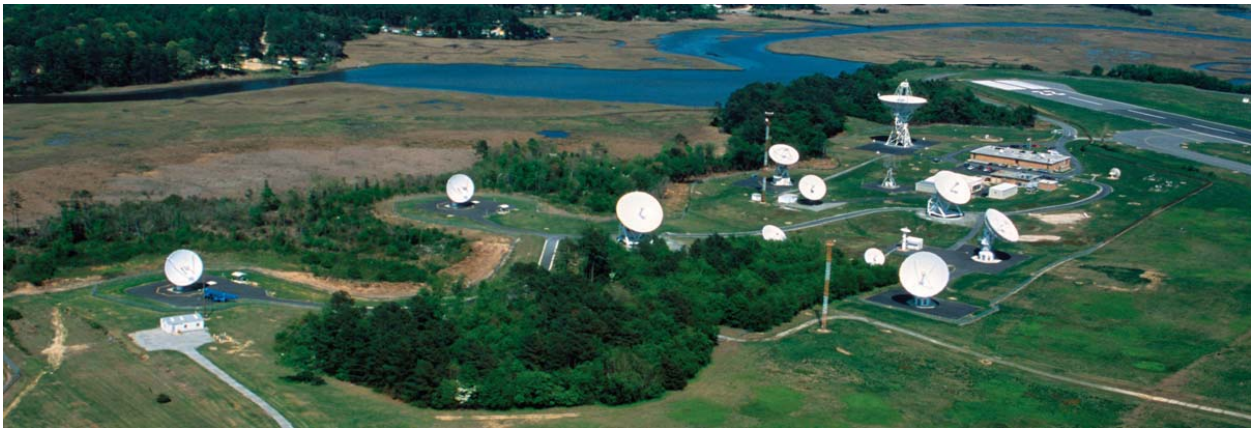
Final Environmental Assessment

Electrical and Operational Upgrade, Space Addition, and Geostationary Operational Environmental Satellite Installation Projects at the Wallops Command and Data Acquisition Station, Wallops, Virginia



National Oceanic and Atmospheric Administration
National Environmental Satellite, Data, and Information Service

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SUMMARY

Background and Purpose

The National Environmental Satellite, Data, and Information Service (NESDIS) is part of the National Oceanic and Atmospheric Administration (NOAA) of the United States (U.S.) Department of Commerce. NOAA/NESDIS operates environmental satellites that collect information on atmospheric, oceanic, and terrestrial environmental conditions. The Wallops Command and Data Acquisition Station (WCDAS), operated by NOAA/NESDIS, gathers data from satellites via radio downlinks and controls satellites via transmission of radio signals.

NOAA/NESDIS proposes to construct WCDAS site-wide electrical-system and facility upgrades that would address several objectives identified in the WCDAS Facility Master Plan and electrical- and mechanical-system studies. Implementation of the proposed upgrades would enhance and expand the NOAA/NESDIS mission capabilities and reduce WCDAS facility and infrastructure shortfalls by providing additional antenna infrastructure, additional operational space, and redundancy of critical electrical and mechanical infrastructure needed to optimize the functional efficiencies of the WCDAS.

The WCDAS is a tenant on the National Aeronautics and Space Administration (NASA) Wallops Flight Facility (WFF) 2,230-acre Main Base. The NASA WFF Main Base is located on the eastern shore of Virginia and is bounded on the east by Chincoteague Bay and its bordering marshlands and creeks, on the north and west by Little Mosquito Creek, and on the south and southeast by State Highway 175. The 29-acre WCDAS is located north of Runway 10-28, east of Runway 17-35, and west of Runway 4-22 at NASA WFF airfield.

Description of Proposed and Alternative Actions

NOAA/NESDIS proposes to implement upgrades to the WCDAS site-wide electrical systems, related infrastructure, and antenna systems. The Proposed Action would include:

- New electrical power/communication ductbank and cabling to serve antenna sites
- Construction and operation of three Geostationary Operational Environmental Satellite (GOES) antennas
- Construction of a new Powerhouse Building
- Construction of a building addition onto the Operations Building to accommodate GOES equipment
- Road realignment and relocation of utilities and ductbanks
- Upgrades to the electrical distribution system within the Operations Building
- Renovation of the mechanical systems within the existing Utility Building

These improvements would occur entirely on the existing WCDAS and NASA WFF airfield property. As required by federal law, the alternative of taking no action is also examined in this Environmental Assessment (EA). Under the No Action Alternative, NOAA/NESDIS would not construct the site-wide electrical systems or related infrastructure at the WCDAS.

NOAA/NESDIS conducted NEPA reviews of proposed ductbank installation, GOES antenna installation and operation, construction of a new Powerhouse Building and an Operations Building addition, and road realignment around the Operations Building addition (NOAA, February 2010, and NOAA, September, 2010). At the time of the reviews, these initiatives qualified for categorical exclusion under NOAA directives. However, design elements of those projects moved construction quantities past thresholds identified in NOAA directives, thereby requiring preparation of this EA.

Environmental Consequences and Mitigation

Implementation of the improvements proposed by NOAA/NESDIS would result in physical changes in the WCDAS environment. The amount of vehicle traffic, noise, and emissions of air pollutants resulting from implementation of the Proposed Action would be temporary and insignificant. No long-term impacts will result from execution of the Proposed Action. Construction expenditures would represent a modest beneficial impact to the local economy. There would be no long-term increase in employment at the WCDAS or the NASA WFF associated with the Proposed Action. The census tract containing the WCDAS has lower per capita income, a lower unemployment rate, a lower percentage of persons living in poverty, and a higher percentage of minority persons than those in Accomack County as a whole. No adverse or disproportionately high numbers of environmental effects on minority or low-income communities would not result from implementation of the Proposed Action. Socioeconomic impacts would be insignificant.

Implementation of the Proposed Action would not adversely affect ecological or natural resources. No adverse effects would occur to protected species or wildlife habitat. The proposed construction activities would not occur in wetlands subject to federal jurisdiction. There would be no adverse effects to wetlands or to the 100-year floodplain. Farmland and designated wild and scenic rivers are not present at or near the WCDAS and would not be affected.

The wooded area and the grass field to the west and southwest of the proposed GOES antenna sites were once part of the Chincoteague Naval Auxiliary Air Station Main Base Skeet Range. Concern about lead-contaminated soil at two of the candidate GOES antenna sites, discussed in the previously published *Categorical Exclusion for Proposed Installation and Operation of Three GOES Antennas at the Wallops Command and Data Acquisition Station*, has been resolved. NASA WFF's recent laboratory analyses of soil samples obtained from the areas found that lead contaminant levels in the soil are similar to background concentration ranges and the soil is not considered hazardous waste with respect to lead, as validated by the Virginia DEQ and U.S. Environmental Protection Agency, Region 3.

No prehistoric or historic archaeological sites were identified in the areas of the Proposed Action during surveys conducted between 2009 and 2011. None of the existing structures at the WCDAS are older than

50 years of age. There are no cultural resources listed on the National Register of Historic Places within the WCDAS and the NASA WFF airfield area.

Under the No Action Alternative, NOAA/NESDIS would not construct the electrical system or facility upgrades. The proposed long-term improvements to the WCDAS infrastructure and operational functionality would not occur, and the expected benefits of modernization would not be achieved. Implementation of the proposed construction and upgrades to enhance and expand the mission capabilities of NOAA/NESDIS, reduce or eliminate WCDAS facility and infrastructure shortfalls, and optimize the functional efficiencies of the WCDAS would not be achieved, putting the facility at risk of failing to maintain its mission requirements.

Findings

Implementation of either the Proposed Action or the No Action Alternative would not result in significant environmental effects.

ABBREVIATIONS & ACRONYMS

BoA	Bojac fine sandy loam
CFR	Code of Federal Regulations
EA	Environmental Assessment
EED	electroexplosive device
EHZ	Explosives Hazard Zone
E.O.	Executive Order
EPA	Environmental Protection Agency
GOES	Geostationary Operational Environmental Satellite(s)
HERO	Hazard of Electromagnetic Radiation to Ordnance
MoD	Molena loamy sand
MSL	mean sea level
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NESDIS	National Environmental Satellite, Data, and Information Service
NOAA	National Oceanic and Atmospheric Administration
NRHP	National Register of Historic Places
POES	Polar-orbiting Operational Environmental Satellite(s)
RADHAZ	radiation hazards
RF	radio frequency
RIR	Range Instrumentation Radar
SH	State Highway
SHPO	State Historic Preservation Officer
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish & Wildlife Service
UST	underground storage tank
VAC	Virginia Administrative Code
VDEQ	Virginia Department of Environmental Quality
VDGIF	Virginia Department of Game and Inland Fisheries
VDHR	Virginia Department of Historic Resources
VSMP	Virginia Stormwater Management Program
WCDAS	Wallops Command and Data Acquisition Station
WFF	Wallops Flight Facility

1.0 INTRODUCTION

The National Environmental Satellite, Data, and Information Service (NESDIS) is part of the National Oceanic and Atmospheric Administration (NOAA) of the United States (U.S.) Department of Commerce. NOAA/NESDIS operates Geostationary Operational Environmental Satellites (GOES) and Polar-orbiting Operational Environmental Satellites (POES), which collect information on atmospheric, oceanic, and terrestrial environmental conditions. Data from these satellites are distributed to many government, industry, and private organizations. These organizations use the data to prepare short-term and long-range meteorological forecasts, monitor important environmental parameters, provide information critical to aviation and maritime safety, aid search-and-rescue missions, and assist in national defense and security. Examples of information collected by NOAA/NESDIS satellites include tracking the movement of storms, volcanic ash, and icebergs; measuring cloud cover; measuring temperature profiles in the atmosphere and the temperature of ocean surfaces; collecting infrared and visual information; and measuring atmospheric ozone levels.

The NOAA/NESDIS Wallops Command and Data Acquisition Station (WCDAS) is a tenant on the National Aeronautics and Space Administration (NASA) Wallops Flight Facility (WFF) 2,230-acre Main Base. The 29-acre WCDAS was developed in 1965 on land leased from NASA Wallops Station (Figure 1) and became operational in January 1966. With the launch of the GOES-1 satellite in 1975, the WCDAS became an integral part of NOAA satellite operations, providing innovative operational and system modifications that enhanced and ensured continuous and reliable data throughput (NOAA, 2004). The WCDAS currently supports operation of the following satellites: GOES I-M, POES, Geosynchronous Meteorology Satellite (METEOSAT) Number 7, METEOSAT Second Generation, and Advance Composition Explorer. The WCDAS provides a critical radio communication link, which sends control messages to those satellites and downloads data collected by the satellites.

