



**STATEMENT OF BASIS
ENVIRONMENTAL HEALTH FACILITY, SWMU 79
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER**



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 Environmental Health Facility¹ (EHF). A Kennedy Space Center (KSC) Remediation Team consisting of National Aeronautics and Space Administration (NASA) and Florida Department of Environmental Protection (FDEP) personnel has determined that the proposed remedy is cost effective and protective of human health and the environment. However, prior to implementation of 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 prior to implementation.

WHY IS A REMEDY NEEDED?

The results of the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) indicated that vinyl chloride (listed in Table 1) is present in groundwater

at levels that could be potentially harmful to human health if this water was used for human consumption now or in the future.

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 EHF 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:

The Cleanup Remedy

The proposed cleanup remedy for the EHF includes the following components:

- Natural Attenuation of groundwater to remove contaminants through natural processes.
- Monitoring of groundwater to document water quality and contaminant levels.
- Implementation of institutional controls to 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 the NASA EHF Site. For detailed information on the site, consult the EHF Site RFI Report, which is available for review at the information repository located at the North Brevard Library, 2121 South Hopkins Avenue, Titusville, FL 32780, telephone: (321) 264-5026.

Mr. John R. Armstrong, P.G.
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 Telephone: (850) 245-8981
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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
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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. 79, the EHF.

SITE DESCRIPTION AND HISTORY

The main facility building L7-1557, was constructed in 1966. From 1966 to 1982, the building was utilized as the Central Instrumentation Facility (CIF). While operated as the CIF, the building was used for housing of computers and some electronic maintenance activities. The main building was also equipped with an ionization detection system. Since 1982, the central office of Environmental Health (EH) Services has occupied the building. EH comprises Industrial Hygiene, Environmental Compliance/Public Health (EC&PH), and Health Physics. The EHF site also includes three numbered structures that were constructed between 1966 and 1985; the main building, L7-1557, an equipment storage shed, L7-1557C, and the asbestos lab, L7-1557D. The asbestos laboratory and Industrial Hygiene equipment storage building, L7-1557D, was constructed in 1985 and is located to the northeast of the main building. The structure is divided equally, with one side being used as an asbestos identification laboratory and the other side as an equipment storage area. A boiler was formerly housed on the western side of the building but was removed in 1985, and the area was converted to an EC&PH laboratory and storage area. An equipment storage shed, L7-1557C, was originally constructed in 1967 as a shelter for backup electrical generators. The generators were removed in 1983, and the building has since been used for equipment storage. Adjacent to the storage shed on the southeastern side is an electrical transformer pad where the original transformers were installed in 1966 to support the facility. The transformers were replaced in the early 1980s. Adjacent to the

storage shed on the northwestern side, is the former location of a 1,500-gallon diesel underground storage tank (UST). The tank may have been used to support the boiler formerly located in the EC&PH lab area and/or the backup generators located in L7-1557C. The tank has not been used since the removal of the backup generators in 1983. An abandoned cooling tower is located on the northwestern side of the main building adjacent to the abandoned acid storage tank. A Domestic Treatment Plant (DTP) septic system and drain field were formerly located in the southwestern corner of the site. The original drain field was replaced in the late 1980s. The facility was then connected to the Industrial Area sanitary sewer system in 1999, and the septic tank and drain field were removed. In 1986 five communication antennas were installed and are located to the northeast of the current facility buildings. Southeast and northwest of these antennas are two other concrete structures. These concrete structures are believed to have supported two previous communication antennas. Approximately 1,200 feet to the southeast of the main building are two additional antennas, a former antenna pad, and two small buildings.

