

# **ENVIRONMENTAL ASSESSMENT**

## **RESTORATION OF THE B - 1 TEST POSITION JOHN C. STENNIS SPACE CENTER HANCOCK COUNTY, MISSISSIPPI**

**CONTACT: RONALD G. MAGEE, ENVIRONMENTAL OFFICER  
NASA CODE GA00, BUILDING 1100  
JOHN C. STENNIS SPACE CENTER  
STENNIS SPACE CENTER, MISSISSIPPI  
(601) 688-7384**

**JULY, 1994**

### **ABSTRACT**

**NASA is planning to restore the existing B-1 Test Position at the Stennis Space Center for continued use in the static test firing of the space shuttle main engines and other propulsion system testing. The proposed restoration will not result in significant impact on the quality of the human environment.**

Table of Contents

ABSTRACT ..... i

1.0 Introduction ..... 1

    1.1 Description and Purpose of the proposed action ..... 1

    1.2 Alternative Actions ..... 1

    1.3 No Action Alternative ..... 1

    1.4 Environmental Considerations ..... 1

    1.5 Conclusions and Recommendations ..... 1

2.0 Facility Description and Purpose ..... 2

    2.1 SSC Location and Function ..... 2

    2.2 The B-1 Test Position ..... 2

3.0 The Proposed Action and Alternative Actions ..... 2

    3.1 The New Facility Alternative ..... 3

    3.2 The No Action Alternative ..... 3

    3.3 Description of the proposed action ..... 3

        3.3.1 Civil/Structural ..... 3

        3.3.2 Electrical ..... 3

        3.3.3 Mechanical ..... 3

4.0 Environmental Impacts ..... 4

    4.1 Air Quality Impacts ..... 4

    4.2 Water Quality Impacts ..... 4

    4.3 Solid and Hazardous Waste Impacts ..... 4

    4.4 Toxic Substances ..... 4

    4.5 Radioactive Materials and Ionizing Radiation ..... 5

    4.6 Wetlands ..... 5

    4.7 Threatened and Endangered Species ..... 5

    4.8 Noise ..... 5

5.0 Land and Natural Resource Impacts ..... 5

    5.1 Geology, Topography, and Soils ..... 5

    5.2 Land Use ..... 6

    5.3 Floodplain ..... 6

    5.4 Energy Impacts ..... 7

6.0 Archaeological, Historic and Cultural Aspects ..... 7

    6.1 Archaeological ..... 7

    6.2 Historical ..... 7

---

6.3	Socioeconomic	7
7.0	<u>Contacts</u>	8
8.0	<u>References</u>	9
	Figure 1 - Site Location	10

## 1.0 Introduction

### 1.1 Description and Purpose of the proposed action:

The National Aeronautics and Space Administration (NASA) is planning to restore the existing B-1 test position located at John C. Stennis Space Center (SSC). The B-1 test position has been in operation since the early 1960's. The test position has not had a major restoration since its construction and requires restoration in order to accommodate plans for expanded operations.

An environmental assessment of the proposed project has been conducted to comply with the requirement of the National Environmental Policy Act (NEPA). The proposed action involves restoration and modernization of the structural, mechanical, and electrical components of the test position and modifications required to bring the position into compliance with current construction codes.

### 1.2 Alternative Actions:

Three possible alternatives to the restoration of the B-1 Test Position are considered: restoration of the existing facility, the construction of a new facility, or the no action alternative. The proposed restoration of the system is the most desirable based on environmental impacts, cost, and expediency.

### 1.3 No Action Alternative:

The major mission of the Stennis Space Center is the static test firing of the Space Shuttle Main Engine (SSME). A no action alternative would result in continued high level maintenance on the test position with the continued gradual deterioration of the structure and unplanned periodic failures.

### 1.4 Environmental Considerations:

Based on the preliminary design requirements, the environmental impact from restoration of this facility identified in this assessment are minor. The result of this action will not alter the environment presently existing and as defined in the SSC Environmental Resource Document.

### 1.5 Conclusions and Recommendations:

Restoration of the B-1 Test Position will cause very minor physical environmental impact. A finding of no significant impact is recommended.

## 2.0 Facility Description and Purpose

### 2.1 SSC Location and Function:

Stennis Space Center is located along the southern edge of the Gulf Coastal Plain near the Gulf of Mexico, approximately 88.5 kilometers (55 miles) northeast of New Orleans, Louisiana and 58 kilometers (36 miles) west of Gulfport/Biloxi, Mississippi. The facility is situated between the towns of Picayune to the north and Bay St. Louis to the south. The majority of SSC is located in Hancock County, Mississippi, although portions of the Buffer Zone extend into St. Tammany Parish, Louisiana and into Pearl River County, Mississippi.