NOAA/NESDIS proposes capital improvements at the WCDAS that would enhance and expand mission capabilities of NOAA/NESDIS, reduce or eliminate WCDAS facility and electrical infrastructure shortfalls, and optimize the functional efficiencies by providing additional antenna infrastructure, additional operational space, and redundancy of critical electrical, communication, and mechanical infrastructure.

This Environmental Assessment (EA) identifies potential changes in the natural and human environments that could result from the proposed site-wide electrical-system and facility upgrades. This EA complies with federal legal requirements for implementing the National Environmental Policy Act of 1969 set forth in Title 40 Code of Federal Regulations (CFR) Parts 1500–1508 and NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act. Based on the findings of this EA, NOAA will issue a Finding of No Significant Impact.

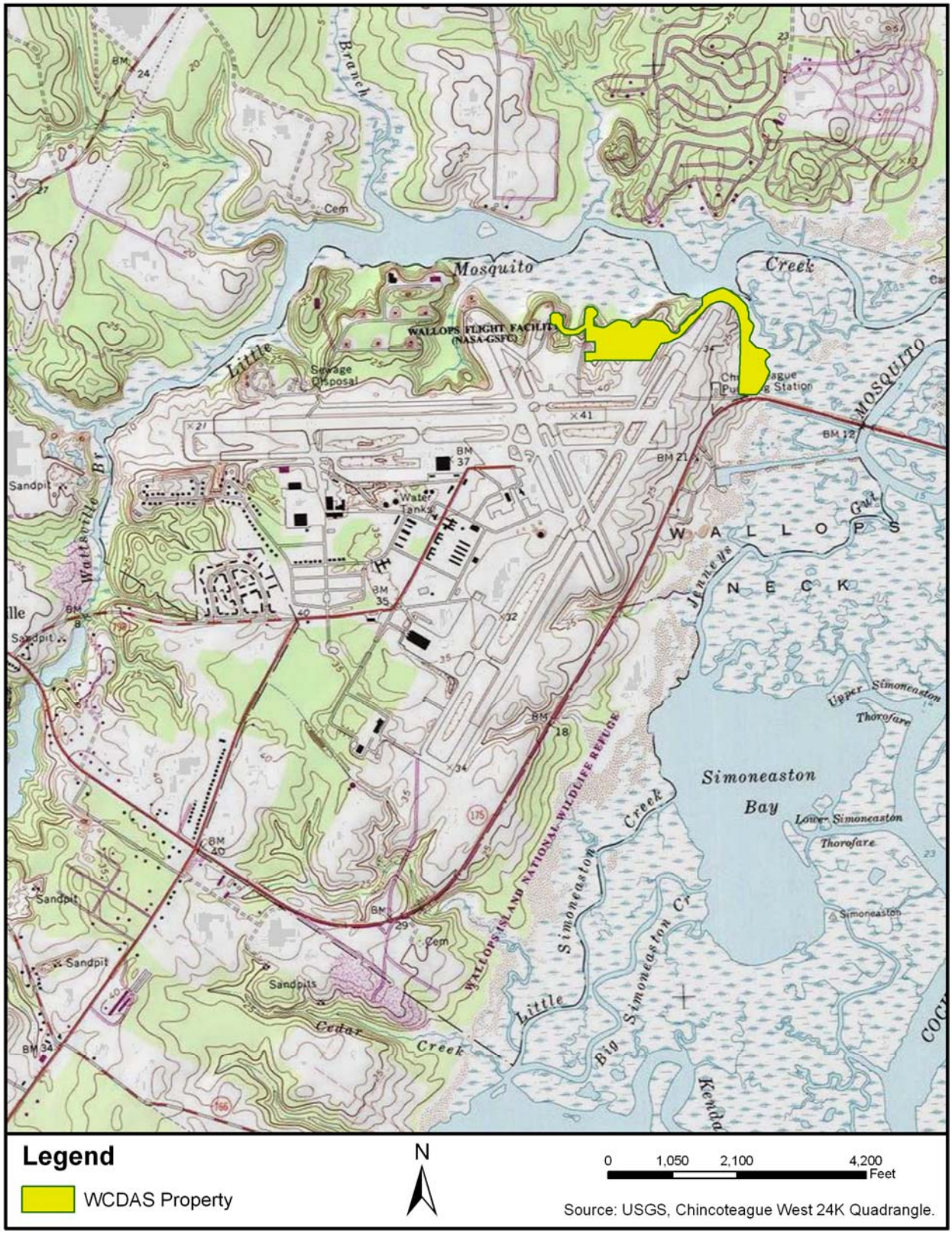

Figure 1 NOAA/NESDIS WCDAS Site Location Map—1:250,000 Scale

2.0 PURPOSE AND NEED

The NOAA/NESDIS WCDAS serves important communication and control missions for the GOES and POES programs and supports scientific activities undertaken by U.S. scientific organizations. In this role, the WCDAS transmits radio messages containing operational instructions for the satellites and receives data on atmospheric, oceanic, and geophysical conditions throughout the world, which are collected by the satellites. It is expected that the WCDAS will also support other satellite systems in the future and will continue to be a focal point for NOAA satellite operations (NOAA, 2004).

NOAA/NESDIS conducted a comprehensive planning effort of the 29-acre WCDAS to assess the long-term potential for continued operation and future development of the WCDAS, which included preparation of a Facility Master Plan and electrical and mechanical system studies (NOAA, 2008, and Virginia A&E, 2008). In these studies, the WCDAS is envisioned as a modern, well-constructed facility that employs state-of-the-art technology in support of the vital NOAA/NESDIS data-acquisition mission.

3.0 PROPOSED ACTION AND ALTERNATIVES

3.1 Proposed Action

3.1.1 Overview of Proposed Improvements

The Proposed Action would be initiated during the summer of 2011 and is expected to be completed by fall 2013. NOAA/NESDIS proposes to implement the following WCDAS site-wide improvements:

- New electrical power/communication ductbank and cabling to serve antenna sites
- Construction and operation of three Geostationary Operational Environmental Satellite (GOES) antennas
- Construction of a new Powerhouse Building
- Construction of a building addition onto either the northeast, southeast, south, or northwest sides of the Operations Building to accommodate GOES equipment
- Road realignment and relocation of utilities and ductbanks
- Upgrades to the electrical distribution system within the Operations Building
- Renovation of the mechanical systems within the existing Utility Building

An existing 60-foot (ft) x 6-ft antenna pad with antennas currently occupies a portion of the proposed Powerhouse Building location. The pad and antennas would be relocated to the southwest of their current location to accommodate the Powerhouse Building and the building's asphalt-paved driveway.

Figure 2 illustrates the locations affected by the Proposed Action. The Proposed Action activities would occur within developed areas of the WCDAS and NASA WFF that the WFF authorized for NOAA/NESDIS use (Personal communication to Stephen Howard, NOAA NESDIS WCDAS], May 19, 2011). Approximate quantities of construction related actions include:

- 6,600 linear feet (lf) of new electric ductbank and 5,200-lf of new communications ductbank, with cross section dimensions of:
  - 1.5 ft x 5ft
  - 2ft x 5ft
  - 7ft x 5ft
  - 7ft x 6ft
- 44,700 square feet of additional impervious surface resulting from:
  - 6,700-sf for the Operations Building and associated construction
  - 13,000-sf for the Powerhouse Building and associated construction
  - 25,000-sf for the GOES antenna Sites 3, 5, and 7 and associated construction

- 1,105-lf of new waterlines
- Electric main routing:
  - Option 1: 3,000-lf of directional drilling, 2,800-sf of trenching/ground disturbance
  - Option 2: 20,000-sf of trenching/ground disturbance
- 950-lf of new security fence
- 50-lf of new sewer line

