NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

NOTICE: 04-GSFC-01

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA): Space Science Building (SSB) at NASA's Goddard Space Flight Center (GSFC), Greenbelt, Maryland

AGENCY: NASA's GSFC

ACTION: Finding of No Significant Impact (FONSI)

SUMMARY: Pursuant to NEPA of 1969, as amended (42 U.S.C. 4321 et seq.), the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508), and NASA Regulations (14 CFR Part 1216 Subpart 1216.3), NASA has made a FONSI with respect to the proposed construction of a Space Science Building (SSB). The proposed action would be the construction of a 28,000 square meter (300,000 square feet) SSB and associated parking area, near the center of GSFC, in the vicinity of Explorer Road and the existing Soil Conservation Road. Construction of the SSB would permit space science activities to be relocated from six buildings on the west campus of GSFC.

The final Environmental Assessment (EA) that supports this FONSI may be reviewed at:

NASA
- GSFC Visitor Center, Soil Conservation Road, Greenbelt, MD 20771
- Homer E. Newell Library, GSFC, Building 21, Room L 100, Greenbelt, MD 20771
- NASA Headquarters, Library, Room 1J20, 300 E Street, SW, Washington, DC 20546

Public Libraries within the Prince George's County Memorial Library System:
- Greenbelt Branch, 11 Crescent Road, Greenbelt, MD 20770
- Bowie Branch, 15210 Annapolis Road, Bowie, MD 20716
- New Carrollton Branch, 7414 Riverdale Road, New Carrollton, MD 20784

A limited number of copies of the EA are available by contacting Mr. David Larsen at the telephone number indicated herein or by mail at:

Mr. David Larsen
NASA's Goddard Space Flight Center
Code 224.2
Greenbelt, MD 20771

FOR FURTHER INFORMATION CONTACT:

David Larsen, 301-286-3918, David.G.Larsen@nasa.gov
Lizabeth Montgomery, 301-286-0469, Lizabeth.R.Montgomery@nasa.gov

SUPPLEMENTAL INFORMATION:

A draft EA was released for public comment to GSFC employees and the local community in September 2003. Comments received were taken into consideration in the final EA.

NASA has reviewed the final EA prepared for the SSB and has determined that it represents an accurate and adequate analysis of the scope and level of associated environmental impacts. The final EA is hereby incorporated by reference in this FONSI.

The proposed action is the construction of the SSB to centralize existing Space Science activities. Included in this action is the construction of a parking area, the vacating of existing buildings, the potential demolition of existing buildings, the stabilization of an unstable slope near the parking area, and the construction of a Beam Line Facility underneath a portion of the parking area. The new building would contain 28,000 square meters (300,000 square feet) of offices, laboratories, meeting rooms and storage. The new Beam Line Facility would be a facility for testing space telescopes. The facility would simulate the space environment and a distant astrophysical object to be observed by the telescopes being tested. The parking area would be adjacent to the SSB and would be approximately 3.6 hectares (9 acres).

The construction of the SSB is part of the overall Facilities Master Plan for the GSFC Greenbelt campus (December 2002). The prime purpose in constructing a new SSB would be to bring together five different organizational elements (Codes 600/603, 630, 660, 680, and 690). These operations are currently distributed among six buildings and an office trailer complex. Consolidating the space science facilities into a single complex would allow GSFC staff to more effectively accomplish space science priorities. New facilities would be flexible enough to keep pace with the rising rate of change in the mission, as well as advancements in technology. The vacated buildings would become available for reuse by NASA business partners in the 2009-2013 timeframe.

The SSB EA addresses the no action alternative and three alternative building sites for the new building. The assessment considers the environmental impacts of the construction of the building at the alternative sites, the construction of the parking area, the stabilization of eroding slope at the eastern edge of the parking area, the construction of the Beam Line Facility underneath the parking area, the vacating of existing buildings, and the potential demolition impacts from the removal of existing buildings.

Alternative Site 1 is located directly north of Explorer Road and south of Building 16/16W. Alternative 2 is located directly north of and adjacent to Building 16/16W. Alternative Site 3 is located on the site of the existing Building 16/16W. All the alternative sites would use the area of Landfill B for the parking area. All three of the alternative sites would be effective in meeting the purpose and need for the proposed action.

The EA addresses the potential for environmental impacts upon population, land use, cultural and historic resources, employment conditions, environmental justice conditions, transportation, noise, waste management, air quality, soils and geology, groundwater, slopes, open space, forest stands, wetlands, flood plains, stormwater management, animal communities, rare and endangered species, infrastructure and safety. Included in the EA is an assessment of cumulative impacts and conformity with the *GSFC Facilities Master Plan*.

The direct environmental impacts thought to be of greatest potential concern were those upon forest stands/open space, the waters of the U.S (including wetlands), stormwater management, and traffic. The analysis has shown that for all three alternative sites the potential impacts would range from negligible to not substantial, provided existing regulatory requirements are met. No other matters of environmental concern were identified.

With respect to the environmental impacts, the relative differences among the three alternatives are small. Variations occur with regards to forest and impervious surface impacts. Alternative Site 1 would require clearing of up to 1.5 hectares (3.73 acres) of forests along the east and west sides of Soil Conservation Service Road and would result in increased impervious surface. Alternative 2, which already includes substantial areas of impervious surface, would requiring some clearing up to 0.5 hectares (1.2 acres) of forest to the north resulting in some increase in impervious surface. Alternative 3 is already developed and thus the amount of impervious surface would remain approximately the same.

All three alternatives propose construction of a parking lot in the area of Landfill B. The area consists of an undulating surface covered with native grasses and a few trees. Construction of the parking lot would result in increased impervious surface and would impact two small wetlands and an intermittent drainage stream that is contained within a deeply eroded channel along the perimeter of the landfill. The construction would involve stabilizing the eroded channel and would improve the current erosion problem and stream condition.

All three alternatives, including the parking area, would require state and federal compliance with forest conservation, stormwater management, sediment and erosion control, and wetland requirements. GSFC is pursuing a Leadership in Energy and Environmental Design (LEED) Silver Rating and is committed to using low impact development (LID) techniques for the project.

NASA has selected Alternative 1 as the preferred site for construction of the SSB. At this time, Alternative 3 is not considered a viable option for NASA due to financial constraints. NASA reserves the right to select one of the other alternative sites (2 or 3) if circumstances change or if the project cannot be implemented at the preferred site.

On the basis of the final SSB EA, NASA has determined that the environmental impacts associated with the construction of the SSB at any one of the three alternative sites will not individually or cumulatively have a significant impact on the quality of the human environment. Therefore, an environmental impact statement is not required.

Original signed by *5/25/04*

A. V. Diaz
Director
NASA's Goddard Space Flight Center

Date

National Aeronautics and Space Administration

Goddard Space Flight Center
The Facilities Management Division

Environmental Assessment

WR# A3444-100 Mod 1

Space Science Building

Facility Engineering and Technical Services (FaCETS)
Parsons Infrastructure & Technology Group, Inc.
with EBA Engineering, Inc. and KCI Technologies, Inc.

FINAL February 2004

ENVIRONMENTAL ASSESSMENT
FOR
SPACE SCIENCE BUILDING
GODDARD SPACE FLIGHT FACILITY
GREENBELT, MARYLAND

Lead Agency: Facilities Management Division, Management Operations Directorate, Goddard Space Flight Center (GSFC), National Aeronautics and Space Administration (NASA)

Proposed Action: The proposed action would be the construction of a 28,000-33,000 square meter (300,000 – 350,000 square feet) Space Science Building (SSB) and associated parking area near the center of GSFC in the vicinity of Explorer Road and existing Soil Conservation Road. Construction of the Space Science Building would permit Space Science activities to be relocated from six buildings on the west campus of GSFC.

For Further Information:

David G. Larsen
Space Science Building Project Manager
NASA Goddard Space Flight Center
Code 224.2
Greenbelt, Maryland 20771
Telephone: 301-286-3918

Date: February 2004

Abstract: To implement the GSFC Facilities Master Plan, NASA proposes the construction of a Space Science Building to centralize existing Space Science activities. The new building would contain 28,000-33,000 square meters (300,000 – 350,000 square feet) of offices, laboratories, meeting rooms and storage. Adjacent to the new Space Science Building would be a parking area of approximately 3.6 hectares (nine acres). Underneath a portion of the parking area would be a Horizontal Beam Source and associated laboratories. Associated with parking lot construction, an existing area of unstable slopes associated with Landfill B would be stabilized.

Upon completion of the new SSB, current Space Science activities would be relocated from six existing buildings and two trailers on the west campus on GSFC. The vacated buildings would become available for reuse by NASA partner businesses in the 2009-2013 timeframe.

This environmental assessment considers a No-action alternative and three alternative building zones for the new SSB. The assessment also considers the environmental effects of the construction of the parking area, stabilization of existing slopes and the vacating of existing buildings. It also addresses the potential for demolition impacts if the selected alternative site requires the removal of existing Buildings 86, 87, 89 or Building 16/16W or the Building 27 complex.

Space Science Building Environmental Assessment

Final –February 2004

Executive Summary

Overview

The purpose of this report is to provide a site-specific evaluation of the potential environmental impacts of a new Space Science Building (SSB) project at the Goddard Space Flight Center's (GSFC) Greenbelt campus. The goal of the Environmental Assessment (EA) is to assist decision-makers in selecting a final site and to determine whether an Environmental Impact Statement (EIS) must be prepared prior to construction of a new SSB.

The *SSB Environmental Assessment* reviews impacts of activities directly associated with the construction of the SSB and the relocation of space science functions. It describes the proposed actions and alternatives, as well as the environment that would be directly affected by each of these actions and alternatives. This document assesses impacts that would result from the construction of the SSB and associated parking area, the stabilization of slopes adjacent to the parking areas, the demolition of existing structures on the site selected for the SSB, and the vacating of buildings currently in use.

Purpose and Need

NASA's prime purpose in constructing a new Space Science Building would be to bring together under one roof, five different organizational elements. The project would co-locate:

- Code 600/603-216, the Space Science Directorate;
- Code 630, the Space Science Data Operations Office;
- Code 660, the Laboratory for High Energy Astrophysics (LHEA);
- Code 680, the Laboratory for Astronomy and Physics; and
- Code 690, the Laboratory for Extraterrestrial Physics

The new building would provide technologically advanced electronics, computer and chemistry labs, cleanrooms, high bay spaces and modern offices.

This new Space Science building would:

- Replace aging facilities on Goddard's west campus that are no longer suitable to

house technologically advanced, high-tech scientific functions essential to NASA's current and future mission;
- Accommodate a series of sophisticated laboratory operations and associated support areas in approximately 28,000 – 33,000 gsm (300,000 – 350,000 gsf) of space.
- Provide space for relocation of an estimated 900 existing employees, visiting scientists, contractors, and interns.

The six buildings that house the current Space Science program (Buildings 2, 6, 20, 21, 26, and 28) are among the original facilities constructed at Goddard's Greenbelt site. These buildings, while still useful for some purposes, are no longer adequate for the demanding technical and functional requirements of NASA's Space Science program.

Alternatives Considered

The analysis considers both build and no action alternatives. The EA evaluates three alternative sites for the 28,000-33,000 gsm (300,000 – 350,000 gsf) Space Science Building. All are within the Space Science Neighborhood shown in the Master Plan. The environmental effects of the proposed parking area and of vacating the six existing buildings that house the Space Science Program are also evaluated.

Alternative Site 1, (**Figure 2-2)** the forested site, is located directly north of Explorer Road and south of present day Building 16/16W. Alternative Site 2, (**Figure 2-3**) the Master Plan Alternative, is located directly north and adjacent to Building 16/16W. Alternative Site 3, (**Figure 2-4**) the 16/16W site, is the present day site of Building 16/16W.

All the alternatives would use the area of Landfill B for the 811 space parking area. The new SSB requires a 300m (1000 ft) excavated and backfilled structure and lab space to conduct beam line research within a vacuum controlled pipe. These facilities are proposed to be located under the parking area. The 0.4 ha (1.1ac) area of eroding steep slopes at the eastern edge of Landfill B near the parking area would be stabilized.

In accordance with the *GSFC Facilities Master Plan*, occupants from Buildings 2, 6, 20, 21, 26 and 28 would be relocated to the new SSB. Building 20 would be reused and adapted to the needs of the Institutional Support community, and Building 28 would be reused and adapted to the needs of the Engineering and Technology community. Buildings 2, 6, 21 and 26 would become available for renewal by NASA partner businesses in the 2009 to 2013 timeframe.

Summary of Environmental Consequences

The potential effect of each proposed action upon key resources and features is shown in the Summary Table below. The analysis has shown that these potential impacts would range from negligible to not significant provided existing regulatory requirements are met.

Summary of Impacts - GSFC Space Science Building

		No-Action	Alternative Site 1 Forested Site	Alternative Site 2 Master Plan Site	Alternative Site 3 16/16W Site	Parking Area	Vacated Buildings
Site Size		**NA**	**2.2 ha (5.4 ac)**	**2.9 ha (7.2 ac)**	**3.6 ha (9 ac)**	**3.6 ha (9.0 ac)**	**NA**
Estimated Disturbed Area[1]		**NA**	**1.0-1.5 ha (2.5-3.7 ac)**	**1.0-1.5 ha (2.5-3.7 ac)**	**1.0-1.5 ha (2.5-3.7 ac)**	**2.8-3.6 ha (7.0-9.0 ac)**	**No change**
Community Issues							
Conformance with Master Plan		No	Partial	Partial	Yes	Yes	Yes
Environmental Justice		No impacts	No impacts	No impacts	No impacts	No impacts	No impacts
Historic/ Archeological Resources		No impacts	No impacts	No impacts	No impacts	No impacts	No impacts
Transportation [2]		Relocate SCS Rd	Relocate SCS Road	Relocate SCS Road	Relocate SCS Road	Relocate SCS Road	No impacts
Noise		No change	No change	No change	No change	No change	No change
Environmental Issues							
Solid Waste		No change	No change	Rubble disposal	Rubble disposal	No change	Rubble disposal
Hazardous Waste Disposal		No change	Some improvement	Relocate Blg 27A	Some improvement	No change	No change
Air Quality		No change	No change	No change	No change	No change	No change
Steep slope impacts (>1:1 or 45%) (hectares)		0.0	< 1ha	< 1ha	< 1ha	0.45 ha (1.1ac)	0.0
Forest area impacts (hectares)		0.0	1.5ha (3.73 ac)	0.0	0.0	Individual Trees	0.0
Waters of the United States (meters)		0.0	0.0	0.0	0.0	250.77m (822.39 lf)	
Wetlands (square meters)		0.0	0.0	0.0	0.0	233.89sm (2,517.57sf)	0.0
Floodplains		0.0	0.0	0.0	0.0	0.0	0.0
Stormwater (% to be controlled)	Quantity	Retrofit Proposed by Others	Full	Reduced	Reduced	Full	Reduced
	Quality		100%	20%	20%	100%	20%
Endangered Species Impacts		No	No	No	No	No	No
Landfill disturbance (hectares)		0.0	0.0	0.0	0.0	2.8-3.9 ha (7.0-9.0 ac)	0.0
Infrastructure Issues							
Utility disturbances		No	Steam, Power, Communications, Sanitary	Chilled Water, Steam, Power, Communications, Water, Sanitary Stormwater	Chilled Water, Steam, Power, Communications, Water, Sanitary, Stormwater	Steam, Power, Communications	No
Safety Issues							
Inhabited building less than 90 ft. from Blg 27B		No	No	No	No	NA	NA
Inhabited building less than 300 ft from 16/16W loading docks		Yes	No	Yes	No	NA	NA

1. The precise location of the SSB within each building zone is not determined, but the area disturbed by construction would be located within the respective building zone. Final impact calculations will be determined during the design phase of the GSFC project.
2. Relocation of SC Road would be a separate action, preceding the SSB construction and is addressed in separate NEPA documentation.

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Final –February 2004

PART I PURPOSE AND NEED

1.1 Overview

The purpose of this report is to provide a site-specific evaluation of the potential environmental effects of the proposed Space Science Building (SSB) at the National Aeronautics and Space Administration (NASA) Goddard Space Flight Center's (GSFC) Greenbelt campus. GSFC is located in Prince George's County, Maryland, northeast of the Washington, DC. **Figure 1-1** provides a general location map. GSFC is one of several large federal research facilities near the City of Greenbelt. **Figure 1-2** shows the location of GSFC in relation to the Beltsville Agricultural Research Center (BARC) and the Patuxent Research Refuge (PRR).

Construction of a new SSB as the focal point for Space Science activities at GSFC is part of NASA's implementation of the 2002 *GSFC Facilities Master Plan* and is supported by the *GSFC Environmental Assessment*, December 2002. This *SSB Environmental Assessment* refines and documents the environmental effects of the proposed SSB at three different sites in the GSFC Campus and the effects if no building is constructed. This report is part of a series of documents prepared to guide the development of the new SSB. The goal of this Environmental Assessment (EA) is to assist NASA decision makers in selecting a final site and to determine whether an Environmental Impact Statement (EIS) must be prepared prior to construction of a new SSB. NASA has not identified a preferred site.

1.2 Scope

This *SSB Environmental Assessment* reviews impacts of activities directly associated with the construction of the SSB and the relocation of the Space Science functions. It describes all of the proposed actions and alternatives, as well as the environment that would be directly affected by each of these actions and alternatives. In addition, it assesses the environmental consequences of each alternative. Specifically, this document assesses impacts that would result from the construction of the SSB and associated parking areas, the stabilization of slopes adjacent to the parking areas, the demolition of existing structures on the site selected for the SSB, and the vacating of buildings currently in use.

Because the construction of the SSB is only one of numerous actions that may be undertaken to implement the *GSFC Master Plan*, the *SSB Environmental Assessment* must be viewed as part of a series of environmental documents addressing the activities outlined in the *GSFC Master Plan*. An evaluation of the overall environmental effects of the Master Plan is presented in the *GSFC Environmental Assessment*, December 2002. Each activity in the Master Plan is subject to additional NEPA documentation. The relocation of Soil Conservation Service Road, which is discussed in this assessment, was fully addressed in the EA for the Master Plan and is not part of the proposed action of this EA. Also, detailed discussions about the reuse of buildings and the relocation of services and personnel will be addressed in separate NEPA documentation when those activities are initiated.

1.3 Purpose & Need

In the past decade GSFC's strategic planning and operations have changed in response to evolving scientific, technological, and economic realities. To better align with new strategies and priorities, GSFC has reorganized a key resource: its talented workforce. Realigning physical resources is part of the effort to maximize the potential of this human resource.

Further, many GSFC facilities (buildings, roads, utilities, fences, and land use relationships) no longer responsibly meet the projected needs of the science mission. Many of the buildings on the GSFC campus are no longer suitable for technologically advanced research. The majority of the existing facilities buildings were constructed in the 1960's in the initial phase of the U.S. space program. The critical evaluation conducted during the *GSFC Facilities Master Plan* process concluded that the lack of a comprehensive plan for facilities renewal would be an unacceptable risk for GSFC mission success. The *GSFC Facilities Master Plan* was developed to address these existing deficiencies. Construction of a new SSB and the consolidation of space science activities into a unique neighborhood is an important step in the implementation of the Master Plan.

1.3.1 Neighborhoods

The *GSFC Facilities Master Plan* land use concept creates "neighborhoods" for each of GSFC's major mission groups: Engineering/Technologies, Program/Project Management, Earth Sciences, and Space Science. Implementation of this concept would require a significant change from the existing landscape of scattered buildings surrounded by parking and large areas of lawn.

The *GSFC Facilities Master Plan* also includes relocating part of Soil Conservation Road to eliminate the physical division of the campus. The current east/west campus split caused by Soil Conservation Road creates safety and security risks for all operations at GSFC and is being realigned. The relocation of Soil Conservation Road was addressed in the environmental assessment for the *GSFC Facilities Master Plan,*

completed in 2002. The current effort to prepare an environmental assessment for the SSB is based on the assumption that this road relocation would proceed as a separate action.

1.3.2 Space Science Neighborhood

The focal point of the Space Science Neighborhood would be the proposed SSB, which would assist GSFC in achieving the following mission objectives identified in the *GSFC Facilities Master Plan*:

- *To perform the long-term scientific and technological research that makes breakthrough discoveries possible.*
- *To provide access to the GSFC's institutional capabilities, including facilities, equipment, and expertise in science, technology, and project management in order to support and build the abilities of the scientific and supporting technical communities. To create and sustain a creative, outward-focused environment that encourages the interchange of ideas.*
- *To assemble and sustain the best possible scientists, engineers, and technologists.*
- *To provide the state-of-the-art facilities and equipment needed to perform cutting-edge research.*
- *To provide employees with the guidance, resources, opportunities, and incentives to be active and effective in sharing knowledge and discoveries.*
- *To define the facility requirements and acquire the resources needed to enhance Goddard's state-of-the-art capabilities.*

NASA's prime purpose in constructing a new SSB would be to bring together five different organizational elements (Code 600/603, 630, 660, 680 and 690). These operations are currently distributed among six buildings and an office trailer complex. Consolidating the space science facilities as a single complex would allow NASA staff to more effectively accomplish space science priorities. New facilities would be flexible enough to keep pace with the rising rate of change in the Space Science mission, as well as advancements in technology.