SSC was built between 1963 and 1966. The facility was originally established to perform developmental and acceptance tests of large liquid-propellant rocket systems for the United States Space Program. Currently, SSC is the site for development and testing of the Space Shuttle Main Engines and other rocket propulsion system testing. SSC is host to other Federal, State, and related organizations located at SSC including, the U.S. Department of Commerce; the U.S. National Oceanic and Atmospheric Administration; the U.S. Environmental Protection Agency-Toxic Analysis Center; the U.S. Department of Defense; the U.S. Geological Survey; and Mississippi and Louisiana State agencies.

SSC consists of both a Fee Area and Buffer Zone. The Fee Area is comprised of approximately 5,439 hectares (13,440 acres) of government-owned land. Within the Fee Area, NASA and the other resident government agencies have constructed the test facilities, laboratories, office, and support buildings necessary to conduct their operations.

Surrounding the Fee Area, the government has acquired a perpetual restrictive easement which prohibits the maintenance or construction of dwellings and other buildings suitable for human habitation or occupancy. This region, which is mainly privately owned, is known as the Buffer Zone and covers approximately 50,505 hectares (124,800 acres).

### 2.2 The B-1 Test Position

Restoration of the B-1 test position at SSC is essential for the development, acceptance testing, and certification of NASA's rocket propulsion systems and subsystems. The B-1 test position was designed and constructed in 1965 to support the Apollo program. Since then, SSC and the mission of SSC have gone through several changes. With the program and propulsion system changes, the mission of the B-1 test position has significantly changed. The B-1 test position is being restored to support the SSME and other propulsion system testing.

## 3.0 Description of the Proposed Action and Alternative Actions

Two alternatives to the restoration of the B-1 Test Position are considered: the construction of a new facility or the no action alternative.

### 3.1 The New Facility Alternative:

The construction of a new facility would cause greater adverse environmental impact. The impact of the siting of a new facility, its associated cost, environmental considerations, and the time required to construct the new facility make this alternative less desirable than the restoration of the existing facility.

### 3.2 The No Action Alternative:

The mission at SSC as a propulsion system testing center will be hampered if forced to continue operations with deteriorating equipment at the B-1 Test Position. The test position must contain state of the art equipment that is modern, efficient, and reliable. The present position is approximately twenty-five years old and has undergone several modifications to accept the changing propulsion systems developed in the ensuing years since its construction. It is also approaching the design life of the system. This modified and aging system is requiring ever increasing maintenance and operational expenses.

### 3.3 Description of the proposed action:

This project provides for the restoration of the B-1 test position at the Stennis Space Center. There are four areas of restoration involved; Civil/Structural, Mechanical, Electrical, and Modifications to accommodate modernized equipment:

#### 3.3.1 Structural:

The restoration of the structural components of the B-1 test position will involve the restoration of the structure, repair of the diffuser, lead paint removal, and asbestos abatement. Structural repairs will involve lead abatement and mitigation as a result of abrasive blasting to prepare the surface for coating replacement.

#### 3.3.2 Electrical:

The restoration of the electrical service on the B-1 test position will involve the installation of new equipment including motor control centers, panels, nitrogen purged electrical boxes, lighting, power conditioning equipment, and switch gear. A considerable portion of the wiring and conduit will require replacement to accommodate the new electrical equipment.

#### 3.3.3 Mechanical:

An extensive portion of the existing piping has reached the limit of its operational lifetime and will be replaced. This includes the hydrogen, nitrogen, and oxygen cryogenic piping and the industrial cooling water piping.

## 4.0 Environmental Impacts

### 4.1 Air Quality Impacts:

Short term fugitive air emissions may result from the construction activities during the restoration efforts. Additional fugitive air emissions may result from the abrasive blasting and re-coating of the structural components of the B-1 test position. Fugitive air emissions resulting from this process will be contained by curtains or other enclosures to prevent deterioration of environmental quality during the restoration. There will be no emissions of air pollutants during normal operation of the system. Flare systems supporting the B-1 test position are covered under Mississippi Air Pollution Control Permit 1000-0005 issued by the Mississippi Department of Environmental Quality.

#### 4.2 Water Quality Impacts:

There should not be any impacts on water quality during the restoration of the B-1 test position. Operational wastewater discharges will consist of sanitary wastewater and storm water runoff from the area. Sanitary wastewater will be conveyed to the sanitary wastewater treatment system as is currently being accomplished. No change in the present operating conditions is anticipated. Current discharges are fully permitted under NPDES Permit Number MS0021610 issued by the Mississippi Department of Environmental Quality.