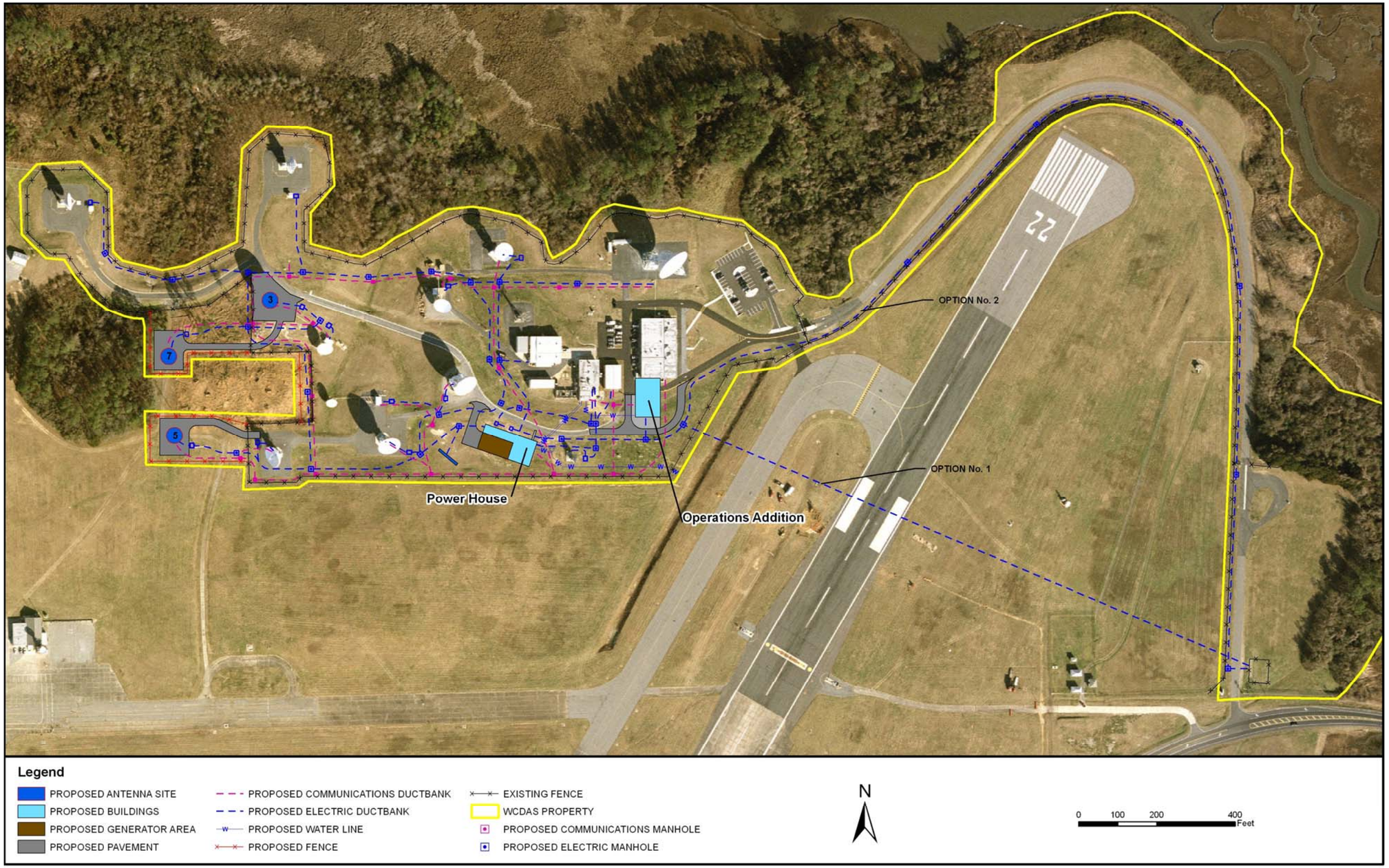

Figure 2 Proposed Action Map

3.1.1.1 New Electrical Power and Communications Ductbank on the Antenna Field

Approximately 6,500-lf of new, low-voltage, electrical-power ductbank and 5,100-lf of communication ductbank would be installed between the new Powerhouse Building, Operations Building, Utility Building, and the antennas on the WCDAS antenna field. The underground ductbank would consist of various configurations of 4-in and 5-in polyvinyl chloride (PVC) conduit encased within concrete with cross section dimensions ranging from 1.5 ft x 5ft to 7ft x 6ft. They would be installed a minimum of 24-in below finished grade, unless existing utilities are encountered and require a change in design.

3.1.1.2 GOES Antenna Installations

Three candidate antenna sites, identified as Site 3, Site 5, and Site 7, have been identified on the western portion of the WCDAS for the proposed installation of three GOES antennas. One of the proposed GOES antennas would replace the existing 18-m GOES "B" antenna at the GOES "B" antenna location. The two other GOES antenna sites would be built on previously disturbed NASA WFF land, adjacent to the WCDAS, which NASA WFF has authorized for NOAA/NESDIS use (Personal communication to Stephen Howard, NOAA NESDIS WCDAS], May 19, 2011). A new, asphalt-paved site-access road would be extended from Site 3 to Site 7. An additional asphalt-paved site-access road would be extended from the HR2 antenna to Site 5. Approximately 950-lf of new security fence would be extended from the existing WCDAS perimeter fence to enclose Sites 5 and 7 within the WCDAS antenna field. Each of the proposed antenna sites would tie in to the electrical and communication ductbank that traverses the antenna field. Each of the proposed GOES antennas would have a dish diameter of 16.4 m and a maximum structural height of 70.2 ft. Approximately 25,000-sf of new impervious surface would be developed for the combined GOES antenna installations and associated construction.

3.1.1.3 New Powerhouse Building

A new one-story, 8,800+ sq-ft Powerhouse Building would be constructed to house four 1,250–kilovolt-ampere (kVA) diesel-fueled engine generators, Uninterruptable Power Supply systems, and electrical distribution switchgear. The engine generators would be located exterior to the building and would be mounted on equipment pads. Each engine generator would have diesel fuel-storage belly tank, plumbed together with one another. Construction of the Powerhouse Building would include a paved parking area adjacent to the building. An existing 60-ft x 6-ft antenna pad with antennas currently occupies a portion of the proposed Powerhouse Building location. The pad and antennas would be relocated to the southwest of their current location to accommodate the Powerhouse Building and the building's asphalt-paved driveway. Approximately 13,000-sf of new impervious surface would be developed for the Powerhouse Building and associated construction.

A new 1.5-in x 589-lf potable water line would be extended from a new hydrant installed adjacent to the proposed Powerhouse Building to provide potable water to the Powerhouse Building. Approximately 160- lf of chilled water piping would be extended from the Utility Building to the Powerhouse Building.

A new 4-in x 50-lf sanitary sewer line would be installed to connect the Powerhouse Building to the existing on-site sanitary sewer utility.

3.1.1.4 Operations Building Addition

A new 6,200+ sq-ft addition would be constructed on to the Operations Building to house additional GOES equipment racks, and electrical, fire-suppression, and mechanical systems for the building addition.

Four options were considered for construction of the Operations Building addition:

- *Alternative 1.* Building addition to the east-southeast edge of the Operations Building
- *Alternative 2.* Building addition to the south end of the Operations Building
- *Alternative 3.* Building addition to the west-northwest edge of the Operations Building
- *Alternative 4.* Building addition to the east-northeast edge of the Operations Building

NOAA/NESDIS conducted an alternatives analysis of the four building addition location alternatives to determine which alternative best met design, operation, environmental, cost, and schedule criteria. Each alternative was ranked from highest to lowest in its suitability to meet each of the above criteria. The findings from the alternatives analysis are presented in the table below.

WCDAS Operations Building Addition Alternatives Analysis Findings			
Alternative	**Primary Advantages**	**Primary Disadvantages**	**Rank**
1 – East-southeast edge of Operations Building	• Best meets environmental criteria – no environmental impacts • Meets operations criteria – close proximity to GOES operations floor • Meets cost criteria • Meets schedule criteria	• Design criteria - proximity to NASA WFF Runway 4-22 requires that first floor be partially underground	3
2- South end of Operations Building	• Best meets design criteria – best location to meet architectural, structural, civil, electrical and mechanical elements • Best meets operations criteria - close proximity to GOES operations floor • Best meets cost criteria • Best meets schedule criteria • Meets environmental criteria	• None	1
3 – West-northwest edge of Operations Building	• Meets environmental criteria • Meets cost criteria • Meets schedule criteria	• Design criteria – would reduce parking spaces and traffic circulation around Operations Building • Operations criteria – too far from GOES operations floor	2
4 – East-northeast edge of Operations Building	• Meets design criteria	• Operations criteria – lowest ranking; too far from GOES operations floor • Environmental criteria – lowest ranking; overlies area of prehistoric sensitivity • Cost criteria - lowest ranking • Schedule criteria - lowest ranking	4

Alternative 2, construction of the building addition to the south end of the Operations Building, was selected as the preferred alternative since it best met the design, operation, cost, and schedule criteria. A 500-sf loading dock would be added on to the south end of the Operations Building addition.

3.1.1.5 Road Realignment and Relocation of Utilities and

The roadway and underground utilities located south of the Operations Building would be realigned around the proposed Operations Building addition to maintain vehicle access and utility service continuity throughout the site. After completion of the roadway construction, demolition of existing roadway would be performed.

Approximately 356-lf of new 8-in–diameter water main would be extended from the existing 10-in–diameter water main located outside of the WCDAS fence line along the eastern property line to a hydrant located near the proposed Powerhouse Building. The new water main would provide a connection point for the fire-suppression line of the Powerhouse Building.

A new electrical primary feed would be installed between the electrical substation located at the WCDAS entrance and the new Powerhouse Building. Two options are proposed for installation of the new electrical feed:

- *Option 1.* Approximately 3,000-lf of directional drilling would occur from the electrical substation located at the WCDAS entrance, directly between the substation and southeast portion of the station, beneath NASA WFF Runway 4-22. Then trenching and ductbank installation would occur over to the proposed Powerhouse Building location. Directional drilling would disturb approximately 1,000-sf of ground surface and trenching an additional 1,800-sf of ground surface during installation of the primary feed.

- *Option 2.* Trenching and ductbank installation would occur from the electrical substation located at the WCDAS entrance, along the edge of the WCDAS entrance road, and along the southeast portion of the station to the proposed Powerhouse Building location. Trenching would disturb approximately 20,000-sf of ground surface during installation of the primary feed.

The underground ductbank would contain various configurations of 4-in and 5-in PVC conduit encased within concrete with cross section dimensions ranging from 1.5 ft x 5ft to 7ft x 6ft. They would be installed a minimum of 24-in below finished grade, unless existing utilities are encountered and require a change in design.

Approximately 100-lf of electric and communications utilities within new ductbank would be installed between the new Powerhouse Building and Operations Building addition to provide electric, telephone, and data connections between the buildings.

3.1.1.6 Operations Building Electrical Distribution System Upgrades

The existing technical and utility power systems within the Operations Building would be replaced. The pad-mounted transformers located south of the Operations Building would be permanently removed and new electric service from the new Powerhouse Building would serve the Operations Building and

building addition. No civil work would be required for the infrastructure upgrades to the Operations Building.

3.1.1.7 Utility Building Renovations

Existing electrical-power and distribution equipment would be removed from the Utility Building. All new main electrical-power distribution equipment would be located within the new Powerhouse Building. Two existing cooling towers within the Utility Building would be replaced. A new water chiller, pumps, and associated piping and electrical work that support building mechanical, power, and lighting systems would be upgraded within the Utility Building.

3.2 No Action Alternative

Under the No Action Alternative, NOAA/NESDIS would not make the proposed capital improvements to the WCDAS. The proposed long-term upgrades to the WCDAS electrical systems and facilities would not occur, and the expected benefits of modernization would not be achieved. The ability of NOAA/NESDIS to fulfill the objectives identified in the WCDAS Facility Master Plan would be compromised, and the benefits of enhancing and expanding the mission capabilities of NOAA/NESDIS, eliminating WCDAS facility and infrastructure shortfalls, and optimizing the functional efficiencies of the WCDAS would not be achieved.

4.0 AFFECTED ENVIRONMENT AND CONSEQUENCES

4.1 Land Use

4.1.1 Existing Environment

The 29-acre WCDAS is located on the northeast portion of the NASA WFF 2,230-acre Main Base in Accomack County, Virginia. The NASA WFF Main Base is zoned for industrial use by Accomack County, Virginia. The proposed facility improvements analyzed in this EA would occur entirely on the existing federal lands administered by NOAA and NASA.

