(FINAL)

ENVIRONMENTAL ASSESSMENT

FOR

ASTRONAUT STRENGTH, CONDITIONING, AND REHABILITATION FACILITY (B-26)

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

LYNDON B. JOHNSON SPACE CENTER

March 2008

CENTER OPERATIONS SUPPORT SERVICE CONTRACTOR
CSC-APPLIED TECHNOLOGY DIVISION
LYNX, LTD.

NASA/JOHNSON SPACE CENTER
2101 NASA PARKWAY (JA 330)
HOUSTON, TEXAS 77058

HOUSTON COMMUNITY NEWSPAPERS

AFFIDAVIT OF PUBLICATION

STATE OF TEXAS
COUNTY OF HARRIS

Personally appeared before the undersigned, a Notary Public within and for said County and State. Angela Holman, Representative for Kevin Barry, Publisher of the Clearlake/Bay Area Citizen, a newspaper of general circulation in the County of Harris, State of Texas. Who being duly sworn, states under oath that the report of Legal Notices, a true copy of which is hereto annexed was published in said newspapers in its issue(s) of the

31 day of January, 2008

_____ day of _____, 2008

Angela Holman
Publisher's Representative

Sworn to and subscribed before me this 1 day of February 2008.

Notary Public

My commission expires on 2/2/11

LESLIE A. SYRING
Notary Public, State of Texas
My Commission Expires
February 02, 2011

Legal Notices | Legal Notices

NOTICE TO BIDDERS

sed to Johnson Development Corporation, for the con-
nd Irrigation for Tuscan Lakes south east Sector 50-1 to
(Job No H07582) in League city, Texas; will be received
Architect TBG Partners, Inc., 3050 Post Oak Blvd. Ste.
l 10:00 a.m. local time, Thursday February 14, 2008 and
or furnishing all labor, material and equipment, and per-
he work is south of State Highway 96 along Louisiana
A mandatory pre-bid conference will be held in the office
.m. local time, Thursday, February 7, 2008. Prospective
locuments at A&E, The Graphic Complex @ 713-579-
be available for review without charge at the offices of
ashier's check in the amount of 10% of the total amount
bid. The successful bidder must furnish a payment and
he owner.

Legal Notices | Legal Notices

CE OF PUBLIC HEARING
Y OF WEBSTER, TEXAS

HAT A PUBLIC HEARING OF THE CITY COUNCIL
TEXAS WILL BE HELD ON TUESDAY, THE 19TH
6:00 P.M. IN THE COUNCIL CHAMBERS AT 101
EBSTER, TEXAS 77598, AT WHICH TIME THE CITY
JBLIC COMMENTS ON THE FOLLOWING RESI-
DISTRICT:

l Permit Parking District Greene Street along the north

JANUARY 2008.

Legal Notices | Legal Notices

PUBLIC NOTICE
OMIC DEVELOPMENT CORPORATION
OJECTS FOR FY 2007/08

OOK ECONOMIC DEVELOPMENT CORPORATION
ons 4B(a)(1) and (a)(2) of Article 5190.6 of the Texas
enditures from EDC funds as listed below. Such expen-
190.6 of the Texas Revised Civil Statutes, including but
4B (a)(3), and Section 23 to retain, assist and promote
prises, the development of parks infrastructure and open
te tourism in and around the City of Seabrook, Texas.

$25,000

$15,000

ounts listed above are scheduled to take place after the
the date this Notice was published in the official news-
meeting the requirements of Sections 4B(a)(4)(B) (a-1)
90.6, Texas Revised Civil Statutes, is submitted to the
or before the close of business on Monday, March 31,

CERTIFICATE

ice was posted on the bulletin board at Seabrook City
08 on or before 5:00 p.m. and that this notice was pub-
r on Thursday, January 31, 2008. This notice shall re-
8 at 5:00 p.m.

Legal Notices | Legal Notices | Legal Notices

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NOTICE: National Environmental Policy Act; Proposed construction of Astronaut Strength, Conditioning, and Rehabilitation Facility (B-26)

AGENCY: National Aeronautics and Space Administration (NASA)

ACTION: Notice of finding of no significant impact

SUMMARY: Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321, et seq.), the Council on Environmental Quality (CEQ) Regulations for implementing the Procedural Provisions of NEPA (40CFR 1500-1508), and the NASA policy and procedures (14 CFR part 1216 subpart 1216.3), NASA announces the availability of the Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) that address the environmental impacts expected to result from the proposed construction of the Astronaut Strength, Conditioning, and Rehabilitation Facility (B-26) at the Lyndon B. Johnson Space Center (JSC) in Houston, Texas. The building would add approximately 2,230 square meters (24,000 square feet) of space located in the eastern portion of JSC.

FOR FURTHER INFORMATION CONTACT: Written requests for copies of the EA and FONSI, or requests for information, should be directed to Mr. David Hickens, Lead, Environmental Office, NASA, Johnson Space Center, Mailcode JE-1, 2101 NASA Parkway, Houston, Texas 77058, FAX (281) 483-3048, or by calling (281) 483-3120.

SUPPLEMENTAL INFORMATION: NASA has reviewed the EA prepared for the construction of the Astronaut Strength, Conditioning, and Rehabilitation Facility and has determined that it represents an accurate and adequate analysis of the scope and level of associated environmental impacts. The EA is hereby incorporated by reference in this final FONSI.

Three alternatives have been considered: the proposed action (new building), renovation of an existing facility, and the no-action alternative. Renovation of an existing building would have less of an impact on the environment than a new building, but it would not provide adequate facilities. The no-action alternative would also not provide the necessary facilities to meet the current and future initiatives of the NASA Space Program.

The potential physical, biological, socioeconomic, and cultural impacts of the construction and operation of the Astronaut Strength, Conditioning, and Rehabilitation Facility have been assessed and evaluated. It appears that no significant impacts, related to any of these environmental issues, were identified. As a result of this assessment and evaluation, a Finding of No Significant Impact has been made.

Physical and biological resources considered included, but were not necessarily limited to, climate and earth movements, water, air, and noise resources, hazardous materials, transportation, floodplains, wetlands, wildlife, and vegetation. The Astronaut Strength, Conditioning, and Rehabilitation Facility would have no substantial impact on any of these resources.

Socioeconomics, including, but not necessarily limited to, land use, demographics, economic activity, and cultural resources were analyzed. The proposed Astronaut Strength, Conditioning, and Rehabilitation Facility would have no substantial impact on any of these resources.

Cumulative Impacts: The EA reviewed cumulative impacts that could result from the incremental impact proposed activities when added to other past, present, and reasonably foreseeable future actions. No other actions have been identified within the area of the proposed site for the Astronaut Strength, Conditioning, and Rehabilitation Facility or its area of influence that would contribute to cumulative impacts.

Mitigation: Standard construction practices would be implemented to reduce erosion potential during ground disturbing activities and compliance with NPDES permit requirements would ensure appropriate storm water runoff control.

On the basis of the EA, NASA has determined that the physical, biological, socioeconomic, and cultural impacts associated with the construction of the Astronaut Strength, Conditioning, and Rehabilitation Facility would not individually or cumulatively have a significant impact on the quality of the human environment. Therefore, NASA has determined that an Environmental Impact Statement need not be prepared. NASA will take no final action prior to the expiration of the 30-day comment period.

Date: Comments in response to this notice should be addressed to Mr. David Hickens and must be received in writing or via facsimile by March 1, 2008.

The EA which supports this draft FONSI may be reviewed at:
(a) NASA, Johnson Space Center, Bldg. 111, Industry Assistant Office, 2101 NASA Parkway, Houston, Texas 77058, between the hours of 7:30 a.m. and 4:00 p.m.
(b) NASA Headquarters, Library, Room 1J20, 300 E. Street SW, Washington D.C. 20546.
(c) Clear Lake City-County Freeman Branch Library, 16616 Diana Lane, Houston, Texas, 77062.

Michael L. Coats, Director
Johnson Space Center

37200 January 31, 2008

Legal Notices | Legal Notices | L

NOTICE OF PUBLIC SALE of property to satisfy landlord's lien 10:30 a.m. on February 21, 2008 at 525 E. NASA Rd One, Webste will be sold to highest bidder for cash. Cleanup and removal de Seller reserves the right to withdraw property from sale if deemed r cludes contents of spaces for the following tenants: JENNIFER RC goods; DAVID KINGKAID - misc. household items; CORDELL E ture, fridge, microwave, computers and files; TERESA TRAFT(items; HECTOR MEJIA, misc. household items; MICHAEL NEVI goods and furniture. **CONTACT:** Wayne Barker at 281-338-281. information.

37215 January 31, 2008 & February 7, 2008

Legal Notices | Legal Notices | L

NOTICE TO BIDDERS

Sealed bids in duplicate, addressed to Taylor Morrison, for the co Lake Improvements for Mar Bella Development to serve Galvestor No H05718) in League City, Texas; will be received at the offices o tect TBG Partners, Inc., 3050 Post Oak Blvd. Ste. 1100, Houston, T a.m. local time, Thursday, February 28, 2008 and then publicly op nishing all labor, material and equipment and performing all work. south of State Highway 96, east of State Highway 146. A mandato will be held in the office of TBG Partners, Inc. at 10:00 a.m. local 22, 2008. Prospective bidders may purchase bidding documents Complex @ 713-579-1234. Bidding documents will be availab charge at the offices of TBG Partners. A bid bond in the amour amount of the bid must accompany each bid. The successful bidd ment and performance bond acceptable to the owner.

37193 January 31, 2008 and February 7, 14, 2008

Careers/ Education | Careers/ Education

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NOTICE: National Environmental Policy Act; Proposed construction of Astronaut Strength, Conditioning, and Rehabilitation Facility (B-26)

AGENCY: National Aeronautics and Space Administration (NASA)

ACTION: Notice of finding of no significant impact

SUMMARY: Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321, et seq.), the Council on Environmental Quality (CEQ) Regulations for implementing the Procedural Provisions of NEPA (40CFR 1500-1508), and the NASA policy and procedures (14 CFR part 1216 subpart 1216.3), NASA announces the availability of the Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) that address the environmental impacts expected to result from the proposed construction of the Astronaut Strength, Conditioning, and Rehabilitation Facility (B-26) at the Lyndon B. Johnson Space Center (JSC) in Houston, Texas. The building would add approximately 2,230 square meters (24,000 square feet) of space located in the eastern portion of JSC.

FOR FURTHER INFORMATION CONTACT: Written requests for copies of the EA and FONSI, or requests for information, should be directed to Mr. David Hickens, Lead, Environmental Office, NASA, Johnson Space Center, Mailcode JE-1, 2101 NASA Parkway, Houston, Texas 77058, FAX (281) 483-3048, or by calling (281) 483-3120.

SUPPLEMENTAL INFORMATION: NASA has reviewed the EA prepared for the construction of the Astronaut Strength, Conditioning, and Rehabilitation Facility and has determined that it represents an accurate and adequate analysis of the scope and level of associated environmental impacts. The EA is hereby incorporated by reference in this final FONSI.

Three alternatives have been considered: the proposed action (new building), renovation of an existing facility, and the no-action alternative. Renovation of an existing building would have less of an impact on the environment than a new building, but it would not provide adequate facilities. The no-action alternative would also not provide the

necessary facilities to meet the current and future initiatives of the NASA Space Program.