#### 4.3 Solid and Hazardous Waste Impacts:

The solids resulting from the abrasive blasting will contain lead from the original paint primers. Emissions resulting from this process will be captured by the method of blasting, the type of blast material or enclosures for capturing the spent material to prevent deterioration of the environmental quality during the restoration. The waste solids containing lead will be transported off-site to a permitted hazardous waste disposal facility. Contractors will be required to have proper permits for the handling of the hazardous waste they generate and provide the appropriate methods for disposal off-site in accordance with Federal and State regulations. Other solid waste produced will be construction debris from the demolition of parts of the old system. The scrap material should not be considered hazardous. Where material recovered from demolition or replacement has a scrap value, it will be salvaged and sold. There will be asbestos wastes generated during the construction. All asbestos abatement activities will satisfy applicable state and Federal requirements. Asbestos wastes are considered special wastes and will be disposed in the SSC landfill as approved by the Mississippi Department of Environmental Quality.

#### 4.4 Toxic Substances:

Curtains or other suitable enclosures will be utilized during the restoration to reduce the airborne fugitive lead emissions to environmentally safe levels. The lead containing abrasive will be collected and removed as described in 4.3 above.

#### 4.5 Radioactive Materials and Ionizing Radiation:

No radioactive materials or the generation of ionizing or non-ionizing radiation will occur during this project nor during normal operations as a result of this project.

#### 4.6 Wetlands:

The SSC facility straddles the watersheds of two rivers: the East Pearl River on the western Fee Area boundary and the Jourdan River on the Eastern Fee Area boundary. Some tributaries at the facility flow west to Harper Bayou and eventually drain into the East Pearl River. Other tributaries flow east into Catahoula Creek, with some intermittent streams flowing south into Devil's Swamp. Catahoula Creek and Devil's Swamp both eventually drain into the Jourdan River. The Pearl River empties into Lake Borgne, while the Jourdan River drains into the Bay of St. Louis. Both Lake Borgne and the Bay of St. Louis discharge into the Mississippi Sound.

As a result of the Wetlands hydrology found at and around SSC and the presence of hydric soils and hydrophytic vegetation, a large portion of both the Fee Area and Buffer Zone are considered jurisdictional Wetlands by the Corps of Engineers. The proposed restoration of the B-1 Test Position is not in a functional Wetlands area and will not encroach on jurisdictional Wetlands. The test position sets on previously developed land. The restoration will not expand the area currently developed. The proposed project will not be located in or affect Wetlands.

#### 4.7 Threatened and Endangered Species:

A survey for threatened and endangered species in the vicinity of the B-1 test position has been reported by Drs. Edmund Keiser and Paul Lago. There have not been any documented sightings of threatened or endangered species in the area of the B-1 test position. A 1992 fall survey of flora at the landfill site did not uncover any threatened or endangered botanical species. Proposed restoration of the B-1 test position should not affect any threatened and endangered species or critical habitat that are unknown but may exist in the SSC Fee Area. Management procedures will be in place to protect any species located during the restoration.

#### 4.8 Noise:

Noise impacts from construction will be short term and not heard outside the immediate construction area. There are no long term adverse noise impacts anticipated as a result of this project.

### 5.0 Land and Natural Resource Impacts

#### 5.1 Geology, Topography, and Soils:

SSC lies in the Lower Coastal Plain Physiographic Province of Mississippi, with the Buffer Zone surrounding the Fee Area extending into the Pine Hills Province. The site is underlain by a thick sequence of sedimentary deposits dipping to the south and west. Recent age alluvium, quaternary coastal deposits, and the citronelle formation of the Pliocene Age occur at the surface. Strata ranges from unconsolidated alluvium and coastal deposits, sands, gravel, and clays to sediments varying from clays to gravel. Bedrock is thought to be as much as 3,000 to 3,700 meters (10,000 to 12,000 feet) below the surface. The Lower Coastal Plain is a low flat area; elevations increase gradually from sea level to slightly higher elevations in the northern highlands

of the Province. Southern areas of the Province are primarily marshlands. North to south elevated ridges are the topographic features. Land surface elevation ranges from 2 to 27 meters (10 to 90 feet) above sea level, and local relief is negligible. Fee Area elevations range from approximately 1.5 to 9.1 meters (5 to 30 feet) above mean sea level. The topography of the Pine Hills Province is generally a level or rolling hills. Heavy forestation of pine occur in parts of the Province.