Accomack County is located on the eastern shore of Virginia, bounded by the Chesapeake Bay on the west and the Atlantic Ocean on the east. Accomack County main industries are farming, fishing, construction, manufacturing, government services, and tourism. Land uses in the vicinity of the WCDAS and NASA WFF include rural agricultural and residential development. State Highway (SH) 175 provides access to the WCDAS and NASA WFF from its western terminus at SH 13. Chincoteague is a coastal community located approximately 5 miles east of the WCDAS and NASA WFF, across Chincoteague Bay. Little Mosquito Creek borders the WCDAS and NASA WFF Main Base to the north and west. Extensive tidal marshlands border the margins of Little Mosquito Creek and Chincoteague Bay.

4.1.2 Environmental Consequences—Proposed Action

There would be no impact to land use or zoning of surrounding properties. No change in the nature or type of activities conducted at the NASA WFF and WCDAS would result, and no significant impacts to existing or planned uses of the properties would result.

4.1.3 Mitigation

No mitigation would be required.

4.2 Noise

4.2.1 Existing Environment

The WCDAS is adjacent to the active airfield at NASA WFF. Noise sources associated with the WCDAS and NASA WFF include aircraft traffic and vehicular traffic on the NASA WFF and vehicular traffic on the WCDAS roads and SH 175. Noise generated by movement of antennas at the WCDAS and operation of heating and air-conditioning equipment adds intermittent, minor increases to the aircraft and vehicular noise.

There are no noise-sensitive receptors, such as residences, schools, or hospitals, located within the WCDAS or the NASA WFF area affected by the Proposed Action. The nearest noise-sensitive receptors in the vicinity of the WCDAS are residential homes located approximately 2,000 ft north of the WCDAS.

4.2.2 Environmental Consequences—Proposed Action

Construction of the proposed ductbanks, Powerhouse Building, Operations Building addition, GOES antennas, and roadways would require use of heavy machinery and equipment (e.g., cranes, excavators, forklifts, compressors, and haul trucks). Use of that machinery would generate intermittent loud noises typical of those at construction sites. The loudest noises would result from use of excavator equipment that would generate noise of up to 98 A-weighted decibels at 50 ft (Bolt, Beranek, and Newman, 1971). Those noises would occur intermittently at the construction sites. Construction activities would occur primarily during normal working hours. Because of the lack of sensitive receptors nearby, construction-noise impacts upon the environment would be insignificant.

Vehicular traffic noise would temporarily increase with the addition of construction vehicles on the WCDAS and SH 175 during construction activities but would not be expected to significantly affect overall traffic-noise levels. After construction activities are completed, noise levels will return to current levels. Implementation of the Proposed Action would result in temporary insignificant impacts to the local noise environment. No long-term increase in noise levels at the WCDAS or NASA WFF would result.

4.2.3 Mitigation

No mitigation would be required.

4.3 Transportation

4.3.1 Existing Environment

SH 175 provides access to the WCDAS and NASA WFF from its western terminus at SH 13 and continues on to the western edge of the town of Chincoteague. The asphalt-paved two-lane WCDAS entrance road runs north from SH 175 to the WCDAS, terminating at the Operations Building parking area. Single-lane paved roadways continue from the parking area to the remainder of the WCDAS facility. The entrance road from SH 175 has no other outlet. Access onto the WCDAS facility is controlled by a guarded security gate, which prevents unauthorized vehicles and persons from entering the WCDAS. Traffic on the access road is limited to WCDAS employees and deliveries.

The Virginia Department of Transportation conducts average daily traffic counts on SH 175 (Virginia Department of Transportation, 2009). Between 6,600 and 7,900 vehicle trips per day are made by vehicles traveling both directions on SH 175. The spring and summer months are expected to yield a higher number of trips, since the primary tourism season for the Town of Chincoteague runs from April through September.

4.3.2 Environmental Consequences—Proposed Action

No changes to the SH 175 roadway would result from implementation of the Proposed Action.

The Proposed Action includes the realignment of the roadway located south of the Operations Building, which would accommodate construction of the building addition. After completion of the new roadway, the existing roadway adjacent to the south end of the Operations Building would be demolished. New antenna-site access roads would be extended from the existing antenna-field road to proposed GOES antenna Sites 5 and 7.

During the construction period, supply trucks, construction vehicles, and workers' vehicles would use SH 175, the WCDAS entrance road, and the WCDAS antenna-field roads to access the project construction areas. The amount of construction-related traffic would vary on any given day during implementation of the infrastructure improvements. Up to several dozen trips per day are anticipated during this period for commute vehicles used by construction workers, construction vehicles, and trucks delivering supplies and equipment. Vehicle trips resulting from construction would not significantly affect traffic levels on SH 175.

Implementation of the Proposed Action would result in short-term insignificant impacts to local and WCDAS traffic patterns. There would be no change to the number of workers employed at the WCDAS; therefore, there would be no long-term impacts to traffic generation on SH 175 or the WCDAS roadways. No adverse effects on the operation of local roads would result.

4.3.3 Mitigation

No mitigation would be required.

4.4 Socioeconomic Impacts and Environmental Justice

Under Executive Order (E.O.) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, federal agencies must identify and address, as appropriate, disproportionately high and adverse environmental or human-health effects on minority populations and low-income populations. Minority communities and low-income communities must also have access to public information on matters related to human health and the environment (E.O. 12898, 1994).

4.4.1 Existing Environment

The WCDAS is located in Census Tract 9902, which covers about 111 square miles or 8 percent of the Accomack County total land area of 1,310 square miles.

Based on the available census data, Accomack County has a population of 38,305. The census tract containing the WCDAS contains 8,801 people, equivalent to 23 percent of the total population of Accomack County. Approximately 36.6 percent of the population of Accomack County is minorities, with 41.2 percent of the minority population living in Census Tract 9902. The rate of unemployment is 6.7 percent, which is below Accomack County's unemployment rate of 7.5 percent. The average per

capita income for people within Census Tract 9902 is $12,761, which is roughly 22 percent less than the average per capita income in Accomack County as a whole. However, 16.4 percent of the population is in poverty as compared to 18 percent in the county as a whole. Overall, the census tract containing the WCDAS has a slightly higher percentage of minorities, lower unemployment, lower per capita income, and a lower percentage of people living in poverty than those of Accomack County as a whole (U.S. Census Bureau, 2000).

4.4.2 Environmental Consequences—Proposed Action

Implementation of the Proposed Action would generate a series of stimuli for the local economy because of construction-related expenditures for equipment, materials, supplies, and so on, as well as potential employment of workers by the construction contractors. This short-term effect would be beneficial and these stimuli would continue over a period of two years. Indirect economic benefits would also occur because of the multiplier effect, as construction-generated revenues are spent by suppliers and workers. Construction expenditures by NOAA/NESDIS would represent far less than 1 percent of the annual domestic product of Accomack County. Thus, the effect of the economic stimulus would be insignificant.

After construction is complete, NOAA/NESDIS would operate and maintain the improved and new facilities. The number of persons employed by NOAA/NESDIS in the Accomack County area would not directly increase. In the long-term, the improvement of the WCDAS facilities would not result in direct economic impacts. Indirectly, the improved quality of facilities of the WCDAS would improve its ability to attract new programs and missions and to retain and expand existing functions. Economic growth induced by continued operation of the WCDAS, even at a higher activity level, would not be significant when compared with the overall economy of the Accomack County area.

Implementation of the Proposed Action would occur in an area with a slightly higher percentage of minority populations, a lower percentage of persons living in poverty, and a lower percentage of unemployed persons. The per capita income of the area is slightly less than that of Accomack County as a whole. Construction of the proposed infrastructure improvements would not result in the dislocation of persons or businesses. Minority or low-income populations of the area and the population as a whole will not be subjected to adverse or disproportionately high numbers of environmental effects.

4.4.3 Mitigation

No mitigation would be required.

4.5 Air Quality

Under the Clean Air Act of 1970, the Environmental Protection Agency (EPA) promulgated primary and secondary National Ambient Air Quality Standards (NAAQS) for six “criteria” pollutants: particulate matter, nitrogen oxides, sulfur dioxides, lead, ozone, and carbon monoxide. Following this legislation, the Clean Air Act Amendments of 1990 identified certain areas of the country as being in nonattainment of the NAAQS. Individual states are then required to submit for federal approval a State Implementation Plan, or SIP. The SIP specifies actions designed to bring nonattainment areas into conformity with federal

air-quality standards. The Virginia Department of Environmental Quality (VDEQ), Division of Air Quality, is responsible for implementing the mandates of the Virginia Air Pollution Control Law, as well as meeting Virginia's federal obligations under the Clean Air Act of 1970. Virginia's federally approved SIP is overseen by the VDEQ Division of Air Quality. Applicable state regulations for the Control and Abatement of Air Pollution are outlined in 9 Virginia Administrative Code (VAC) 5-80. Accomack County is in attainment with NAAQS for all criteria pollutants (NOAA, 2008).

4.5.1 Existing Environment

The WCDAS currently operates three 750-kVA diesel-fueled engine generators during loss of primary electrical power and testing and after any necessary repairs. The combustion of the diesel fuel generates air emissions. These emissions are temporary and are not a major stationary source of air pollutants. The three generators are registered with the VDEQ and are exempt from permitting requirements of 9VAC5-80-6 (VDEQ, 2011).

4.5.2 Environmental Consequences—Proposed Action

4.5.2.1 Construction Activities

Implementation of the Proposed Action would involve the utilization of mechanized equipment that burns fossil fuels and releases exhaust emissions into the air. Additionally, construction would require soil excavation for building foundations, ductbank trenches, and roadbeds. These soil excavations would expose soils to wind erosion, potentially generating moderate amounts of dust. Dust could also be generated during placement and removal of surcharge materials and final site-grading.

Construction activities would be temporary and would not be a major stationary source of air emissions from burning of fossil fuels, soil erosion, or dust. It would not result in emissions that would require a federal consistency determination.