1.3.3 Proposed SSB

The project would place the Space Science Directorate and the Space Science Data Operations Office near three laboratories: the Laboratory for

High Energy Astrophysics (LHEA), the Laboratory for Astronomy and Solar Physics (LASP), and the Laboratory for Extraterrestrial Physics (LEP) in a new SSB. The new building—with its state-of-the-art electronics, computer and chemistry labs, cleanrooms, high bay spaces, and modern offices—would contribute significantly to the goals of the *GSFC Facilities Master Plan* and *Strategic Implementation Plan, 2001.*

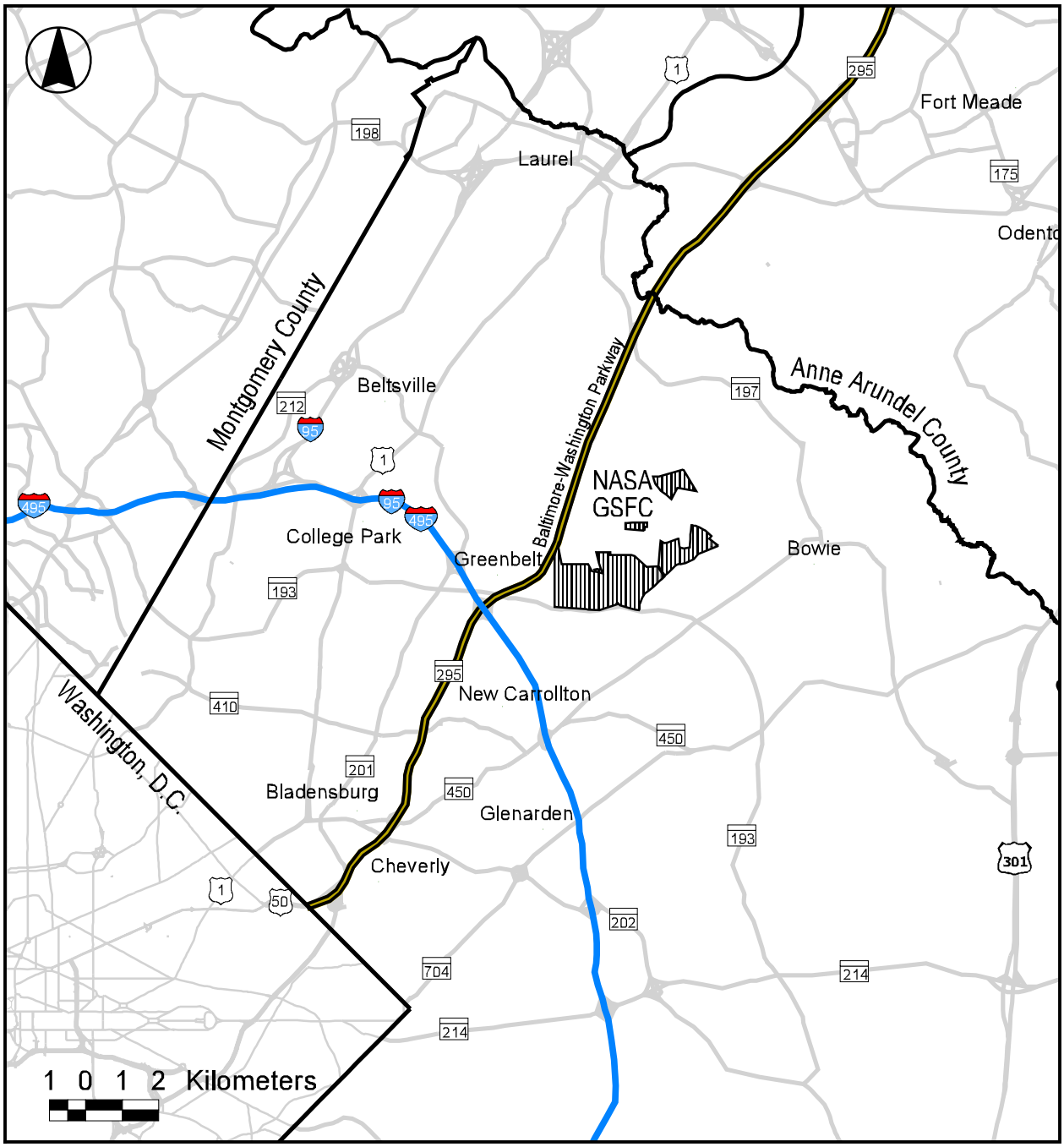

Figure 1-1 Location Map

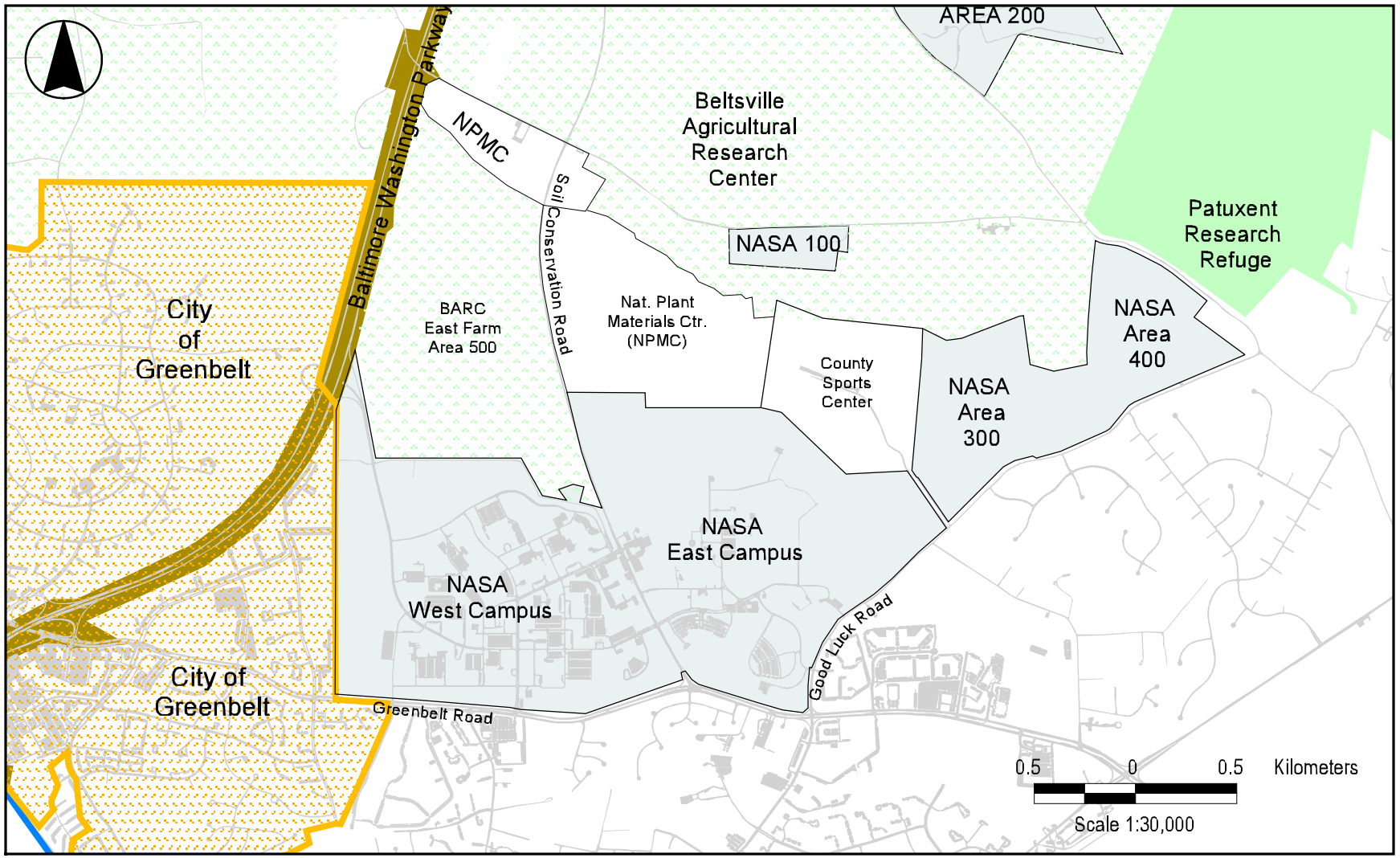

Figure 1-2 Vicinity Map

City of Greenbelt

NASA Properties

Patuxent Research Refuge

Beltsville Agricultural Research Center

Baltimore Washington Parkway

The proposed location of the Space Science Neighborhood at a high topographic elevation on the campus is appropriate to the importance of Space Science within GSFC. This prominent site would provide long views from the upper floors in all directions. The *GSFC Facilities Master Plan* proposes that the ultimate access to the SSB parking area be provided via a new loop road circulating through the campus and tying into the existing street system. However, the construction of the loop road would be a separate and independent activity, not part of the proposed action addressed in this EA.

The new Space Science Neighborhood is an integral part of the effort to consolidate the east campus with the west campus. In combination with the rerouting of Soil Conservation Road, a central location for the SSB contributes to and reinforces the overall *GSFC Facility Master Plan* vision.

1.3.4 Inadequate Current Facilities

The Space Science program at Goddard is currently housed in six buildings (Buildings 2, 6, 20, 21, 26, and 28) and an office trailer complex on the west side of the existing campus (**Figure 1-3)**. Space Science shares Buildings 6, 20 and 28 with other GSFC Programs. Buildings 2, 6, 21, and 26 are located along Explorer Road, interspersed between parking lots and buildings dedicated to other programs. Buildings 20 and 28 are located at the north end of the campus along COBE Road.

The buildings that currently house Space Science are among the original facilities constructed at Goddard's Greenbelt site. These buildings, while still useful for some purposes, are no longer adequate for the technical and functional requirements of NASA's Space Science program. Deficiencies in either the amount or quality of space have been identified in the specialty and traditional lab areas, in the general office areas, and in the hazardous facility areas of the buildings.

The spatial distribution of the aging facilities across Goddard's large campus is also of major concern. **Figure 1-4** shows the existing geographic relationships between the facilities for the principal functional groups operating at GSFC. Related Space Science activities needing interaction are often spread across great distances. The pedestrian system connecting Buildings 2, 6, 21, with Building 26, is not easily traversed. No pedestrian system connects these four buildings to Building 28. The straight-line distance between Buildings 2 and 28 is over 600 m (2,000 ft). For pedestrians using existing roads and pedestrian paths, the distances are even greater. These distances create a barrier to informal, unscheduled interaction among researchers.

1.3.5 Why A New Space Science Building Is Needed

Under the new *GSFC Facilities Master Plan,* all of Goddard's Space Science organizations would be consolidated into one new neighborhood, centrally located on the Greenbelt site (**Figure 1-5**). The proposed consolidation in the new SSB would:

- Replace aging facilities on GSFC's west campus that are no longer suitable to house state-of-the-art, high-tech scientific functions essential to NASA's current and future mission
- Accommodate a series of sophisticated laboratory operations and associated support areas in approximately 28,000 – 33,000 gross square meters (gsm) (300,000 – 350,000 gross square feet [gsf]) of space
- Provide space for an estimated 900 existing employees, visiting scientists, contractors, and interns and facilitate their interaction

To establish the requirements for this planned single complex solution, a process was initiated having key science personnel meet with the facilities management team in a workshop atmosphere. The stakeholders of Space Science include mission customers (NASA and the broader science community), the workforce (onsite civil service and contractor employees), the partners in the work (private companies, universities, and international space agencies), and the community (organizations and individuals affected by Goddard's actions). Collaborative efforts guided the evolution of the objective planning criteria for the proposed functional design of SSB.

A detailed summary of the mission and programs of Space Science at Goddard, and the Scientific Goals and Building Goals developed, can be found in the *Requirements Document, Space Science Building, Program of Needs, October 2002* and the *SSB Siting Analysis Report*, *January 2003*.

1.3.6 Program Needs and Building Requirements

As part of the effort to design a new SSB, the facilities planning team met with staff from the Space Science community in a workshop process. The results of those discussions, summarized in the *SSB Program of Needs,* identified several program needs that affect siting requirements.

1.3.6.1 Lobby and Entrances

In the category of Public Space there is a requirement for a Lobby. This lobby would be oriented to accommodate visitors from other Goddard neighborhoods, informal daily public visits, and formal VIP or visiting scientist visits. Depending on the final building design configuration, the entry to the public lobby would be from the pedestrian pathways of the campus green space, and from a more formal vehicular drop off. It may be necessary and ideal to have access to the public lobby from more than one direction. This public lobby and the other direct points of entry to the facility would accommodate employee access from the parking area. The other entries also would accommodate pedestrian linkages from the campus. All entries would be fully accessible to people with disabilities.

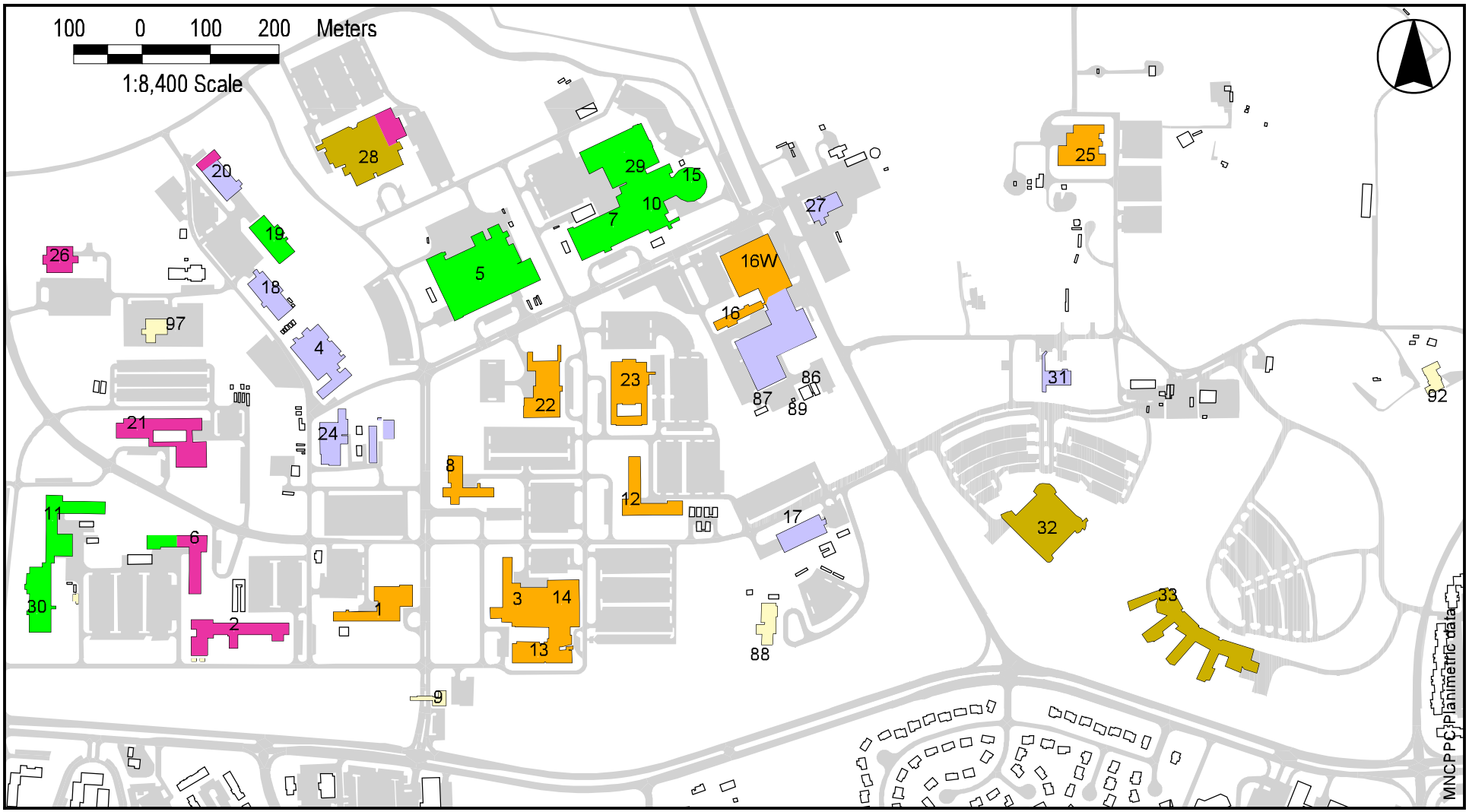

Figure 1-3 Existing Buildings

1- Program/ Project Management
2- Space Science
3- Program/Project Management
4- Institutional Support
5- Engineering
6- Program/Project Management
7- Engineering
8- Program/Project Management
9- Main Gatehouse
10- Engineering
11- Engineering
12- Program/Project Management
13- Program/Project Management
14- Program/Project Management
15- Engineering
16- Program/Project Managment
16W- Institutional Support
17- Institutional Support
18- Institutional Support
19- Institutional Support
20- Engineering
21- Space Science
22- Program/Project Management
23- Program/Project Management
24- Institutional Support
25- Program/Project Management
26- Space Science
27- Institutional Support
28- Program/Project Management
29- Engineering
30- Engineering
31- Institutional Support
32- Program/Project Management
33- Earth Science
88- Visitor Center
92- Recreation Center
97- Health Unit

Existing NASA Buildings

- Earth Science
- Engineering/Technology
- Program/Project Management
- Space Science
- Institutional Support
- Other

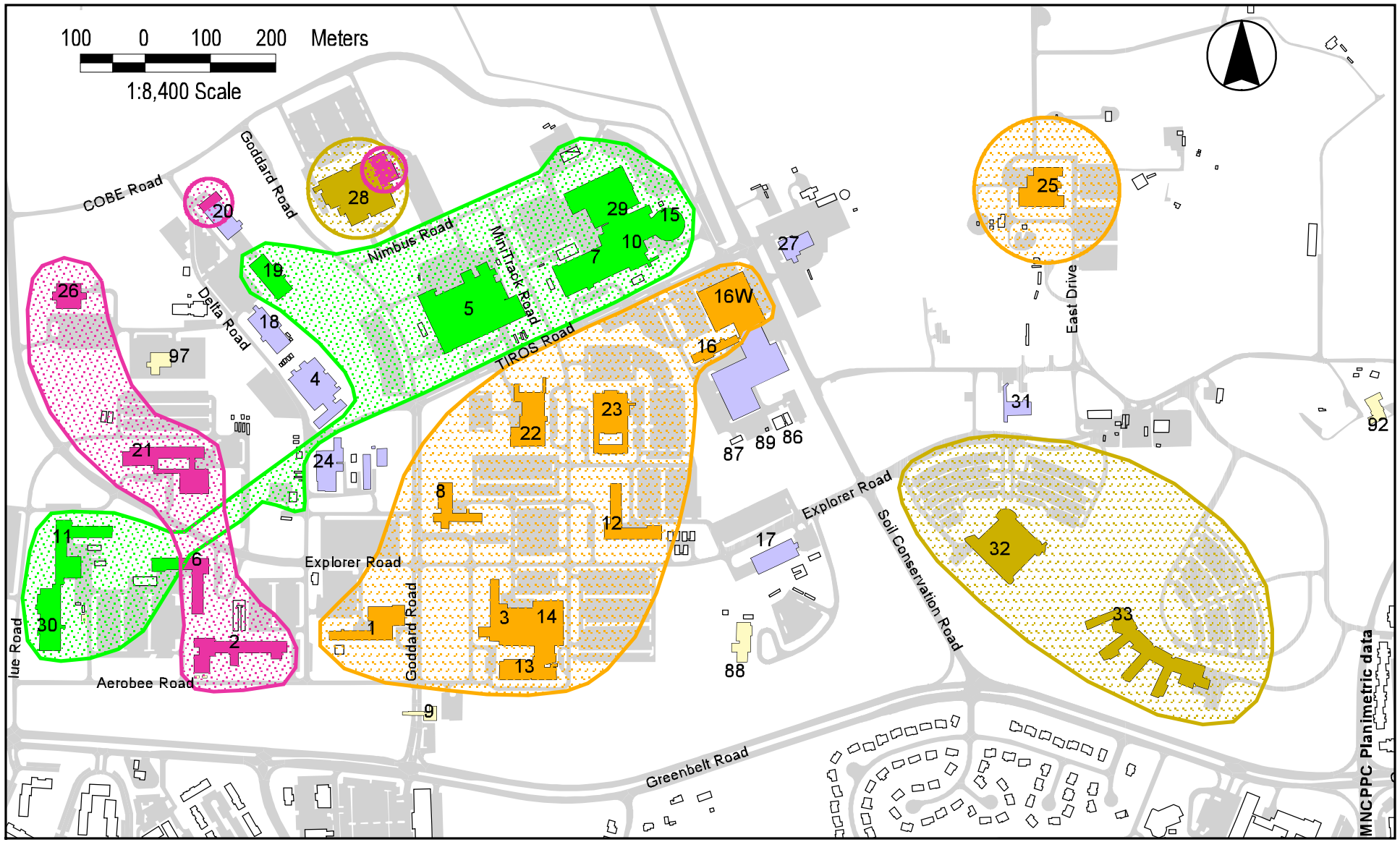

Figure 1-4 Existing Conditions

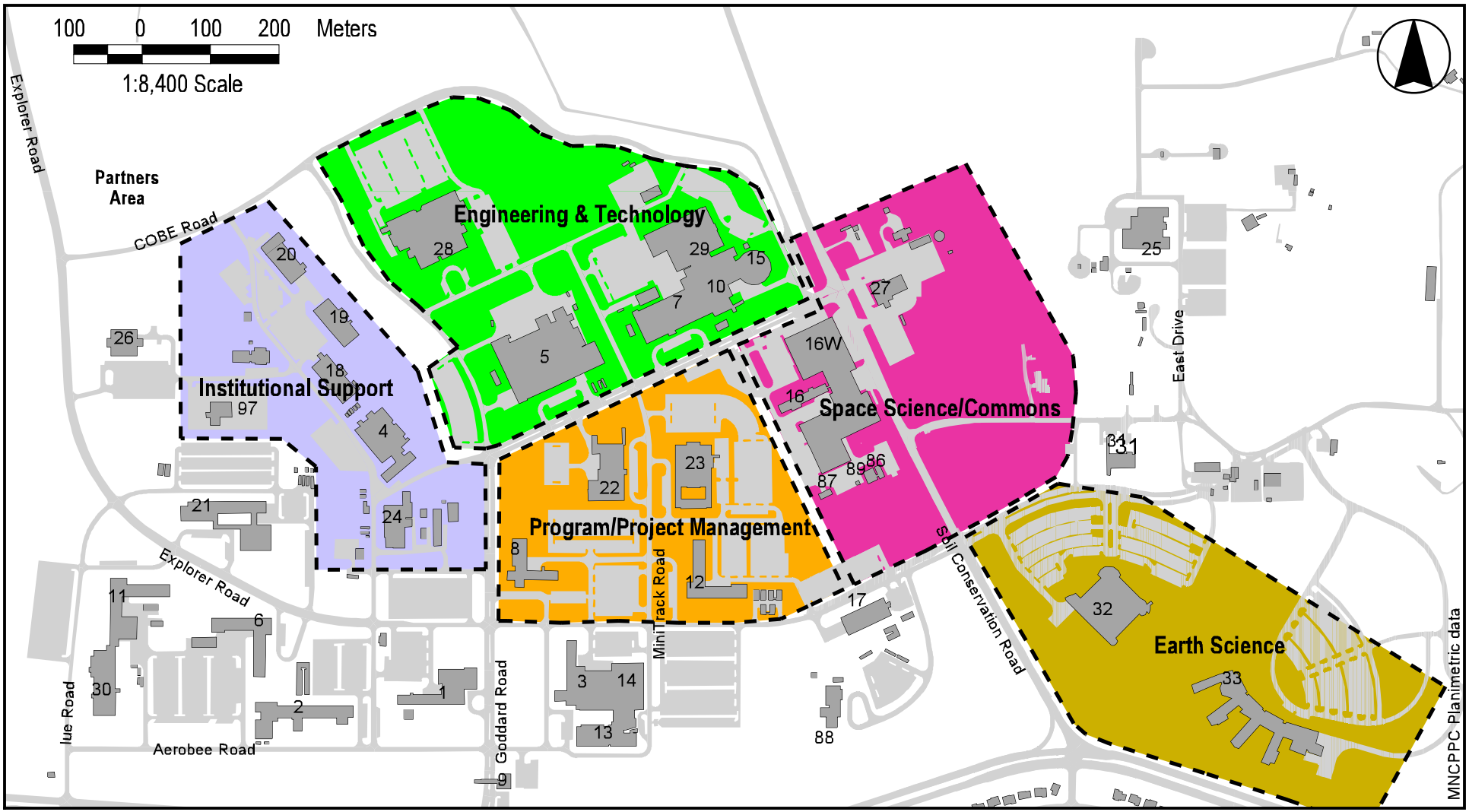

Figure 1-5 Proposed Neighborhoods - GSFC Facilities Master Plan, 2002

1.3.6.2 Vehicular Access

Trucks would require access to a loading dock, a dumpster and trash removal area, a chemical storage area, and the hazardous materials storage facility. Additionally, truck entry is required into the high bay areas to allow for direct loading and unloading by means of overhead cranes. Passenger vehicles would have access to a public drop-off and pick-up area near the main entrance and lobby.