The Hancock County, Mississippi Soil Survey indicates the soils in the Fee Area are dominated by Atmore silt loam (At), the Smithton association (Su), and Escambia loam (EsA). These soils are generally composed of poorly to somewhat poorly drained silty and loamy soils. They are generally acidic with other significant characteristics of wetness, high organic matter, and weathered clay mineralogy.

There will be no impacts to the geology, topography, or soils at SSC as a result of this project.

### 5.2 Land Use:

The Fee Area and Buffer Zone at SSC occupy approximately 36% of the Hancock County land base. Land uses outside the Buffer Zone vary. Urban areas interspersed with open spaces, such as coastal Wetlands, are scattered along the coast. The northern half of the county is primarily commercial forestry and cropland. Recreational areas are scattered along open bodies of water. Institutional and industrial land uses occupy areas of the Buffer Zone perimeter.

The majority of the land within the Buffer Zone is used for commercial pine forests. The remaining land uses include wildlife management areas, cattle grazing, limited cropland, and small mineral mining operations.

There will be no changes to or impacts on the land use at SSC as a result of this project.

### 5.3 Floodplain:

The B-1 test position is not a critical activities facility. The documented floodplain at SSC includes a 100-year floodplain along the East Pearl River at the western edge of the Fee Area, and a 100-year floodplain along the Wolf Branch and along the Lion Branch of Catahoula Creek in the northeast portion of the Fee Area. The majority of SSC is in an area of minimal flooding. The B-1 test position is not located in the 100 year floodplain and is considered Zone C per the Flood Insurance Rate Map of Hancock County, Mississippi, Panel 125 of 195, revised 18 September 1987, Federal Emergency Management Agency. Zone C is defined as areas of minimal flooding.

### 5.4 Energy Impacts:

Restoring the facility with modern, energy-efficient motors and electrical systems along with replacing the aged mechanical systems will result in a net positive impact on the energy demand of the B-1 test position.

## 6.0 Archaeological, Historic and Cultural Aspects

### 6.1 Archaeological:

Historically, the land at SSC has been severely disturbed by timber harvesting and the associated naval stores industry during the late nineteenth and early twentieth centuries. More recently, the land was disturbed by the construction of the facility during the 1960's, making it unlikely that undisturbed archaeological sites would be found. In the Fee Area, only the townsite of Gainesville may require future archaeological considerations if land disturbing activities are proposed for the Fee Area. This project is not located near the Gainesville townsite and is on previously disturbed land. There should be no archaeological impact resulting from this project.

### 6.2 Historical:

Three test stands at SSC have been designated as National Historic Landmarks and appear on the National Register of Historic Places. These test stands and associated control centers have been so designated because of their importance in the testing of Saturn rockets, and the importance of the Saturn rocket in landing men on the moon. This project involves the restoration of the B-1 test position. This project will not alter the primary function, architecture, or structure of the test position. The project will preserve the character and physical attributes of the facility and will not affect the property from a cultural resource standpoint. This project will not alter the historical attributes of the B-1 test position. The State Historical Preservation Office will be presented with the plans once they have been finalized. Their comments will be given consideration in the final work specifications.

### 6.3 Socioeconomic:

This project will not change the number of personnel presently involved in the operations of the B-1 Test Position. There will be an increase in the number of transient short term construction and installation personnel. The B-1 test position restoration project does not have a socioeconomic impact.