4.5.2.2 WCDAS Back-up Engine Generators

The four 1,250 kVa, standby diesel-engine generators would operate during loss of primary electrical power, when tested, and briefly after any necessary repairs. With the addition of a diesel-engine generator and an increase in the size of the generators, there would be a minor increase in air emissions generated from combustion of fossil fuels during periods of operation. The overall air emissions would be temporary and would not be considered a significant stationary source of air pollutants.

When the existing engine generators are replaced, the WCDAS must register the four new generators with the VDEQ per 9 VAC 5-20-120, thereby notifying VDEQ of the change in generator usage. The registration would include the expected emissions levels of the new generators. After the four new generators are registered with the VDEQ, the VDEQ will notify the WCDAS if a permit is required per 9 VAC 5-80-6 to operate the generators.

4.5.3 Mitigation

To minimize the amount of dust generated during construction, exposed areas of soil would be periodically sprayed with water, as warranted. Additionally, spilled or tracked dirt would be promptly removed from paved surfaces.

Preliminary design specifications require that the proposed diesel-engine–generator exhaust emissions meet EPA Tier-4 standards and all other federal, state, and local regulations.

4.6 Geology and Soils

4.6.1 Existing Environment

The WCDAS is located in the Atlantic Coastal Plain physiographic province. The area underlying NASA WFF consists of a thin sequence of marine sediments overlying a much thicker sequence of Cretaceous- to Quaternary-age (144 million years ago to the present) continental sediment deposits. These 7,000-ft-thick sediment layers consist of unconsolidated clay, silt, sand, and gravel. Crystalline bedrock underlies these sediments.

The proposed buildings, ductbank, antennas, and roadway locations overlay Bojac fine sandy loam (BoA) and Molena loamy sand (MoD) (National Resources Conservation Service, 2010). BoA soil is classified as nearly level, very deep, well-drained soil. MoD soil is classified as very deep and somewhat excessively drained. Neither of these soil units is considered hydric soil. Depth to groundwater is reported to be greater than 6 ft below grade in both soil units. Neither of these soil units is considered a source of important mineral resources. There are no mineral-extraction activities at either the NASA WFF or WCDAS properties.

4.6.2 Environmental Consequences—Proposed Action

Implementation of the Proposed Action would disturb approximately 7 acres of ground, including removal of approximately 5,000 sq ft of asphalt roadway south of the Operations Building and the placement of approximately 10,000 sq ft of asphalt roadway for the realigned roadway. Installation of the electrical primary feed-line via the trenching option along the WCDAS entrance road would disturb an additional 0.5 acre of ground. If the directional drilling option beneath NASA WFF Runway 4-22 were selected, approximately 2,800-sf of additional ground would be disturbed as compared to the 0.5 acre of ground disturbance associated with the trenching option. Approximately 1 acre of ground would be covered with new, impervious surface associated with the new Powerhouse Building, Operations Building, and roadway. The majority of the remaining disturbed ground surface would be backfilled over the top of the newly installed utilities, but a small volume of surplus soil would need to be removed from the site by the contractor. Erosion-control measures would be implemented to prevent significant soil erosion.

NASA requires that an excavation permit be obtained from the NASA Facilities Management Branch prior to any excavation activities and requires sediment- and erosion-control measures for ground disturbances.

Implementation of the Proposed Action would not affect access to mineral resources. Effects on geologic conditions, soils, and mineral resources would be insignificant.

4.6.3 Mitigation

To minimize the potential of soil washing into nearby storm-water drainages, erosion- and sediment-control measures would be implemented in accordance with the Virginia Stormwater Management Law and regulations and the Virginia Erosion and Sediment Control Law. Those measures would include placement of temporary silt fences or hay bales at the edge of the areas of disturbance to retain soil.

4.7 Drainage and Water Quality

The Virginia Department of Conservation and Recreation manages the Virginia Stormwater Management Program (VSMP) and determines permitting requirements for discharge of storm water from construction sites. Construction projects that would disturb more than 1 acre of land (based on the totality of the common development plan) and have the potential to discharge storm water require coverage under the VSMP General Permit for Discharges of Stormwater for Construction Activities (Virginia Department of Conservation and Recreation, 2010).

The VDEQ, Water Division, Office of Spill Response and Remediation manages the registration of aboveground storage tanks (AST). The VDEQ's *Facility and Aboveground Storage Tank (AST) Regulation* (9 VAC 25-91-10 et seq.) requires that operators of a facility with ASTs having storage capacity greater than 660 gallons of oil, or with an aggregate storage capacity greater than 1,320 gallons of oil, register the facility or ASTs with the VDEQ within 30 days after the ASTs are brought into use.

4.7.1 Existing Environment

The topography of the WCDAS and NASA WFF is characterized as gently undulating, with elevations ranging from sea level along Little Mosquito Creek to approximately 37 ft above mean sea level (MSL) at proposed GOES antenna Site 7 and approximately 41 ft above MSL at the eastern end of Runway 10-28. Storm-water drainage on both the WCDAS and NASA WFF follows natural drainage swales and man-made storm-water drainage structures. WCDAS drainage flow is to the north into Little Mosquito Creek. NASA WFF drainage is predominantly to the north and west, into Little Mosquito Creek.

4.7.2 Environmental Consequences—Proposed Action

Approximately 7 acres of ground would be disturbed for the Proposed Action, including approximately 1 acre of ground that would be covered with new, impervious surfaces associated with the new Powerhouse Building, Operations Building, and roadway. The remaining 6 acres of disturbed ground would be backfilled, graded, and seeded to allow proper drainage across the station.

The construction contractor would obtain a VSMP General Permit for Discharges of Stormwater for Construction Activities prior to the start of construction and would be responsible for preparing erosion and sediment controls and storm-water management plans in compliance with the VSMP to manage erosion, sedimentation, and storm-water runoff at the WCDAS during construction. Construction activities would be monitored to ensure strict adherence to erosion- and sediment-control parameters, as well as storm-water management practices and compliance with VSMP regulations. There would be a short-term insignificant impact to drainage and water quality during construction, but there should be no long-term impact resulting from the Proposed Action.

The new Power House's four 1,250–kVA diesel-fueled engine generators would each have a sub-base fuel-oil aboveground storage tank. The four ASTs would be plumbed together with an aggregate AST capacity of a minimum of 7,200gallons. The WCDAS would register the ASTs with the VDEQ per 9 VAC 25-91-10 et seq. within 30 days after the ASTs are brought into use.

4.7.3 Mitigation

To minimize the potential for soil erosion and sedimentation, standard erosion- and sedimentation-control measures and best management practices need to be developed for all areas of soil disturbance (i.e., areas cleared of vegetation and pavement). Those measures could include, but are not limited to, placement of temporary silt fences or hay bales at the boundaries of cleared areas to retain soil, periodic spraying of water on bare soil to reduce dust entrainment, and prompt planting or hydro seeding of bare areas after construction is complete to establish vegetative cover.

Construction activity should be monitored to ensure strict adherence to erosion- and sediment-control measures, as well as storm-water management practices and compliance with the VSMP.

4.8 Cultural Resources

Section 106 of the National Historic Preservation Act requires federal agencies to consult with the State Historic Preservation Officer (SHPO) prior to taking actions that may affect cultural resources. NASA completed a cultural resources assessment of the NASA WFF in November 2003 (NASA, 2003). Areas of moderate sensitivity for historic archaeological sites and high sensitivity for prehistoric archaeological sites are located on the northern and eastern margins of the WCDAS and NASA WFF.

4.8.1 Existing Environment

The NASA WFF Main Base was owned by the Wallop family in 1664. During World War II, the U.S. Navy acquired the property and established the Chincoteague Naval Auxiliary Air Station. NASA acquired the property in 1959.

The original WCDAS facility was developed in 1965 on 10 acres of land that had previously been used as a golf course on what is now NASA-WFF. None of the existing structures at the WCDAS are older than 50 years of age.

There are no cultural resources listed on the National Register of Historic Places (NRHP) within the proposed project area. Portions of the proposed duct-bank installation and GOES-antenna installations involve ground disturbance within areas previously determined by NASA WFF to possess moderate-to-high archaeological sensitivity (Figures 3a and 3b).

4.8.2 Environmental Consequences—Proposed Action

On behalf of NOAA/NESDIS, Versar, Inc (Versar) conducted the following three Phase-I archaeological surveys of the areas of the proposed duct-bank and GOES-antenna sites that lie within areas of moderate-to-high archaeological sensitivity, referred to as the Area of Potential Effect:

1. Phase-I archaeological survey of areas of proposed duct-bank installation on the north-central portion of the WCDAS, final report completed in December 2009 (Versar, 2009)
2. Phase-I archaeological survey of areas of the proposed GOES-antenna sites, final report completed in September 2010 (Versar, 2010)
3. Phase-I archaeological survey of areas of proposed duct-bank installation on the northwest and eastern portions of the WCDAS, final report completed in March 2011 (Versar, 2011)

The purpose of the surveys was to determine the presence or absence of archaeological resources within the Area of Potential Effect and to provide preliminary recommendations for NRHP eligibility. The Phase-I archaeological surveys consisted of a pedestrian survey and systematic subsurface testing within the Area of Potential Effect. No archaeological sites were identified as a result of the surveys, and no further archaeological surveys of the proposed project area were recommended.

Versar submitted Project Review Applications for the three surveys to the Virginia Department of Historic Resources (VDHR), outlining the findings of the final Phase-I archaeological survey reports and requesting the VDHR's concurrence with their determination that no historic properties would be adversely affected by the Proposed Action. In letters dated December 15, 2009, August 25, 2010, and March 23, 2011, the VDHR responded with their concurrence of the findings of the final Phase-I archaeological survey reports (VDHR, 2009, VDHR, 2010, and VDHR, 2011).

No additional Phase-I archaeological surveys are required for the Proposed Action, as all of the areas that have been identified as possessing moderate-to-high archaeological sensitivity in the NASA WFF cultural resources assessment have been surveyed. No effects on historic properties are expected to result from implementation of the Proposed Action.

4.8.3 Mitigation

If potentially significant artifacts are uncovered during construction activities, activities that could harm the find will be suspended, and the NASA WFF SHPO and Facility Historic Preservation Officer (FHPO) will be notified to assess the significance of the find.