1.3.6.3 Horizontal Beam Line Facility

A new beam line facility would replace the beam line laboratory currently located on the roof of Building 2. The new beam line facility would be an 300 m (1000 ft) long underground tunnel 1.8 m (6 ft) wide by 1.8 m (6 ft) deep, made with reinforced concrete and partially conditioned with sprinklers and floor drains. Tubes would be placed inside the tunnel and would be under vacuum pressure. The tunnel would originate inside the SBB at the Beam Target Lab and extend through the exterior wall to the area outside the building. An intermediate room of about 28 square meters (sq m) (300 net square feet [NSF]) would be located about halfway along its length. The intermediate lab would be 3.5 m (12 ft) high, underground, and have access above ground. The Horizontal Beam Source Lab would be 56 sq m (600 NSF), 3.5 m (12 ft) high, and located underground at the end of the tunnel outside the SSB. It would have an overhead crane/lift in it with access above ground.

1.3.7 Vacated Buildings

When the new SSB is constructed, Space Science personnel would move out of Buildings 2, 6, 21, and 26. The vacant space would then become available for other GSFC users. The *GSFC Facilities Master Plan* proposes that, once fully vacated, these buildings would become excess. In the 2009 to 2013 timeframe these excess buildings would be made available for renewal by partner businesses and contractors. The *GSFC Transportation Management Plan* specifies that before these buildings are turned over to future partners, the parking areas would be taken out of service. When the partners renovate the buildings, they would establish new parking areas meeting then-current parking and stormwater management requirements.

Space Science personnel would also vacate Buildings 20 and 28. Building 20 would be reused and adapted to the needs of the Institutional Support community, as shown on Figure 1-5, and Building 28 would be reused and adapted to the needs of the Engineering and Technology Neighborhood. Under-utilized parking areas would be removed from service progressively, as specified in the *GSFC Transportation Management Plan.* Additional NEPA documentation of the environmental effects resulting from reuse of any vacated buildings would be developed at the time specific actions are proposed.

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PART II PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

NASA proposes to construct a new Space Science Building in order to relocate space science research from its existing facilities to new facilities in the Space Science Neighborhood shown in the *GSFC Facility Master Plan*. The proposed General Site Area (**Figure 2-1**) for the Space Science Neighborhood is strategically located at the center of the campus providing strong links to the other future neighborhoods. The neighborhood would provide appropriate space for the full build-out of the proposed SSB, as well as a new Campus Commons, a new Media Center, and other new work-related ancillary spaces. Its location is coordinated with the intent of the overall campus plan— to create a natural "greenway" of open civic space edged by existing and new buildings, and connected by pedestrian pathways.

The proposed SSB area is 28,000-33,000 gsm (300,000 – 350,000 gsf) in a 3-4-story structure with a footprint of approximately 7,000-9,300 gsm (75,000-100,000 gsf). The area affected by this construction would be 1.0-1.5 ha (2.5-3.7ac). Three alternative building zones for the proposed building are described below, along with the No-Action Alternative. The precise location of the SSB within each building zone is not determined, but the area disturbed by construction would be located within the respective building zone.

The construction of the SSB is contingent upon the relocation of Soil Conservation Road, a separate action for which an separate NEPA documentation has been prepared as part of the EA for the *GSFC Facility Master Plan.* Other separate actions including construction of a loop road would be subject to additional NEPA documentation.

2.1.1 No-Action Alternative

Under the No-Action Alternative, the Space Science Program would continue to be housed in Buildings 2, 6, 20, 21, 26, and 28 and in two trailers. Each building would have its own parking area.

2.1.2 Alternative Site Area 1 (Figure 2-2)

Alternative Site Area 1, the forested site, is located directly north of Explorer Road and sits south of present day Building 16/16W. The building zone is approximately 2.2 ha (5.4 ac) and is heavily wooded. Soil Conservation Road currently runs directly through the center of the proposed site. After Soil Conservation Road is relocated the SSB would be constructed across the former roadbed. Construction of this alternative would include the demolition of Buildings 86, 87 and 89.

2.1.3 Alternative Site Area 2 (Figure 2-3)

Alternative Site Area 2, the *GSFC Facility Master Plan* Alternative, is located directly north and adjacent to Building 16/16W. The proposed building zone, approximately 2.9 ha (7.2 ac), extends west to the Building 16/16W and east to the opposite side of Soil Conservation Road. The proposed building would be built across existing Soil Conservation Road and would require relocation of the motor pool with its associated buildings. Construction of this alternative includes the demolition of the Building 27 complex.

2.1.4 Alternative Site Area 3 (Figure 2-4)

Alternative Site Area 3, the 16/16W site, would be located on the grounds of the present day Building 16/16W. If chosen as the proposed site, Building 16/16W would be demolished and a new structure would be developed in its place. The building zone is approximately 3.6 ha (9.0 ac) in size. The 16/16W site sits directly south of TIROS Road and west of existing Soil Conservation Road.

2.1.5 Parking Area

Parking for all three alternative sites areas would be located on Landfill B, which is just east of Building 16/16W on the opposite side of Soil Conservation Road. The parking proposed for the SSB is 811 spaces. If all parking were on grade, the overall site area would be approximately 3.6 ha (9.0 ac). Impacts in this document are calculated based upon the largest potential site area. The parking area would be accessed from Explorer Road.

The Beam Target Lab would be located inside the SSB with the vacuum tube, an intermediate lab and the Horizontal Beam Source Lab all located outside the SSB, underneath the parking area.

Near the eastern edge of the proposed parking area and within Landfill B is an area of unstable slopes adjoining an existing drainage channel. As part of the SSB project, NASA proposes to stabilize this area by creating a 4:1 slope that would extend the toe approximately 15.2 m (50 ft) from the toe of slope of the existing landfill. The new slope would be stabilized with topsoil and landscaped with grasses, shrubs and trees. The new drainage channel would be relocated just beyond the toe of the slope parallel to the existing eroded channel. The new drainage channel would be engineered to prevent erosion, using riprap or other suitable material and incorporating structures designed to retain some of the water, allowing seepage into the soil and reducing runoff and downstream silting.

Figure 2-1 General Site Area

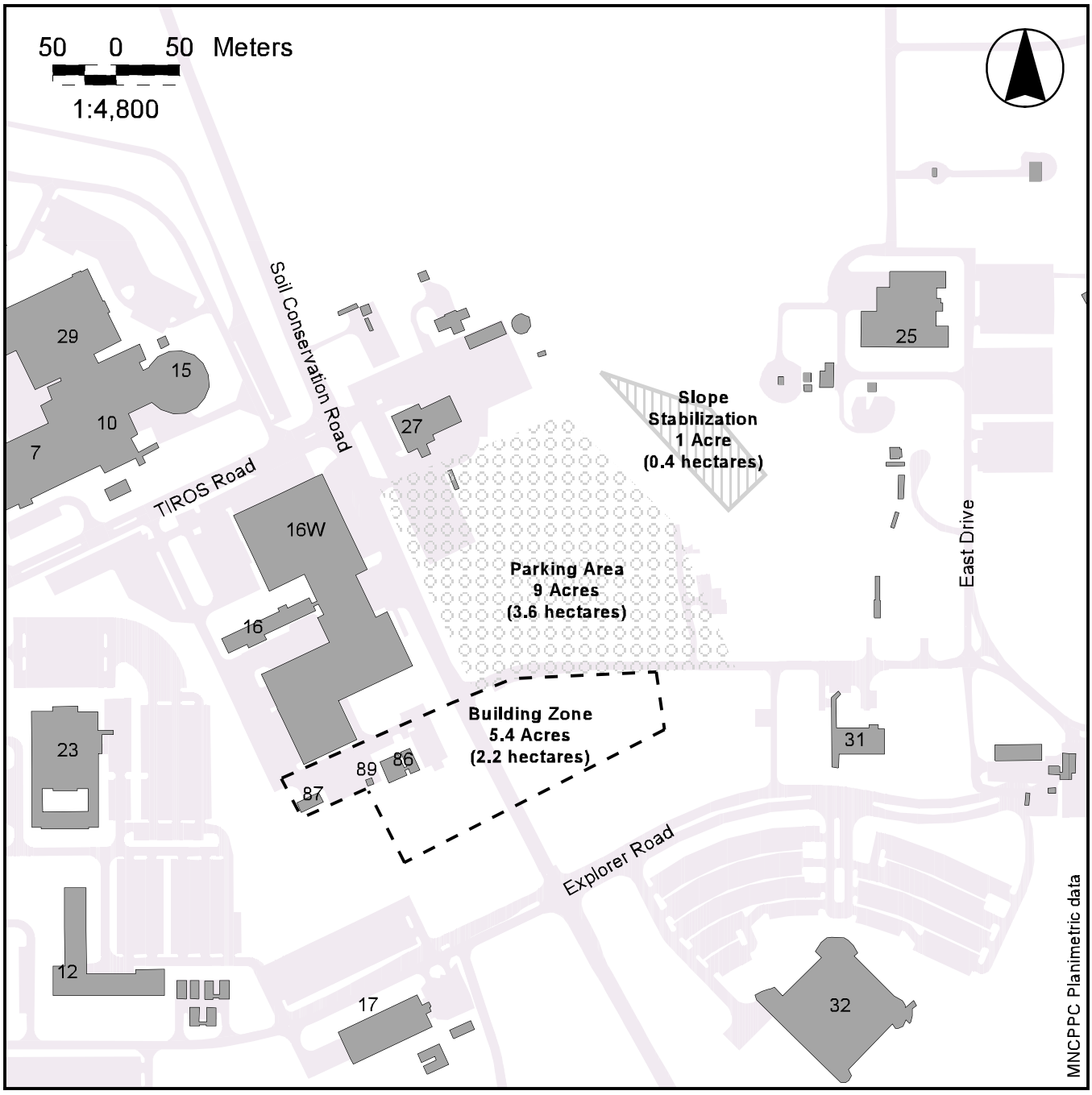

Figure 2-2, Alternative Site Area 1

Building Zone

Parking Area

Slope Stabilization

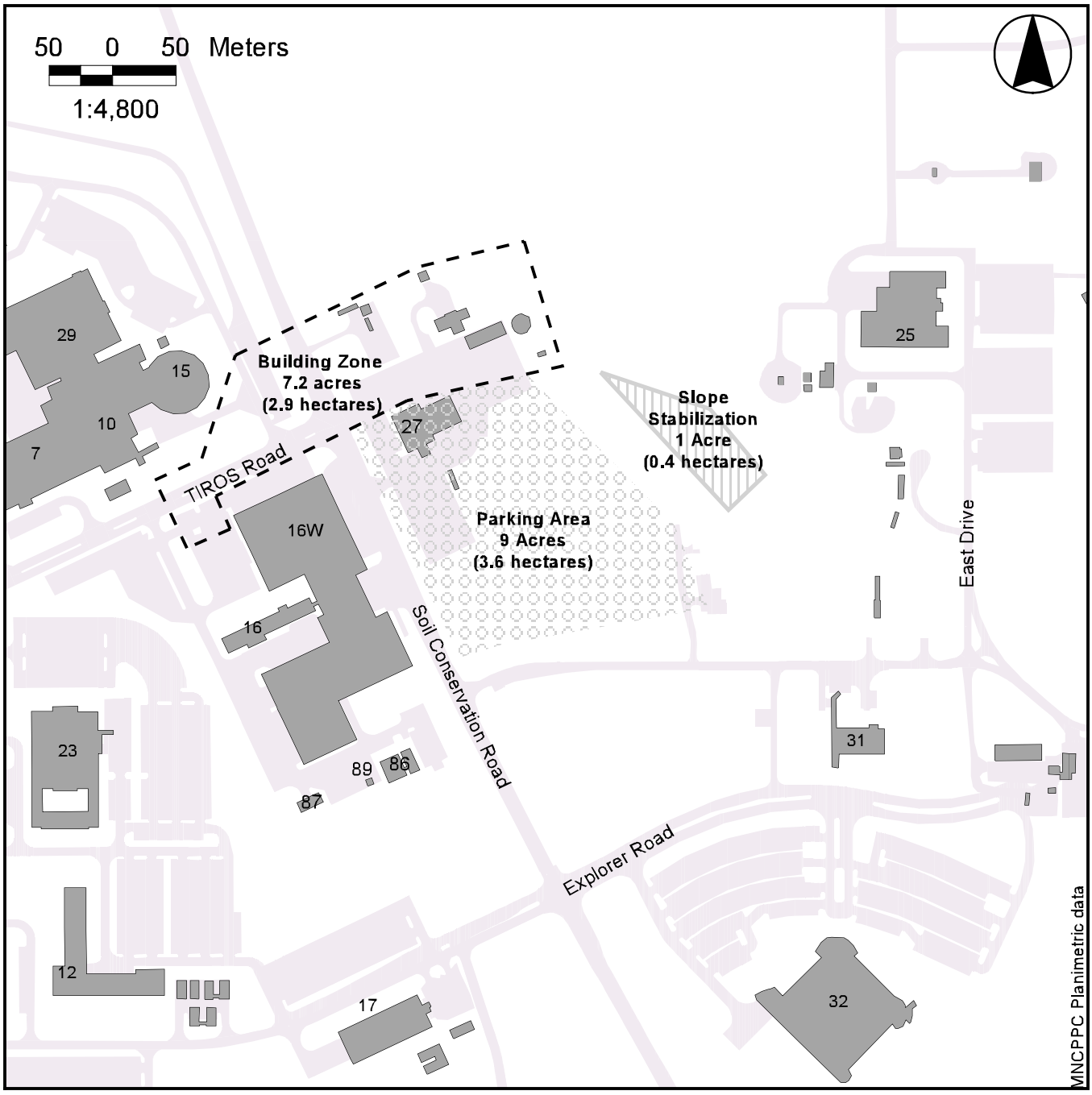

Figure 2-3, Alternative Site Area 2

Building Zone

Parking Area

Slope Stabilization

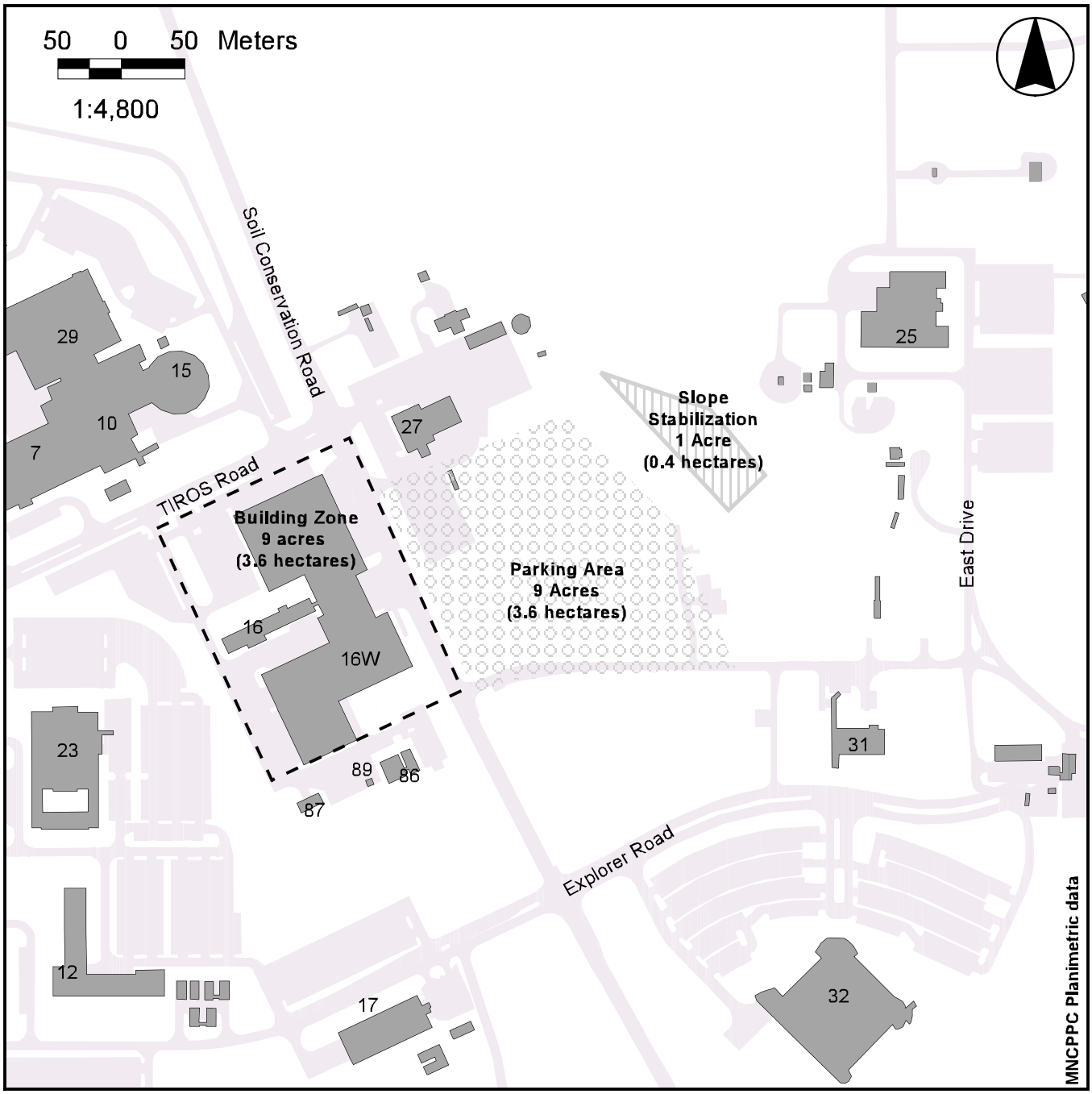

Figure 2-4, Alternative Site Area 3

Building Zone

Parking Area

Slope Stabilization

PART III AFFECTED ENVIRONMENT

3.1 SSB Study Area

The General Site Area for the proposed SSB is in the very center of what would be the GSFC campus after Soil Conservation Road is relocated and the current east and west campuses are combined. The relocation of this road provides the available land for what was identified early in the *GSFC Facilities Master Plan* framework process as a "Priority Development Zone." As the campus framework developed further, this zone was then determined to be the location for a future Space Science/Commons Neighborhood—one that was within walking distance of Goddard's current Engineering and Earth Science buildings.

The developable land area for this new neighborhood, under study within this report, is located on prominent high ground east and south of the Building 7/10/15/29 complex. The General Site Area encompasses the Building 27 area, the Building 16/16W area, the Landfill B site, two forested groves to the north of Explorer Road on both sides of Soil Conservation Road, and the woodland along the eastern edge of the study area adjacent to the landfill.

3.2 Population

GSFC is located about 11.27 km (7 mi) northeast of Washington, DC, in Prince George's County, Maryland. Prince George's County is developing rapidly and is part of the Baltimore-Washington Consolidated Metropolitan Statistical Area (CMSA). By 1990 the county had become the largest jurisdiction in the CMSA in terms of population, with a census count of 729,268. The County's population is nearly 11 percent of the total CMSA population. Between 1990 and 2000, the county's population grew by 10 percent to a total population of 801,515. Growth in this county is expected to continue with a projected population for 2010 and 2020 of 852,000 and 917,000, respectively (*GSFC Environmental Assessment, 2002*). **Figure 3-1** shows the Year 2000 Census Tracts surrounding GSFC.

In 2000, the total population in the census tracts around the facility was 38,237. Racial minorities accounted for 40.1 percent, and those of Hispanic origin, regardless of race, accounted for 3.6 percent of this population. The number of Asian Americans within the study area has rapidly increased since the 1970's. In the 1970's, fewer than 100 Asian Americans resided within the area. Currently, 3,918 Asian Americans reside in census tracts around the GSFC campus.

