STAFF RECOMMENDATION

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NCPC File No. 6585

GODDARD SPACE FLIGHT CENTER
SEARCH AND RESCUE ANTENNAS AT BUILDING 25
Greenbelt, Prince George's County, Maryland

Submitted by the National Aeronautics and Space Administration

May 26, 2005

Abstract

The National Aeronautics and Space Administration (NASA) has submitted plans for the installation of prototype transmitting and receiving antennas. The submission specifies an antenna array design at the Goddard Space Flight Center (GSFC) for a facility that would provide rescue signal identification via the global positioning satellite system (GPS). The new format would be tested through this new antenna array just north of Building 25. The proposed system has several advantages over the current use of polar orbiting and geosynchronous satellites. Standardization of this system into general use will allow the saving of many human lives when search and rescue events are necessary.

Commission Action Requested by Applicant

Approval of preliminary and final building plans pursuant to Section 5 of the National Capital Planning Act (40 U.S.C. § 8722(b)(1)).

Executive Director's Recommendation

The Commission:

Approves the preliminary and final site and building plans for seven transmitting and receiving Search and Rescue prototype antennas at Building 25 of the Goddard Space Flight Center, as shown on NCPC Map File No. 3214.20(38.30)-41602, for a period not to exceed 10 years.

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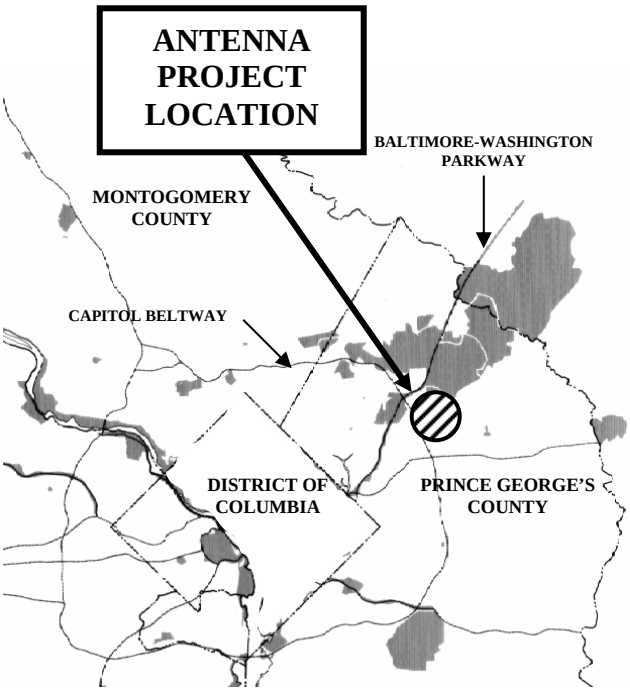
PROJECT DESCRIPTION

Site

The Goddard Space Flight Center (GSFC) occupies about 1,270 acres immediately north of the Capitol Beltway in Princes George's County, Maryland. An area of many large and medium test and operational transmitting and receiving antennas exists near Building 25 within the GSFC that is bounded by Soil Conservation Road at the west boundary of the Building 25 area, and is situated in the GSFC east campus. The area is generally known as the Ground Station 600 area and consists of various antenna structures including tower antenna facilities.



REGIONAL LOCATION

Background

The Commission has previously reviewed communication antennas located at area 600 and particularly near the Building 25 complex. In April 2005 the Executive Director approved a replacement 7.2 meter C-Band satellite communications antenna east of Building 25, as shown on Map File No. 3212.00(38.30)-41576.