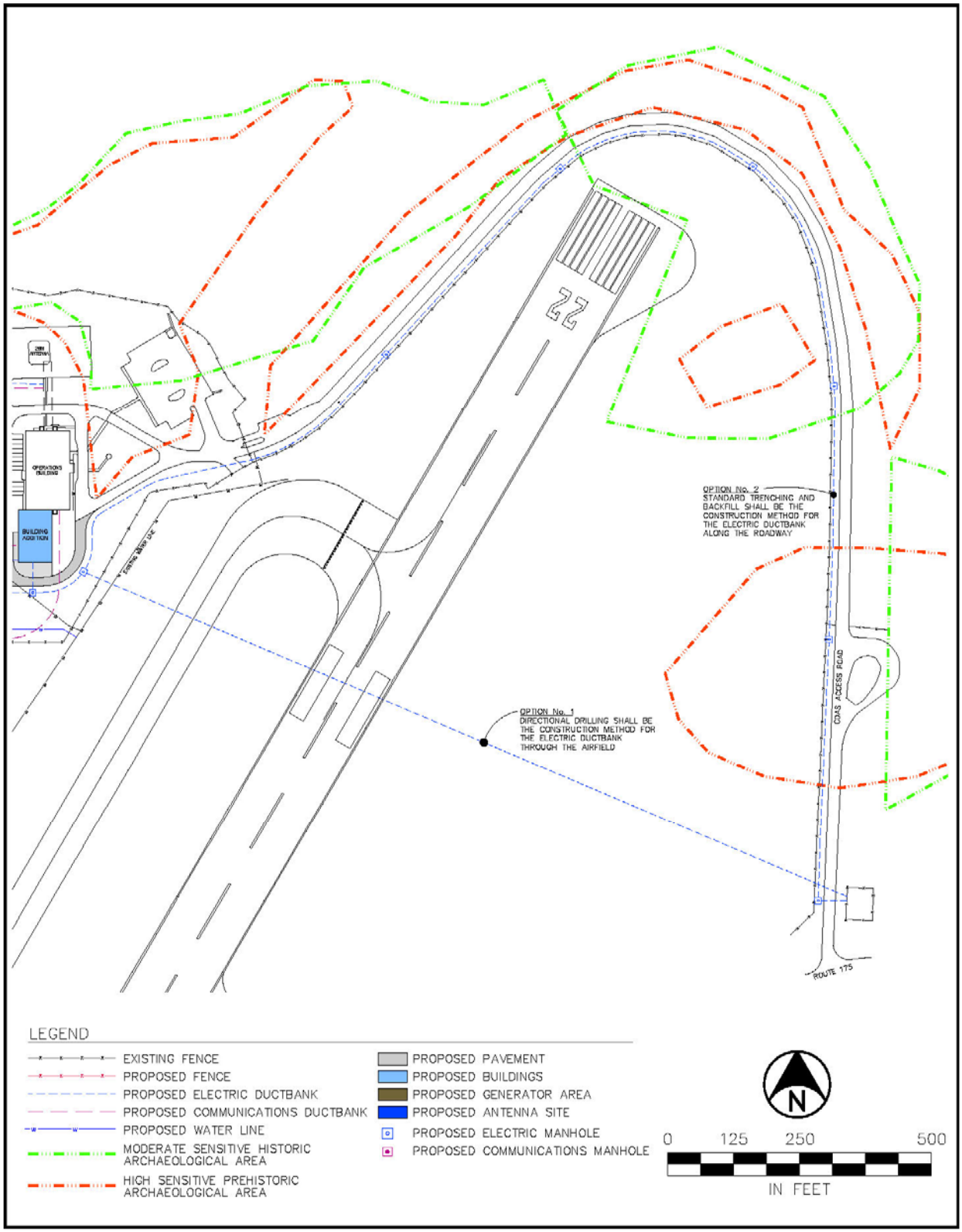

Figure 3a WCDAS Historic Sensitivity Map – East

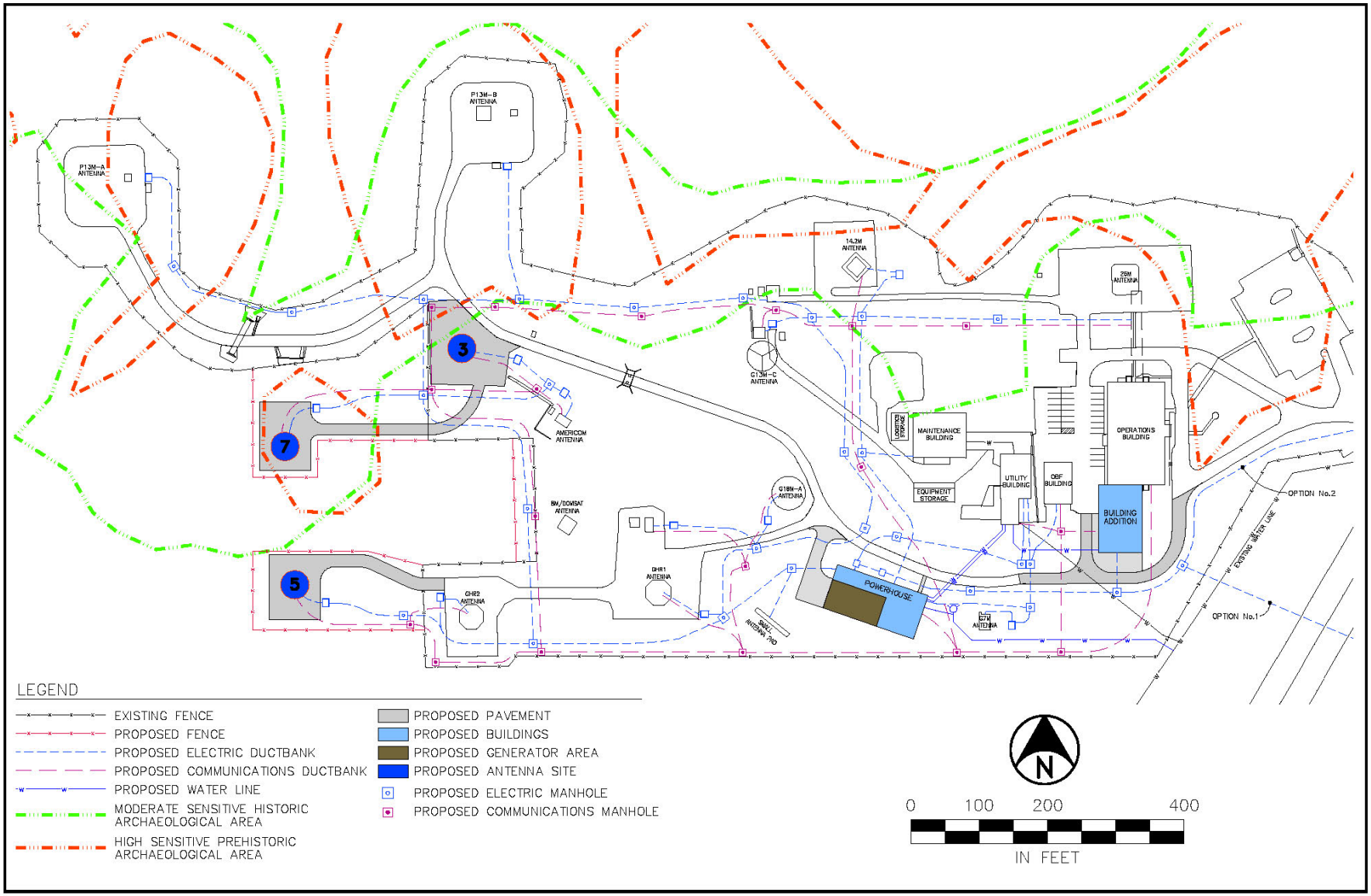

Figure 3b WCDAS Historic Sensitivity Map – West

4.9 Endangered and Threatened Species

Section 7 of the Endangered Species Act, as amended (U.S. Code 1531–1544), requires that federal agencies evaluate the effects of their Proposed Actions on protected plant and animal species and their habitats and take appropriate measures to conserve and protect these species. Special-status species are defined as plants and animals that are listed as sensitive, threatened, or endangered by the U.S. Fish & Wildlife Service (USFWS), as well as those that are candidates or proposed for listing as threatened or endangered. The Virginia Endangered Species Act (29 VAC 29.1-563–570) is administered by the Virginia Department of Game and Inland Fisheries (VDGIF) and prohibits the taking of any state- or federally listed threatened or endangered species.

4.9.1 Existing Environment

The WCDAS and NASA WFF are bounded on the east by Chincoteague Bay and its bordering marshlands and creeks, on the north and east by Little Mosquito Creek and associated tidal marshes, and on the south and southeast by SH 175.

The following federally and state-listed threatened and endangered species may occur in the vicinity of the NASA WFF, predominantly along the beaches and undisturbed forested areas on Wallops Island, located more than 4 miles southeast of the WCDAS (NASA, 2010):

Reptiles:

- threatened Loggerhead Sea Turtle (*Caretta caretta*); *F, S
- threatened Atlantic Green Sea Turtle (*Chelonia mydas*); F, S
- endangered Leatherback Sea Turtle (*Dermochelys coriaces*); F, S
- endangered Hawksbill Sea Turtle (*Eretmochelys imbricate*); F, S
- endangered Kemp’s Ridley Sea Turtle (*Lepidochelys kempi*); F, S

Birds:

- threatened Piping Plover (*Charadrius melodus*); F
- candidate Red Knot (*Calidris canutus*); F
- endangered Wilson’s Plover (*Charadrius wilsonia*); S
- threatened Henslow’s Sparrow (*Ammodramus henslowii);* S
- threatened Bald Eagle (*Haliaeetus leucocphalus*); S
- threatened Gull-billed Tern (*Sterna nilotica*); S
- threatened Upland Sandpiper (*Bartramia longicauda*); S
- threatened Peregrine Falcon (*Falcons peregrinus*); S
- threatened Loggerhead Shrike (*Lanius ludovicianus*); S

- threatened Migrant Loggerhead Shrike (*Lanius ludovicianus migrans*); S

Mammals:

- endangered Delmarva fox squirrel (*Sciurus niger cinereus*); F, S
- endangered Rafinesque's eastern bigeared bat (*Corynorhinus rafinesquii macrotis*); S

Invertebrates:

- threatened northeast beach tiger beetle (*Cicindela dorsalis*); F, S

Plants:

- threatened seabeach amaranth (*Amaranthus pumilus*); F, S

*F = Federally listed; S = State listed

The WCDAS is not within the known ranges of federally listed endangered and threatened species. The Proposed Action areas include paved roadways, mowed grass fields within the WCDAS antenna field, and a portion of the NASA WFF Runway 4-22 taxiway and runway. All of the Proposed Action areas are located in developed areas that are subject to periodic mowing. Appropriate habitat for federally and state-listed species is not present on the WCDAS.