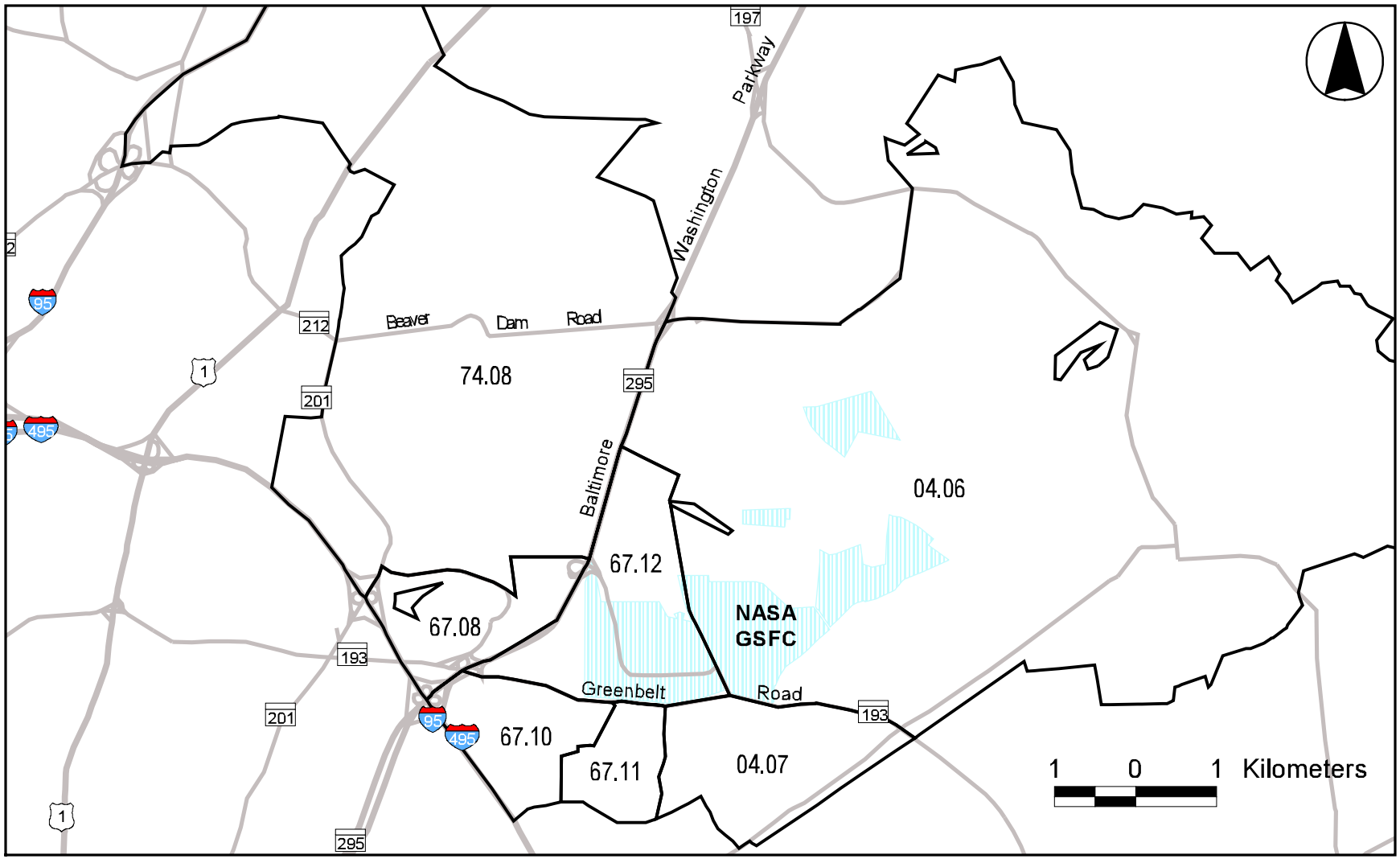

Figure 3-1 2000 Census Tracts

3.3 Land Use

3.3.1 Land Use – Prince George's County

The Beltsville Agricultural Research Center (BARC) borders GSFC to the north. GSFC and BARC contribute to a resource known within Prince George's County as the "green wedge"—a continuous, lightly developed area in a rapidly developing region. The City of Greenbelt is adjacent to the western property limit of GSFC. A mix of commercial and residential development consisting primarily of shopping malls, office parks, and low-rise apartments and condominiums is prevalent in this area. Areas to the south and east of GSFC include the residential areas of Seabrook, Lanham and Glenn Dale.

The goals of the *Prince George's County General Plan* include:

- Promoting economic vitality and a sustainable pattern of development
- Utilizing existing and public facilities efficiently
- Enhancing the quality and character of the communities and neighborhoods
- Protecting environmentally sensitive lands
- Preserving rural, agricultural and scenic areas

The *Prince George's County General Plan* divides the County into policy Tiers: the Developed Tier, the Developing Tier, and the Rural Tier. Each Tier is characterized by the intensity of development, both residential and employment. The Developing Tier encompasses the middle section of Prince George's County and includes GSFC. This Tier experiences the greatest amount of pressure for residential community growth. Due to the dispersed nature of the development in this Tier, circulation depends on the automobile, which has created roadway congestion. Development controls within this Tier need to balance the pace of development with the demands for adequate roads and new facilities. New development is designed to be more land efficient, more environmentally sensitive, and more effective with respect to transit support. The main goal of the Developing Tier is to maintain a pattern of low- to moderate-density suburban residential communities, distinct commercial centers, and employment areas that are increasingly serviceable by transit.

The areas surrounding GSFC have a mix of suburban land uses, including residential, commercial, and institutional activities that closely match the *Prince George's County General Plan* proposed land use. No future land use or zoning changes are planned within the *Prince George's County General Plan* for the areas in the vicinity of GSFC.

3.3.2 Land Use - GSFC Campus

GSFC is a 514 ha (1,270 ac) campus divided into two large areas, the east and the west campuses, which are separated by Soil Conservation Road. Existing structures

are widely spaced across the campus and surrounded by parking areas and broad lawns. **Figure 1-4** displays the functional distribution of uses**.** Most science and research activities are located on the west campus. During the 1990s, Earth Science activities were relocated to new facilities on the east campus. The largest undeveloped areas are located on the east campus.

In coming years, the operations on the GSFC campus will be streamlined by consolidating major activity groupings into five neighborhoods consistent with the *GSFC Facilities Master Plan*, as shown in **Figure 1-5**. The consolidation of functional uses would strengthen overall teamwork by interconnecting all activities across the campus. To begin this consolidation process, Space Science, as a functional group, would be relocated from its existing facilities to new facilities in a new neighborhood. The proposed site is located in the center of the GSFC campus and provides strong links to other future neighborhoods. The current pedestrian network and location of amenity services are characterized as disconnected by roadways and parking and scattered. The new neighborhoods would surround a natural greenway of open space and would be connected by pedestrian walkways. Through the realignment of resources to consolidate similar functions and the development of supportive pedestrian access, as described in the Master Plan, GSFC encourages alternatives to reliance on single occupancy vehicles.

3.4 Cultural and Historic Resources

The *GSFC Environmental Assessment, 2002*, does not show any known historic resource within the General Site Area. This finding was confirmed by a review of the Maryland Department of Natural Resource (MDNR) Technology Toolbox database. Based on the current level of disturbance within the study area and its general location, no archeological resources are likely to be found. A review of the Phase I Archeological Survey conducted for GSFC also confirms that the probability of finding archeological resources within the SSB General Site Area is low. In a letter dated August 12, 2002 the Maryland Historic Trust agreed that:

> …the activities described in the Master Plan and the EA, with the exception of the Soil Conservation Road Realignment, would have **no effect to historic properties**. (Emphasis in the original letter from Elizabeth J. Cole to Mr. Kim Toufectis, dated August 12, 2002.)

No additional archeological surveys were conducted as part of the preparation of this EA for the SSB.

3.5 Employment Conditions

In 2002, with a workforce of more than 8,000 federal employees and contractors, GSFC has become the third largest job center in the County, behind the University of Maryland College Park Campus and Andrews Air Force Base (*Prince George's County*

Brief Economic Facts, Maryland Department of Business and Economic Development, 2001). The majority of the federal employees and private contractors are technical personnel, scientists, engineers, and computer and communications specialists.

GSFC contributes more than a billion dollars each year to Maryland's economy. Space and engineering service industries account for about 70 percent of the total direct expenditures. The direct and indirect total economic impact of GSFC has been estimated at $2.156 billion in annual gross sales, $905 million in annual employee income, and a maintenance level of 26,690 full-time jobs (*GSFC Environmental Assessment*, *2002*).

The NASA work force at GSFC is projected to slowly decline from the current level to about 5,800 by 2020. At the same time, an additional 1,950 employees are expected to work for NASA partners on-site, keeping the overall employee population at the site relatively consistent. This projection assumes that there would be no radical change in the mission of GSFC. An additional 1,000 NASA employees at GSFC could result if there were a significant expansion of the space or earth science programs (*GSFC Environmental Assessment*, 2002).

3.6 Environmental Justice Conditions

Presidential Executive Order 12898, issued February 11, 1994, requires federal agencies to ensure environmental justice as part of their overall mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of activities on minority or low-income populations.

Based on the 2000 Census data, minority individuals comprise greater than 50 percent of all individuals living in five of the seven census tracts that surround GSFC. Census tracts 67.08 and 74.08, both located on the west side of the Baltimore-Washington Parkway, have a greater percentage of white population than of minority populations.

Within Prince George's County, 7.7 percent of the people live in households below the poverty level. Six of the seven census tracts that surround GSFC have a higher concentration of poverty than the county average. Census tract 67.08 has a lower concentration of poverty than Prince George's County as a whole.

3.7 Transportation

3.7.1 Area Roadways

One mile (2.6 km) southwest of GSFC lies the I-95/I-495 Washington Beltway, an eight-lane interstate freeway that is 103 km (64 mi) long and that encircles the District of Columbia and the inner suburbs of Virginia and Maryland. This highly congested freeway provides the region's main access to the District of Columbia and the surrounding suburban areas.

To the west of GSFC lies the Baltimore-Washington Parkway. This four-lane divided highway with limited access connects the cities of Baltimore, MD and Washington, DC. The segment of the Baltimore-Washington Parkway near GSFC is owned and maintained by the National Park Service (NPS), and is listed on the National Register of Historic Places. The Baltimore-Washington Parkway is a primary route for employee access to the campus.

Greenbelt Road (Maryland Route 193) is an east-west arterial located along the southern boundary of GSFC. This is the primary route for visitor access to and from the campus. Greenbelt Road, which is four to six lanes wide, is owned and maintained by the State of Maryland.

Good Luck Road is adjacent to the eastern boundary of GSFC. This road, which is classified as a county collector road, is generally two lanes wide until it reaches the intersection with Greenbelt Road, where it becomes four lanes. Good Luck Road is owned and maintained by Prince George's County.

Soil Conservation Road is a two lane road available for public use that divides GSFC into two sections, the east and west campuses. It connects with Greenbelt Road to the south and with Powder Mill Road to the north. Soil Conservation Road is owned by the U.S. Government. The 914.4 m (3,000 ft) section runs through the facility and is maintained by NASA. The road is often used as an alternative to the Baltimore-Washington Parkway and as a shortcut from the Parkway to points east along Greenbelt Road.

The *GSFC Facilities Master Plan* calls for a more efficient consolidated facility that would eliminate division into two campuses. The *GSFC Facilities Master Plan* proposes to relocate Soil Conservation Road to the east connecting with Good Luck Road. This relocation would prevent public access through the GSFC and would unite the two campuses. More detailed information on the proposed rerouting of Soil Conservation Road can be found in the *GSFC Environmental Assessment, 2002*.

The *GSFC Facilities Master Plan* includes an internal loop road within GSFC that would be constructed to create a pedestrian friendly campus core area. This road would route GSFC traffic around the large pedestrian-oriented core area encompassing the Space Science and Central Commons, Engineering and Technology, and Program and Project Management Neighborhoods. The loop road would be two lanes wide with left turn lanes at parking lot entrances. The environmental effects of the Loop Road are addressed generally in the *GSFC Environmental Assessment* and would be evaluated in detail as part of any proposed plan for construction.

3.7.2 Traffic

As part of the *GSFC Transportation Management Plan,* current commuting and transportation patterns were determined at several locations in the vicinity of GSFC. An employee commuting survey was conducted in October 1999, which determined that during peak usage times, an average of 90 percent of the GSFC staff commute using a single occupancy vehicle. Only eight percent of the employees use ridesharing, 2.2 percent arrive by bus, and less than one percent ride a bike or walk to the facility (*GSFC Transportation Management Plan,* 2002).

Employees access GSFC and Soil Conservation Road via Good Luck Road and Greenbelt Road from the south and Baltimore-Washington Parkway from the north. Delivery trucks enter Soil Conservation Road from the north or south and go to the loading dock at building 16w. Fences prohibit delivery trucks from entering the secured area of GSFC.

The predominant direction of travel along the Baltimore-Washington Parkway is southbound in the morning and northbound in the evenings. During these peak rush hour periods, the Parkway is typically at or beyond its capacity in the direction of high commuter traffic, while the reverse commute direction is well below its capacity. Trucks, cyclists, and pedestrians are prohibited from using the Baltimore-Washington Parkway.

Soil Conservation Road follows a similar traffic pattern, with the majority of the traffic flowing to the south in the mornings and the north in the evenings. During rush hour peak periods, flow frequently becomes congested at each end of the road and significant delays can occur. Cyclists and pedestrians are able to utilize Soil Conservation Road, although the conditions for such use are inadequate.

A mix of commuters, local retail and commercial traffic, and residential traffic utilizes Greenbelt Road. The rush hour commuter traffic can be fairly heavy eastbound in the mornings and westbound in the evenings, and several intersections along the road tend to reach capacity during this time. Conditions for pedestrians and cyclists are inadequate and potentially unsafe.

3.7.3 Parking

In order to achieve the parking space reductions described in the *GSFC Transportation Management Plan*, incremental goals were established for the life of the *GSFC Facilities Master Plan, from 2002 to 2022*. GSFC intends to apply the parking ratio goals to entire functional neighborhoods, such as the Space Science and Commons Neighborhood, which includes the SSB.

In order to achieve these goals, GSFC is actively pursuing transportation initiatives to

reduce the reliance on single occupancy vehicles.

3.7.4 Pedestrian/Bicycle

Three Prince George's County pedestrian/bike trails are in the vicinity of GSFC. The Good Luck Road Trail is a multi-use trail that parallels Good Luck Road. Trail IE, the Greenbelt Road Commuter Trail, is a Class I bikeway that is part of the Northeast Branch Park and the related trail system. This 3.6 mile long exclusive right-of-way trail is located alongside Greenbelt Road between Indian Creek and the GSFC in the vicinity of Cipriano Road.

Trail 5A, the South Laurel Trail, which runs alongside Soil Conservation Road, is the main trail in the South Laurel Trail system. The six-mile trail runs between the town of Laurel to the north of GSFC and the Soil Conservation Road/Greenbelt Road intersection, following Soil Conservation Road in the southern half of its route. This is a Class III bikeway that shares the road and shoulder with vehicle traffic. Most of this commuter/recreational trail is located within BARC.

3.8 Noise

Development at GSFC is surrounded by a perimeter buffer, which is primarily forested. NASA operations are generally conducted indoors and produce negligible exterior noise levels. Many laboratory, testing, and communications functions are extremely sensitive to noise and vibrations. The shortest distance between any NASA building (Building 33) and an outside residence is about 90 m (300 ft).

3.9 Waste Management

3.9.1 Non-hazardous Waste

Solid waste at GSFC and in the Space Science program consists of office waste, plastics, glass, wood, and trash. Waste is collected by custodial staff and placed in dumpsters. A private contractor then picks up the waste and hauls it to the Prince George's County sanitary landfill. GSFC recycles standard items such as white and mixed paper, cardboard, aluminum soda cans, ferrous and nonferrous metals, and glass and plastic containers. Several contractors collect materials for recycling.

3.9.2 Hazardous Waste

The Environmental Protection Agency (EPA) classifies GSFC as a large quantity hazardous waste generator. The GSFC Safety and Environmental Division oversees handling, use, and storage of hazardous waste. Personnel working with hazardous materials and hazardous waste are trained in hazards, safety, waste minimization, and emergency response procedures. Hazardous wastes are accumulated in secure areas within the building of origin and then transported to the storage facility in Building 27A, where it is stored for no more than 90-days. Procedures for the control and minimization of hazardous waste releases are covered in the *GSFC Storm Water*

Pollution Prevention Plan and the *GSFC Integrated Contingency Plan*. The Safety and Environmental Division oversees all handling, transport, and disposal of hazardous waste at GSFC to assure compliance in accordance with GSFC procedures and federal regulatory requirements.

GSFC generally possesses only a small fraction of the quantity of radioactive material allowed by the Nuclear Regulatory Commission General Research And Development License issued to GSFC (NRC license 19-05748-02). A private contractor serving federal agencies in the Washington, DC area handles off-site transport and disposal under a general U.S. Army contract (*GSFC Environmental Assessment, 2002*).

3.10 Air Quality

The Washington Metropolitan Area is in severe non-attainment for ground-level ozone. The State Implementation Plan for the attainment of the ozone standard outlines programs and policies for reducing emissions of the ozone-causing pollutants, nitrogen oxides (NOx) and volatile organic compounds (VOC). The reductions would enable the region to meet the federal health standard for ozone. The National Capital Transportation Planning Board (TPB) and the Metropolitan Washington Air Quality Committee (MWAQC) determine conformity of transportation facilities and systems with this plan.

Non-transportation projects financed with federal funds, located in severe non-attainment areas that produce more than 25 tons (22.6 metric tons) per year of nitrogen oxide or VOC emissions, are required to receive an assessment for general conformity from the Maryland Department of the Environment.

3.11 Soils and Geology

The GSFC is located in the Atlantic Coastal Plain physiographic province. This region is underlain with unconsolidated coastal plain sediments. The project area lies in the Christiana-Sunnyside-Beltsville Soil Association. Dominant soil series in the general site area include Sassafras, Sandy Clay, and Sunnyside. These soils are generally deep, well drained, and compacted.

At the base of the wooded slope, east of the existing Landfill B (**Figure 3-2**), Elkton soils are evident. These are the only hydric soils within this portion of the Space Science Neighborhood study area. Hydric soils are generally saturated with the water table at or near the ground surface and are an indicator for potential wetlands (description below). All of the soils referenced above possess moderate erosion hazards.

3.12 Groundwater

GSFC is located within the Patuxent aquifer, which is a ubiquitous confined (artesian) aquifer. Two on-site production wells serve cooling towers only. The GSFC campus is

served by public water and sewer, primarily provided from surface water sources, and therefore does not significantly draw from the groundwater system.

3.13 Slopes (Topography)

The gently undulating topography of GSFC is typical of the upper Coastal Plain. The General Site Area for the project proposed is centrally located on the campus, and on one of three high ground areas of the GSFC site.

As indicated by the topographic conditions shown in **Figure 3-2**, there are some very steep slopes in the General Site Area, especially within the wooded area just east of the existing Landfill B site (description below). Steep slopes are defined as slopes with an incline greater than 1:1 or 45 percent. It appears that the steep slopes are the result of the earlier landfill grading activities. This is confirmed by a comparison of historic contour maps of the area. Intermittent swales are evident along and at the base of the slopes below the landfill. There is a natural swale along the northern edge of the landfill.

The swale along the northern portion of the existing landfill site is substantially eroded, especially as it begins to flow along, and at the base of the steep slopes. Waterways located at the base of the steep slopes associated with the landfill are also substantially eroded.

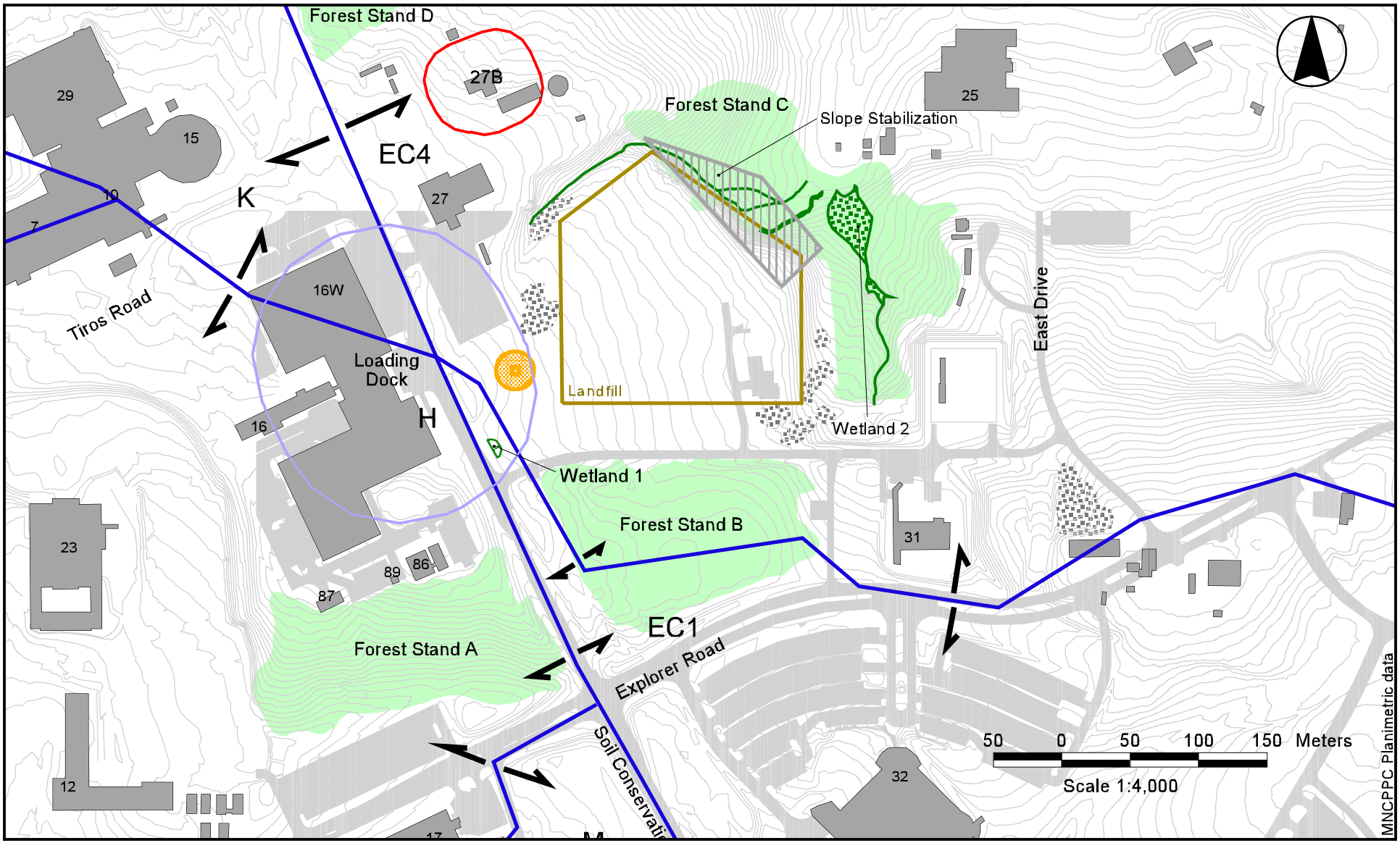

Figure 3-2 Existing Environmental Features

Waters of the U.S.
Emergent Wetland
Forested Wetland
Big Willow Oak
Forest Stand
Isolated Stand
Landfill B
Slope Stabilization
Drainage Areas
Within 300 feet of Loading Dock
Within 90 feet of Building 27B

3.14 Open Space / Forest Stands

Forested areas with the General Site Area are shown on **Figure 3-2.** Forest Stand A is on the west side of existing Soil Conservation Road, between Building 16/16W and Explorer Road, and is 1.75 ha (4.32 ac). On the east, between the existing Landfill B site and Explorer Road is the 2.54 ha (6.28 ac) Forest Stand B. A third forested area, Forest Stand C, is located on the east side of the landfill site, southeast of the Building 27 Complex and is 2.29 ha (5.65 ac). Forest Stand D is located at the northern edge of the study area (north of the Building 27 Complex, and east of Soil Conservation Road) and is greater than 1.26 ha (3.12 ac).

