	Site-Specific Cleanup Level ² (µg/L)
Cis-1,2-dichloroethene	0.93-5,400	70
Tetrachloroethene	1.0-68,000	3
Trichloroethene	0.74-8,000	3
Vinyl Chloride	1.2 - 510	1
1,2,4-Trichlorobenzene	3.4-1,500	70
1,3-Dichlorobenzene	2.9-600	10
PCBs (Total)	0.26-1.9	0.5

¹Detections in monitoring wells and DPT groundwater samples.

²Cleanup levels are GCTLs from Florida Administrative Code 62-777.

Table 2

Site-Related Chemicals of Concern (COCs)	Range of Detections (mg/kg)	Soil Above Water Table	Soil Below Water Table
PCBs (Total)	0.22 – 62,132	2.1 ¹	17 ²

¹Cleanup levels are Industrial SCTLs from Florida Administrative Code 62-777.

²Cleanup Target Level based on CMS Report for soil below the water table.

REMEDIAL ALTERNATIVES FOR GSA

Remedial alternatives are different combinations of plans or technologies to restrict access, and to contain or treat

contamination to protect human health and the environment. Several alternatives were considered, as summarized below.

PCB Soil Contamination:

- Presumptive Remedies
 - Excavate PCB contaminated soil above cleanup goals and properly dispose.

Groundwater PCB and Chlorobenzene Contamination:

- Presumptive Remedies
 - Short-term dewatering
- Innovative Technology
 - In situ chemical oxidation

VOC Dissolved Groundwater Contamination:

- Presumptive Remedies
 - Short-term dewatering
 - Excavate soil in highest VOC concentration areas
- Proven Alternative Technologies
 - Air sparging with soil vapor extraction (AS/SVE)
 - Short-term dewatering with long term monitoring
- Innovative Technologies
 - In situ chemical oxidation
- Passive Remedies
 - Long term monitoring
- Land Use Controls (LUCs)

Several potentially applicable corrective measures for GSA were identified and screened in the Corrective Measures Study (CMS). Detailed information was presented

concerning each potentially applicable corrective measure for contaminated soil and groundwater.

EVALUATION OF REMEDIES

Various remedial alternatives were evaluated to determine if they will comply with EPA's four threshold criteria and five balancing criteria for corrective measures. The four threshold criteria for corrective measures 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;
- short-term effectiveness;
- reduction in the toxicity, mobility, and volume of wastes;
- implementability; and
- cost.

Excavation, Permanganate Introduction, and Long-Term Monitoring meet each of the threshold criteria and were determined by the KSC Remediation Team to be the best overall approach.

FINAL REMEDY

The final corrective measure for soil contaminated with PCBs above cleanup levels in the northeast corner of the GSA is excavation and off site disposal (Figure 3).

The final remedy for groundwater contaminated with PCBs and chlorobenzenes above cleanup levels in the northeast corner of GSA is dewatering during PCB soil excavation.

The final corrective measure for the VOC source area contaminated groundwater in the southwest corner of GSA is dewatering and excavation (Figure 3). Chemical oxidant such as permanganate will be added to the excavation as a final remedy for the VOC contaminated groundwater. After excavation and permanganate introduction, the corrective measures will be followed by long-term monitoring.

PCB Impacted Area -Excavation with short-term dewatering. A dewatering system will be installed to lower the water table for soil excavation. The dewatering system will consist of a dewatering pump and well point system, a groundwater treatment system, and an effluent disposal system. Once the dewatering system lowers the water table below the anticipated excavation depth, the PCB contaminated soil above cleanup levels will be removed. The soil will be segregated between non-hazardous soil and Toxic Substance Control Act (TSCA) soil for disposal purposes. The non-hazardous soil and TSCA soil will be disposed of off site and clean fill will replace the excavated material.

VOC Impacted Area - Excavation, Permanganate Introduction, and Long Term Monitoring. A dewatering system will be installed to lower the water table for soil excavation. The dewatering system will consist of a dewatering pump and well point system, a groundwater treatment system, and an effluent disposal system. Once the

dewatering system lowers the water table below the anticipated excavation depth, the soil where the highest concentrations of VOCs were detected will be removed. The soil will be segregated between non-hazardous soil and hazardous soil for disposal purposes. Soil initially classified as hazardous will be placed into roll-off bins and treated by soil vapor extraction (SVE) in an effort to decrease VOC concentrations to allow for non-hazardous disposal. The non-hazardous soil and hazardous soil will be disposed of off site and permanganate will be added to the open pit of the excavation. After the addition of permanganate, clean fill will be added to the open pit to replace the excavated material. After excavation and permanganate introduction, the corrective measures will be followed by long term monitoring.

Land Use Controls and Long-Term Monitoring. Natural processes such as biological degradation, dispersion, advection, and adsorption will reduce COC concentrations to cleanup levels over time. Groundwater will be regularly sampled and analyzed to monitor and document the decrease in contaminant concentrations. Data collected during the RFI indicated that natural attenuation mechanisms will likely reduce contaminant concentrations below cleanup levels. The RAOs will be achieved using excavation for soil and source area contamination, and a combination of permanganate introduction and long term monitoring for the groundwater contamination. The effectiveness of the remedies will be evaluated to determine if the remedies are effective or if implementation of additional corrective measures are necessary.

In addition to active remediation, institutional controls will be implemented for site soil and groundwater. The institutional controls will maintain the site use so that the residential scenario developed in the PRE remains applicable and will also limit the use of groundwater as a drinking water source.