The potential physical, biological, socioeconomic, and cultural impacts of the construction and operation of the Astronaut Strength, Conditioning, and Rehabilitation Facility have been assessed and evaluated. It appears that no significant impacts, related to any of these environmental issues, were identified. As a result of this assessment and evaluation, a Finding of No Significant Impact has been made.

Physical and biological resources considered included, but were not necessarily limited to, climate and earth movements, water, air, and noise resources, hazardous materials, transportation, floodplains, wetlands, wildlife, and vegetation. The Astronaut Strength, Conditioning, and Rehabilitation Facility would have no substantial impact on any of these resources.

Socioeconomics, including, but not necessarily limited to, land use, demographics, economic activity, and cultural resources were analyzed. The proposed Astronaut Strength, Conditioning, and Rehabilitation Facility would have no substantial impact on any of these resources.

Cumulative Impacts: The EA reviewed cumulative impacts that could result from the incremental impact proposed activities when added to other past, present, and reasonably foreseeable future actions. No other actions have been identified within the area of the proposed site for the Astronaut Strength, Conditioning, and Rehabilitation Facility or its area of influence that would contribute to cumulative impacts.

Mitigation: Standard construction practices would be implemented to reduce erosion potential during ground disturbing activities and compliance with NPDES permit requirements would ensure appropriate storm water runoff control.

On the basis of the EA, NASA has determined that the physical, biological, socioeconomic, and cultural impacts associated with the construction of the Astronaut Strength, Conditioning, and Rehabilitation Facility would not individually or cumulatively have a significant impact on the quality of the human environment. Therefore, NASA has determined that an Environmental Impact Statement need not be prepared. NASA will take no final action prior to the expiration of the 30-day comment period.

Date: Comments in response to this notice should be addressed to Mr. David Hickens and must be received in writing or via facsimile by March 1, 2008.

The EA which supports this draft FONSI may be reviewed at:

(a) NASA, Johnson Space Center, Bldg. 111, Industry Assistant Office, 2101 NASA Parkway, Houston, Texas 77058, between the hours of 7:30 a.m. and 4:00 p.m.

(b) NASA Headquarters, Library, Room 1J20, 300 E. Street SW, Washington D.C. 20546.

(c) Clear Lake City-County Freeman Branch Library, 16616 Diana Lane, Houston, Texas, 77062.

Michael L. Coats, Director

Johnson Space Center

EXECUTIVE SUMMARY

Type of report

This report is an Environmental Assessment (EA) Report.

Name of proposed action

The name of the proposed action is construction of an Astronaut Strength, Conditioning, and Rehabilitation Facility (ASCR), Lyndon B. Johnson Space Center (JSC), Houston, Texas.

Description of proposed action

The proposed action discussed in this document is the construction of an ASCR to be used by astronauts for preflight physical fitness and post-flight rehabilitation associated with long-duration space flights. The proposed site is located in the eastern portion of JSC and would host an approximately 2,230 square meters (24,000 square feet), single story building (B-26). This document provides an environmental assessment of the proposed action.

Description of alternative action

The alternative action discussed in this document is the renovation of an existing on-site building and shared use of an off-site swimming pool to provide the necessary facilities. The building that would be renovated is the Astronaut Gym (B-260A), which is approximately 1,970 square meters (21,200 square feet) and is located in the northeastern portion of JSC. This document also provides an environmental assessment of this alternative action.

Description of no-action alternative

Alternatives that were considered include the proposed action, renovation of an existing building with use of an off-site swimming pool, and the no-action alternative. The no-action alternative would result in inadequate facilities for astronaut physical fitness/rehabilitation. This alternative would not meet the purpose and need for the proposed project. The no-action alternative would have several negative consequences

for JSC. JSC has responsibilities to certify tours of Astronaut duty, to support development of the space program, to determine physiological consequences of extended-duration missions, and to develop measures to safeguard the crewmember's health throughout their duty. The existing Astronaut Gym and planned demolition of the aquatic rehab and conditioning pool are critically limiting the implementation of JSC initiatives and no-action would result in JSC's inability to execute programs. JSC is the lead NASA agency for human space flight operations support.

Physical resources

Construction of the Astronaut Strength, Conditioning, and Rehabilitation Facility (ASCR) on the proposed site at NASA's Lyndon B. Johnson Space Center (JSC) would impact approximately 0.56 hectares (1.38 acres) of undeveloped land. Due to the location, the proposed addition would comply with hurricane construction codes and would be constructed to effectively drain excess water from the site.

Construction activities may cause short-term air emissions and dust. This can be mitigated with proper dust control methods. Construction noise may exceed normal ambient noise levels, but normal levels are expected after construction activity ceases. Traffic flow may be temporarily affected during the construction phase. No hazardous materials would be generated as a result of the construction or operation of the proposed facility and preventive measures would be incorporated to reduce potential spills from construction equipment.

Normal operations of the proposed facility will not generate hazardous materials. Operation of the facility will also not result in air emissions.

The topography on the site is relatively flat and slopes towards the east. There is a drainage ditch that runs parallel to the former Houston Lighting and Power cooling water discharge canal located east of the proposed site. Some short-term erosion of soil and turbidity in drainage swales may occur during construction of the proposed facility; however, with appropriate storm water pollution prevention controls and practices, the impact would be minimal. JSC has a sedimentation and erosion control program in place that would be utilized during the construction of this project to minimize impacts. The site is not located within the 100-year flood plain.

Biological resources

The proposed site is in the Gulf Prairies and Marshes area. The footprint of the proposed building addition is currently dominated by tall prairie grasses that are regularly mowed.

The proposed site is part of a larger undeveloped area that includes open land and a pecan grove that provides habitat for deer, small mammals, birds, reptiles, and amphibians that are adapted to suburban and rural environments. Minimal displacement of wildlife is expected as a result of the proposed action due to the small area involved. No impacts to threatened and endangered species or designated critical habitat would result from the proposed action.

None of the wetlands located at JSC will be affected by the proposed action. Drainage ditches constructed in uplands are not considered waters of the United States and, thus, a permit from the USACE is not required for any re-alignment of drainage swales (33CFR333.4(a)(3) and CFR33 Part 330).

Socioeconomic and cultural resources

Construction and operation of the proposed facility would not adversely impact minority or low-income populations. Some temporary construction jobs and potential learning opportunities would be created. National Historic Landmarks (NHLs) located at JSC would not be impacted.

Conclusions

Short- and long-term effects on the quality of the human environment would be minimal if the proposed action were implemented. The only potential impacts to the physical and biological resources would be temporary and no impacts to socioeconomic and cultural resources would occur. No reasonable foreseeable cumulative effects associated with the construction of the proposed Astronaut Strength, Conditioning, and Rehabilitation Facility were identified. Construction of a new dedicated facility would have minor impacts to the environment. The no-action alternative would not provide the resources for meeting the project objectives.

ENVIRONMENTAL ASSESSMENT
For
ASTRONAUT STRENGTH, CONDITIONING, AND REHABILITATION FACILITY (B-26)
LYNDON B. JOHNSON SPACE CENTER
Houston, Texas

Lead Agency:	NASA – Lyndon B. Johnson Space Center
Proposed Action:	Astronaut Strength, Conditioning, and Rehabilitation Facility
For Further Information:	Mr. David Hickens Chief, Environmental Services Office, JE-1 2101 NASA Parkway Houston, TX 77058 (281) 483-3120
Date:	March 2008

Abstract:

The proposed action discussed in this document is construction of an Astronaut Strength, Conditioning, and Rehabilitation (ASCR) Facility (B-26), which will enable the Lyndon B. Johnson Space Center (JSC) to provide a strength conditioning and rehabilitation facility for long duration flights. The ASCR is a key element in meeting NASA's long range human space flight goals. This document provides an environmental assessment of the proposed Astronaut Strength, Conditioning, and Rehabilitation Facility and reasonable alternatives.

TABLE OF CONTENTS

APPENDICIES

LIST OF FIGURES

LIST OF TABLES

Glossary: Abbreviations, Acronyms, and Terms

Alternative	Plan, option, choice (this EA analyzes three alternatives)
ASCR	Astronaut Strength, Conditioning, and Rehabilitation
Baseline conditions	Existing condition of a resource issue
BDCF	Baseline Data Collection Facility
CEQ	Council on Environmental Quality
BMP	Best management practices
CEQ	Regulations that tell how to implement NEPA
CFR	Code of Federal Regulations
COH	City of Houston
Cumulative effects	Past, present, and reasonably foreseeable effects added together (regardless of who or what has caused, is causing, and might cause these effects)
Decision-maker	JSC Management, with review from NASA Headquarters Environmental Management Code JE
DOC	Discipline Operations Center
EA	Environmental Assessment
EIS	Environmental Impact Statement
FONSI	Finding of No Significant Impact (on the human environment, as defined in CEQ Regulations 1508.14)
FPPA	Farmland Protection Policy Act
HCFCD	Harris County Flood Control District
Issue	An environmental resource about which someone has a concern; identified in NEPA, § 102 (2) (E) as an unresolved conflict

JSC	Lyndon B. Johnson Space Center, Houston, Texas
LEED	Leadership in Energy & Environmental Design green building rating system of U.S. Green Building Council
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act of 1969
NHL	National Historic Landmark
No-action	Continue present management, but do not implement the proposed project(s)
Objective	A subset of the project's goal
OSHA	Occupational Safety and Health Administration
Preferred Alternative	The alternative (option/plan) that the decision-maker plans to select near the end of the analysis process
PPE	Personal protection equipment
ROD	Record of Decision
Selected Alternative	The alternative (option/plan) that the decision-maker selects to implement
TARL	Texas Archeological Research Laboratory
TCEQ	Texas Commission on Environmental Quality
THC	Texas Historical Commission
USACE	United States Army Corp of Engineers

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 Introduction

NASA proposes to construct an Astronaut Strength, Conditioning, and Rehabilitation Facility at the Lyndon B. Johnson Space Center (JSC) in Houston, Texas beginning in 2008.

The functional requirement of the Astronaut Strength, Conditioning, and Rehabilitation Facility would be to provide a facility for enhancing the health and well-being of astronaut crews preparing to support or returning from space flight.

1.2 Need for the Astronaut Strength, Conditioning, and Rehabilitation Facility

The Astronaut Strength, Conditioning, and Rehabilitation Facility is required to enable JSC to implement a high level of strength, conditioning and rehabilitation of astronauts to support existing and new initiatives directly related to human space flight. This facility will promote crew health and performance by housing a variety of aerobic and resistive exercise equipment, rehabilitation treatment areas, dedicated treatment personnel, specialized in-flight exercise hardware, and a two-lane lap pool (natatorium) all in one location. The consolidation of strength and rehabilitation functions is required to efficiently and closely monitor crew health, safety and performance. The ASCR is a key element in meeting NASA's long range human space flight goals.

1.3 Decisions That Must Be Made

JSC management must decide:

• Whether to construct a new Astronaut Strength, Conditioning, and Rehabilitation Facility, renovate an existing facility, or choose the no-action alternative.