These forest stands are dominated by upland canopy species, primarily red oak (*Quercus rubra)*, white oak (*Quercus alba),* red maple (*Acer rubrum*), and sweet gum (*Liquidambar styraciflua).* The under story, especially the shrub layer, is sparse in Forest Stand A, mainly due to the overabundance of white-tailed deer overgrazing in this area. The shrub layer in Forest Stand B is dominated by mountain laurel (*Kalmia latifolia*), but is also severely overbrowsed by white-tailed deer (Odocoileus virginianus). Forest Stand C area contains the previously mentioned tree species as well as tulip poplar (*Liriodendron tulipifera*). The low ground portion of this woodland contains headwater seeps, wetlands, and associated vegetation. A large area of Forest Stand D is located outside the GSFC on the BARC property and is similar in community structure to Forest Stands A and B. Along Soil Conservation Road Forest Stand D is dominated by young Virginia pine (*Pinus virginiana*) with a narrow strip of mountain laurel (*Kalmia latifolia*) located between the pine and the oak dominated forest. Deer browse is evident in this woodland as was identified in all other Forest Stands within the GSFC.

A single large willow oak (*Quercus phellos*) tree (52.5” or 133cm DBH) is located on the landfill site near Soil Conservation Road.

3.15 Wetlands

Two wetlands are shown on **Figure 3-2**. They are located within the area of Forest Stand C and outside the limits of the landfill site. One is a forested wetland at the lowlands east of the landfill and south of the old radar tracking area adjacent to Building 25. The other is a 72 sqm (775 sq foot) isolated depression wetland containing hydrophytic vegetation along the fence line in the southwestern corner of Landfill B. Part of the wetland area is periodically mowed during routine maintenance. A Jurisdictional Determination (JD) would be required to validate wetland boundaries of these wetland systems if any disturbance is planned.

3.16 Floodplains

The GSFC campus does not include any land within the 100-year floodplain as defined by the Federal Emergency Management Act (FEMA). The closest 100-year floodplain is associated with Beck Branch and is located northeast of the existing GSFC complex

outside the study area.

3.17 Stormwater Management

GSFC is located on the Anacostia-Patuxent River drainage divide at the apex of five separate tributary stream basins. Virtually no other neighboring property drains onto the site. Stormwater at GSFC is managed by eight stormwater management (SWM) ponds located around the periphery of the Center. The conveyance system consists of closed storm drains and open drains, such as channels and swales.

Some improvements to the existing SWM system are planned to prevent active erosion from continuing to degrade receiving stream channels, resulting in decreased water quality and a reduction of viable aquatic habitat. Existing Outfall 5 discharges to the Bald Hill drainage basin without SWM protection. The County plans to construct a SWM facility at Outfall 5.

SWM would be required for any new construction. SWM is regulated under the recently issued *Maryland Stormwater Management Guidelines for State and Federal Projects* (MDE, Water Management Administration, July 2001) and the *2000 Maryland Stormwater Design Manual, Volumes I&II* (MDE, April 2000). The new MDE design criteria for SWM encourages low impact development practices and the use of bio-retention devices. New development in Prince George's County is required to control for the 24-hour, 10-year frequency storm event according to the *MDE Design Manual*. (*Maryland Stormwater Management Guidelines for State and Federal Projects,* July 2001).

The MDE Sediment and Stormwater Management Division regulates all SWM compliance issues for federal facilities in Maryland. Waivers of stormwater management quantity and quality control requirements for a specific site may be granted if control of stormwater from the site is provided through an approved institutional management plan.

3.18 Animal Communities / Endangered Species

Based on a review of the *GSFC Environmental Assessment* for the *GSFC Facilities Master Plan*, no threatened or endangered species are known to inhabit the GSFC campus. The site is home to a variety of wildlife, including at least 40 species of mammals, 65 species of birds, and 50 species of reptiles and amphibians. The overabundance of two species, white-tailed deer (Odocoileus virginianus) and Canada goose (Branta Canadensis), constitutes a significant ecological imbalance. GSFC recently initiated a wildlife management program to address this problem.

3.19 Landfill B

One existing landfill site is located in the General Site Area for the project: Landfill B, referred to as the "Metro Fill" Site. Soil Conservation Road to the west borders the

landfill; Building 27 is to the northwest, and Forest Stand C to the north and east.

Washington Metropolitan Area Transit Authority (WMATA) contractors used Landfill B as an un-permitted construction rubble and debris fill in constructing the New Carrollton Metro Center site. The landfill soils are comprised of relatively unconsolidated fill material with some construction debris.

Geophysical surveys conducted in the preparation of the *GSFC Site Investigation Report - Land Fill B* (GSFC, December 31, 2002) indicate that the landfill rubble and debris extend across most of the Landfill B site and that its thickness increases from west to east. Observations made during the trench investigation indicate that Landfill B is comprised predominantly of soil, not rubble or debris. The fill is approximately 6.0-7.5 m (20-24 ft) thick at the eastern edge and thins to zero to the west and south.

Data acquisition is complete and the information provides a good indication that no further remedial action should be required.

The Risk Assessment completed as part of the *GSFC Site Investigation Report - Land Fill B* concluded that adverse non-carcinogenic health effects would not be expected for construction workers or future building occupants at this site. The report further concluded that:

> Property development may proceed without undertaking any remedial measures or incorporating any special protective measures for site workers or on-site employees.
> (*GSFC Site Investigation Report - Land Fill B,* GSFC, December 31, 2002, p. 10)

3.20 Infrastructure Issues

Goddard's Facilities Management Division (FMD) utility plans were reviewed to evaluate the location, quality, capacity, and reliability of GSFC utilities. Linear utility concentrations exist within and adjacent to road right-of-ways.

The first concentration is in TIROS Road running from west to east toward Building 25. This includes a waterline, a sanitary line, a steam/condensate line, a chilled water line, power lines, street light power lines, a telephone line, and communication lines. This concentration serves the Buildings 16/16W and Buildings 7, 10, 15 and 29 complex. It continues across Soil Conservation Road below the Building 27 Complex Area through Forest Stand C toward Building 25.

A waterline, a steam/condensate line, power lines, street light power lines, a telephone line, and communication lines are present in a linear concentration running north-south along Soil Conservation Road. Included with the steam line, there are high-pressure

drip lines and condensate lines.

Power lines, street light power lines, and communication lines run from Soil Conservation Road east along the southern end of the Landfill toward Building 31.

A power line, a water line, street light power lines, steam lines, condensate lines, and communication lines run along the southern boundary of the General Site Area in Explorer Road. These utility lines continue across Soil Conservation Road, toward Building 32.

GSFC uses public water from a public utility, the Washington Suburban Sanitary Commission (WSSC), for potable water and fire protection. An elevated steel storage tank, or water tower, is centrally located within the GSFC site water distribution system on the south side of Building 16/16W. Two on-site production wells located near Building 8 (east campus) and Building 31 (west campus) are used for cooling towers.

There is no natural gas present within the general site area of the project.

3.21 Safety

3.21.1 Explosive Storage Facility

If the Building 27 Complex Area is to remain in place, the proposed project must conform to the required setbacks for explosive storage Building 27B. As cited in the *GSFC Evaluation of Explosives Storage Building 27B* (1995), the minimum distance for inhabited buildings is 27.5 m (90 ft) according to NFPA 495.

3.21.2 Security/Blast Requirements

Security guidelines call for a 91.5 m (300 ft) buffer between all public vehicles and occupied buildings without proper screening (*SSB Site Selection Study*, 2002). If Building 16/16W is to remain, and continue to accept outside deliveries, a 91.5 m (300 ft) buffer would be appropriate around the present loading docks and access routes required by trucks to reach those docks.

3.22 Site Sustainability, LEED Ratings and Evaluations

The future planning, design, and construction phases of the SSB would be coordinated with the essential elements of a *NASA Policy Directive for "Facility Sustainable Design"* (NPD 8820.3). The proposed SSB design and construction would be evaluated according to its contribution toward a sustainable future. The evaluation would consider issues of reducing the environmental impact of the building, increasing localized density, rehabilitating damaged or contaminated sites, locating near alternative transportation, and conserving natural habitats—all "green architecture" strategies.

3.22.1 LEED Rating System

LEED is the acronym used by the U. S. Green Building Council, on contract with the Department of Energy, to identify a rating system to evaluate building projects. LEED stands for Leadership in Energy and Environmental Design. The LEED documents and system are "efforts to develop a standard that improves environmental and economic performance of buildings using established and/or advanced industry principles, practices, materials, and standards." A project garners points, up to a maximum of 69, for accomplishment of requirements, and is able to achieve several levels of ratings: Certified 26-32, Silver 33-38, Gold 39-51 and Platinum 52-69.

The checklist is divided into the following categories: Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials and Resources, Indoor Environmental Quality, and Innovation and Design Processes.

PART IV ENVIRONMENTAL CONSEQUENCES

4.1 Master Plan Compatibility

In 2002 the *GSFC Facilities Master Plan* was approved. This document is intended to guide the overall development of the GSFC campus in future years and, in particular for the period of 2002-2009. The *GSFC Facilities Master Plan* calls for the realignment of resources at GSFC to consolidate similar functions into a series of neighborhoods: Earth Science Neighborhood, Space Science Neighborhood, and Engineering and Technology Neighborhood. Existing buildings would be renovated or replaced to provide the state-of-the-art laboratories and research facilities needed to support the mission of NASA well into the twenty-first century.

A primary goal of the *GSFC Facilities Master Plan* is the uniting of the east and west campuses of GSFC by relocating Soil Conversation Road to eliminate public traffic through the center of the property. The Space Science Neighborhood, as envisioned in the *GSFC Facilities Master Plan,* would straddle the existing fences that separate the east and west campuses and become a central focal point for the entire GSFC campus.

4.1.1 No-Action Alternative

If No-Action to construct the SSB is taken, major parts of the Master Plan could not be implemented. The Space Science functions would continue to be spread across the west side of the GSFC campus. Space Science researchers would continue to find collaboration a geographic challenge and would remain remote from the Earth Science researchers. The buildings currently occupied by Space Science would not become available for business partners and the western security fence could not be relocated as called for in the *GSFC Facilities Master Plan.*

4.1.2 Alternative Site 1

Alternative Site 1 is the most remote from the proposed Engineering and Technology Neighborhood of Buildings 7, 10, 15 and 29. Selection of this alternative site may require removal of Buildings 86, 87 and 89. Locating new SSB on this site may require some modification to the *GSFC Facilities Master Plan* concept for the proposed new front entrance to GSFC. The site is consistent with the *GSFC Facilities Master Plan* connection between the Space Science and Earth Sciences Neighborhoods. One of the organizing concepts of the *GSFC Facilities Master Plan* is the idea of a reforested, pedestrian-only, landscaped quad at the center of the campus, common in traditional college campus design. (An SSB on Alternative Site 1 would not form an edge to the central collegial quad.)

4.1.3 Alternative Site 2

This option is consistent with the use, adjacency, greenway, and other long-term principles of the *GSFC Facilities Master Plan*, especially the relationship to Buildings 7/10/15/29. Alternative Site 2 assumes the closing of TIROS Road and the relocation of Soil Conservation Road. It would require removal of the motor pool and Building 27 Complex buildings A, B, and C. The Master Plan proposes that the motor pool and associated functions be relocated to a site on the east campus along the relocated portion of Soil Conservation Road.

4.1.4 Alternative Site 3

Alternative Site 3 would be in a visible and prominent location and would support many of the *GSFC Facilities Master Plan* principles, including creation of a common collegial quad edged by buildings, program neighborhoods, and pedestrian linkages. Selection of Alternative Site 3 would require the removal of Building 16/16W. According to the *GSFC Facilities Master* Plan, the warehouse and support services in Building 16/16W would be relocated to a site on the east campus along the relocated portion of Soil Conservation Road. A detailed assessment of the environmental effects of such a move would be prepared if a relocation is proposed.

4.1.5 Parking Area

The location of the proposed parking area is the same for all three alternative sites and is consistent with the *GSFC Facilities Master Plan*. If constructed as proposed in the Master Plan, the loop road would be built directly to the east of the SSB parking area. The construction of the loop road is not proposed as part of the construction of the SSB.

4.1.6 Vacated Buildings

The *GSFC Facilities Master Plan* proposes that the vacated buildings be renovated and reused. Between 2009 and 2013, Buildings 2, 6, 21 and 26 would be made available for GSFC business partners and would be outside the relocated security fence. Vacating Building 20 would make it available for Institutional Support activities. Relocating space science functions would partially vacate Building 28 and make it available for Engineering and Technology activities. These efforts would help create the Engineering and Technology Neighborhood envisioned in the *GSFC Facilities Master Plan*. The environmental effects of the reuse of the vacated buildings would be addressed in additional NEPA documentation when specific plans for reuse are proposed.

4.2 Population and Land Use

4.2.1 Population

Since most of the area surrounding GSFC is developed, future growth in population in the immediate vicinity would be slower than in surrounding Prince George's County as a whole. Since no additional jobs would be created, the proposed SSB is not expected

to have any impact on the population within the area.

4.2.2 Land Use

The proposed SSB would be strategically located in the center of the GSFC campus, providing strong links to other future neighborhoods. The proposed site is a prominent location on the high ground of the campus, chosen to mark the importance of the SSB within the GSFC community. The proposed location of the SSB on all alternate sites would complement the overall campus vision of buildings set in natural greenways connected via pedestrian paths.

4.3 Cultural Resources

Based on surveys to date, no archeological or historic resources occur or are expected to occur on or near any of the alternate sites. Thus, no impacts to historic or archeological resources are expected from any of the proposed development.

4.4 Employment Impacts

The proposed SSB would permit consolidation of space science personnel who are now dispersed around the GSFC campus. An estimated 900 existing employees—including visiting scientists, contractors, and interns—would occupy the new SSB. No change in employment at GSFC is expected as a result of the new SSB.

4.5 Environmental Justice Issues

While several of the communities surrounding GSFC meet thresholds for environmental justice considerations, there would be no impacts to minority or low-income communities from the construction of the SSB.

4.6 Transportation

Construction of the proposed SSB is dependent upon the relocation of Soil Conservation Road to the east of the GSFC. This road relocation is proceeding in advance of, and independent of, the SSB proposal. For a full description of the effects of that proposed action, see Chapter 7 of the *GSFC Environmental Assessment*, *2002.*

The relocation of Soil Conservation Road to run east to Good Luck Road would change future traffic patterns. The primary changes to traffic would occur along Good Luck Road and in the section of Greenbelt Road between the existing Soil Conservation Road intersection and the Good Luck Road intersection. Once Soil Conservation Road is relocated, visitor traffic would use Good Luck Road to travel between Soil Conservation Road and Greenbelt Road. Relocation of Soil Conservation Road also permits the creation of a new main entrance to GSFC by redeveloping the intersection of existing Soil Conservation Road and Greenbelt Road. Visitors using Soil Conservation Road to reach the SSB would travel across Good Luck Road and Greenbelt Road to the GSFC gate.

4.6.1 Traffic

Under the new road configuration, NASA employee traffic volumes would increase at the new main or south gate along Greenbelt Road. Overall however, the new traffic patterns would not affect the total traffic flow on Greenbelt Road by more than 20 percent on any link. (*GSFC Environmental Assessment*, *2002.*)

Good Luck Road currently has comparatively low traffic volumes. It functions primarily as a collector-distributor of traffic to the residential areas on the east side of GSFC. The relocation of Soil Conservation Road to an eastern alignment would substantially increase peak hour traffic volumes on Good Luck Road in the section between the Soil Conservation Road intersection and Greenbelt Road as shown in Table 4-1 below.

Table 4-1. Projected Peak Hour Trips on Good Luck Road, 2022

Good Luck Road	No Relocation of SC Road	SC Road Relocated
Northbound AM Peak Hour	225	641
Southbound AM Peak Hour	281	684
Northbound PM Peak Hour	331	1,225
Southbound PM Peak Hour	230	707

Source: *Chapter 7, GSFC Environmental Assessment, 2002*

Pedestrian/bike Trail 5A, which currently runs along Soil Conservation Road, would be retained with the eastern relocation. The trail would be relocated along with the road and connect to Trail 1E along Greenbelt Road. The Good Luck Road trail would be incorporated into the Good Luck Road sections of the eastern alignment.

Under Alternative 1, the forested site, transportation flows would be identical to those identified in the Master Plan EA. Trucks would travel along Greenbelt Road to Goodluck Road and on to the new SCS road, accessing the warehouse from the north. For Alternative 2, the Master Plan site, traffic flows would be as described in the Master Plan EA, minus truck and construction traffic that would access GSFC from the south, via Greenbelt Road. Traffic due to construction would be interspersed throughout the day. For Alternative 3, the warehouse site, traffic flows would be identical to the MP EA since the warehouse traffic would be going to the new warehouse along the new SCS Road and the construction traffic would also be using the new SCS road and accessing the Center from the north, like Alternative 1.

4.6.2 Parking

When the Space Science Building is built, 900 employees would be moved there and 811 parking spaces would be created for them, creating a 0.9 space to employee ratio. This is consistent with reaching the goal incrementally. As creation of the Space

Science and Commons Neighborhood continues, GSFC will continue to work toward the goal of a 0.7 ratio by 2022. Over time parking in the neighborhood would be steadily reduced. As personnel are moved to the SSB/ neighborhood, parking in vacated areas would be taken out of service and underused parking would be eliminated. When vacated facilities are turned over to future partners the same approach and goals would apply to parking.

In order to achieve these goals, GSFC is actively pursuing transportation initiatives to reduce the reliance on single occupancy vehicles.

4.7 Noise

No noise impacts from the operations at the SSB are expected. Noise during building construction would be episodic, not continuous. The proposed SSB is located in the central core of the campus away from any residential areas. Since no change is expected in trip generation to GSFC as a result of the new SSB, none of the alternatives would produce traffic noise impacts.

4.8 Waste Management

4.8.1 No-Action Alternative

Building 2A Outside Chemical Storage Facility

In the main part of Building 2 most of the chemicals used would continue to be solvents, such as acetone, ethanol, cleaners, or strippers, and inert high-pressure gas cylinders, e.g. helium and nitrogen, and cryogenics.

In Building 2A (Chemical Laboratory Wing), a greater variety of chemicals would continue to be used. Chemicals used are in small amounts. A few, such as cryogen liquid nitrogen, helium and nitrogen would be used in larger quantities. The hazards associated with these chemicals are flammability, corrosiveness, toxicity, and high pressures. Most of the laboratories would continue to use high-pressure gas cylinders.

One class of chemicals, the smaller hydrocarbons, is flammable. Solvents such as acetone and ethanol are included in this class. Silane and phosphine (gases) are the most flammable. The halogens (mostly gases) and ammonia are corrosive. Liquid acids or bases are used on a very limited basis.

Building 2A Outside Chemical Storage Facility consists of two buildings.

The black building contains four rooms for storage of high-pressure gas cylinders. Two rooms would continue to be used for storage of flammable gases and two rooms for storage of oxidizing and corrosive gases. Inert gases can be stored in any room.

The yellow building contains one large room for storage of liquids and solids in

approved chemical storage cabinets. Except for one cabinet, which belongs to Code 660, Codes 691 and 693 are responsible for their respective cabinets. Different types of cabinets are used for storage of flammables, corrosives/oxidizers, acids, or bases.

Chemical collection and disposal
No substantial changes are anticipated to the collection, amount, or disposal of chemical materials and wastes. Pollution prevention and control programs would continue.

4.8.2 Alternative Site 1
The new SSB would provide consolidated, state-of-the-art storage areas for the collection of solid, hazardous, and radioactive materials within the Space Science program. Selection of Alternative Site 1 would not result in substantial changes to the collection, amount, or disposal of these materials and wastes. Pollution prevention and control programs would continue.

4.8.3 Alternative Site 2
The new SSB would provide consolidated, state-of-the-art storage areas for the collection of solid, hazardous, and radioactive materials within the Space Science program. Selection of Alternative Site 2 would require the demolition of the motor pool area, including Building 27A, currently used for the consolidation, packaging, labeling, and preparation of transport manifests for hazardous wastes. This function would be moved to a new site along Soil Conservation Road relocated. This new site would be subject to its own Environmental Assessment. No other substantial changes are anticipated to the collection, amount, or disposal of solid and radioactive and wastes. Pollution prevention and control programs would continue.

4.8.4 Alternative Site 3
As with Alternatives 1 and 2, the new SSB would provide consolidated, state-of-the-art storage areas for the collection of solid, hazardous, and radioactive materials within the Space Science program. Selection of Alternative Site 3 would not result in any substantial changes to the collection, amount, or disposal of these materials and wastes. Pollution prevention and control programs would continue.

4.8.5 Construction Waste
If construction occurs, any solid waste from construction, demolition and land clearing activities would be properly disposed of at a permitted solid waste acceptance facility, or recycled if possible.

4.9 Air Quality
Construction of the new SSB and parking lot would generate temporary increases in dust levels. Demolition of Building 86, 87, 89, 16/16W or the Building 27 Complex, if necessary, would produce short-term increases in dust levels. Demolition of buildings

and construction of the new SSB building would be conducted in accordance with COMAR 26.11.06.03D, Particulate Matter from Materials Handling and Construction. As stated therein, reasonable precaution would be taken to prevent dust and any other particulate matter from becoming airborne during these activities. In accordance with MDE air quality regulations, no cutback asphalt would be used during the months of June through August.

Once occupied, the SSB would house existing programs already in operation at GSFC and would not increase employment or traffic at the facility. It would not create any new emissions of ozone-causing pollutants. Therefore, the construction of the SSB would not produce more than 25 tons (22.6 metric tons) per year of new ozone-causing emissions and would not have a significant effect on regional air quality.

4.10 Soils and Geology

The existing geology and soils present within the study area do not significantly limit any development.

4.11 Slopes

4.11.1 No-Action Alternative

The No-Action Alternative would have no effect on slopes within the GSFC campus. Additional studies may be conducted and slope protection may be implemented to ensure that further erosion in areas of steep slopes is minimized. In addition, the swales and waterways that are currently eroded should be restored. Taking no action would allow erosion of the unstable slope and the drainage channel along the edge of Landfill B to continue. Continuing erosion causes silt to accumulate downstream. An alternative of installing a large culvert was evaluated, considered impractical, and eliminated from detailed study.