Proposal

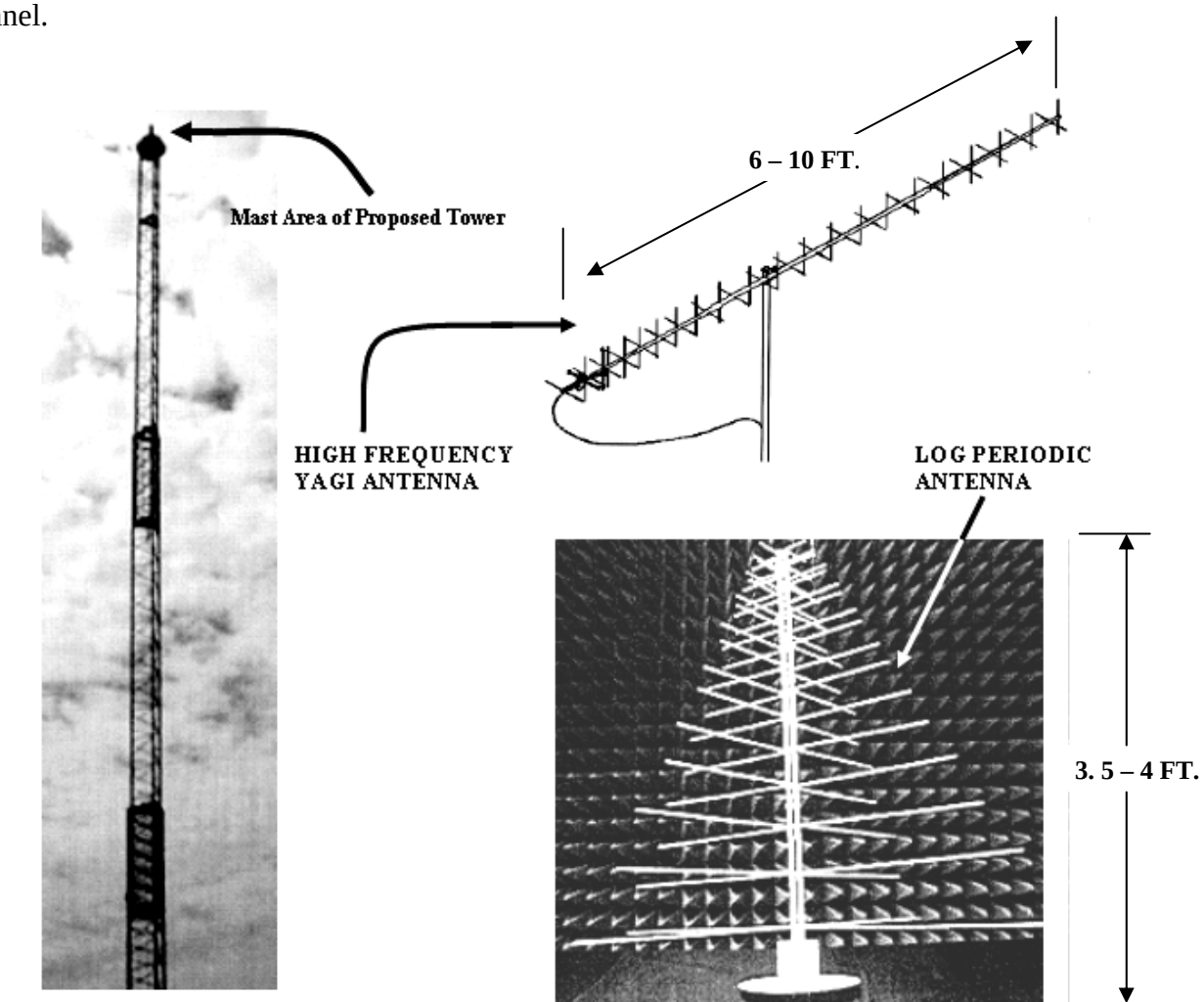
The submitted project describes an antenna array design at the GSFC for a prototype facility that would provide rescue signal identification via the global positioning satellite system (GPS). The new format would be tested through this new antenna facility. The proposed system has several advantages over the current use of polar orbiting and geosynchronous satellites. Most significant is the redundancy of available satellites and the number of satellites available in any one portion of the sky that would be able to pick-up a distress beacon. Standardization of this system will allow the saving of many human lives when search and rescue events are necessary.

The new antenna is a portion of the system that would transmit beacon signals and other test signals to the GPS satellites. The antenna would be located within a wooded portion of the GSFC distant from any public thoroughfare or viewshed in the east area of the campus. The antenna tower would use an existing antenna pad 750 feet north of Building 25 where a previous antenna once existed several years ago.

No additional employees or other facilities are required with the new antennas. The antenna array complex is small and is comprised of the following:

- An 89-foot high crank-up lattice type tower, with a 15 foot mast for the individual frequency antennas. A new 12.5 foot concrete foundation would be constructed for the tower.
- One yagi type antenna to transmit 1.21.5 MHz signals to orbiting satellites
- One yagi type antenna to transmit 243.0 MHz signals to orbiting satellites
- Four yagi type antenna to transmit at 406.0 to 406.1 MHz band to satellites
- One log periodic antenna that would be used to transmit 121.5, 243.0, or 404.0 to 406.1 MHz signals.