NASA, EPA, and FDEP have entered into a Memorandum of Agreement (MOA), which outlines how institutional controls will be managed at NASA². The MOA requires periodic inspections, condition certification, and agency notification. The area of the site that will be under institutional control is shown on Figure 2.

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 at KSC. The alternatives selected include administrative actions to limit the use of groundwater until the cleanup levels have been reached. Long-term groundwater monitoring will be used to monitor and document reduction in contaminant concentrations to cleanup target levels. Institutional controls will also prevent exposure to contaminants prior to cleanup levels being achieved.

WHY DOES THE KSC REMEDIATION TEAM RECOMMEND THIS REMEDY?

The team recommends the proposed remedy because the remedies selected are cost effective means to remediate/control soil and groundwater in a reasonable amount of time. The long-term monitoring will be used to monitor and document reduction in contamination concentrations to the cleanup target levels. The institutional controls will also prevent exposure to contaminants prior to the cleanup levels being achieved. The proposed remedy meets the four general standards for corrective measures and was determined to be the best overall approach.

NEXT STEPS

The KSC Remediation Team will review all comments on this SB to determine if the proposed remedy needs modification prior to implementation and prior to incorporating the proposed remedy into KSC's HSWA permit. If the proposed remedy is determined to be appropriate for implementation, then a long term monitoring program will be initiated, and a Land Use Control Implementation Plan (LUCIP) will be developed to incorporate the institutional controls at this site.

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 inspections, 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.

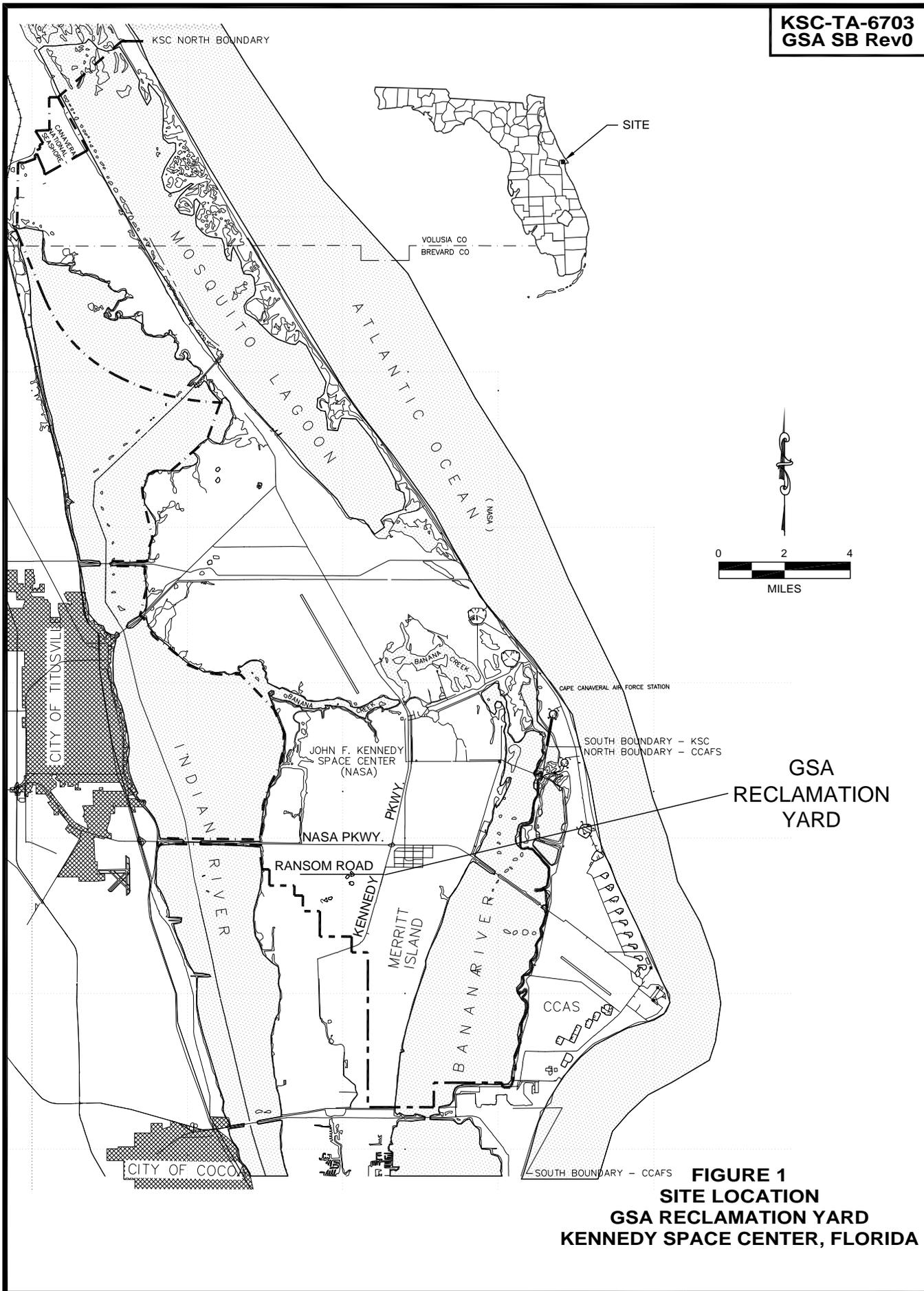


FIGURE 1
SITE LOCATION
GSA RECLAMATION YARD
KENNEDY SPACE CENTER, FLORIDA