4.11.2 Alternative Site 1

The majority of the Alternative Site 1 is relatively flat. Steeper slopes (approximately 12 percent) occur immediately adjacent to Explorer Road and on the south and western portion of the wooded site. The wooded area west of Soil Conservation Road contains steep slopes (approximately 12 percent) on the eastern edge as well as small areas in the east-central portion.

4.11.3 Alternative Site 2

The majority of Alternative Site 2 is relatively flat, although the ground has a 12-20 percent slope east to west on the northern edge of the landfill. Two extremely small areas of steep slopes are located immediately north of outbuildings associated with the Building 27 complex.

4.11.4 Alternative Site 3

The site is generally located on level ground with minimal grading required.

4.11.5 Parking Area

The majority of the site is relatively flat except for the eastern edge of the landfill where the slope stabilization is proposed. The slopes in this area are greater than 25 percent. The slope stabilization would correct the erosion that is currently compromising the eastern edge of the landfill and degrading the unnamed tributary to Beck Branch. The landfill area east of Soil Conservation Road and west of the slope stabilization area contains a gentle slope.

The preferred method of stabilizing the steep, unstable landfill slope is adding sufficient fill material to create a reduced slope that would extend the toe approximately 15.2 m (50 ft) beyond its present location. The slope's additional horizontal extent would fill in the eroded channel and would require removal of trees. The new slope's topsoil would be stabilized by planting native grasses, shrubs and trees.

The new drainage would be relocated just beyond the toe of the slope approximately parallel to the existing eroded channel. The new drainage would be engineered to prevent erosion using riprap or other suitable material and would use structures designed to retain some of the water, allowing seepage into the soil while reducing runoff and downstream siltation.

4.11.6 Vacated Buildings

The vacated buildings would have no effect on slopes within the GSFC campus.

4.12 Open Space and Forest Stands

4.12.1 No-Action Alternative

With the No-Action Alternative, no existing forest stands would be affected; however, proposed reforestation and landscaping would not occur and forest stands would remain fragmented.

4.12.2 Alternative Site 1 (Figure 4-1)

Building on this site would affect Forest Stands A (0.92 ha/2.29 ac) and B (1.6 ha/3.98 ac) and would require compliance with the Maryland Forest Conservation Act. Reforestation or forest conservation efforts would be required by the state. With the closing of Soil Conservation Road, reforestation could connect the remaining portions of the Forest Stands A and B to meet forest conservation/reforestation requirements. Any reforestation or designated forest conservation areas are subject to protection in perpetuity and cannot be used for any future campus development. Requirements of the Maryland Forest Conservation Act as applied to federal agencies are enforced by Maryland Department of Natural Resources.

4.12.3 Alternative Site 2 (Figure 4-2)

Forest Stand D is located above the northern boundary of Alternative Site 2. By reducing the building site of Alternative Site 2 impacts (formerly 0.49 ha/1.23 ac) to Forest Stand D were avoided.

4.12.4 Alternative Site 3 (Figure 4-3)

Isolated landscaping trees would be removed under this alternative. If reforestation is required, few opportunities exist within Alternative Site 3. Perimeter tree plantings are possible and appropriate sites for reforestation exist elsewhere in the General Site Area and on GSFC.

4.12.5 Parking Area

One existing large (DBH 52.5") willow oak (*Quercus phellos*) located on the western side of the landfill is located within the proposed parking area. The *GSFC Facilities Master Plan*, however, incorporates the tree into the parking area design as an amenity. This large willow oak would be preserved and its root system protected from construction damage. Small isolated stands of trees on the landfill site would also be affected by construction of the parking area.

Forest Stand C located east of the landfill would be affected by the proposed slope stabilization. A reduction of slope from the existing 1:1 slope to a 4:1 slope would result in the removal of numerous trees. Reforestation planned after grading would replace the removed trees. If reforestation is required for development of the parking lot, potential sites are located at the perimeter of the existing landfill. Reforestation around the landfill and the slope stabilization area would increase the net acreage of Forest Stand C and provide additional stabilization of the landfill.

4.12.6 Vacated Buildings

Vacated buildings would have no effect on forest stands within the GSFC campus.

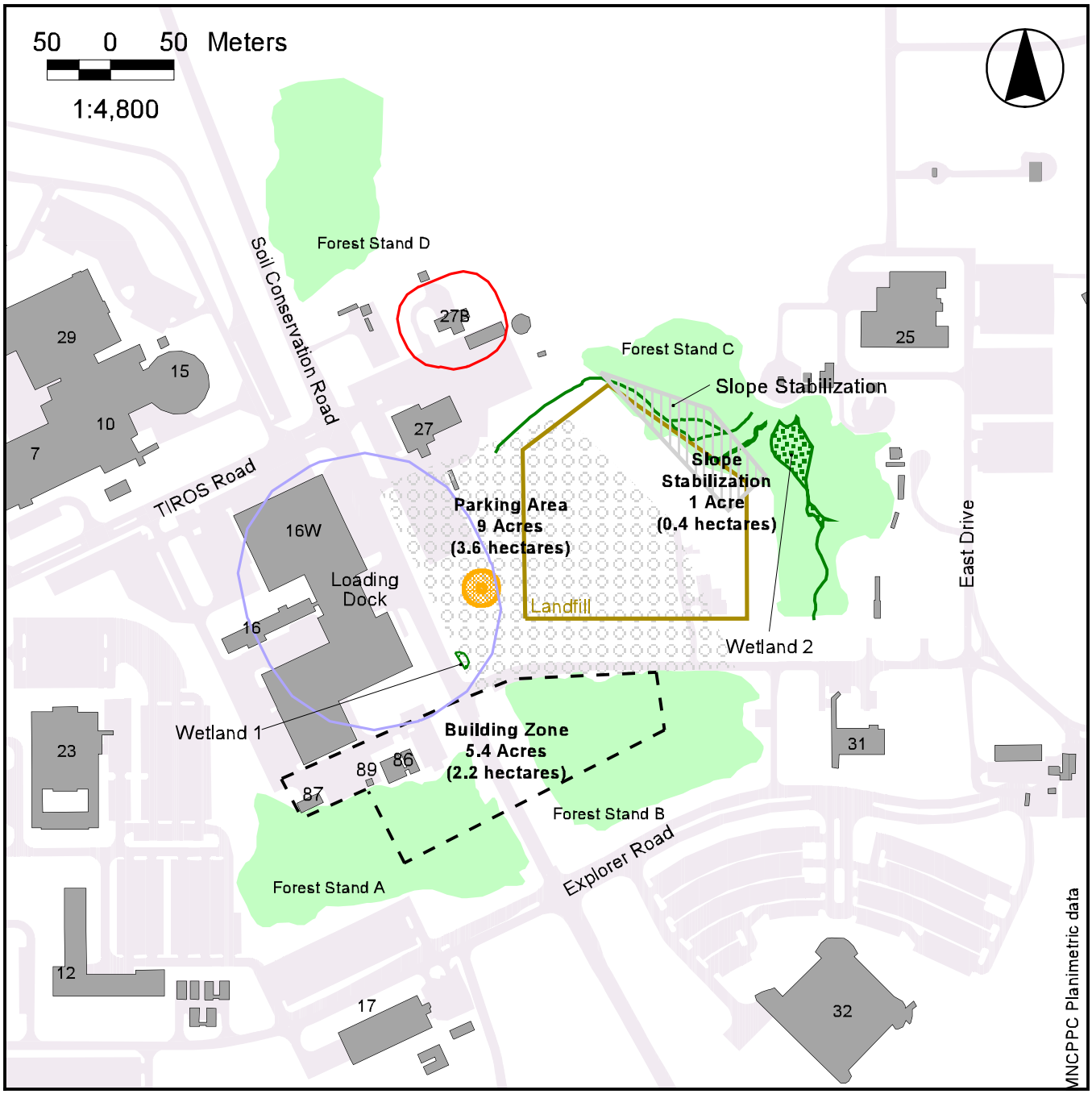

Figure 4-1, Alternative Site Area 1, Environmental Consequences

Building Zone
Parking Area
Slope Stabilization
Landfill B
Within 300 feet of Loading Dock
Within 90 feet of Building 27B
Waters of the U.S.
Emergent Wetland
Forested Wetland
Big Willow Oak
Isolated Stands
Forest Stands

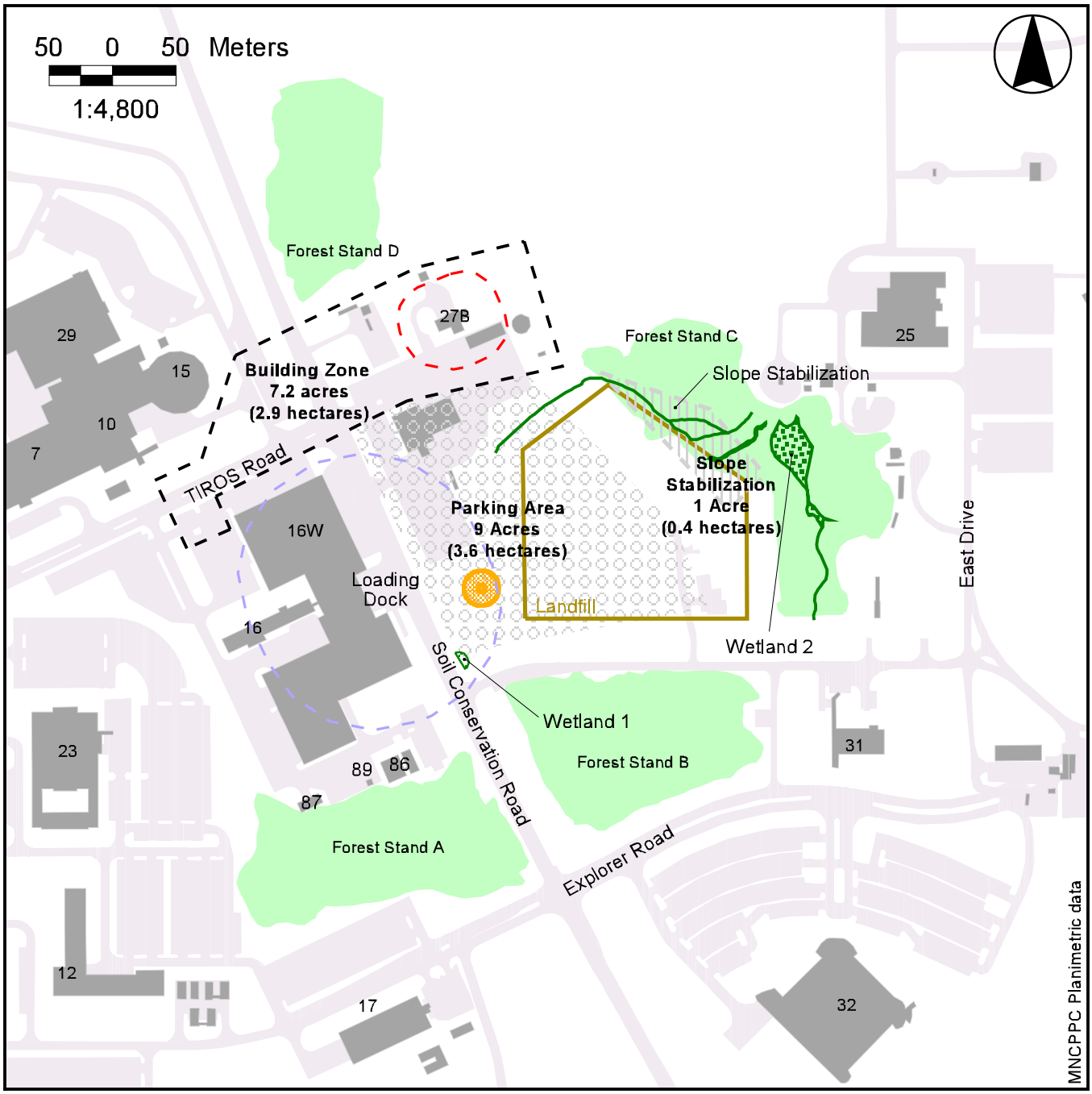

Figure 4-2, Alternative Site Area 2, Environmental Consequences

Building Zone
Parking Area
Slope Stabilization
Landfill B
Within 300 feet of Loading Dock
Within 90 feet of Building 27B
Waters of the U.S.
Emergent Wetland
Forested Wetland
Big Willow Oak
Isolated Stands
Forest Stands

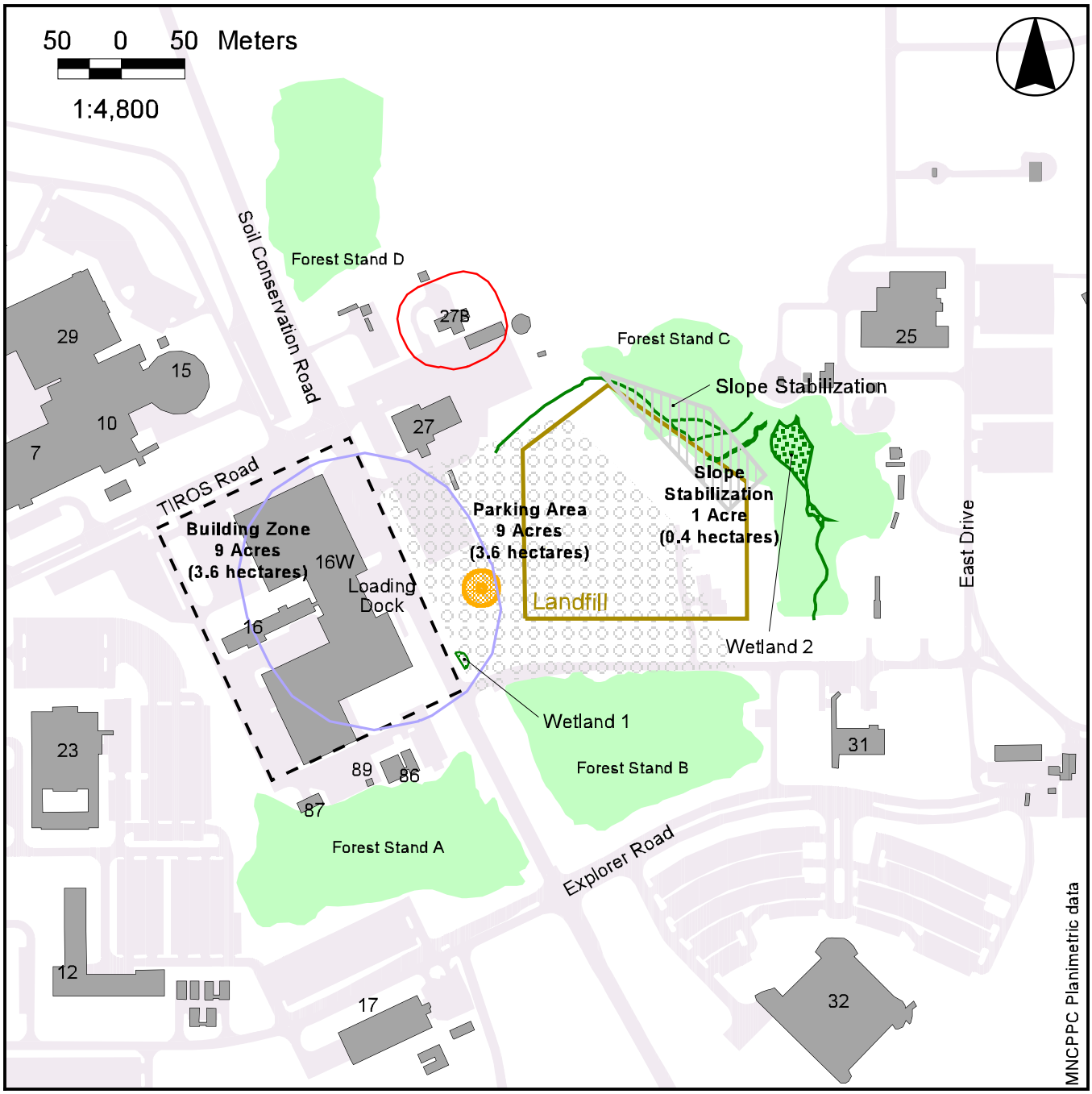

Figure 4-3, Alternative Site Area 3, Environmental Consequences

Building Zone
Parking Area 1
Slope Stabilization
Landfill B
Within 300 feet of Loading Dock
Within 90 feet of Building 27B
Waters of the U.S.
Emergent Wetland
Forested Wetland
Big Willow Oak
Isolated Stands
Forest Stands

4.13 Groundwater Impacts

Neither the No-Action Alternative nor any of the proposed development would have a significant impact on groundwater quality. The SWM proposed by the project seeks to improve the quality of waters that could reach groundwater sources. This project would provide stormwater management to developed areas that do not currently have stormwater treatment, quantity or quality, in place.

No evidence suggests that landfill materials could be leaching from the landfill into groundwater. However, as a precautionary measure, the parking area would be located over the landfill to negate the possibility that a future use at that site could damage the integrity of the landfill.

In addition, as existing facilities are demolished, some pervious surface would be restored to the campus. The Master Plan seeks to use GSFC land more efficiently by realigning buildings and services, by removing unnecessary buildings and parking and by creating the campus quad and other greenspaces. Implementation of new landscaping practices to encourage natural reforestation at the edges of the campus would also improve the quality, and reduce the quantity of runoff that could reach groundwater sources.

4.14 Wetlands

4.14.1 No-Action Alternative

Existing wetland systems would not be affected if the No-Action Alternative were selected.

4.14.2 Alternative Site 1

No wetlands are located within or adjacent to Alternative Site 1; thus, no wetland impacts are anticipated.

4.14.3 Alternative Site 2

No wetlands are located within or adjacent to Alternative Site 2; thus, no wetland impacts are anticipated.

4.14.4 Alternative Site 3

No wetlands are located within or adjacent to Alternative Site 3; thus, no wetland impacts are anticipated.

4.14.5 Parking Area

Two wetlands (72.8 sq m/0.018 ac, 161.09 sq m/0.12 ac) and one Waters of the U.S. (WUS) (250.77 m/822.39 linear ft) systems would be affected by construction of the parking area and the slope stabilization area.

The WUS is the headwaters of a tributary to Beck Branch. It begins in the northern

portion of the landfill and drains around the eastern edge of the landfill before draining northeast to Beck Branch. The WUS system is contained within a deeply eroded channel that is greater than 1.5 m (5 ft.) deep along the northwestern perimeter of the landfill. This channel is becoming much more deeply eroded along the eastern perimeter of the landfill. The WUS system is a USE I stream that under Title 26 regulations has stream closure dates from March 1 through June 15, when in-stream construction is prohibited.

A 72 sq m (775 sq ft) isolated depression contains cattails along the fence line near Soil Conservation Road. The area is an isolated depression and is not contiguous to a watercourse or other water body. Part of the area is periodically mowed during routine maintenance. This wetland would be filled as part of the parking lot construction.

The second wetland system is a headwater seep wetland that begins at the base of the landfill slope and drains into the unnamed tributary to Beck Branch. Modification of the existing steep slope to a 4:1 slope would result in filling a portion of this wetland system (161.09 sq. m. /0.12 acres).

Under Sections 401 and 404 of the Clean Water Act, any potential impacts to wetlands (vegetated or un-vegetated) or waterways would require the submittal of a permit application to the U.S. Army, Corps of Engineers (ACOE) and MDE, Non-tidal Wetlands Division (Joint Application). Mitigation may be required as part of the permit approval. Wetland permitting is a separate requirement from SWM regulations.

If wetlands are to be filled or disturbed during construction, a jurisdictional delineation (JD) of wetlands on the site must be conducted and approved by the ACOE. Typically, two permits would be needed once the final layout of the building, parking area and access roads is known. A Section 404 permit would come from the ACOE, whereas the Section 401 Water Quality Certification would come from MDE. After the permit applications are submitted, it takes about 4 to 8 months to receive approval. The length of the permit approval time is dependent upon whether public notice and hearing(s) are required.

Onsite wetland mitigation opportunities within the parking area are limited as there are no obvious hydrology sources. Wetland mitigation may be achieved in conjunction with the slope stabilization in and adjacent to Forest Stand C. One potential approach is reconstruction of the wetland seep that as part of the slope stabilization. A second approach is wetland creation in the open area adjacent to the stream channel that drains from Forest Stand C to Beck Branch. A third approach is to remove the concrete channel surrounding the south side of a satellite dish located immediately north of Forest Stand C and restore the drainage area to a natural channel. Improvements to the wetland/waterways complex within and downstream of Stand C would provide additional water quality functions and would increase the wetland, terrestrial, and

aquatic habitat quality of Forest Stand C. Water quality improvements, especially sediment reduction, to waters draining into Beck Branch would improve the stream itself and protect existing Wetlands of Special State Concern adjacent to its banks.

4.14.6 Vacated Buildings

The vacated buildings would have no effect on wetlands within the GSFC campus.

4.15 Floodplains

Neither the No-Action Alternative nor any of the proposed development would include construction or fill within 100-year floodplains, as defined by the FEMA.

4.16 Stormwater Management

4.16.1 No-Action Alternative

The No-Action alternative would have no effect upon existing SWM facilities. Some improvements to the existing SWM system are planned to prevent active erosion from continuing to degrade receiving stream channels, resulting in decreased water quality and a reduction of viable aquatic habitat.

4.16.2 Alternative Site 1

Development of Alternative Site 1 would result in new impervious surfaces and increased velocities of stormwater runoff. All new development and redevelopment must comply with the State SWM program. SWM practices in compliance with current regulations would include use of bio-retention devices where feasible. Approximately one-half of the proposed building zone is within Sub-watershed H that drains to Outfall 5 (currently without SWM protection). The other half of the building zone drains into Sub-watershed EC4. The impervious surface within both sub-watersheds would be increased. Compliance with current standards in SWM that include use of appropriate bio-retention devices would decrease runoff velocity and improve the water quality in both watersheds.

4.16.3 Alternative Site 2

Alternative Site 2 includes substantial areas of existing impervious surfaces—including buildings and other structures, and pavement and parking areas within the Building 27 Complex—that would qualify as a redevelopment area under MDE regulations. Recharge, channel protection and overbank flood protection may not be required as part of the SWM for redevelopment sites. The area of impervious surface would have to be reduced by 20 percent, or an equivalent level of water quality control would have to be provided.

Buildings and roadways would be removed and re-configured to accommodate the proposed building layout, leaving the impervious surface area within Sub-watershed K approximately the same. Because current SWM practices are more stringent, water quality within Sub-watershed K would be improved. The impervious surface within

Sub-watershed EC4 would be increased and, as described under Alternative Site 1, could be offset by the more comprehensive implementation of SWM practices now required by State regulations.