Investigations conducted at the EHF include:

- 1995: An Underground Storage Tank (UST) was removed from the west side of L7-1557-C as part of the UST removal project at KSC. Soil surrounding the UST, which produced organic vapor concentrations in excess of 50 parts per million (ppm), was excavated (37.74 tons).
- 1996: A Preliminary Assessment was conducted by Universal Engineering Sciences, Inc. Based on soils samples taken, 24.51 tons of contaminated soil was removed.
- 1998: A SWMU Assessment (SA) was conducted on site media including soils, groundwater, and sediment. The SA recommended that confirmatory sampling be performed at locations with matrices that were found to exceed screening levels. The EHF SA identified five Locations of Concern (LOCs) which warranted further investigation in a Confirmation Sampling investigation.
- 2000: Confirmation Sampling (CS) of soil, sediment and groundwater at five locations was performed at EHF. Metals and polychlorinated biphenyls (PCBs) were detected above Human Health and Ecological Criteria. Vinyl chloride in groundwater was the only constituent detected above FDEP Groundwater Cleanup Target Levels (GCTLs). Metals and PCBs were also identified in sediment at levels above the Probable Effect Level (PELs). A RCRA Facility Investigation was required at EHF to further evaluate the extent of contamination and associated human health and ecological risks.
- August 2004: Phase I of the RFI was conducted, which included Direct Push Technology (DPT) groundwater samples from eight locations, the installation of six monitoring wells, collecting soil, swale soil and sediment samples and collecting and analyzing groundwater samples.
- December 2004: Phase II of the RFI was conducted to determine the extent of contamination in various site media. Activities were conducted to confirm VOC groundwater exceedances identified in intermediate groundwater DPT sampling results and to delineate the PCB exceedances.

- April-June 2005: Phases III and IV of the RFI were conducted to refine the horizontal and vertical limits of impacts of soil at LOC 8, and swale soils at LOC 2 for a potential Interim Measure (IM).
- 2005: An IM was conducted to remove chromium- and PCB-affected soil at LOC 2. The IM also removed the PCB affected soil at LOC 8. Therefore, the only constituent retained as a chemical of potential concern (COPC) was vinyl chloride in groundwater. A Preliminary Risk Evaluation (PRE) was conducted in conjunction with the RFI. The PRE for groundwater indicated that the lifetime excess lifetime excess cancer risk is above the threshold used by FDEP to identify potentially significant cancer risk associated with using the site groundwater as a drinking water source. However, there is no current use of the site groundwater and therefore no exposure or current risk. No ecological habitat was identified at the site.

SUMMARY OF SITE RISK

As part of the RFI activities a PRE was completed in accordance with KSC's Remediation Team Risk Assessment Decision Process Document (DPD).

The Chemical of Concern (COC) identified for human health from the RFI is vinyl chloride in groundwater (Table 1). No COCs were identified for soil.

The PRE indicated the estimated excess lifetime cancer risk for the hypothetical future resident was 8.9×10^{-5} , which exceeds FDEP's acceptable level of 1×10^{-6} . This assumes use of site groundwater as a drinking water source. However, there is no current use of site groundwater and therefore no exposure or current risk.

WHAT ARE THE REMEDY OBJECTIVES AND LEVELS?

The remedial action objective (RAO) is to protect humans from exposure to groundwater contaminants that exceed FDEP residential-use cleanup target levels by restricting use of site groundwater as a drinking water source. Table 1 lists the COC present in groundwater. The first column lists the chemical name, the second column lists the range of concentrations detected in groundwater, and the last column presents the FDEP cleanup target level.

Table 1

¹ Cleanup levels are GCTLs from Florida Administrative Code 62-777

Site Related Chemical of Concern (COC)	Range of Detections (µg/L)	Site Specific Cleanup Level ¹ (µg/L)
Vinyl chloride	1.2-89	1

REMEDIAL ALTERNATIVES FOR THE EHF

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. Because of the low levels of groundwater contamination present at the EHF only one remedy was considered for the EHF.

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

Under this alternative, material 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 de-

crease in contaminant concentrations. Data collected during the RFI indicated that natural attenuation mechanism will likely reduce contaminant concentrations below cleanup levels within 5 years. In the long-term this alternative will meet RAOs and will also allow re-evaluation to determine if the remedy is working and provide an opportunity for change if necessary. In addition, institutional controls will be implemented to limit 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. Controls will include periodic inspection, condition certification and agency notification. The area of the site that will be under institutional control is shown on Figure 2.

EVALUATION OF REMEDY

The selected remedy was evaluated to determine if it will comply with EPA’s four threshold 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.

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 at KSC. The natural attenuation and long-term monitoring alternative includes administrative actions to limit the use of groundwater until the cleanup levels have been reached.