The tower is designed to be constructed of hot dipped galvanized steel and would remain a natural steel color. All antennas are unpainted aluminum. NASA has certified the new antennas would meet all Federal Communications Commission (FCC) operational requirements. The antennas are far removed from any public accessible area and are elevated and oriented to direct all signals skyward. Access to the antenna tower itself can be achieved only by authorized personnel.

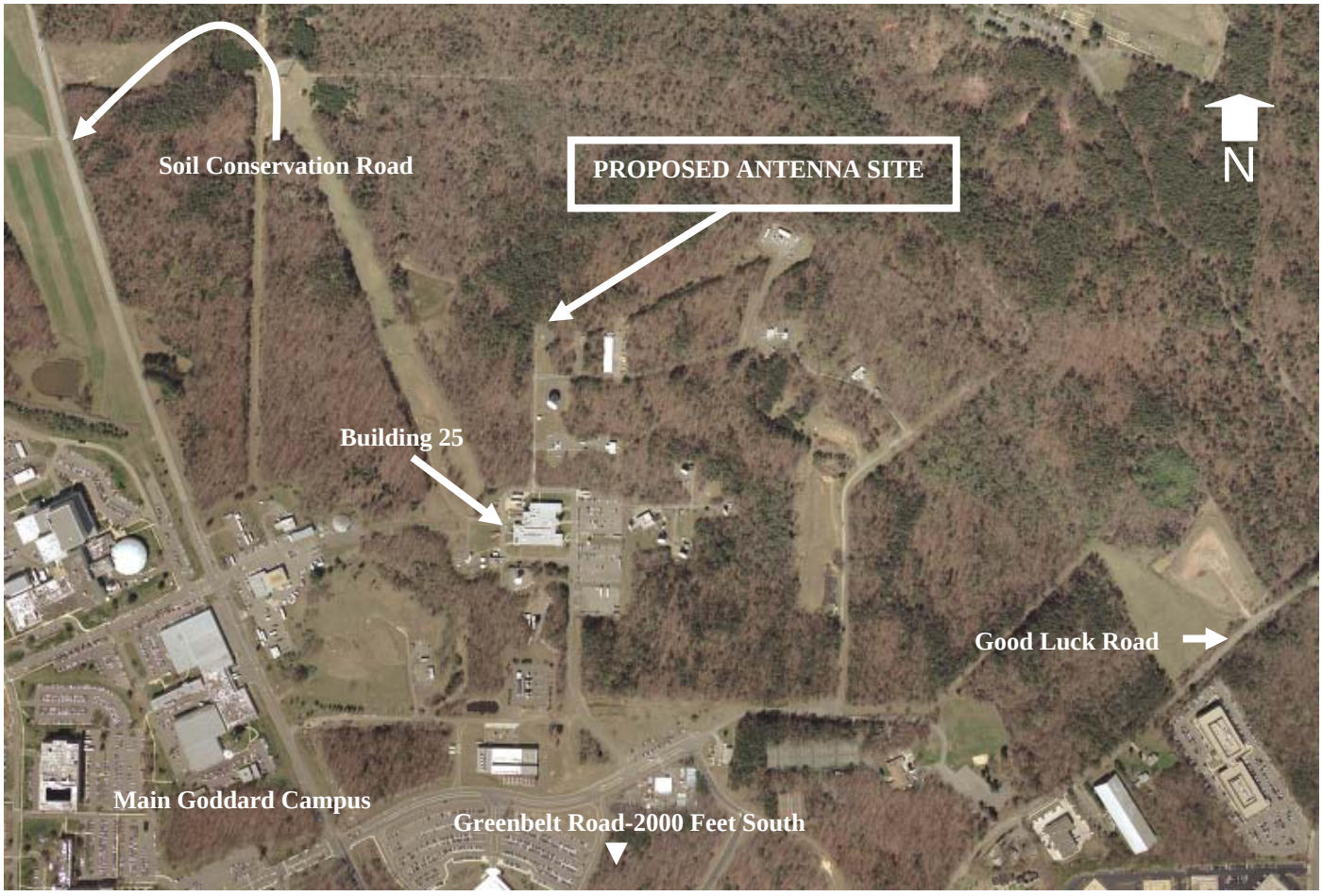


EXAMPLE OF PROPOSED
LATTICE TOWER

PROJECT ANALYSIS

Executive Summary

The **staff recommends approval of the proposal** for a period not to exceed 10 years. The proposed antennas are consistent with the Commission's Antenna Guidelines which encourage placement of large operational antennas on federal property. Furthermore the submission is consistent with the Commission's preference for collocation of antennas when possible. All seven antennas will be minimally visible in their elevated and operational arrangement within a wooded section of the GSFC. The Commission has the authority to approve the antennas for a period of ten years, outside the Monumental Core area of the Capital Region, and staff recommends this time period since it's a prototype facility that would have a functional life of testing and become an "example" or demonstration facility. NASA personnel estimate the antenna array's use to extend 10 years or more. Staff highlights to NASA that they are to be cognizant of the time sensitive approval, and that NASA should anticipate the coordination of a renewal approval for theses facilities by no later than June 2015, if necessary.



AERIAL VIEW OF GODDARD SPACE FLIGHT CENTER BUILDING 25 VICINITY

Radiofrequency Radiation Analysis

NASA has submitted information about the proposed antennas, consistent with the Commission's applicable Guidelines and Submission Requirements for Antennas. No new structures will need to be constructed on the ground surface other than the new steel tower and concrete foundation base. Submission documents indicate the proposed antennas will not adversely affect human health and safety. Part of the lack of potential hazards is attributed to the distance of the antennas above ground and the lack of habitable, nearby structures anywhere in the vicinity of GSFC. The proposed antennas are highly directional and will radiate most of the power skyward rather than towards the ground. The maximum effective high level emission from all antennas was identified by staff review to be at 25 to 35 feet from the antenna mast. Since all antennas are located at 89 feet above the ground, no adverse emission levels are encountered by any ground area.

The maximum power densities are well below the maximum permissible exposure standards established by the Federal Communications Commission. Cumulative RF effects are not significant and would not impact people on the ground in any general public area.

CONFORMANCE

Comprehensive Plan for the National Capital