4.16.4 Alternative Site 3

Alternative Site 3 is a redevelopment site and subject to the same SWM requirements as Alternative Site 2. In Alternative Site 3 the impervious surface area would remain approximately the same, since Building 16/16W would be demolished to accommodate the proposed building layout. Stormwater in Sub-watersheds K, H and EC4 would all be treated with the current SWM standards, resulting in improved water quality.

4.16.5 Parking Area

Development of the parking area would be considered new development and subject to the same requirements as Alternative Site 1. Reducing the total number of parking spaces to conform to the parking ratios in the later years of the *GSFC Facilities Master Plan* schedule could lessen the overall impact of the stormwater runoff from the parking area. The slope stabilization would rehabilitate the existing degraded drainage channel that would drain runoff from the proposed parking lot. SWM measures in conjunction with grade control and velocity controls in the channel would reduce the potential for erosive damage from stormwater.

Current SWM regulations recommend the use of low-impact development practices and use of bio-retention devices where feasible. The increased impervious surface within the EC4 sub-watershed would result in increased volume and rate of stormwater runoff that must be treated, and the velocity would be controlled so as not to adversely impact the restored slope stabilization area and the reconstructed stream channel.

The SWM associated with a parking facility would need to take into consideration impacts to existing drainage channels, including the swale located along the northern portion of the landfill. Any adverse impacts to existing swales would be addressed as part of SWM compliance. During development of the required stormwater management plans, low impact development practices such as rain gardens, to reduce runoff quantity and improve its quality, will be evaluated. Stormwater drainage and wetland mitigation efforts will be submitted to MDE for review.

Approval from MDE is needed prior to construction and may involve multiple separate approvals, including a sediment and erosion control plan, a SWM plan, and a waterway construction permit.

4.16.6 Vacated Buildings

Vacated buildings would be considered redevelopment sites and when redevelopment occurs would be subject to the then-current SWM requirements.

4.17 Animal Communities and Endangered Species

4.17.1 No-Action Alternative

The No-Action Alternative would not affect existing animal communities.

4.17.2 Alternative Site 1

Building on this site would affect Forest Stands A and B, which serve as habitat for a variety of mammal and avian species. Both forest stands are isolated. Stand B, on the north side of Explorer Road, is closer to forest Stand C, located north of Explorer Road and east of the landfill. Both forest stands are comprised of relatively mature trees dominated by deciduous species with an under story overgrazed by white-tailed deer. Forest stands A and B provides little forage opportunities, except for acorns that the current deer, squirrel and rodent populations have consumed during the fall and winter. The main habitat benefit is cover. The relocation of part of Soil Conservation Road would create the opportunity for reforestation between the remaining stands, providing a more contiguous habitat and an opportunity for the introduction of tree and shrub species with a higher habitat value.

4.17.3 Alternative Site 2

Development of Alternative Site 2 would affect a portion of Forest Stand D, adjacent to Soil Conservation Road. Forest Stand D connects to larger forests located on the BARC property. The contiguous forest provides habitat to numerous bird and mammal species. Since the portion of forest that would be impacted is adjacent to Soil Conservation Road, the forest provides habitat to edge dwelling animal and bird species. Development of Alternative Site 2 would affect the size of Forest Stand D, reducing the overall habitat area. A portion of Soil Conservation Road could be reforested to offset a portion of the forest removal.

4.17.4 Alternative Site 3

Development of Alternative Site 3 would affect areas of impervious surface, mowed grass, and isolated landscaping trees only. No viable wildlife habitat areas exist within this site. Development of this alternative would have no effect on habitat quality.

4.17.5 Parking Area

Development of the parking area would affect small, isolated stands of trees, shrubs and open fields habitat on the landfill site. The stands of trees and shrubs are not connected to a contiguous forest stand; therefore, any wildlife habitat afforded by them is minimal. The value of the existing open field habitat is greater because this type of habitat is very limited within the GSFC. However, the lack of diversity in the emergent plant species reduces the overall quality of the open field. The resident deer population uses this open field frequently as do small mammal and rodent species. Development of the parking area would eliminate these areas of open field and further reduce the availability of open field habitat at GSFC.

The proposed slope stabilization area on the east side of the landfill would change the existing steep unstable embankment. The stabilization would change the existing configuration of stream channel and require removal of large trees and a small amount of wetlands. However the existing erosion is also destroying large trees and impacting wetlands. Disturbance to these resources would reduce habitat for mammals and birds. However, after the slope stabilization is complete, the stream channel would have a natural configuration with reduced erosion potential and the area would be reforested with native trees and shrubs.

4.17.6 Vacated Buildings

Vacated buildings would have no effect on animal habitat within the GSFC campus.

4.18 Landfill B

4.18.1 No-Action Alternative

The No-Action Alternative would have no impact on Landfill B. Significant erosion at the toe of the slope would continue.

4.18.2 Space Science Building and Vacated Buildings

All three of the site alternatives and the buildings to be vacated are outside the limits of Landfill B and would have no impact upon it.

4.18.3 Parking Area

The proposed parking area would be built on top of this landfill site and the Horizontal Beam Line would be built within it. The slope stabilization planned for the east side of the Landfill B would reduce the grade and stabilize the slope through reforestation.

In December 2002, GSFC completed the *Site Investigation Report for Landfill B.* The results of this investigation, which was limited to subsurface soil, indicate that extremely low concentrations of metals, VOCs, SVOCs, pesticides, and PCBs are present at the site. Mercury is the only compound detected in concentrations slightly exceeding MDE Standards; all other compounds detected are below MDE cleanup standards. Recent 2003 ground water data shows low levels of trichloroethene (TCE). The TCE levels have steadily decreased from past years.

The risk assessment determined that Hazardous Indices (HI) and Hazard Quotients (HQ) are all well below unity (1.0), indicating that adverse non-carcinogenic health effects from mercury in the soil are not expected for construction workers or future office workers at this site. Property development may proceed without undertaking any remedial measures or incorporating any special protective measures for site workers.

NASA would probably be required to modify the existing swale on the northern portion of the landfill. This swale becomes a deeply eroded channel on the east side of the landfill. A review of the historical map, which shows contours before landfill operations,

indicates that a swale existed within the landfill boundary. A second issue to be investigated is the possibility that the swale has been created from run-off from the surface area of the Building 27 complex. Treatment of the historic drainage patterns would affect the design of the proposed parking area, and associated SWM and erosion control plans. As part of slope stabilization, the existing drainage channel that drains around the landfill would be reconfigured and armored. This treatment, in conjunction with SWM from the parking area, would result in increased protection from erosive forces that are currently compromising the landfill.

4.19 Infrastructure Issues

Generally, all utilities would be available to all sites within reasonable distance of the buildings. The building location could disrupt the utility continuity and require relocation or protection in thru-building tunnels or basements. Relocation of the utilities would depend on the elevation of the utility with respect to the future SSB foundation system and the size of the utility. Smaller utilities could be relocated easily, or the building being serviced by these utilities may be serviced from an alternative location. GSFC guidelines require that proposed buildings on the current east campus, east of Soil Conservation Road, concentrate building utilities in tunnels similar to those serving Buildings 32 and 33.

The existing water tower on the west campus, west of Soil Conservation Road, would remain under all site alternatives. Adequacy of fire-flow from this tower to serve the new SSB would be verified during site design.

4.19.1 No-Action Alternative

The No-Action alternative would not impact existing utilities.

4.19.2 Alternative Site 1

Construction of Alternative Site 1 would affect the power, steam, communications, water and sanitary utilities that parallel Soil Conservation and Explorer Roads and bisect Forest Stand A.

4.19.3 Alternative Site 2

Construction of Alternative Site 2 would affect the chilled water, power, steam, communications, water, sanitary, and storm water utilities that parallel Soil Conservation and TIROS Roads and surrounding Building 16/16W and the Building 27 Complex.

4.19.4 Alternative Site 3

Construction of Alternative Site 3 would affect the chilled water, power, steam, communications, water, sanitary, and storm water utilities that parallel Soil Conservation Road and surround Building 16/16W.

4.19.5 Parking Area
Construction on the proposed parking site would affect the power, steam, and communications utilities that parallel Soil Conservation and Explorer Roads and service the trailers at the eastern end of the landfill site.

4.19.6 Vacated Buildings
Existing utilities that service the buildings to be vacated would not be affected. Removal of the parking lots of the vacated buildings may impact utilities that are located beneath or adjacent to the lots. Renovations of the buildings for new tenants may also impact utilities.

4.20 Safety

4.20.1 No-Action Alternative
The No-Action alternative would not affect safety conditions at GSFC.

4.20.2 Alternative Site 1
All areas of Alternative Site 1 are more than 27 m (90 ft) from Building 27B (Explosives Storage) and more than 92 m (300 ft) from the loading docks in Building 16/16W.

4.20.3 Alternative Site 2
A portion of Alternative Site 2 is within 27 m (90 ft) of Building 27B. If Alternative Site 2 is selected, Building 27B would be demolished and the safety buffer would not be necessary.

4.20.4 Alternative Site 3
All areas of Alternative Site 3 are more than 27 m (90 ft) from Building 27B. If Alternative Site 3 is selected, Building 16/16W would be demolished and the safety buffer would not be necessary.

4.20.5 Parking Area
The parking area does not include inhabited buildings and is not affected by buffer requirements.

4.20.6 Vacated Buildings
The vacated buildings would be secured against unauthorized entry if they are left vacant after the current users move into the new SSB.

4.21 LEED Rating and Sustainability

4.21.1 No-Action Alternative
The No-Action Alternative presents no opportunity to participate in the LEED Green Buildings Program or to improve the sustainability of the facilities at GSFC.

4.21.2 Alternative Sites

All three build-alternatives have the potential to qualify for one of the three achievement levels as outlined in the LEED Green Building Rating System. GSFC would strive for a Silver Rating for the SSB. All three alternatives would likely have similar ratings for the following categories:

- Water Efficiency
- Energy and Atmosphere
- Indoor Environmental Quality
- Materials and Resources
- Innovation and Design Processes

Under these categories, new construction of all three build alternatives provides numerous opportunities to consider and incorporate many of the energy and environmental design guidelines described in the LEED program into the final building design.

The three build alternatives differ slightly in their ranking under the category for Sustainable Sites. Under this category, the eight different subsections or credits are as follows:

- Credit 1 - Site Selection
- Credit 2 - Urban Redevelopment
- Credit 3 - Brownfield Development
- Credit 4 - Alternative Transportation
- Credit 5 - Reduced Site Disturbance
- Credit 6 - Storm Water Management
- Credit 7 - Landscape and Exterior Design
- Credit 8 - Light Pollution Reduction

The primary difference in comparing the three build alternatives focuses on Credit 5 - Reduced Site Disturbance. Alternative Site 1 would likely receive fewer points for this credit since forest cover would be impacted. Alternative Sites 2 and 3 may also receive more points under the urban development category for utilizing an existing urban area. However, when considering the potential credits available to all three alternatives, the differences between the alternatives as it relates to Credit 5 may not be substantial.

4.21.3 Parking Area

The parking area may qualify for LEED credits under the category for Sustainable Sites. Of the eight different subsections or credits available in this category, the parking area would be able to seek credits for the following:

- Credit 1 - Site Selection

- Credit 5 - Reduced Site Disturbance
- Credit 6 - Storm Water Management
- Credit 7 - Landscape and Exterior Design
- Credit 8 - Light Pollution Reduction

4.21.4 Vacated Buildings

If one of the build alternatives is selected, credit may also be received for reuse of the vacated buildings. Additional credit could also be gained from any environmental improvements made as part of the building reuse.

4.22 Demolition Impacts

Development of all three alternative sites could require the demolition of existing structures. The location of the new SSB on Alternative Site 1 may require demolition of Buildings 86, 87 or 89. Alternative Site 2 would require demolition of the Building 27 Complex, including 27A, 27B and 27C. Alternative Site 3 would require demolition of Building 16/16W.

The structures were visually inspected and associated documents were reviewed for Buildings 86, 87, 89, 16/16W and the Building 27 Complex (including 27A, B, and C) to identify potential environmental concerns associated with demolition of each structure.

Each building was inspected for the presence of asbestos-containing building materials, lead-based paints, polychlorinated biphenyls (PCBs), chlorofluorocarbons, hydro chlorofluorocarbons (CFCs), mercury-containing equipment and building components, petroleum hydrocarbons, and other regulated material contamination of soils and groundwater.

4.22.1 Buildings 86, 87 and 89 – Part of Alternative Site 1

Building 86 reportedly has been renovated several times since construction in the late 1950's. GSFC personnel believe that any lead-based paints or asbestos-containing materials issues would have been mitigated at the time of construction. Suspect asbestos-containing materials were observed in the building, primarily in the form of acoustic ceiling tiles. Pipe insulation observed in the building appeared to be fiberglass. Lead-based paints: Based on the date of original construction, the structure is suspected to contain lead-based paint on remaining original surfaces. The current finished areas are believed to be lead free. Building components containing regulated materials: The facility was observed to utilize fluorescent lighting systems, these systems are known to contain mercury and PCBs. Mercury thermostats and air conditioning units containing CFCs were also observed at the facility.

Building 87 is used for the temporary storage and transfer of compressed gas cylinders. Gases observed at the time of the site inspection include Oxygen, Nitrogen, Argon, Helium, Carbon Monoxide, Acetylene, Hydrogen and Propane. No suspect asbestos-

containing materials were observed in the building. Lead-based paints: Based on the suspected date of original construction, the structure is suspected to contain lead-based paint on original surfaces.

Building 89 has been reported to have been used for the Fire Extinguisher replacement program. Currently, the security contractor for GSFC uses building 89 for storage of miscellaneous items. No suspect asbestos-containing materials were observed in the building. Lead-based paints: Based on the suspected date of original construction, the structure is suspected to contain lead-based paint on original surfaces. Building components containing regulated materials: The facility was observed to utilize fluorescent lighting systems. These systems are known to contain mercury and PCBs. CFC air conditioning units were also observed at the facility.

4.22.2 Building 27 Complex (including 27A, 27B, and 27C) – Part of Alternative Site 2

File review and site inspection yielded the following observations:

- Suspect materials containing asbestos – Observed primarily in the form of floor tiles and acoustic ceiling tiles. Pipe insulation appeared to be fiberglass.

- Lead-based paints – Based on the date of construction 1975, the structure is suspected to contain lead-based paint coated surfaces.

- Building components containing regulated materials – The facility was observed to utilize fluorescent and high intensity discharge lighting systems, these systems are known to contain mercury and PCBs. Mercury thermostats and CFC air conditioning units were also observed at the facility.

- Other potential concerns -- In-ground hydraulic hoists, an oil-water separator and an underground storage tank and pump island were observed at this facility. All represent a potential source for subsurface and groundwater contamination. Above-ground bulk storage of waste and virgin materials—including anti-freeze, motor oil, lubricants, waste oil, and so forth—appeared to be managed in a way that minimizes volume; however, the handling and storage of these materials represents a potential source of contamination of soil and groundwater. Additionally, a sump pump and pit was noted in close proximity to bulk materials storage, which may create a pathway for these materials if released. Some effort was noted, during the inspection, to dike off the sump pit from the storage area.

- Building 27A is utilized for temporary (less than 90-day) storage of universal, regulated and hazardous wastes. Building 27B is utilized for explosive of explosive materials. Inspection of these facilities did not reveal any immediate concerns; however, considering the long operational history of the structures, they represent

potential sources of soil and groundwater contamination.

4.22.3 Building 16/16W – Part of Alternative Site 3

File review and site inspection yielded the following observations:

- Suspect asbestos-containing materials – Observed in the building, primarily in the form of floor tiles and acoustic ceiling tiles. Pipe insulation observed in the building appeared to be fiberglass.

- Lead-based paints – Based on the date of original construction, 1964, the structure is suspected to contain lead-based paint coated surfaces.

- Building components containing regulated materials – The facility was observed to utilize fluorescent and high intensity discharge lighting systems, these systems are known to contain mercury and PCBs. Mercury thermostats and CFC air conditioning units were also observed at the facility.

- Other potential concerns – One electrical power generator was observed to be associated with this structure. Soil and/or groundwater contamination may exist in association with the fuel storage tank for this generator. Also, a circuit board assembly area was observed during the site inspection. Cleaning solvents used in association with this operation are reclaimed and recycled.

4.22.4 Remediation

After final site selection it is recommended that a detailed inspection for asbestos-containing materials, lead-based paint and hazardous/regulated building materials be performed, including location and quantification of materials that may require special health and safety, handling, disposal and management requirements.

After completion of the inspection for asbestos-containing materials (ACM), lead-based paint (LBP), and hazardous/regulated building materials:

- The material identified as containing asbestos should be removed and disposed of prior to scheduled demolition activities, which may impact the materials. A State of Maryland licensed asbestos abatement contractor should conduct the removal in accordance with all applicable federal, state, and local regulations. According to EPA regulations, ACM vinyl floor tile/mastic is defined as a category I non-friable ACM. Category I ACMs are not required to be removed prior to demolition provided that they remain non-friable. However, according to EPA regulations, if the concrete at the selected site is to be recycled, any ACM must be abated from concrete materials prior to the recycling process that would render these ACMs friable.

- Paint and other surfacing materials identified as containing lead must be handled in accordance with requirements of the OSHA Lead Exposure in Construction Standard (29 CFR 1926.62) and any applicable State and local requirements. Debris resulting from LBPs and other lead-containing material removal must be disposed of according to MDE and EPA Resource Conservation and Recovery Act (RCRA) requirements. RCRA requires that representative material samples from the waste stream be subjected to toxicity characteristic leaching procedure (TCLP) analysis. Waste stream debris found to contain lead in concentrations greater than 5-ppm (parts per million) must be treated as hazardous waste.

Other potentially hazardous or regulated waste materials observed during the site inspection include PCB-containing light ballasts, mercury vapor lights, and mercury containing thermostats. The EPA and MDE encourage the classification of these materials as universal wastes. Universal waste regulations provide alternate management standards for these wastes so that these materials are not subject to the complete hazardous waste regulations.

Soil and groundwater sample collection and analysis may be necessary if evidence is developed that soil and groundwater contamination exists at either or both sites.

4.23 Cumulative Impacts

Although a single action, like the construction of the SSB, may have a minimal impact upon the environmental and community resources, these impacts in combination with others can create a cumulative impact on those same resources. Cumulative impacts are those "impacts on the environment, which result from incremental impact of the action when added to other past, present, and reasonably foreseeable future actions" (40 CFR 1508.7). The purpose in assessing cumulative effects is to determine whether resources of concern have already been affected by past and present activities and would be further impacted by future activities. In developing the cumulative effects analysis, the direct environmental consequences for the construction of the SSB, as assessed previously in this document, form the basis for determining the resources that warrant analysis from a cumulative effects perspective. Based on the assessment of direct environmental impacts, wetlands, watersheds, Waters of the US, open space/forest stands, SWM, and traffic are the important resources to analyze from a cumulative effects perspective.

The cumulative effects analysis identified possible impacts of the project on individual resources projected over time and in combination with other transportation and development projects with the potential to have environmental effects within the study area. The study area includes all areas along Greenbelt, Good Luck, and Beaver Dam Roads as well as the Baltimore-Washington Parkway within the vicinity of the campus. Any environmental impacts are anticipated to be confined within the areas immediately surrounding the campus.

The timeframe for assessing potential future cumulative impact is 2002-2009, the timeframe for implementation of Stage 1 of the *GSFC Facilities Master Plan.* Projects outside GSFC were identified through consultation with Maryland-National Capital Park and Planning Commission. The projects considered were those that have the potential to result in cumulative environmental impacts to wetlands, watersheds, waters of the US, open space/forest stands, SWM, and traffic.

The *GSFC Facilities Master Plan* proposes several stages of development within the GSFC campus. Stage 1 of the master plan will be implemented through 2009. This stage of the plan focuses on meeting state-of-the-art quality requirements for the Center's most crucial activities. This stage of the plan proposes several new facilities. These include construction of the following buildings by 2009:

- Space Science Complex (Bldg A)
- Earth Science Cafeteria (Bldg I)
- Earth Science Infill (Bldg J)
- Engineering Technology Infill (Bldg S)
- Central Receiving and Warehouse (Bldg N)

In addition to the construction of these new facilities, Buildings 86, 87, 89, 16/16W and the Building 27 Complex would be removed. A loop road around the perimeter of GSFC would be constructed to allow for internal vehicular circulation around the campus. Soil Conservation Road would be relocated, and the bridge over the Baltimore-Washington Parkway would be renewed to ensure continued safe and reliable service for GSFC employees. New landscaping practices to encourage natural reforestation at the edges of the campus would also be implemented.

Several projects are proposed along Greenbelt Road within the vicinity of the GSFC campus. These include the Glenn Dale Business Campus, the Goddard Corporate Park, Greenbelt Commercial Offices, Greenspring Retail Center, and the Maryland Corporate Center. Since these developments are proposed in already developed areas, the only anticipated impact would be potentially increased traffic levels along Greenbelt Road.

GSFC is located on the Anacostia-Patuxent River drainage divide at the apex of five separate tributary stream basins. The parking area for the SSB would create approximately nine acres of impervious surface and would impact two wetlands and one Waters of the U.S. This impact would occur regardless of which building site alternative is selected. The parking area would be located on the existing landfill. The impervious surface created from the parking area would divert runoff from the landfill surface and prevent the possibility of leaching from the landfill. Within this drainage area, Stage 1 of the *GSFC Facilities Master Plan* calls for the demolition of the Building

27 Complex, which is adjacent to the proposed parking area site, and the construction of a new central receiving facility and warehouse (Building N). All of the proposed construction and demolition activities are located along the outer edges of the drainage area. Thus, even with added impervious surfaces, drainage patterns would be minimally affected.

Using SSB Alternative Site 1 would require clearing of up to 1.5 hectares (3.73 ac) of forest stands A and B. These impacts would be added to those resulting from the relocation of Soil Conservation Road. The relocation of Soil Conservation Road would require the clearing of 4.29 ha (10.6 ac) of forest. The mitigation for this loss of forest area could be combined with the mitigation for the loss of forest area associated with the SSB to further enhance the connectivity of the existing forest stands at GSFC as recommended in the *GSFC Facilities Master Plan*.

If constructed, the loop road recommended in the *GSFC Facilities Master Plan* could access the parking area. The loop road could be aligned to accommodate the design of the parking area and insure proper traffic flow.

Due to the construction of the SSB and the associated parking area, GSFC employees coming from the north would no longer gain vehicular access to the south part of the campus via Soil Conservation Road. Employees would be required to use a circuitous internal route involving TIROS Road, MiniTrack Road and Explorer Road; travel around the campus along relocated Soil Conservation Road, Good Luck Road and Greenbelt Road; or remain on the Baltimore-Washington Parkway (south of the campus) before exiting onto Greenbelt Road south of the campus. The separation of the north and south portions of the campus could temporarily cause heavier traffic volumes along Good Luck and Greenbelt Roads, until and unless the loop road is constructed.