WHY DOES THE KSC REMEDIATION TEAM RECOMMEND THIS REMEDY?

The team recommends the proposed remedy because the naturally occurring processes observed 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 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 with respect to the balancing criteria.

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.

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 will be developed to incorporate the institutional controls at this site.

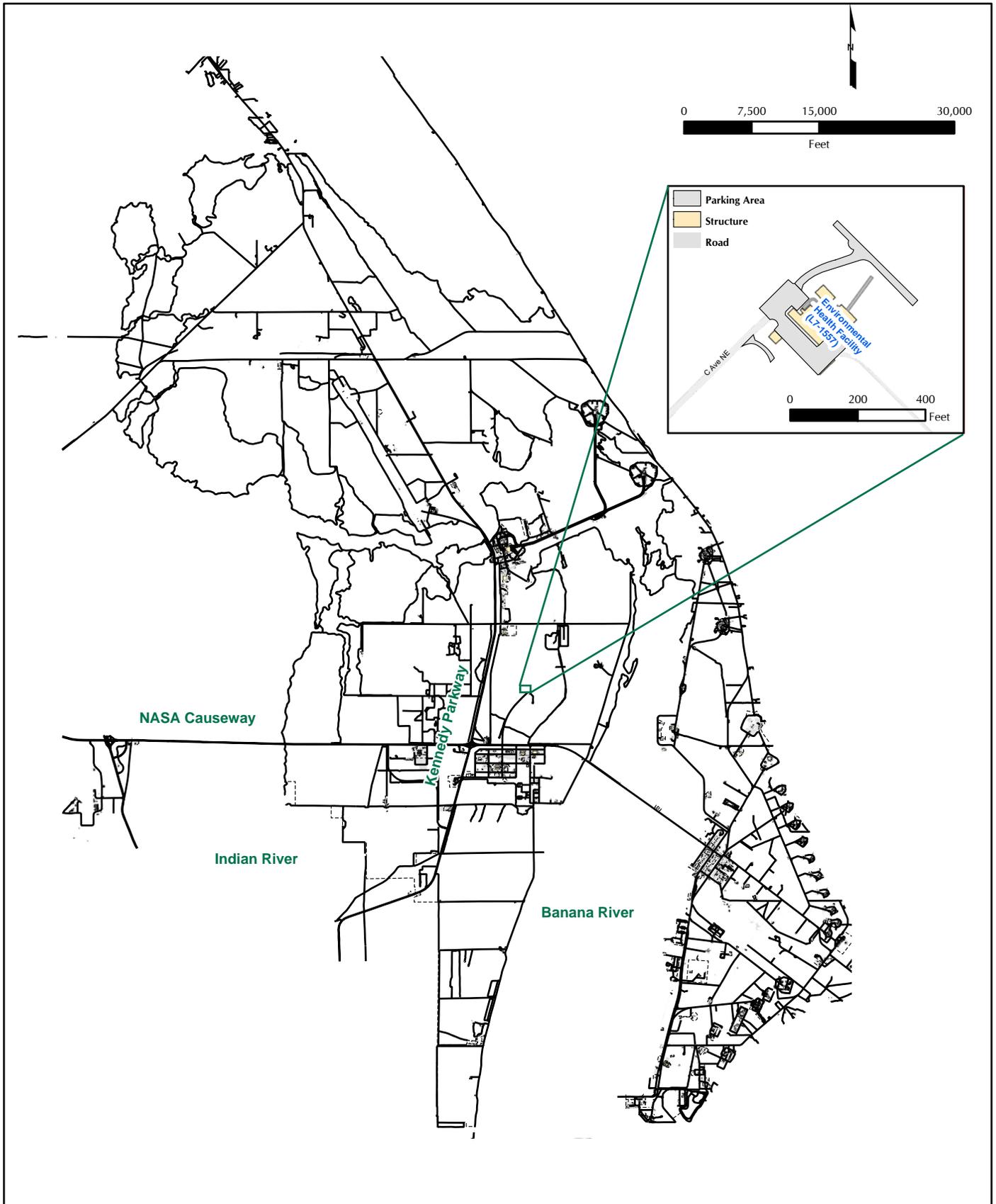


Figure 1
Location Map
Environmental Health Facility (EHF; SWMU 79)