• Determine whether the proposed action would or would not be a major Federal action significantly affecting the quality of the human environment. If JSC management determines that there will or may be a significant effect on the quality of the human environment, then an EIS (Environmental Impact Statement) must be prepared and a ROD (Record of Decision) signed for the Astronaut Strength, Conditioning, and Rehabilitation Facility project to proceed.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 Construction of New Astronaut Strength, Conditioning, and Rehabilitation Facility

The ASCR Facility would be located at JSC in Harris County, Texas (Figure 2-1). The proposed site contains approximately 0.56 hectares (1.38 acres) of undeveloped land. The ASCR Facility would be a free standing, one-story building having an area of 2,230 square meters (24,000 square feet). The ASCR will be located north of Building 27 and assigned Building Number 26 (Figure 2-2).

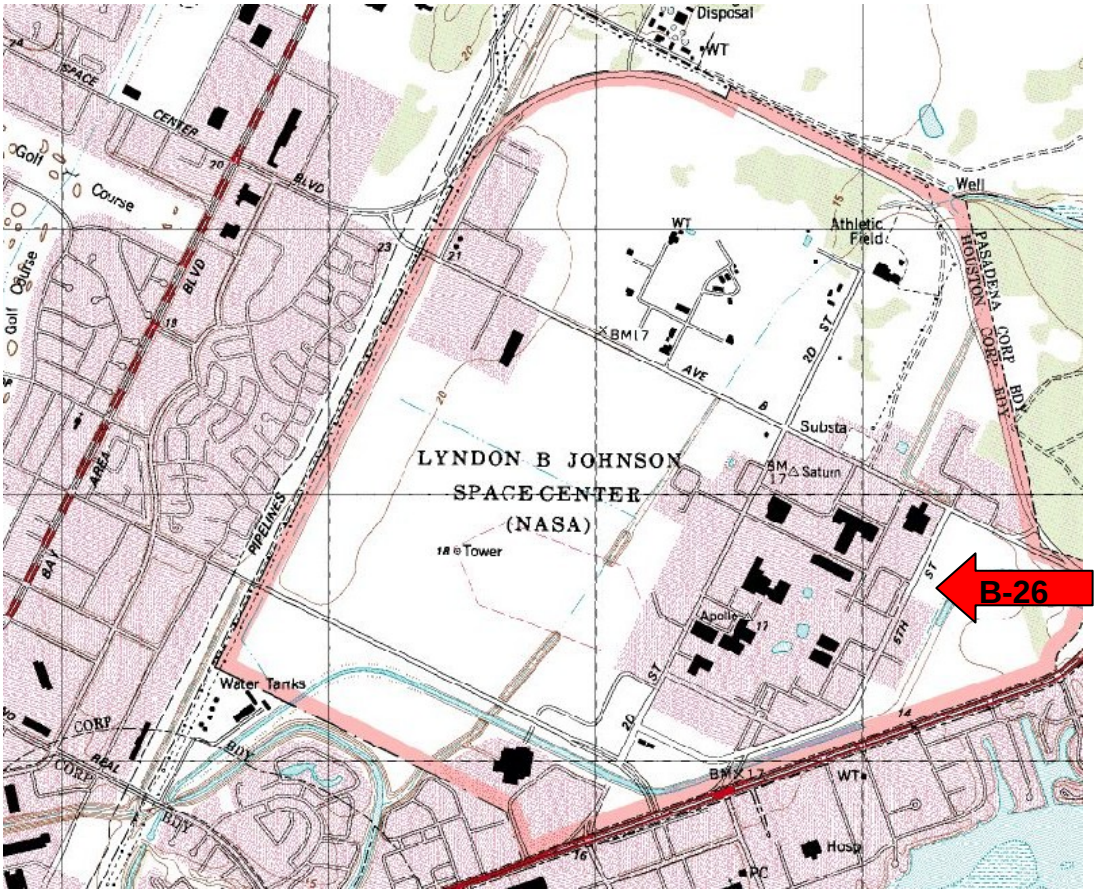

Figure 2.1 - Vicinity Map

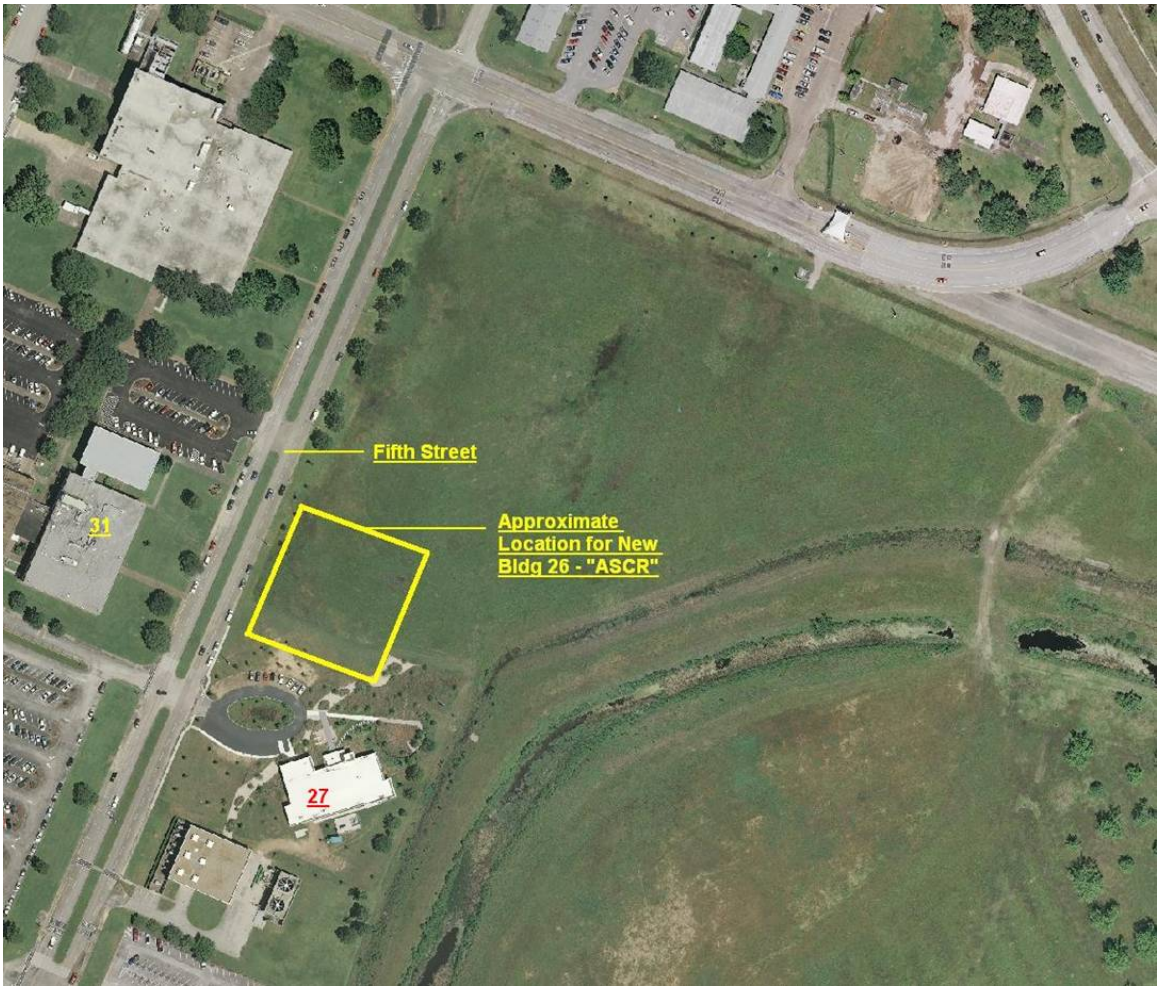

Figure 2.2 - Alternative 1 - Proposed ASCR Facility Location

Disadvantages of this alternative are that new site utilities would need to be constructed and additional parking may have to be provided for facility occupants.

2.2 Renovation of Existing Building and Shared Use of Swimming Pool

The alternative action discussed in this document is the renovation of an existing on-site building and shared use of an off-site swimming pool to provide the necessary facilities. The building that would be renovated is the Astronaut Gym (B-260A), which is approximately 1,970 square meters (21,200 square feet) and is located in the northeastern portion of JSC.

The existing Astronaut Gym was built in 1963 and was designed to handle only 16 astronauts. The current condition of the building is substandard, including insufficient

HVAC equipment, roof leaks, and inadequate insulation. The facility has inadequate space to house exercise equipment and is in generally poor condition. The facility has no swimming pool, so it would be necessary to share access at an existing, off-site facility, such as a high school swimming pool. This shared use would not provide adequate time for necessary training, and it would constrain schedules of astronauts. Also, separate training facilities would create operational inefficiencies for training staff.

2.3 No-Action Alternative: Maintenance of site in the undeveloped condition

The no-action alternative would have several consequences for JSC and NASA. JSC has responsibilities to support the training of astronauts, to support Space Station missions and other exploration ventures, to determine physiological consequences of extended duration missions, and to develop measures to safeguard the crewmembers health throughout their duty. Lack of space and a centralized location for physical conditioning activities are critically limiting the implementation of JSC initiatives and no-action would result in JSC's inability to properly execute programs.

3.0 AFFECTED ENVIRONMENT

3.1 Introduction

The affected environment succinctly describes the relevant resources of the areas that would affect or that would be affected by the alternatives if they were implemented. In conjunction with the description of the no-action alternative in Chapter 2 and with the predicted effects of the no-action alternative in Chapter 4, this chapter establishes the scientific baselines against which the decision-maker and the public can compare the effects of the action alternatives.

The two action alternatives of a new facility or renovation of an existing building would both be located at JSC in Harris County, Texas. JSC is located 35.4 kilometers (22 miles) southeast of downtown Houston, near Clear Lake. Both proposed sites are located in the eastern portion of JSC (Figure 3.1). Since the two proposed sites are in close proximity of 366 meters (1,200 feet), the following discussions will consider them in unison. Any differences in the two sites will be described as necessary.

3.2 Climate and Earth Movements

3.2.1 Hurricanes and Tidal Surge

From June to November, the Gulf Coast may be struck by hurricanes and tropical storms with sustained heavy rain and strong winds. Flooding may occur in coastal areas due to storm surge (extremely high tides caused by wind) and receding waters. A review of the U.S. Geological Survey (USGS) Topographic Map (League City Quadrangle) indicates the proposed site for the ASCR has an elevation of approximately 4.57 meters (15 feet) above mean sea level (USGS, 1995) (Figure 3-2). The proposed sites and the land surrounding the site are generally flat, with a gentle slope to the east. The northeastern portion of the site is topographically lower than the rest of the site. Areas of the proposed site for the ASCR are just outside the 100-year floodplain of Clear Lake, as shown in the flood plain map updated in 2002 (Figure 3-1) obtained from the JSC Facilities Master Plan, Vision 2020.