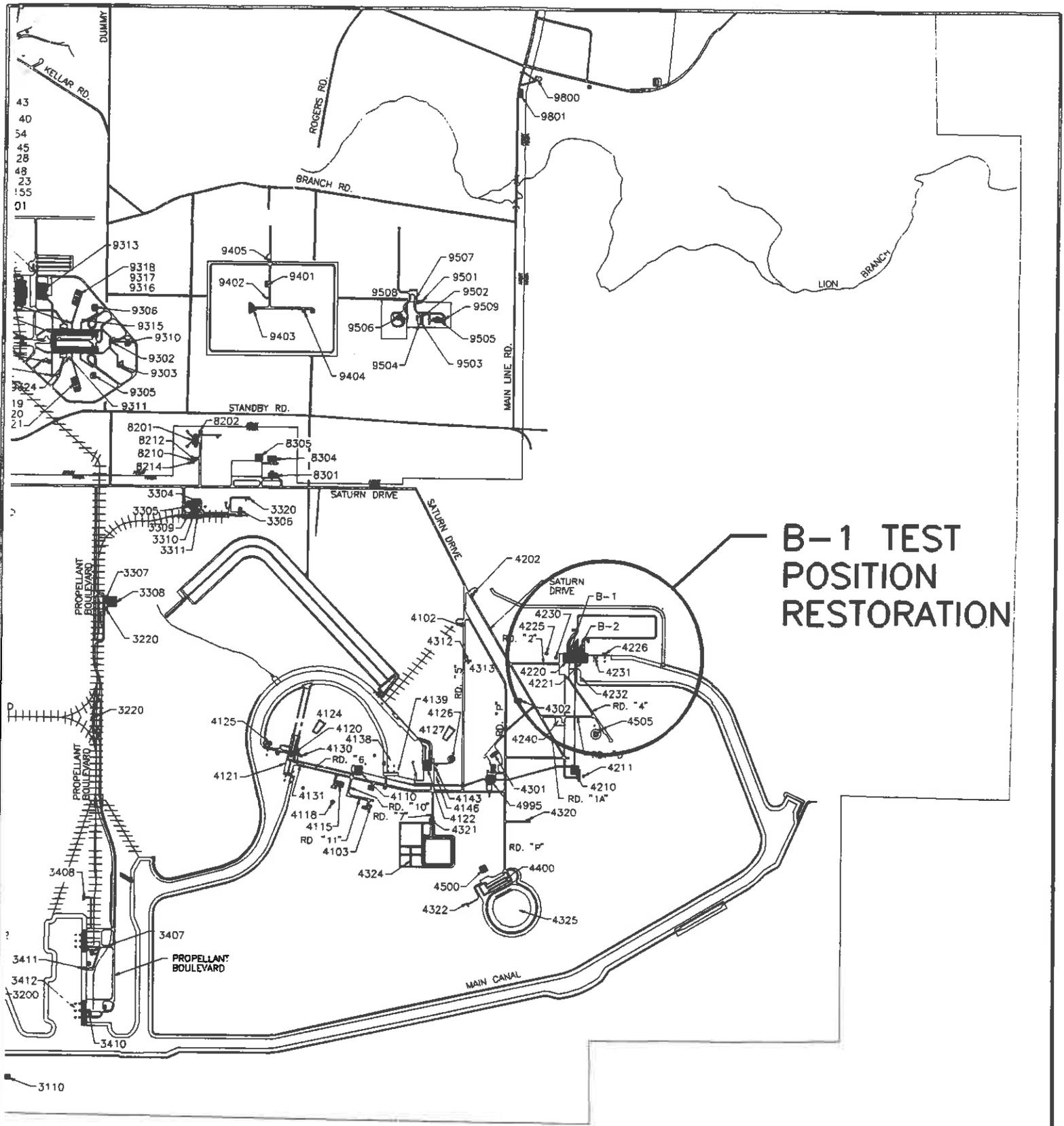
7.0 Contacts

Ronald G. Magee	NASA, SSC - Environmental Officer	Environmental Concerns
Anne Johnson	NASA, SSC - Environmental Staff	Environmental Concerns
Stan Gill	NASA - SSC Center Operations - Construction	Engineering Design
Carolyn Kennedy	Sverdrup Technologies	Environmental Health
Lynn Landrum	Johnson Controls World Services	Environmental Regulations

**8.0** References

1. Federal Emergency Management Agency, Flood Insurance Rate Map, Hancock County, Revised Map, September, 1987.
2. Federal Interagency Committee for Wetlands Delineation, 1989, Federal Manual for Identifying and Delineating Jurisdictional Wetlands, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and U.S. Department of Agriculture Soil Conservation Service, Washington, D.C., Cooperative Technical Publication.
3. Keiser, E.D., and Lago, P.K., 1991, Survey of the Amphibians, Reptiles, Birds, and Mammals on the 3,000 acre Stennis Space Center ASRM Site Final Report, University of Mississippi, University, Mississippi, 185 p.
4. NASA, Stennis Space Center, 1992, Environmental Resources Document.
5. Smith, W., Nichols, P., Jr., and Walton, L., 1978, Soil Survey of Hancock County, Mississippi, United States Department of Agriculture, Soil Conservation Service.
6. Wooten, J.W., 1990, A Fall Botanical Survey of a portion of the National Aeronautics and Space Administration Installation Stennis Space Center Mississippi, 120 p.
7. U.S. Army Corps of Engineers, Mobile District, 1988 Cultural Resources Investigations for NASA, Stennis Space Center, Mississippi.

Figure 1 - Proposed Location of the B-1 Test Position restoration



**B-1 TEST  
POSITION  
RESTORATION**

# STENNIS SPACE CENTER

MISC\0000024