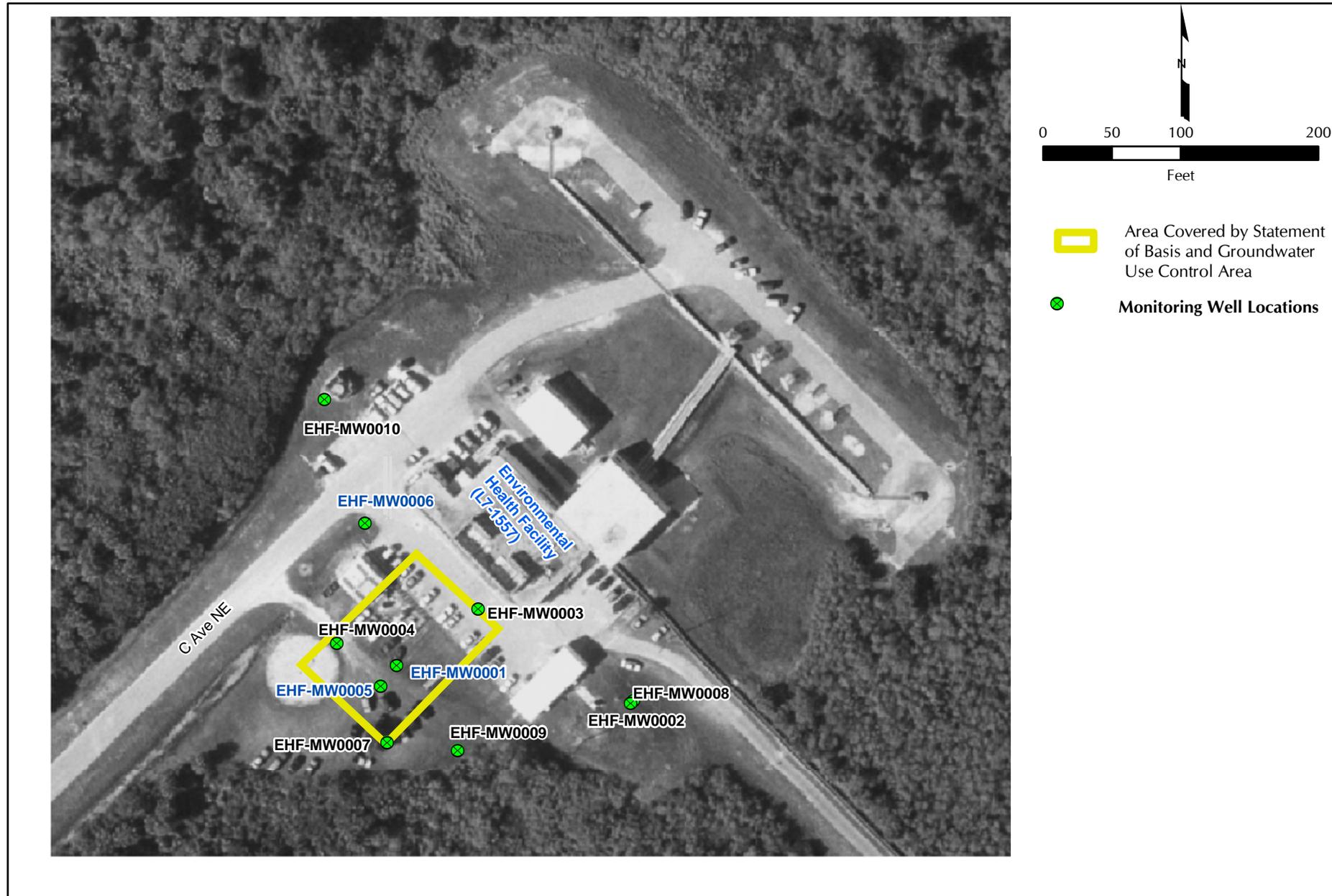


Figure 2
Site Map
Environmental Health Facility (EHF; SWMU 79)