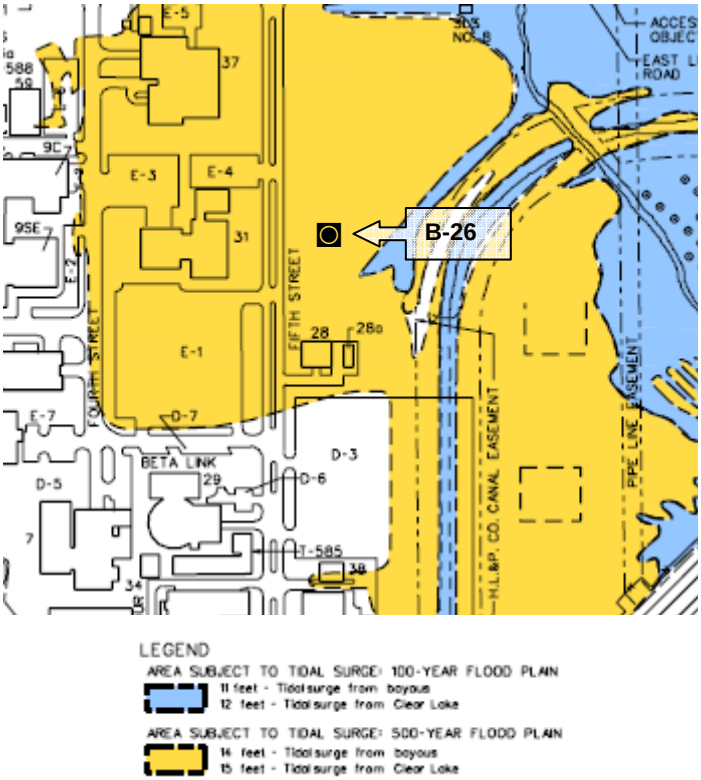

Figure 3.1 - Site Flood Plain Map

3.2.2 Rainfall

Rainfall is evenly distributed throughout the year, with an annual average of about 121.9 centimeters (48 inches) (WeatherBase). Thunderstorms are common in summer months when the sun warms the air near the surface, causing it to rise and cool, resulting in clouds and rain. Showers and thunderstorms also occur when weather fronts pass through the area.

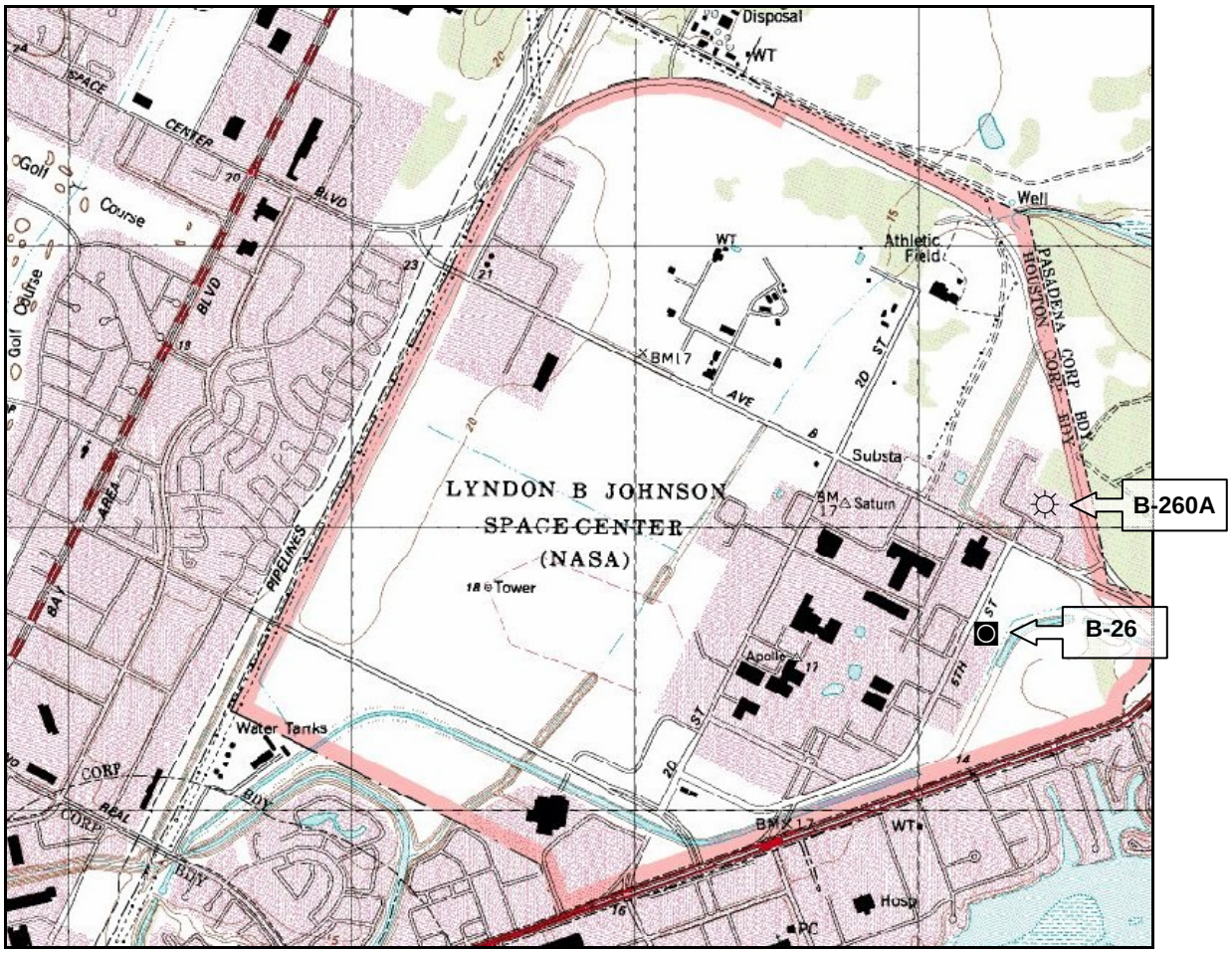

Figure 3.2 - Site Location Map

3.3 Construction Impacts

3.3.1 Air Resources

The U. S. Environmental Protection Agency established National Ambient Air Quality Standards (NAAQS) for ozone, lead, carbon monoxide, sulfur dioxide, nitrogen dioxide, and respirable particulate matter. The Texas Commission on Environmental Quality (TCEQ) has adopted the NAAQS standards presented in Table 3.3.1 for each of the six pollutants.

Table 3.3.1 - National Ambient Air Quality Standards (NAAQS)

Pollutant	Averaging Period	Primary NAAQS	Secondary NAAQS
Ozone	8-hour[a]	85 ppb	85 ppb
Carbon Monoxide	1-hour[b]	35.5 ppm	35.5 ppm
	8-hour[b]	9.5 ppm	9.5 ppm
Sulfur Dioxide	3-hour[b]	-	550 ppb
	24-hour[b]	145 ppb	-
	Annual[c]	35 ppb	-
Nitrogen Dioxide	Annual[c]	54 ppb	54 ppb
Respirable Particulate Matter (10 microns or less) (PM**10**)	24-hour[d]	155 µg/m³	155 µg/m³
	Annual[e]	51 µg/m³	51 µg/m³
Respirable Particulate Matter (2.5 microns or less) (PM**2.5**)	24-hour[f]	66 µg/m³	66 µg/m³
	Annual[g]	15.1 µg/m³	15.1 µg/m³
Lead	Quarter[c]	1.55 µg/m³	1.55 µg/m³

Notes: Source: TCEQ 2007; http://www.tceq.state.tx.us/compliance/monitoring/air/monops/naaqs.html

Primary NAAQS: the levels of air quality that the EPA judges necessary, with an adequate margin of safety, to protect the public health.

Secondary NAAQS: the levels of air quality that the EPA judges necessary to protect the public welfare from any known or anticipated adverse effects.

ppb = parts per billion, ppm = parts per million, µg/m3 = micrograms per cubic meter

a – The average of the annual fourth highest daily eight-hour maximum over a three-year period is not to be at or above this level.

b – Not to be at or above this level more than once per calendar year.

c – Not to be at or above this level.

d – Not to be at or above this level on more than three days over three years with daily sampling.

e – The three-year average of annual arithmetic mean concentrations at each monitor within an area is not to be at or above this level.

f – The three year average of the annual 98th percentile for each population-oriented monitor within an area is not to be at or above this level.

g– The three year average of annual arithmetic mean concentrations from single or multiple community-oriented monitors is not to be at or above this level.

The TCEQ classifies the air quality status of each county with respect to NAAQS as attainment, non-attainment, maintenance, or unclassified. Attainment indicates that the air quality is within the NAAQS. Non-attainment indicates that the air quality exceeds NAAQS for a specified pollutant or pollutants. Unclassified indicates insufficient data to

categorize a particular county. Harris County is classified as a "severe non-attainment" area for ozone. It is in attainment for all other NAAQS. Ozone is not emitted directly into the air. It is formed through chemical reactions between natural and man-made emissions of volatile organic compounds (VOCs) and nitrogen oxides (NOx) in the presence of sunlight. Ozone pollution is the periodic increase in the concentration of ozone in the ambient air. When temperatures are high, sunshine is strong, and winds are weak, ozone can accumulate at ground level to unhealthful levels (TCEQ 2007).

3.3.2 Sound Environment

Most of the land immediately surrounding the proposed site for the ASCR hosts buildings, parking lots, or open fields. Adjacent to the south of the site is the Astronaut Quarantine Facility (B-27) and a small parking lot. Adjacent to the north is an open field. Adjacent to the west is Fifth Street, and further west are the Planetary and Earth Sciences Laboratory (B-31) and parking lots. Adjacent to the east are a drainage ditch, the former Houston Lighting and Power (HL&P) canal, an open field, and a pecan grove. A fence marking the perimeter of JSC, a public roadway (NASA Parkway), and Clear Lake are located further to the east. Noise levels are very low and do not appear to exceeded normal background levels typically associated with such areas.

3.3.3 Spills and Hazardous Materials

The proposed site for the ASCR is undeveloped and has not been associated with any known activities or past uses, which involved the generation, storage, or disposal of hazardous materials. The application of herbicides and insecticides is presumed to have occurred as part of normal pest control procedures. Residual concentrations of these chemicals are not expected to be present on the proposed site. There are no records of spills having occurred at this site.

3.3.4 Transportation

The proposed ASCR site is located on Fifth Street. Vehicles currently travel on this roadway when going to and from surrounding buildings. There is a facility entry gate from Space Center Boulevard into JSC to the northeast of the proposed site. In general, there is light vehicular traffic in this area of JSC.

3.4 Water Resources

3.4.1 Surface Water and Drainage

A cooling water canal, formerly maintained by the Houston Lighting and Power Company (HL&P), is located approximately 100 meters (330 feet) west of the proposed ASCR site. Based on historical aerial photographs and USGS topographic maps, the canal was constructed between 1944 and 1957. A storm water drainage ditch runs parallel to the HL&P canal. Based on historical aerial photographs and USGS topographic maps, the drainage ditch was constructed in the late 1960's. The drainage ditch discharges into the HL&P canal before the canal discharges into Clear Lake. The drainage ditch and canal typically hold water. The gentle slope of the land toward the east indicates runoff would flow into the drainage ditch east of the ASCR and eventually into Clear Lake.