Staff review finds the proposal is consistent with the Comprehensive Plan for the National Capital. The Federal Facilities Element designates GSFC as a Research and Development facility. No boundary changes are required in the facility for the proposal, and the campus adheres to the goals of *The Comprehensive Plan for the National Capital: Federal Elements*, which notes the existence and location of the GSFC as a federally owned workplace in the National Capital Region (Federal Workplace Element, p. 29). Furthermore, the *Comprehensive Plan for the National Capital: Federal Elements* includes the following polices that pertain to the antenna proposal. These include:

4. Discourage the location of towers, antennas, or similar structures in or adjacent to the federal park system, to the extent possible.

6. …identify appropriate locations for the siting of antennas and towers through their master plans and comprehensive plans, to the extent practical. This should help protect the functional integrity of, and the important view-sheds to and from, federal parks and open space areas.
(Parks and Open Space Element, p. 115)

Staff has determined that the antenna installation would not have an effect on other federal facilities or federal interests. The Baltimore-Washington Parkway is not adversely affected because the antennas are situated on a relatively low structure east of the Parkway. Moreover, the tower site is located over 7,000 feet from the Parkway travel lanes behind stands of tall trees that provide a heavy canopy cover during much of the year. Consequently, the tower would not be visible from any vantage point on the Parkway.

Master Plan

The Commission approved a revised master plan for the GSFC in April 2003. The antennas are not inconsistent with the master plan, which identifies the Building 25 area for Research and Development.

National Environmental Policy Act

Pursuant to the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA), the Commission staff has reviewed the submission and has found the applicant specified that the proposal is consistent with the Commission's categorical exclusion provisions at Section 8 of the Commission's Environmental Procedures. The staff finds the Section 8 categorical exclusion applies to the proposal regarding criteria of co-location of transmitting antennas on federal property. The submitted RF evaluation for operation of the antennas confirms the elements coincide with all environmental impact criteria of the Federal Communications Commission.

National Historic Preservation Act

NASA has reviewed its data from the master plan, which was commented on by the Maryland Historical Trust in August 2002, determining the existing Building 25 area has no effect or impact on any historic resources at the GSFC pursuant to Section 106 of the National Historic Preservation Act.

Goddard has one historic property listed in the National Register of Historic Places: the Spacecraft Magnetic Testing Facility, Building 305, which has also been designated a National Historic Landmark for its national significance to the space program. Building 305 is located in satellite area 300, north of Good Luck Road and east of Building 25. Building 305 requires isolation from all outside manmade magnetic sources and a forest buffer surrounds that test area. This facility is far removed visually from the Building 25 vicinity, at over 3800 feet east of the antenna site.