The analysis has shown that potential cumulative impacts would range from negligible to not significant, provided existing regulatory requirements are met.

PART V AGENCY AND PUBLIC COMMENT

5.1 Distribution of the Environmental Assessment

NASA distributed the draft of the Environmental Assessment to review agencies and the general public.

5.1.1 Federal Agencies

Beltsville Agricultural Research Center, US Department of Agriculture
National Capital Planning Commission
Advisory Council on Historic Preservation
Fish and Wildlife Service, US Department of the Interior

5.1.2 State Agencies

Maryland Department of Business and Economic Development
Maryland Department of the Environment
Maryland Department of Housing and Community Development, including
Maryland Historic Trust
Maryland Department of Natural Resources
Maryland Department of Planning
Maryland Department of Transportation
Maryland State Clearinghouse

5.1.3 Local Agencies

Cities of Bowie, Greenbelt, Laurel and New Carrollton
Coordinating Council of Community Organizations (CCCO)
Maryland National Capital Park and Planning Commission
Washington Suburban Sanitary Commission

5.2 Comments and Responses

NASA received comments on the draft of the Environmental Assessment from several federal, state and local agencies and from the general public. Those comments and responses to each are shown in the following table.

Comments on November Draft Environmental Assessment

No.	Reviewer	Section	Para.	Comment	Response
1	City of Greenbelt, MD Dept. Planning & Community Development			I have reviewed the EA for the proposed SSB at GSFC. The EA indicates that the construction of a new SSB on the GSFC campus will not have any direct impact on the City, so I have no specific concerns regarding the proposal.	Comment noted.
2	City of Greenbelt, MD Dept. Planning & Community Development			Of the alternatives presented however, I recommend Alternative Site Area 3, as it seems to have the least environmental impact on the campus, while still meeting the goals of the Master Facilities Plan. Since its creation, the City has endeavored to support development while providing good stewardship of the environment. I urge NASA to consider this in the site selection process.	Comment noted.
3	City of Greenbelt, MD Dept. Planning & Community Development			In that same vein, I would like to recommend that GSFC explore ways to reduce the impact of the proposed parking lot associated with the SSB. While the parking ratio is less than 1 space per employee, and therefore also meets the stated goals of the Master Facilities Plan; it is the lot that has the most impact on the environment of the proposal. The size of the parking spaces is not mentioned; perhaps more compact spaces could be added to the lot, thereby using less land to accommodate the same number of spaces.	Impacts in this EA are based upon the largest potential site area. Efforts would be made to use less area and to use low-impact development practices.
4	City of Greenbelt, MD Dept. Planning & Community Development	4.8.3	9	I would also like to request that if Alternative Site Area 2 is selected, that the City be informed of the chosen location for the hazardous waste storage/collection area that would be slated to be sited along Soil Conservation Road relocated.	If Alternative Site Area 2 is selected, separate NEPA documentation would be prepared for the selection of a new site for hazardous waste storage.
5	Jeff de La Beaujardiere, NASA GSFC			Though not clearly stated in the EA, all plans would seem to require the relocation of building 16 shipping/receiving activities to an area along the edge of campus. It is not clear in alternatives 1 & 2 whether building 16 would be conserved or destroyed.	Building 16/16W would be conserved in Alternatives 1 and 2.
6	Jeff de La Beaujardiere, NASA GSFC	Fig 2-4		Alternative site 3 is best because it reuses the area occupied by building 16/16w. The other sites require the destruction of additional forested area.	Comment noted.
7	MD DBED			This project is consistent with our plans, programs and objectives.	Comment noted.
8	MD DHCD, including the MD Historic Trust.			This project is consistent with our plans, programs and objectives.	Comment noted.
9	MD Department of Natural Resources			This project is consistent with our plans, programs and objectives.	Comment noted.
10	MD Department of Planning			This project is consistent with our plans, programs and objectives.	Comment noted.
11	MD DOT			This project is consistent with our plans, programs and objectives.	Comment noted.
12	MDE ARMA	3.3.2	4	The project should support resource conservation and pollution prevention through land use and transportation designs that provide alternatives to single occupant vehicle use.	The GSFC Master Plan was designed to reduce vehicle trips by locating related GSFC functions in close proximity to one another. This land use design based on functional proximity would allow

No.	Reviewer	Section	Para.	Comment	Response
					better exchange between employees in their own neighborhood, and would allow more opportunities for carpooling, addressed in Section 3.3.2.
13	MDE ARMA	3.10	3	If boilers or other equipment capable of producing emissions are installed as a result of this project, the applicant is requested to obtain a permit to construct from MDE's Air and Radiation Management Administration (ARMA) for this equipment, unless the applicant determines that a permit for this equipment is not required under State regulations pertaining to "Permits, Approvals, and Registration" (COMAR 26.11.02). A review for Toxic Air Pollutants (TAPs) should be performed. Please contact Dr. Justin Hsu, Ph.D., P.E., New Source Permits Division of ARMA at (410) 537-3230 to learn about the State's requirements and the permitting processes for such devices.	The use of boilers or other emissions generating equipment is not anticipated. No new or increased emissions of TAPs above current permit limits are anticipated. TAP limits are reviewed annually.
14	MDE ARMA	3.10 4.9	4 1	If a project receives federal funding, approvals and/or permits, and will be located in a non-attainment area or maintenance area for ozone or carbon monoxide, the applicant should determine whether emissions from the project will exceed the thresholds identified in the federal rule on general conformity. If the project emissions will be greater than 25 tons per year, contact James Wilkinson of ARMA at (410) 537-3245 for further information regarding threshold limits.	The project would not create any new emissions of ozone-causing pollutants. Comments addressed in Section 4.9.
15	MDE ARMA	3.7.3	4	The applicant is encouraged to plan for the maximum utilization of carpools and public transit by employees providing preferential carpool/vanpool parking and bus shelters for commuters that use these methods of transportation. This will minimize the adverse impact of additional traffic generated by the proposed project. Please contact the Mobile Sources Program of ARMA at (410) 537-3270 for additional information.	No new jobs or traffic would be created as a result of this proposal. GSFC is actively pursuing transportation initiatives to reduce the reliance on single occupancy vehicles.
16	MDE ARMA	4.9	1	Construction, renovation and/or demolition of buildings and roadways must be performed in conformance with State regulations pertaining to "Particulate Matter from Materials Handling and Construction" (COMAR 26.11.06.03D), requiring that during any construction and/or demolition work, reasonable precaution must be taken to prevent particulate matter, such as fugitive dust, from becoming airborne.	Project would comply with COMAR requirements related to air quality Comments addressed in Section 4.9.
17	MDE ARMA	4.9	2	The applicant should be advised that no cutback asphalt should be used during the months of June, July and August.	Project would comply with COMAR requirements related to air quality. Comment addressed in Section 4.9.
18	MDE ARMA	4.21.1	6	Fossil fuel fired power plants emit large quantities of sulfur oxide and nitrogen oxides, which cause acid rain. In addition, nitrogen oxide emissions contribute to the problem of global warming and also combine with volatile organic compounds to form smog. The MDE supports energy conservation, which reduces the demand for electricity and therefore, reduces overall emissions of harmful air pollutants. For these reasons, MDE recommends that the builders use energy efficient lighting, computers, insulation and any other energy efficient equipment. Contact the U.S. EPA at (202) 233-9120 to learn more about the voluntary Green Lights Program that encourages businesses to install	GSFC would strive for a silver rating in the LEED Green Building Rating System, through the design of the SSB. The three alternatives would likely have similar ratings in these LEED categories: water efficiency, energy and atmosphere, indoor environmental quality, materials and resources and innovation and design processes. Comment addressed in Section 4.21.

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				energy-efficient lighting systems.	
19	MDE Technical & Regulatory Services Admin.			This project is consistent with our plans, programs, and objectives.	Comment noted.
20	MDE WMA	4.8.4	2	Any solid waste including construction, demolition and land clearing debris, generated from the subject project, must be properly disposed of at a permitted solid waste acceptance facility, or recycled if possible. Contact the Solid Waste Program at (410) 537-3318 for additional information.	Comment addressed in Section 4.8.5.
21	Miller 4	3.19 4.18.3	6 5	Indicates results of the Site Investigation Report for Landfill B, but does not discuss methane. Was methane evaluated, and if so, what were the results?	Trench tests showed that 95% of the material in Landfill B is soil and that less than 5% was concrete or wood. Due to the content in Landfill B, production of methane from organic decay was not expected and therefore not discussed in the report.
21	Miller	4.9 4.12.2	3 9	Summary of Impacts Table shows Alternatives 1 & 2 to have no changes in air quality. It seems the removal of between 1 and 4 acres of trees, which serve as a sink for greenhouse gasses, would result in air quality impacts.	The functions of forest, that may include improving air quality, are protected through the MD Forest Conservation Act. Replacement of acreage and function would be in compliance with the act. Even dramatic changes to thousands of acres of forested areas would have small effects on atmospheric CO2 compared to the atmospheric effects of fossil fuel usage. Recognizing the impact of fossil fuels on greenhouse gases, several Executive Orders require NASA to purchase energy efficient products, reduce energy use below 1985 levels, increase the use of alternative fuels and renewable energy (hydroelectric, solar power, etc.), and reduce greenhouse gas emissions. SSB would contribute to this effort by seeking LEED certification for the building.
22	Miller	4.13	4	States that additional impervious areas that cause groundwater impacts are insignificant because groundwater impacts already exist. It seems the opposite would be true. Already impacted areas would be MORE significantly impacted by additional impervious area, not less impacted.	Among the causes of the existing groundwater impacts is the extensive area at GSFC developed without stormwater management. The SWM proposed as part of the SSB and associated parking areas would address some of the previously uncontrolled runoff, reducing velocities and improving water quality, through the use of state-or-the-art SWM practices. The additional impervious surface over the landfill would act to cap the landfill. This would ensure that the landfill is not disturbed and would be an added precaution against leaching from rainwater to groundwater.
23	Miller	4.16.5	3	The document indicates the Parking Area is to be included in all alternatives. However, the parking area appears to have a number of adverse environmental impacts (steep slopes, waters of the State, wetlands). Given the impacts, other parking alternatives should be examined (for example, don't build anything beneath the parking area and make it permeable, or drain the parking area to rain gardens and divert the filtered water to infiltration structures, or build a parking garage with a smaller footprint.)	Through development of required Storm water management plans, stormwater management analysis would evaluate and utilize low-impact development practices such as rain gardens to reduce the quantity of runoff while improving its quality.

No.	Reviewer	Section	Para.	Comment	Response
24	Miller	4.23	6	Says, "The analysis has shown that potential cumulative impacts will range from negligible to not significant, providing existing regulatory requirements are met." It is not clear how the potential elimination of 4 acres of trees from Alternate Site 1, plus elimination of over 10 acres of trees from relocation of SCS Rd., plus an additional 9 acres of impervious parking area, plus the impervious area of the SSB complex itself would be "not significant." Even with reforestation, it would be years before the newly forested area would provide the environmental benefits of a mature forested area. Please clarify. More effort appears to be needed to minimize these impacts (such as selecting Alternate Site 3 and investigating alternatives to the parking plan).	The functions of forest areas are protected through the MD Forest Conservation Act. Replacement of acreage and function would be in compliance with the act. If reforestation is required, the EA proposes that the existing break between Stands A and B caused by SCS Road be selected in an effort to reduce the fragmentation of the existing areas.
25	Miller	4.16.5 4.3	1 2	Says the impervious parking area would serve as a cap to prevent leaching of contaminants from Landfill B. However, other sections of the document indicate there are no environmental impacts from Landfill B. Please clarify. Also, this same paragraph says, "even with added impervious surfaces, drainage patterns are not expected to be affected." Please provide a basis for this statement, as the parking area will add 9 acres of impervious surface, and impact 2 wetlands and 1 Waters of the U.S.	There is no evidence to suggest a problem with leaching. Locating the parking area over Landfill B is a precautionary measure to ensure that a future use would not damage the integrity of the landfill. Changes to drainage patterns adjacent to the landfill would be designed to eliminate the existing erosion problem and improve the overall condition of the existing stream.
26	NCPC			Please ensure that the final determination of your NEPA process is provided, along with a final copy of the EA, when you submit the specific proposal for the Commission's review.	Comment noted.
27	NCPC	3.7.3	5	The amount of parking proposed, as well as the number of employees identified with the project, is inconsistent in the EA. On page ES-2 of the document it is specified that there will be 811 parking spaces for approximately 900 employees. Page 25 indicates that 1,059 employees are expected and that there will be 953 spaces in the project. Page 25 also references a reduction in the new parking spaces over time. Regardless, because of the amount of parking proposed is in excess of that recommended by the Comprehensive Plan for the National Capital Region, GSFC will be required to include the following with the submission of the project for Commission review: documentation showing how much additional new parking is proposed, if any existing parking at GSFC is being removed, and what the parking ratio for the project and the GSFC as a whole will be as a result of the new construction. It appears at this time that the amount of proposed parking associated with the SSB might be in excess of what the Commission would approve for the SSB. NCPC staff would encourage GSFC to be more aggressive in reducing the amount of parking associated with the project.	Parking provided for the SSB is in accordance with the approved GSFC Master Plan and Transportation Management Plan. See ES-2 and Section 3.7.3.
28	NCPC	4.16.5	3	Additionally, the Commission staff would expect that stormwater drainage and wetland mitigation efforts would be coordinated and submitted for review and comment to the M-NCPPC and the Prince George's County Planning Board for their cooperative review. Prince George's County is a leader in low-impact development drainage and	Under agreements with the State, MDE is the agency responsible for the review of SWM at GSFC. Newly revised state regulations incorporate low impact development and similar state-of-the-art SWM techniques. Comment addressed in Section 4.16.5.

No.	Reviewer	Section	Para.	Comment	Response
				NCPC expects full utilization of this site development approach in the site planning for the SSB. As the EA fully identifies Forest Stand C as a workable mitigation area, Commission staff anticipates incorporation of at least some of the measures as committed mitigation within the NASA developed NEPA determination.	
29	NCPC	4.14.5	2	The EA at several points in the text identifies wetlands and stormwater drainage impacts resulting from the proposed project. While the NCPC staff fully supports the proposed location of the project at Alternative Site 3, in conformance with the approved 2003 master plan; specific mitigation efforts must be defined by NASA in its NEPA determination to address Waters of the U.S. impacts regarding the proposed parking area use of the landfill area and the effects to the headwater tributary of Beck Branch. Moreover, NCPC would require, at the time of the project review submission, full and complete indications of compliance with all state and federal dredge and fill, water quality control, and stormwater management permit requirements through submitted documentation of preliminary or final permit applications. As the MDE and U.S. Army Corps of Engineers have developed a joint permit process, NCPC strongly endorses the utilization of that streamlining process in a timely manner prior to submission of the SSB project to the Commission.	Actions to stabilize the existing slope erosion would, of necessity, affect drainage patterns and some wetlands areas. The overall benefits of reduced erosion and water velocities offset any negative consequences associated with the action. The project would comply with MDE's water quality and storm water management regulations. The SSB project would use the MDE/USACE Joint application process for any impacts to Waters of the U.S. and wetlands.
30	Robert Duffin LWS Supporting Scientist. Solar Physics Branch NASA Goddard Space Flight Center	4.23 4.6	6	There should be a Complete Road Plan of GSFC for each of the various alternate building sites.	See Section 4.23 and 4.6 for explanation of how traffic patterns would be altered by each alternative. While there are variations in the implications of each routing option, the overall traffic impact of each scenario is minimal.
31	Timothy Regan NASA GSFC	Within the table	Line 8	Summary of Impacts, under the No-Action column, for the Transportation line, it indicates no impacts. For the Alternates, it indicates Relocate SC Road. It is my understanding that for SSB should No Action be chosen, SCS Road would still be relocated per the on-going design project. If this is correct, then perhaps the Transportation impact, even for the No Action column, should reflect Relocate SC Road.	Relocation of SCS Road was added as an impact to the No Action alternative under Community Issues, Transportation on page ES-3.
32	Timothy Regan NASA GSFC		2	The sites are all very proximate to each other, and don't offer much in the way of significant alternative analysis.	The location of the Space Science Neighborhood was determined in the Master Plan and its environmental consequences were evaluated in the Master Plan Final Environmental Assessment. Site alternatives were limited because they had to be located within the SS neighborhood.
33	Timothy Regan NASA GSFC	1.1.3	1	Indicates, "location of the Space Science Neighborhood at a high topographic elevation on the campus is appropriate to the importance of Space Science with GSFC. This prominent site would provide long views from the upper floors in all directions." These seem somewhat arbitrary reasons for siting a building.	Siting the SSB in a prominent location is a response to GSFC Master Plan goals.
34	Timothy Regan NASA GSFC	3.7.3		The text indicates beginning in 2002 with 953 parking spaces, parking would be steadily reduced, ending in 2022 with 741 spaces. Does this mean that in 2002 there are 953 spaces in the Neighborhood, growing in	Comment addressed in Section 3.7.3.

No.	Reviewer	Section	Para.	Comment	Response
				2006/2007 to 1764 spaces with the addition of the 9 acre parking area which is part of the SSB construction, dropping to 741 by 2022?	
35	Timothy Regan NASA GSFC	4.6 4.23	4 5	I think the discussion on traffic misses the point on subtleties between the alternatives. As indicated in my comment to ES-3 above, my understanding is that SCS Road is intended to be relocated regardless of SSB, and the existing SCS road made into employee only entrances, thus diverting the traffic as discussed. However there are minor variants between the three alternative's traffic patterns as to their relation to the existing warehouse operations located along existing SCS road, and how access to this warehouse operation will function in each of the three alternatives. In alternative site 1, truck access to the existing warehouse will need to follow the new SCS road to the east because access to the warehouse will be from the north. In alternative site 2, truck access to the existing warehouse will follow current patterns because access to the warehouse will be from the south as how it is now. In alternative site 3, truck access is eliminated because the warehouse is removed.	See Section 4.23 and 4.6 for an explanation of how traffic patterns would be altered by each alternative.
36	Timothy Regan NASA GSFC	4.12.1	5	What is the proposed reforestation indicated? Although 4.12.2 indicates potential reconnection of forest stands A and B, this alternative has significant impact to each of the stands as well. Is it intended that reforestation will occur if forest conservation thresholds are exceeded by the chosen alternative, or will existing forest stands be used as compensation/mitigation and set-aside for long-term conservation without any reforestation?	Any necessary conservation or reforestation would be done in accordance with the MD Forest Conservation Act as per an interagency agreement between the MD Dept. of Natural Resources and Prince George's County. Final decisions on forest conservation or reforestation would be made as part of site design and review.
37	Timothy Regan NASA GSFC	4.21.1		The text indicates that the no action alternative presents no opportunity to participate in the LEED program or to improve sustainability of the facilities at GSFC, thus giving the impression of being a poor choice. However the text in 4.21.4 discusses potential LEED credit opportunity in vacated buildings as a result of choosing a build alternative, or improvements made to the vacated buildings in reuse of the building (presumably from their renewal by partner business and contractors). This seems somewhat contradictory. Following similar logic, one might argue that Alternative 3 actually may be the better alternative from a LEED perspective, because this eliminates a large existing facility that likely is energy inefficient, and the site would be reused thus gaining the plus from credit 5 (reduced site disturbance). In addition (although not related to LEED) this site is slightly higher than the Alternative 1 site, thus providing a higher topographic elevation as discussed in 1.3.3.	No action means no action of any kind would be taken and the status quo would be maintained, offering no opportunity for LEED credits. Renovation of the existing facilities for continued use was eliminated as a feasible alternative during the Master Plan process because it would not serve the purpose of the project or the goals of the Master Plan. Selection of Alternative 3 would allow LEED credits associated with removal of an inefficient building.

PART VI LIST OF PREPARERS

This Environmental Assessment was prepared under the direction of the GSFC Space Flight Center, The Ralph Parsons Company, and EBA Engineering by KCI Technologies, Inc.

NASA – Goddard Space Flight Center
David Larsen
Pete Lauren
Lizabeth Montgomery
MaryEllen Ramsey

Parsons Infrastructure and Technology Group, Inc.
Walter Daly, R.A.
Gavin A. Perry, R.A.

EBA Engineering
Brian Croyle
Kunal Gangopadhyay P.E.
Harish Patel, P.E.
Kirit Patel

KCI Technologies, Inc.
Brian Bernstein, AICP
Christopher Carbone
Matthew Folley
Kristen Goddard
Jennifer Powers, AICP
Jacquelyn Magness Seneschal, AICP
Holly Shipley

PART VII ACRONYMS, SYMBOLS AND ABBREVATIONS

ACOE	United States Army, Corps of Engineers
BARC	Beltsville Agricultural Research Center
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
CFC	chlorofluorocarbons and hydrochlorofluorocarbons
CMSA	Baltimore-Washington Consolidated Metropolitan Statistical Area
FCA	Forest Conservation Act
FEMA	Federal Emergency Management Agency
FMD	Facilities Management Division
ft	feet
GSFC	Goddard Space Flight Center
h	hectare
HI	Hazardous Indices
HQ	Hazardous Quotients
JD	Jurisdictional Determination
LASP	Laboratory for Astronomy and Solar Physics
LEED	Leadership in Energy and Environmental Design
LEP	Laboratory for Extraterrestrial Physics
LHEA	Laboratory for High Energy Astrophysics
m	metric
MDE	Maryland Department of the Environment
MDNR	Maryland Department of Natural Resources
M-NCPPC	Maryland-National Capital Park and Planning Commission
MODC	Management Operations Directorate Consolidation Facility
MSWM	Maryland Stormwater Manual
MWAQC	Metropolitan Washington Air Quality Committee
NASA	National Aeronautics Space Agency
NPD	NASA Policy Directive
NRC	Nuclear Regulatory Commission
PCB	Polychlorinated Biphenyls
PRR	Patuxent Research Refuge
SC	Soil Conservation Road
SEB	Safety and Environmental Branch

SSB	Space Science Building
SVOC	Site Volatile Organic Compound
SWM	Stormwater Management
TAP	Toxic Air Pollutant
TCE	Trichloroethene
TPB	National Capital Transportation Planning Board
VOC	Volatile Organic Compound
WMATA	Washington Metropolitan Area Transit Authority
WSSC	Washington Suburban Sanitary Commission
WUS	Waters of the United States

PART VIII REFERENCES

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