3.4.2 Floodplains

Floodplains are low areas adjoining inland and coastal waters. Those that have a one percent chance or greater for flooding in any given year are considered to be in a 100-year floodplain. The Astronaut Strength, Conditioning, and Rehabilitation Facility, whether in a new building or as an existing building that would be renovated, would not be a “critical action” facility. Activities in floodplains should be compatible with the natural propensity for flooding. Structures in the floodplain may further exacerbate flooding upstream or downstream.

The Federal Emergency Management Agency (FEMA) publishes flood maps for insurance ratings. A floodplain map of the site was obtained from FEMA and is included as Figure 3-3 (Map number 48201C1090 K, revised April 20, 2000). The proposed sites are not located within the 100-year floodplain.

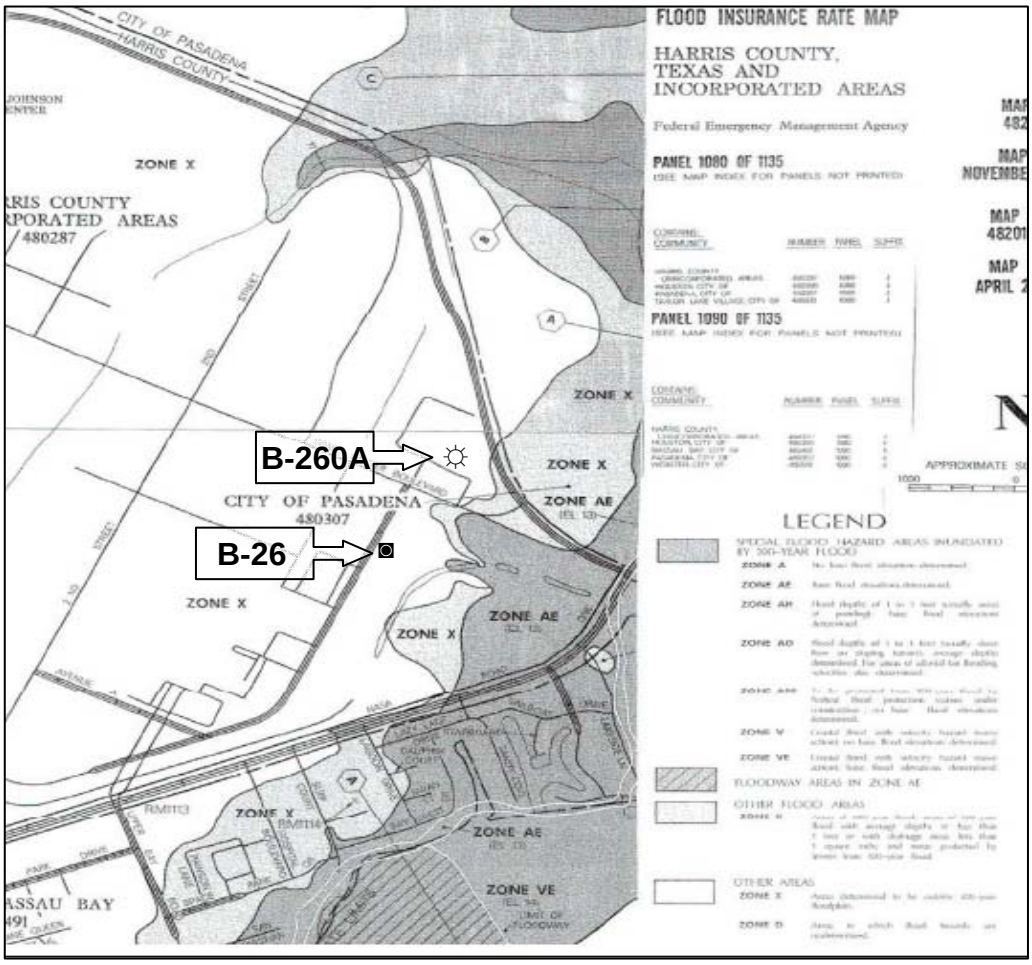

Figure 3.3 - FEMA Map

3.4.3 Groundwater

The Beaumont Formation, along with the underlying Montgomery, Bentley, and Willis Sand Formations, comprise the Chicot Aquifer, which extends approximately 210 meters (700 feet) below surface in the area of the proposed ASCR site. The Evangeline Aquifer is approximately 671 meters (2,200 feet) thick and extends from the base of the Chicot Aquifer to approximately 884 meters (2,900 feet) below surface (Digital Models for Simulation of Groundwater Hydrology of the Chicot and Evangeline Aquifers Along the Gulf Coast of Texas, 1985, Texas Department of Water Resources). Shallow groundwater can typically be encountered at a depth of 3.05 to 6.10 meters (10 to 20

feet) below the surface at JSC. The Chicot and Evangeline Aquifers are the principal sources of groundwater for public water supply in the Houston area.

Harris County has restricted the pumping of groundwater due to the subsidence in the area. The main source of water supply for JSC and the surrounding vicinity is treated surface water. According to the Joint Groundwater Monitoring and Contamination Report prepared by the Texas Groundwater Protection Committee in 1998, JSC is not located in a groundwater protection or recharge zone.

3.5 Biological Resources

3.5.1 Vegetation

The proposed ASCR site is in an undeveloped portion of JSC. The general area is in the Gulf Prairies and Marshes area of Texas, with nearly level coastal prairie, slowly drained by many slow-moving streams, surrounded by low woodlands (Hatch et al. 1990). Tall prairie grasses are the dominant vegetation in coastal prairies. Naturally fires and grazing have prevented trees and shrubs from dominating the landscape. Development has affected plant communities at and surrounding the proposed site.

The proposed ASCR site was used for agriculture prior to 1969 and many species of natural vegetation were removed by these practices. In addition, the site was used for fill deposit for approximately 20 years. The dominant vegetation now consists of Bermuda grass (*Cynodon dactylon*), Dallisgrass (*Paspalum dilatatum*) and Johnson grass (*Sorghum halapense*).

The Endangered Species List maintained by the U.S. Fish and Wildlife Service was reviewed. The only plant species listed for Harris County is the Texas prairie dawn-flower (*Hymenoxys texana*). Jill Seed, Senior Biologist of URS Corporation in Austin, Texas, performed a preliminary plant and wildlife survey of JSC in 2005. The Texas prairie dawn-flower was not reported to be observed during the survey.

3.5.2 Wildlife

The Upper Texas Gulf Coast is home to many species of birds, mammals, reptiles, and amphibians. However, agriculture and urban development have fragmented and altered

wildlife habitat. Open fields, administrative and operation buildings, roadways, and parking lots surround the proposed site.

The open land near the proposed sites provide habitat for deer, small mammals, birds, reptiles, and amphibians that are adapted to suburban and rural environments. During previous field reconnaissance, species observed in nearby open areas included green heron, (*Butorides striatus*), great egret (*Casmerodius albus*), grackle (*Quiscalus sp*.), barn swallow (*Hirundo rustica*), mottled duck (*Anus fulvigula*), red-winged blackbird (*Agelaius phoeniceus*), Eastern meadowlark (*Sturnella magna*), loggerhead shrike (*Lanius ludovicianus*), purple martin (*Progne subis*), scissor-tailed flycatcher (*Tyrannus forficatus*), snowy egret (*Egretta thula*), doublecrested cormorant (*Phalacrocorax auritus*), killdeer (*Charadrius vociferus*), American crow (*Corvus brachyrhynchos*), crawfish, and several snakes. Owl pellets consisting primarily of crawfish were found at open areas on JSC, indicating this may be a foraging area for some wildlife.

Birds such as mourning doves (*Zenaida macroura*), European starling (*Sturnus vulgaris*), house sparrows (*Passer domesticus*), Northern mockingbird (*Mimus polyglottos*), Northern cardinal (*Cardinalis cardinalis*), and blue jay (*Cyanocitta cristata*) may also be found in nearby open areas. Small mammals such as raccoon (*Procyonlotor*), opossum (*Didelphis virginiana*), and rodents are found in nearby open areas. Whitetail deer (*Odocoileus virginianus*) that are frequently observed on JSC property are considered a captive population due to the high security fencing that surrounds the site. Due to overpopulation concerns, Texas A&M University is conducting a population control program for the Whitetail deer herd at JSC.

The Endangered Species List maintained by the U.S. Fish and Wildlife Service was reviewed. The only wildlife species listed for Harris County is the bald eagle (*Haliaeetus leucocephalus*) which was delisted in August 2007. No nesting pairs of bald eagles have been observed at JSC.

3.5.3 Wetlands

The U.S. Army Corps of Engineers (UAACE) is responsible for administering and enforcing Section 404 of the Clean Water Act. Wetlands are defined in Title 33, Code of Federal Regulations (CFR) Part 328, Section 3(b), as those areas that are inundated or saturated by surface of groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. A jurisdictional wetland, as defined by the 1987 Corps of Engineers Wetland Delineation Manual, must meet three mandatory criteria: hydric soils, wetland hydrology, and hydrophytic vegetation.

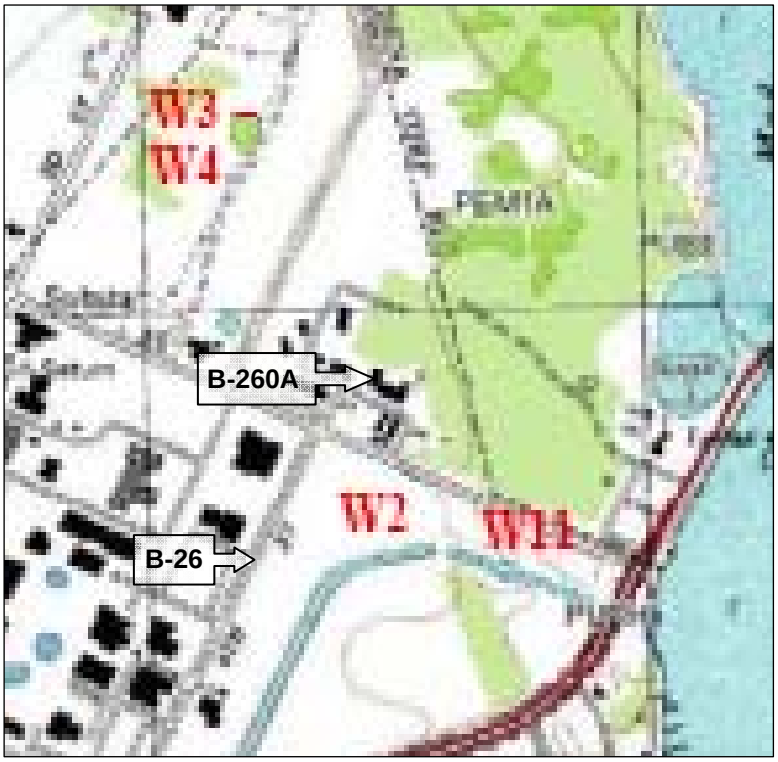

Figure 3.4 - Wetlands Map

The U.S. Department of the Interior, Fish and Wildlife Service has published National Wetland Inventory maps that identify wetland areas. No wetlands were shown on or directly adjacent to the proposed sites, although wetlands are mapped on other portions of the JSC property (Figure 3-3). During site reconnaissance, no wetland indicators were observed. The drainage ditch and former HL&P canal to the east of the proposed site for the ASCR supports hydrophytic vegetation, but they are both manmade structures created from uplands, and are not considered waters of the United States.