4.9.2 Environmental Consequences—Proposed Action

The Proposed Action areas consist of existing paved parking areas, roadways, and mowed-grass areas adjacent to existing development. Implementation of the Proposed Action would not affect habitat for any of the listed species or species of concern identified by the USFWS and VDGIF. No effects on biological resources are expected to result from execution of the Proposed Action.

4.9.3 Mitigation

No mitigation would be required.

4.10 Wetlands

E.O. 11990, *Protection of Wetlands,* requires that federal agencies avoid locating facilities in wetlands unless no alternative locations are available (E.O. 11990, 1977b). Under Section 404 of the Clean Water Act, USACE is responsible for delineating federal jurisdictional wetlands and issuing permits for construction in wetlands. USACE defines federal jurisdictional wetlands as areas with a suitable hydrology regime and hydric soils that support (or could support) hydrophilic vegetation.

4.10.1 Existing Environment

The Proposed Action areas include paved roadways, upland areas within the WCDAS antenna field, and a portion of the NASA WFF Runway 4-22 taxiway and runway. According to the USFWS National Wetlands Inventory map for this area, wetlands are present along the margins of Little Mosquito Creek.

The margins of Little Mosquito Creek include areas of estuarine intertidal, palustrine forested, and palustrine scrub-shrub wetlands (Figure 4). No federal jurisdictional wetlands are present within the Proposed Action areas. Jurisdictional wetlands are present outside of the WCDAS fence line and off of the WCDAS property, approximately 150 ft north of the proposed duct-bank installation area that would traverse the north-central portion of the WCDAS.

Field reconnaissance of the Proposed Action areas did not yield signs of wetland hydrology (i.e., standing water, water-stained leaves, drift lines, or scour marks) or the presence of hydrophytic vegetation.

4.10.2 Environmental Consequences—Proposed Action

The absence of wetland hydrology and hydrophytic vegetation, combined with the absence of mapped wetland areas overlying the WCDAS, indicate that it is highly unlikely that wetlands are present in the Proposed Action areas and that a formal wetland delineation is not warranted.

No construction would occur in wetlands, and no direct effects on wetlands would occur as a result of implementation of the Proposed Action. There would be no impact to wetlands, and the Proposed Action would be consistent with E.O. 11990.

4.10.3 Mitigation

To minimize the potential for sedimentation of the off-site wetland area during construction, standard erosion- and sedimentation-control measures should be implemented at all areas of soil disturbance. Those measures could include placement of temporary silt fences or hay bales at the boundaries of cleared areas to retain soil, periodic spraying of water on bare soil to reduce dust entrainment, and prompt planting or hydroseeding of bare areas after construction is complete to establish vegetative cover. Construction activities should be monitored to ensure that erosion- and sediment-control parameters and storm-water management practices are adequately preventing sediment and pollutant migration into surface waters, including wetlands.

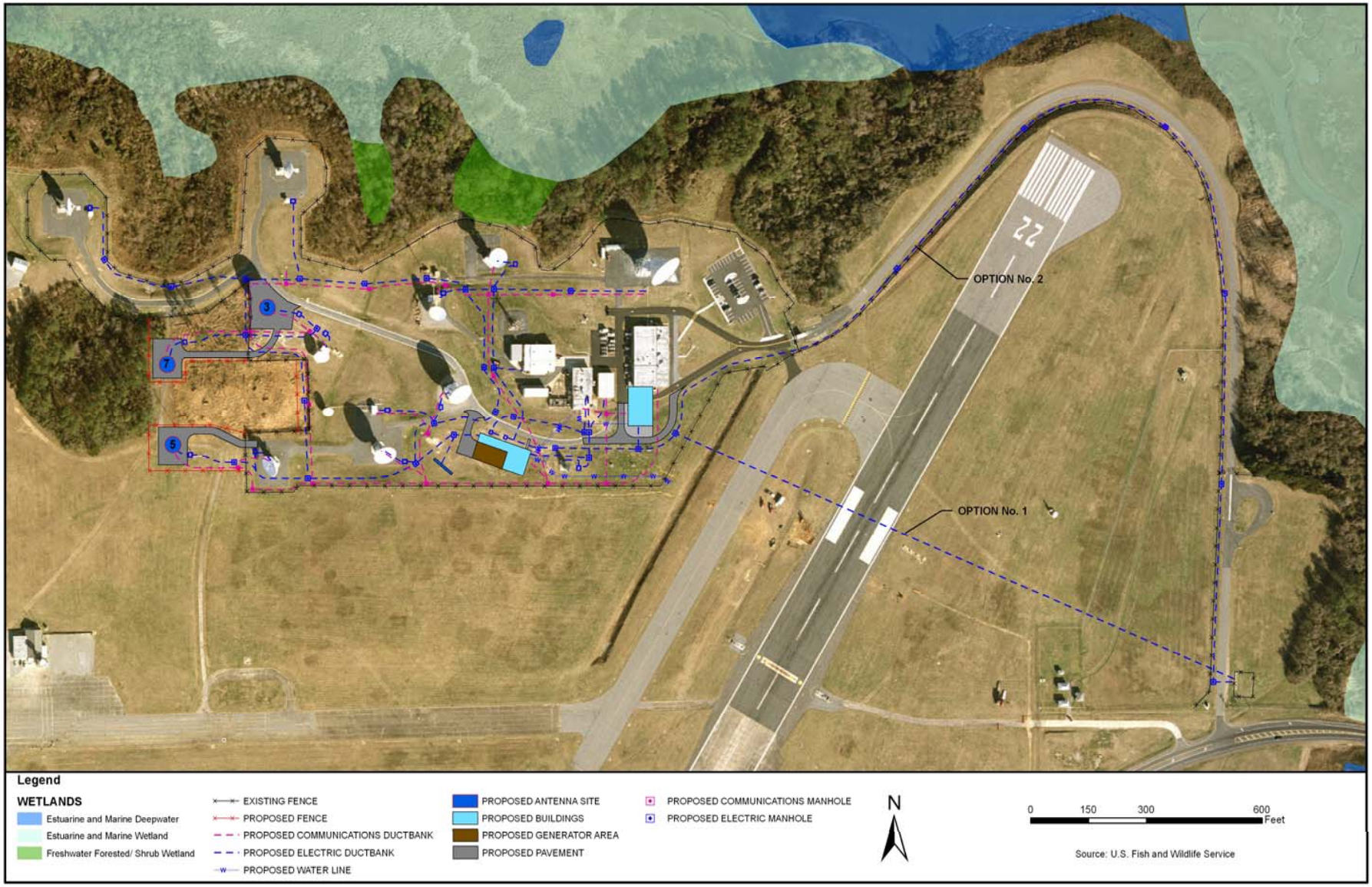

Figure 4 WCDAS Wetlands Map

4.11 Floodplains

E.O. 11988, *Floodplain Management*, requires that federal agencies avoid to the extent possible the long and short- term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative (E.O. 11988, 1977a).

4.11.1 Existing Environment

According to the Federal Emergency Management Agency, the majority of the Proposed Action areas are located in Flood Zone X. Flood Zone X covers areas of minimal flood hazards above the 500-year flood level (Figure 5). Approximately 300 ft of proposed ductbank between the POES A and POES B antennas on the northwest portion of the antenna field lies within Flood Zone AE. Flood Zone AE has a base elevation of 9 ft above sea level in this area.

4.11.2 Environmental Consequences—Proposed Action

The Proposed Action would be executed within areas of well-drained soils and is not subject to flood hazards, except for a short segment of proposed ductbank on the northwest portion of the antenna field. Periodic flooding across the proposed ductbank on the northwest portion of the antenna field could occur, but flooding would not be increased as the ductbank would be buried and the overlying ground would be graded to its original contours. There would be no impact to floodplains from implementation of the Proposed Action, and it would be consistent with policies set forth in E.O. 11988.

4.11.3 Mitigation

No mitigation would be required.