3.5.4 Soils

Soils at the proposed ASCR site are mapped as Urban land and Lake Charles-urban complex (Figure 3-4). The Lake Charles-Urban land complexes soils are about 36 inches thick. In the upper 22 inches it is very firm, neutral, black clay. In the lower 14 inches it is very firm, mildly alkaline, very dark gray clay. The layer below that is about 16 inches thick and is very firm, mildly alkaline, dark gray clay that has intersection slickensides. Soils are nearly level, sloping between 0 - 3% (usually 0 – 1%). These soils are somewhat poorly drained, and very slowly permeable.

The Urban complex includes soils that have been altered or covered by buildings and structures. Fill material often covers natural soils (Soil Conservation Service, Harris County Soil Survey, 1976).

Unless modified, these soils are poor building foundations due to their potential to shrink when dry and swell when wet. Soils on the proposed site are not subject to Farmland Protection Policy Act.

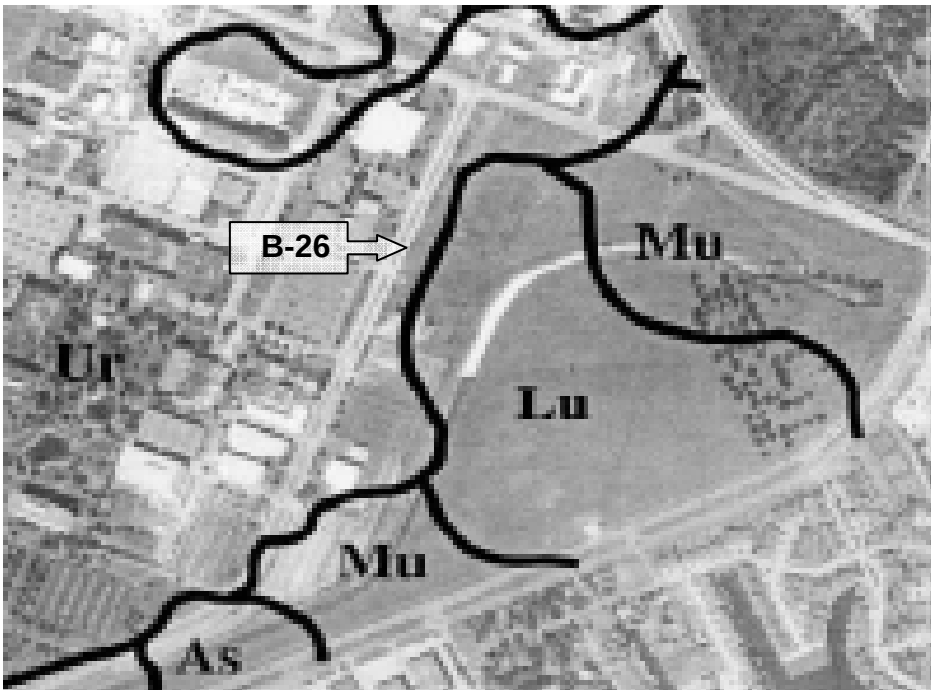

Figure 3.5 - Soils Map

Legend

Ur - Urban Soil Complex

Lu - Lake Charles/Urban Soil Complex

3.6 Socioeconomic and Cultural Resources

3.6.1 Demographics and Economic Activity

The proposed sites are located in the Clear Lake area, which lies within Houston city limits. The Clear Lake area includes the cities of Friendswood, Kemah, League City, Nassau Bay, Seabrook, Webster, Clear Lake Shores, El Lago, Taylor Lake Village, and parts of Houston and Pasadena. The 2000 population estimate for the Clear Lake area is about 200,000 persons (Clear Lake Economic Development Foundation 2000).

Table 3.6.1 Demographics of Census Tract 373.03 (including all blocks)

Census Tract 373.03		
Persons:	White	4,506
	Black	328
	Native American	14
	Asian	338
	Hispanic	801
	Other	13
Total Persons:		6,000
Persons of Voting Age:	White	4,218
	Black	247
	Native American	8
	Asian	251
	Hispanic	560
	Other	184
Total Persons of Voting Age:		5,468*
Persons in Work Force:		4,268
Average Household Income		$34,272
Housing Units:	Occupied	3,182
	Vacant	462
Total Housing Units:		3,644

Source: U.S. Department of Commerce, 1990
*The actual number of persons of voting age is 4,908. Due to data collection methods, age categories for Hispanic origin by race were not provided. Consequently, Hispanic voters were tallied among the other races.

The proposed sites are located within one census tract composed of five block groups, mapped and designated by the U.S. Department of Commerce, Bureau of the Census. The proposed sites are located in the 1990 census tract 373.03, surrounding NASA Johnson Space Center, in Houston, Harris County, Texas. Table 3.6.1 lists the race, ethnicity, the number of persons of voting age, the number of persons in the workforce, the average household income, and the number of housing units and their occupancy status for all block groups in tract 373.03.

The aerospace industry, specialty chemical industry, tourism, and boating and recreation dominate the Clear Lake area economy. Additional area businesses include the service, wholesale, and retail sectors (Bay Area Houston Economic Partnership website).

3.6.2 Cultural Resources

Archeological site records on file with the Texas Archeological Research Laboratory (TARL) at the University of Texas at Austin were reviewed to determine the presence of recorded sites within or immediately adjacent to the project area. Based on a review of these records, no archeological sites have been recorded within the project limits. However, numerous sites in the immediate vicinity of Clear Lake are on record with the state files at TARL suggesting a favored location for habitation during the prehistoric period.

Two buildings at JSC house National Historic Landmarks, including the large vacuum chamber in building 32 and the old mission control room in building 30. These two facilities are approximately 610 meters (2,000 feet) west of the proposed ASCR site.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

Environmental consequences is the scientific and analytic basis for the summary comparison of effects. This chapter presents in detail and by resource the direct, indirect, and cumulative effects of all alternatives.

4.2 Climate and Earth Movements

4.2.1 Hurricanes and Tidal Surge

4.2.1.1 Effect of the Proposed Action

The proposed ASCR (B-26) would be constructed to comply with all required hurricane construction codes. JSC has an emergency plan outlining hurricane procedures that would be adopted and applied to the ASCR. If tidal surge or receding floodwaters were to reach the ASCR, possible structural damage could occur.

4.2.1.2 Effect of Existing Facility Renovation (alternative action)

Renovation of the existing facility (B-260A) would be performed to comply with all required hurricane construction codes. JSC has an emergency plan outlining hurricane procedures that would be adopted and applied to the facility. If tidal surge or receding floodwaters were to reach the renovated facility, possible structural damage could occur.

4.2.1.3 Effect of the No-action Alternative

Hurricane and tidal surge damage would be minimal on the site as there would be no new structures to damage. Some damage to the land surface including deposition of foreign materials may result if these climatic events were to occur.

4.2.2 Rainfall

4.2.2.1 Effect of the Proposed Action

Heavy rain events would not result in significantly worse flooding around the ASCR due to the relatively small footprint of the building. The ASCR would be constructed to effectively drain any excess water in a manner not to cause additional flooding upstream or downstream of the proposed site or to other JSC property.

4.2.2.2 Effect of Existing Facility Renovation (alternative action)

Heavy rain events could result in flooding around the facility if topography was altered without adequate drainage. However, the renovations at the facility would be constructed to effectively drain any excess water in a manner not to cause additional flooding upstream or downstream of the proposed site or to other JSC property.

4.2.2.3 Effect of the No-action Alternative

Heavy rains should not cause flooding upstream or downstream of the undeveloped site outside of existing conditions. Flow levels would not be changed from the current conditions unless modifications occurred elsewhere on JSC property.

4.3 Construction and Operational Impacts

4.3.1 Air Resources

4.3.1.1 Effect of the Proposed Action

The construction of the proposed facility would produce some air emissions. An increase of 22,700 Kg (25 tons) per year for VOCs or NOx, resulting from the proposed project, could trigger general conformity analysis. Emissions from the ASCR are not expected to reach this significance level; consequently, a general conformity analysis should not be required.

Heavy machinery and trucks emit carbon monoxide, particulate matter, nitrogen oxides, hydrocarbons, and sulfur oxides. Steps will be taken to mitigate emissions and control any dust created during construction. Air quality effects from construction equipment and

associated vehicular traffic would be localized and temporary. These actions should pose no substantial impact upon air quality.

The proposed facility will consume a moderate amount of additional electric power. Additional equipment will be necessary and vehicle use would occur, but normal operation and use of the proposed facility indicate there would be no effect on ambient air quality.

4.3.1.2 Effect of Existing Facility Renovation (alternative action)

The renovation of the proposed facility would produce some air emissions. An increase of 22,700 Kg (25 tons) per year for VOCs or NOx, resulting from the proposed project, could trigger general conformity analysis. Emissions from the NDF are not expected to reach this significance level; consequently, a general conformity analysis should not be required.

Heavy machinery and trucks emit carbon monoxide, particulate matter, nitrogen oxides, hydrocarbons, and sulfur oxides. Steps would be taken to mitigate emissions and control any dust created during construction. Air quality effects from construction equipment and associated vehicular traffic would be localized and temporary. These actions should pose no substantial impact upon air quality standards.

The renovated facility would consume a small amount of electric power compared to that currently used. The renovated facility would require little additional equipment consisting primarily of upgraded HVAC units. Additional equipment may be necessary and vehicle use would occur, but normal operation and use of the proposed facility indicate there would be an insignificant effect on ambient air quality.

4.3.1.3 Effect of the No-action Alternative

There would be no changes in air quality if the no-action alternative were implemented. Construction equipment would not be necessary and general maintenance activities would continue.

4.3.2 Sound Environment

4.3.2.1 Effect of the Proposed Action

Operation of heavy machinery and increased vehicular traffic would temporarily increase noise levels during the construction of the proposed facility on-site and to surrounding buildings. The temporary noise increase would not be likely to pose a threat to occupants, but the potential for hearing loss in construction workers at the site would exist during most construction phases.

Best management practices (BMP) shall be incorporated to minimize the impact of construction related noise to surrounding areas. JSC would require OSHA safety standards be followed including wearing personal protection equipment (PPE) at all times during the construction of the ASCR.

4.3.2.2 Effect of Existing Facility Renovation (alternative action)

Operation of heavy machinery and increased vehicular traffic would temporarily increase noise levels during the construction of the proposed facility on-site and to surrounding buildings. The temporary noise increase would not be likely to pose a threat to occupants, but the potential for hearing loss in construction workers at the site would exist during most construction phases.

Best management practices (BMP) shall be incorporated to minimize the impact of construction related noise to surrounding areas. JSC would require OSHA safety standards be followed including wearing personal protection equipment (PPE) at all times during the renovation of the facility.

4.3.2.3 Effect of the No-action Alternative

The sound environment would remain unaltered if the no-action alternative were implemented.

4.3.3 Spills and Hazardous Materials

4.3.3.1 Effect of the Proposed Action

Heavy construction equipment brought from outside JSC has resulted in spills of hydraulic fluid and other petrochemicals at other construction sites. JSC would take precautions at the ASCR site to prevent potential spills by requiring construction equipment be adequately maintained and serviced.

Based on the preliminary data provided, the generation of hazardous materials is not anticipated as a result of construction. Normal operations of the proposed facility should not generate hazardous materials or wastes. No effects from hazardous materials, when managed in compliance with environmental regulations, are anticipated.

4.3.3.2 Effect of Existing Facility Renovation (alternative action)

Heavy construction equipment brought from outside JSC has resulted in spills of hydraulic fluid and other petrochemicals at other construction sites. JSC would take precautions at the ASCR site to prevent potential spills by requiring construction equipment be adequately maintained and serviced.

Based on the preliminary data provided, the generation of hazardous materials is not anticipated as a result of construction. Normal operations of the proposed facility should not generate hazardous materials or wastes. No effects from hazardous materials, when managed in compliance with environmental regulations, are anticipated.

4.3.3.3 Effect of the No-action Alternative

Existing conditions should remain unchanged if the no-action alternative were implemented.

4.3.4 Transportation

4.3.4.1 Effect of the Proposed Action

There is sufficient parking for the adjacent building to the south (B-27) to accommodate the future occupants of the ASCR. No transportation impacts are expected at JSC. Some minor traffic congestion may occur during construction, but steps should be taken to ensure safe roadway conditions and access to all facilities. Traffic volume through the

JSC Space Center Boulevard entrance may increase, but the entrance already uses a traffic signal and alterations in traffic flow outside JSC are not anticipated. Long-term effects on transportation are not anticipated.

4.3.4.2 Effect of the Existing Facility Renovation (alternative action)

The existing facility B-260A is located on the site road, Theta Link. There is sufficient parking in this area for facility occupants and visitors.

No transportation impacts are expected at JSC. Some traffic congestion may occur during construction, but steps should be taken to ensure safe roadway conditions and access to all facilities. Traffic volume through the JSC Space Center Boulevard entrance may increase, but the entrance already uses a traffic signal and alterations in traffic flow outside JSC are not anticipated. Long-term affects on transportation are not anticipated.

4.3.4.3 Effect of the No-action Alternative

Alterations in the traffic flow patterns are not anticipated with the no-action alternative. Any changes in traffic flow or volume would be a result of changes occurring elsewhere at JSC.

4.4 Water Resources

4.4.1 Surface Water and Drainage

4.4.1.1 Effect of the Proposed Action

The Astronaut Strength, Conditioning, and Rehabilitation Facility will require little alteration of the existing grade so a minimal impact to surface water drainage patterns is expected. The proposed construction will disturb less than 2.02 hectares (5 acres) so preparation of a Notice of Intent for a Texas Pollution Discharge Elimination System permit would not be required.

There may be temporary erosion during construction causing sedimentation and turbid waters in drainage structures. Contractors should create and implement a stormwater pollution prevention plan in accordance with JSC and regulatory guidelines before construction begins. These sedimentation and erosion control procedures should be carried out for the duration of construction.

4.4.1.2 Effect of Existing Facility Renovation (alternative action)

The majority of the work to renovate the existing facility would occur on the interior so little impact to stormwater drainage and flow are anticipated.

During construction there may be temporary erosion causing sedimentation and turbid waters within the drainage ditches along the road (Theta Link). Contractors should create and implement a stormwater pollution prevention plan in accordance with JSC and regulatory guidelines before construction begins. These sedimentation and erosion control procedures should be carried out for the duration of construction.

4.4.1.3 Effect of the No-action Alternative

Increases in surface drainage and non-point source discharges are not anticipated with the no-action alternative. The site would remain undeveloped with general maintenance continuing in its current manner. The no-action alternative should have no effect.

4.4.2 Floodplains

4.4.2.1 Effect of the Proposed Action

The ASCR would not affect any Harris County Flood Control District (HCFCD) infrastructure; consequently, there would be no detention requirement. The design engineer would be responsible for incorporating a design mechanism that would adequately address the local hydraulic conditions due to increased runoff. NASA should provide information to the City of Houston (COH) from hydraulic studies and impact analysis to allow for determination of impacts; however, the COH does not evaluate the effects of development on the floodplain. Federal facilities not falling under the jurisdiction of the County or City must comply with requirements of Executive Order 11988, which cover development in Special Flood Hazard Areas. No portion of the proposed facility falls within the 100-year floodplain so no measurable impacts to floodplain levels are anticipated.

4.4.2.2 Effect of Existing Facility Renovation (alternative action)

Renovation of the existing facility B-260A would not affect any Harris County Flood Control District (HCFCD) infrastructure; consequently, there would be no detention

requirement. The design engineer would be responsible for incorporating a design mechanism that would adequately address the local hydraulic conditions due to increased runoff. NASA should provide information to the City of Houston (COH) from hydraulic studies and impact analysis to allow for determination of impacts; however, the COH does not evaluate the effects of development on the floodplain. Federal facilities not falling under the jurisdiction of the County or City must comply with requirements of Executive Order 11988, which cover development in Special Flood Hazard Areas. No portion of the proposed facility falls within the 100-year floodplain so no measurable impacts to floodplain levels are anticipated.

4.4.2.3 Effect of the No-action Alternative

The no-action alternative would not alter the surface elevation of the designated floodplain.

4.4.3 Groundwater

4.4.3.1 Effect of the Proposed Action

Groundwater contamination has been detected in the ESTA area which is over three-quarters mile west of the proposed site for the ASCR. Construction of the ASCR may include drilled piers and drillers may encounter shallow groundwater. However, there is no expectation that construction workers would come in contact with contaminated groundwater. Potable water at the proposed site would be supplied by the Clear Lake City Water Authority, which draws its supply from surface water (D. Plaisance 2000).

4.4.3.2 Effect of Existing Facility Renovation (alternative action)

Groundwater contamination has been detected in the ESTA area which is over three-quarters mile west of B-260A. Sampling of the monitoring well in the vicinity of B-260A has indicated that the groundwater is not impacted in this area. Renovation of the facility should not involve excavation to a depth that would encounter the shallow groundwater. Therefore, there is no expectation that construction workers would come in contact with contaminated groundwater. Potable water at the proposed site would be supplied by the Clear Lake City Water Authority, which draws its supply from surface water (D. Plaisance 2000).

4.4.3.3 Effect of the No-action Alternative

No anticipated effects on the groundwater would occur if current maintenance activities continue. The existing groundwater wells at the site should still be sampled in order to monitor contaminant levels.

4.5 Biological Resources

4.5.1 Vegetation

4.5.1.1 Effect of the Proposed Action

The proposed site is in a developed area with infrequently maintained, native grasses. Planted pecan trees to the east of the ASCR would not be disturbed during construction. Because existing grass would be removed during construction of the proposed facility, some short-term erosion may occur.

4.5.1.2 Effect of Existing Facility Renovation (alternative action)

The existing facility is in a developed area with maintained grass. This area was developed in the 1960's; therefore, the native vegetative community was altered many years ago. Renovation would cause minor disturbance of existing vegetation so some short-term erosion may occur.

4.5.1.3 Effect of the No-action Alternative

The present vegetative community would persist in its early successional stages because maintenance mowing would continue with the no-action alternative.

4.5.2 Wildlife

4.5.2.1 Effect of the Proposed Action

Proposed improvements to the site would not support habitat areas suitable for most wildlife; however, landscaped areas may provide small pockets of habitat for adaptive species. Substantial displacement of wildlife is not anticipated, although a minor amount of habitat would be lost. Remaining fields at or near the site would easily accommodate displaced wildlife.

4.5.2.2 Effect of Existing Facility Renovation (alternative action)

Since the proposed work is renovation of an existing facility, no additional habitat would be lost and substantial displacement of wildlife is not anticipated.

4.5.2.3 Effect of the No-action Alternative

The existing vegetation at the proposed site for the ASCR does offer some protective cover and food resources for wildlife. The no-action alternative would involve continued maintenance mowing of this area and this would result in the periodic removal of this vegetation, which may have a negative impact for some species, but a positive impact for others.

4.5.3 Wetlands

4.5.3.1 Effect of the Proposed Action

Executive Order 11990 calls for the avoidance and minimization of wetland impacts wherever there is a practicable alternative. Wetlands are not present on the proposed site of the ASCR. Drainage ditches constructed in uplands are not considered waters of the United States and, thus, no permit from the USACE is required for any re-alignment of ditches and drainage swales (33CFR333.4(a)(3) and CFR33 Part 330).

4.5.3.2 Effect of Existing Facility Renovation (alternative action)

Wetlands are not present on the site of the existing facility B-260A. Drainage ditches constructed in uplands are not considered waters of the United States and, thus, no permit from the USACE is required for any re-alignment of ditches and drainage swales (33CFR333.4(a)(3) and CFR33 Part 330).

4.5.3.3 Effect of the No-action Alternative

Since a wetland is not present in this portion of the site, no effects are anticipated.

4.6 Socioeconomic and Cultural Resources

4.6.1 Demographics and Economic Activity

4.6.1.1 Effect of the Proposed Action

The ASCR would only employ existing civil service and/or contract personnel that will be relocated from their current location. Also, astronauts will visit the facility on a periodic basis for physical training activities. Some temporary jobs may be created during the construction.

Executive Order 12898, dated February 11, 1994, requires the preparation of an environmental justice strategy that follows the framework of the National Environmental Policy Act (NEPA) and Title VI of the Civil Rights Act. The Executive Order requires identifying and addressing disproportionately adverse human health or environmental impacts within minority populations and low-income populations.

Studies conducted for this project indicate that there will not be any disproportionate impacts to low-income populations or minority populations from the proposed action or any of the alternatives. No displacements will be required, and no impact to community cohesion is anticipated now or in the future, since the project area is confined to JSC property. Because no residential households will be displaced, no minority populations or low income populations will be divided or isolated by the proposed project, and no adverse effects from noise or air emissions will be created, no environmental justice issues have been identified for the proposed project.

4.6.1.2 Effect of Existing Facility Renovation (alternative action)

The renovated facility would only employ existing civil service and/or contract personnel that are currently located at the facility. Some temporary jobs may be created during the construction.

Executive Order 12898, dated February 11, 1994, requires the preparation of an environmental justice strategy that follows the framework of the National Environmental Policy Act (NEPA) and Title VI of the Civil Rights Act. The Executive Order prohibits disproportionately adverse human health or environmental impacts within minority and low-income populations.

Studies conducted for this project indicate that there will not be any disproportionate impacts to low-income or minority populations. No displacements will be required, and no impact to community cohesion is anticipated now or in the future, since the project area is confined to JSC property. Because no residential households will be displaced, and no minority populations or low income populations will be divided or isolated by the proposed project, no environmental justice issues have been identified for the proposed project.

4.6.1.3 Effect of the No-action Alternative

The implementation of the no-action alternative would have no effect on employment. If the ASCR or facility renovation were not constructed, new jobs consisting of temporary construction work would not be created and potential learning opportunities would cease to exist.

4.6.2 Cultural Resources

4.6.2.1 Effect of the Proposed Action

Impact to cultural or archaeological resources is not anticipated at the proposed site. The THC has reviewed the project and determined that the JSC properties classified as National Historic Landmarks (i.e.; vacuum chamber in building 32 and mission control in building 30) will not be effected by the proposed action. In the event that archeological deposits or features are encountered during construction, the construction operations shall cease within the immediate area and the Archeological Division of the THC and NASA shall be immediately contacted for further consultation. Work would cease in the vicinity until the requirements of Section 106 of the National Historic Preservation Act were met.

4.6.2.2 Effect of Existing Facility Renovation (alternative action)

Impact to cultural or archaeological resources is not anticipated at the proposed site. The JSC properties classified as National Historic Landmarks (i.e.; vacuum chamber in building 32 and mission control in building 30) would not be effected by the renovation of the existing facility. In the event that archeological deposits or features are encountered during renovation, the construction operations shall cease within the immediate area and the Archeological Division of the THC and NASA shall be immediately contacted for

further consultation. Work would cease in the vicinity until the requirements of Section 106 of the National Historic Preservation Act were met.

4.6.2.3 Effect of the No-action Alternative

The no-action alternative would not result in land alterations; consequently, any unknown archeological deposits or features would not be disturbed. There are no records of cultural resources for this site.

4.7 Cumulative Effects

The proposed actions are not anticipated to have any measurable affect on local resources and facilities. Little, if any, new demand is expected for land resources, recreational space, or other resources in any other areas surrounding the proposed facilities. Implementation of these actions would provide the necessary facilities for supporting current manned space programs and help in meeting NASA's long range manned space flight goals without any reasonably foreseeable physical, biological, social, or economic effects on the quality of the human environment.

5.0 AGENCIES AND INDIVIDUALS CONTACTED

5.1 Federal Agencies

Mr. Dale R. Hoff
Federal Emergency Management Agency, Region VI
800 North Loop 288
Denton, Texas 76201-3698

Mr. Michael Jansky
Regional Environmental Review Coordinator
United States Environmental Protection Agency
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Ms. Christine Maylath
National Park Service, IMDE-PE
P.O. Box 25287
Denver, Colorado 80225

Mr. Sam Brown
United States Department of Agriculture, Natural Resource Conservation Service
101 South Main
Temple, Texas 76501-7682

Ms. Edith Erfling
United States Fish and Wildlife Service
Division of Ecological Services
17629 El Camino Real, Suite 211
Houston, Texas 77058

5.2 State Agencies

Ms. Cathy Mayes
Texas Natural Resource Conservation Commission
Office of Policy and Regulatory Development
P.O. Box 13087 - MC-205
Austin, Texas 78711-3087

Mr. Roy G. Frye
Texas Parks and Wildlife Department
Wildlife Habitat Assessment Program
4200 Smith School Road
Austin, Texas 78744

Dr. James E. Bruseth
Deputy State Historic Preservation Officer
Texas Historic Commission
P.O. Box 12276
Austin, Texas 78711-2276

Mr. Tom Knuckoles
Texas General Land Office
1700 North Congress Avenue
Austin, Texas 78701-1495

5.3 Local Agencies

Mr. Michael D. Talbott, P. E.
Harris County Flood Control District
9900 Northwest Freeway
Houston, Texas 77092

Mr. Sheldon M. Kindall
Regional Director
Texas Archeological Society
414 Pebblebrook
Seabrook, Texas 77586

Mr. Al Davis
Harris County Historical Commission
929 Waxmyrtle
Houston, Texas 77079

Mr. Alan C. Clark
MPO Director
Houston-Galveston Area Council
P.O. Box 22777
Houston, Texas 77227-2777

Mr. Rick Beverlin
Houston-Galveston Area Council
P.O. Box 22777
Houston, Texas 77227-2777

6.0 REFERENCES

Bay Area Houston Economic Partnership website, Economic Impact -JSC NASA (http://www.bayareahouston.com/Home/NASA-JohnsonSpaceCente/EconomicImpact/)

Federal Emergency Management Agency, National Flood Insurance Program; Flood Insurance Rate Map, Harris County and Incorporated Areas, Map Number 48201C1090K, Panel 1090 of 1135, 2000.

Hatch, S.L., K.N. Gandhi and L.E. Brown. 1990. Checklist of the Vascular Plants of Texas. Publication MP-1655. Texas Agricultural Experiment Station. College Station, Texas.

Plaisance, David; Clear Lake City Water Authority, personal communication, June 2000.

Preliminary Engineering Report, NASA Source Board Facility Addition; Shah Smith & Associates, Inc., January 2000.

Soil Conservation Service, United States Department of Agriculture; Soil Survey of Harris County, Texas, 1976.

Texas Department of Water Resources; Digital models for simulation of ground-water hydrology of the Chicot and Evangeline aquifers along the Gulf coast of Texas, 1985.

United States Department of Commerce, Bureau of the Census; Census of Population and Housing. Harris County, Texas, Census Tract Number 373.03, 2000.

U.S. Fish & Wildlife Service Endangered Species List (http://www.fws.gov/southwest/es/EndangeredSpecies/lists/ListSpecies.cfm)

United States Geological Survey, United States Department of the Interior; League City, Texas, 7.5 Minute Topographic Quadrangle, 1995.

Vision 2020, Facilities Master Plan, Lyndon B. Johnson Space Center, Houston, Texas, October 2000, revised October 2002.

WeatherBase – National Climatic Data Center; Canty and Associates LLC, Great Falls, VA (http://www.weatherbase.com/weather/weather.php3?s=34227&refer=&units=us)

APPENDIX A

Selected Site Photographs

1. Proposed location for New ASCR Facility (view to northeast)

2. Proposed location for New ASCR Facility (view to southeast towards B-27)

APPENDIX A

Selected Site Photographs

3. Proposed location for New ASCR Facility (view to west towards B-31)

4. Drainage ditch to east of proposed site for ASCR (view to northeast)

APPENDIX B

Agency Correspondence

U.S. Department of Homeland Security
FEMA Region 6
800 North loop 288
Denton, TX 76209-3698

FEMA

Region VI
Federal Insurance and Mitigation Administration

Public Notice Review

Re: Astronaut Strength Conditioning and Rehabilitation Facility
NASA LBL Space Center

- We offer the following comments:

If the facility is being located in a Special Flood Hazard Area (1% Flood or 100 Year Floodplain), please refer to Executive Order 11988.

http://www.fema.gov/plan/ehp/ehplaws/eo11988.

Reviewer

1.25.08
Date

If further information is required, please write to the address above or call (940) 898-5463.

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
2101 NASA Parkway
Houston, Texas 77058-3696

Reply to Attn of JE-08-002

JAN 17 2008

Mr. Carl Masterson
Community Resources Program Manager
Community and Environmental Planning
P.O. Box 22777
Houston-Galveston Area Council
Houston, Texas 77227-2777
713-993-4503 (fax)

RE: Coordination Request for Environmental Assessment
Project Name: Astronaut Strength Conditioning and Rehabilitation Facility
Project Location: NASA - Johnson Space Center, Houston, Texas

Dear Mr. Masterson:

Lynx, Ltd. is in the process of preparing an Environmental Assessment (EA) for the above referenced project. This EA is being prepared on behalf of NASA - Johnson Space Center. As required under the National Environmental Policy Act (NEPA), we are submitting pertinent information concerning the proposed project for your review and comment.

Please provide any comments on the proposed project by February 8, 2008. If there are no comments, please sign below and fax to (281) 483-7285. If there are any questions, please contact Barry Daniels, with Lynx, Ltd., at 281-483-4748 or by e-mail at barry.daniels-1@nasa.gov.

Sincerely,

David Hickens
Lead, Environmental Office

Enclosure

Approval:

Carl Masterson

1-24-08
Date

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
2101 NASA Parkway
Houston, Texas 77058-3696

Reply to Attn of JE-08-002

JAN 17 2008

Ms. Edith Erfling
United States Fish and Wildlife Service
Division of Ecological Services
17629 El Camino Real, Suite 211
Houston, Texas 77058
281-488-5882 (fax)

RE: Coordination Request for Environmental Assessment
Project Name: Astronaut Strength Conditioning and Rehabilitation Facility
Project Location: NASA - Johnson Space Center, Houston, Texas

Dear Ms. Erfling:

Lynx, Ltd. is in the process of preparing an Environmental Assessment (EA) for the above referenced project. This EA is being prepared on behalf of NASA - Johnson Space Center. As required under the National Environmental Policy Act (NEPA), we are submitting pertinent information concerning the proposed project for your review and comment.

Please provide any comments on the proposed project by February 8, 2008. If there are no comments, please sign below and fax to (281) 483-7285. If there are any questions, please contact Barry Daniels, with Lynx, Ltd., at 281-483-4748 or by e-mail at barry.daniels-1@nasa.gov.

Sincerely,

David Hickens
Lead, Environmental Office

Enclosure

Approval: No comments

Edith Erfling

Edith Erfling

2/7/08

Date

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
2101 NASA Parkway
Houston, Texas 77058-3696

Reply to Attn of JE-08-002

JAN 17 2008

Ms. Sue Gross
Region 5 Director
Texas Archeological Society
114 Marigold
Lake Jackson, Texas 77566
979-238-0094 (fax)

RE: Coordination Request for Environmental Assessment
Project Name: Astronaut Strength Conditioning and Rehabilitation Facility
Project Location: NASA - Johnson Space Center, Houston, Texas

Dear Ms. Gross:

Lynx, Ltd. is in the process of preparing an Environmental Assessment (EA) for the above referenced project. This EA is being prepared on behalf of NASA - Johnson Space Center. As required under the National Environmental Policy Act (NEPA), we are submitting pertinent information concerning the proposed project for your review and comment.

Please provide any comments on the proposed project by February 8, 2008. If there are no comments, please sign below and fax to (281) 483-7285. If there are any questions, please contact Barry Daniels, with Lynx, Ltd., at 281-483-4748 or by e-mail at barry.daniels-1@nasa.gov.

Sincerely,

David Hickens
Lead, Environmental Office

Enclosure

Approval: No Comments

Sue Gross

2-4-08
Date

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
2101 NASA Parkway
Houston, Texas 77058-3696

Reply to Attn of JE-08-002

JAN 17 2008

Ms. Anne Clarke
National Aeronautics and Space Administration
Environmental Management Division / Mailcode JE
Washington, D.C. 20546-0001

RE: Coordination Request for Environmental Assessment
Project Name: Astronaut Strength Conditioning and Rehabilitation Facility
Project Location: NASA - Johnson Space Center, Houston, Texas

Dear Ms. Clarke:

Lynx, Ltd. is in the process of preparing an Environmental Assessment (EA) for the above referenced project. This EA is being prepared on behalf of NASA - Johnson Space Center. As required under the National Environmental Policy Act (NEPA), we are submitting pertinent information concerning the proposed project for your review and comment.

Please provide any comments on the proposed project by February 8, 2008. If there are no comments, please sign below and fax to (281) 483-7285. If there are any questions, please contact Barry Daniels, with Lynx, Ltd., at 281-483-4748 or by e-mail at barry.daniels-1@nasa.gov.

Sincerely,

David Hickens
Lead, Environmental Office

Enclosure

Approval:

~~Anne Clarke~~ Kathleen Callister

FEB 01 2008
Date

Comments sent via email on January 22, 2008