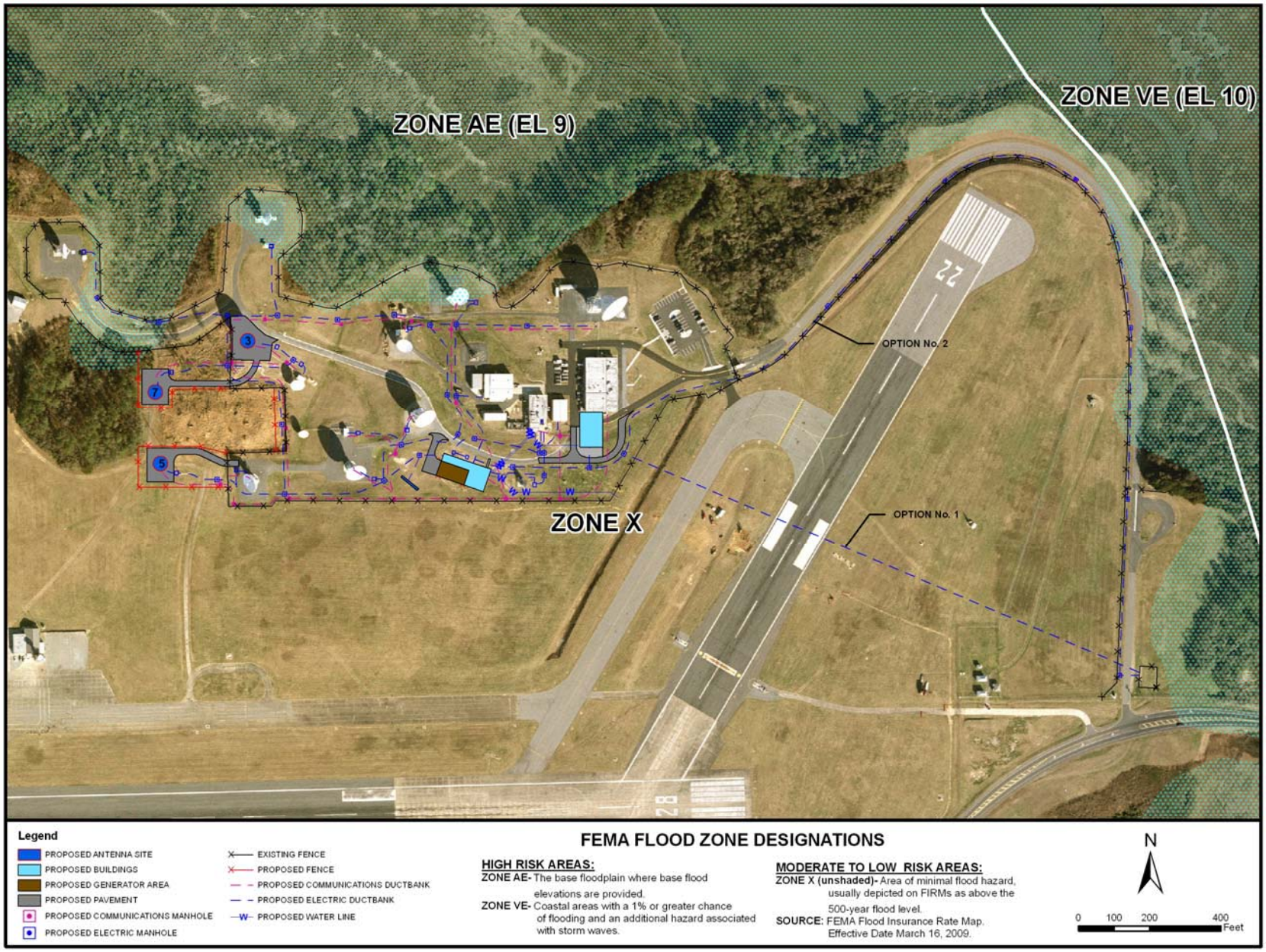

Figure 5 WCDAS Floodplain Map

4.12 Coastal Zone Management

The Coastal Zone Management Act of 1972 requires the protection of coastal natural resources and the management of coastal development.

4.12.1 Existing Environment

Virginia's coastal resources include Little Mosquito Creek and tidal shorelines located along the northern margin of the WCDAS. VDEQ is the lead agency for the Virginia Coastal Zone Management Program, which is authorized by NOAA to administer the Coastal Zone Management Act. Virginia's Coastal Zone Management Program is a network of state agencies and local governments that administers laws, regulations, and policies that protect and manage the following coastal resources:

- Tidal and nontidal wetlands
- Fisheries
- Subaqueous lands
- Dunes and beaches
- Point-source air pollution
- Point-source water pollution
- Nonpoint-source water pollution
- Shoreline sanitation
- Coastal lands

Although federal lands are excluded from Virginia's coastal management zone, activities on federal lands that have reasonably foreseeable coastal effects must be consistent with Virginia's Coastal Zone Management Program.

4.12.2 Environmental Consequences—Proposed Action

The Proposed Action would be executed within Virginia's coastal zone, as designated by Virginia's Coastal Management Zone Program. The Proposed Action would disturb approximately 7 acres of ground in upland areas within the WCDAS and the NASA WFF airfield. Implementation of the Proposed Action would be fully consistent with the Virginia Coastal Resources Management Program, as follows:

- Tidal and nontidal wetlands—No wetlands would be impacted. Erosion- and sedimentation-control measures would be implemented to prevent the sedimentation of wetland areas adjacent to the WCDAS and NASA WFF.
- Fisheries—All project activities would occur on upland areas, and no fisheries would be impacted.
- Subaqueous lands—All project activities would occur on upland areas, and no subaqueous areas would be impacted.

- Dunes and beaches—All project activities would occur on developed areas of the WCDAS and NASA WFF, and no dunes or beaches would be impacted.
- Point-source air pollution—Implementation of the Proposed Action would result in temporary, minor sources of air emissions. Operation of the standby engine generators would result in minor, temporary increases in air emissions but would not be a major stationary source of air pollutants nor violate federal or Virginia air-quality standards.
- Point-source water pollution—The project would not involve new point-source discharges into Virginia waters.
- Nonpoint-source water pollution—Erosion- and sedimentation-control measures would be implemented to prevent the airborne and waterborne sedimentation of adjacent lands and wetland areas along Little Mosquito Creek.
- Shoreline sanitation—The Proposed Action does not include installation of septic systems.
- Coastal lands—The Proposed Action would be executed on lands that lie outside of the area administered by the Chesapeake Bay Local Assistance Program.

4.12.3 Mitigation

The construction contractor should prepare an erosion- and sedimentation-control plan and a storm-water management plan to ensure best management practices and compliance with VSMP regulations. To minimize the potential for soil erosion and sedimentation, standard erosion- and sedimentation-control measures should be implemented at all areas of soil disturbance. Construction activity should be monitored to ensure strict adherence to erosion- and sediment-control parameters, as well as storm-water management practices and compliance with the VSMP.

4.13 Wild and Scenic Rivers

The National Wild and Scenic Rivers Act aims to preserve and protect aesthetic and recreational values of designated free-flowing rivers. The Virginia Scenic Rivers Act aims to preserve and protect state-designated rivers for their natural beauty and recreational, geologic, and cultural attributes.

4.13.1 Existing Environment

There are no designated wild and scenic rivers or portions of those rivers in Virginia. The nearest designated wild and scenic river to the WCDAS is White Clay Creek, located approximately 125 miles to the north-northwest of the WCDAS in northern Delaware (National Park Service, 2011).

The state-designated rivers nearest to the WCDAS are the Chickahominy State Scenic River, located approximately 102 miles to the west-southwest, and James River State Scenic River, located approximately 107 miles to the southwest (Virginia Department of Conservation and Recreation, 2007).

At these distances from the Proposed Action site, no effects would occur on federally or state-designated scenic rivers.

4.13.2 Environmental Consequences—Proposed Action

No direct or indirect effects on wild or scenic rivers would occur as a result of implementation of the Proposed Action.

4.13.3 Mitigation

No mitigation would be required.

4.14 Farmlands

The Farmland Protection Policy Act (FPPA) of 1980 and 1995, 7 U.S.C. 4202, requires federal agencies to use criteria to identify and take into account the adverse effects of their programs on the preservation of farmland, consider alternative actions that could lessen adverse effects, and ensure that their programs, to the extent practicable, are compatible with state and units of local government and private programs and policies to protect farmland.

4.14.1 Existing Environment

The Proposed Action would affect facilities that have been established and used as government scientific facilities for the past 60 years. Neither the WCDAS nor the NASA WFF has been utilized for agricultural purposes during this time.

The areas affected by the Proposed Action would extend across BoA and MoD soils within the WCDAS and NASA WFF. BoA soil is classified as a prime farmland soil (National Resources Conservation Service, 2010); however, BoA soil affected by the Proposed Action is in an urban, developed area. Because of this, BoA soil in this situation is not considered prime farmland, farmland of state or local importance, or unique farmland.

4.14.2 Environmental Consequences—Proposed Action

Implementation of the Proposed Action would have no effect on agricultural production. No land would be removed from existing agricultural use. No impacts to farmlands would result.

4.14.3 Mitigation

No mitigation would be required.

4.15 Solid and Hazardous Waste and Regulated Materials

4.15.1 Existing Environment

Nonhazardous solid wastes are removed from the WCDAS facility and NASA WFF by a private collection contractor and disposed of off-site at an approved landfill. There are no solid-waste disposal areas on either the WCDAS or NASA WFF.

The NOAA/NESDIS WCDAS is a Conditionally Exempt Small Quantity Generator (CESQ), EPA ID No. VAR000518803. Hazardous wastes generated on the WCDAS are separated from nonhazardous wastes, and treated in accordance with the WCDAS Integrated Contingency Plan. Hazardous materials used at the WCDAS include lubricants, paints, and diesel fuel. The WCDAS tracks hazardous-waste manifests and certificates of disposal for all hazardous wastes, which are disposed of off-site.

Proposed GOES antenna Site 7 is adjacent to the northwest corner of the Formerly Utilized Defense Site that contains two 600,000-gallon JP-4 jet-fuel USTs that have been closed in place. In 1999 and 2006, USACE conducted soil and groundwater contaminant-characterization studies of the contents of the USTs and the surrounding vicinity. Results of the study were that petroleum-contaminated soil and groundwater were present predominantly to the north of the USTs and that low levels of petroleum contaminants were present in the groundwater to the northwest of the USTs (USACE, 1999 and 2006).

In June 2006, the VDEQ determined that the contamination levels at the UST site did not warrant further corrective action and issued a “Case Closure” letter. In September 2007, NASA permanently closed the two USTs in place by dewatering and cleaning the tanks and filling them with grout (USACE, 2007).

Concern about lead-contaminated soil at proposed GOES antenna Site 5 and Site 7, discussed in the previously published *Categorical Exclusion for Proposed Installation and Operation of Three GOES Antennas at the Wallops Command and Data Acquisition Station*, has been resolved. NASA WFF’s recent laboratory analyses of soil samples obtained from Site 5 and Site 7 found that lead contaminant levels in the soil are similar to background concentration ranges and the soil is not considered hazardous waste with respect to lead, as validated by the Virginia DEQ and U.S. Environmental Protection Agency, Region 3 (Personal communication with Stephen Howard [NOAA NESDIS WCDAS], April 11, 2011).

4.15.2 Environmental Consequences—Proposed Action

Implementation of the Proposed Action would generate wastes typical of building construction and utility installations, such as plastic and metal pipe scrap, electrical wire and piping, cleaners, shipping crates, and so on. All solid wastes generated from project activities would be reduced at the source, reused, or recycled. Some wastes, such as chemicals used to clean or degrease equipment, and waste engine and equipment fluids drained from equipment that would be removed from the Utility Building as part of the Proposed Action, may be considered hazardous. Generation of all hazardous waste materials would be minimized, and these materials would be separated from nonhazardous wastes for proper disposal. All solid waste, hazardous waste, and hazardous materials would be managed in accordance with all applicable federal, state, NASA WFF, and WCDAS environmental regulations and practices.

Asphalt pavement would be removed from the roadway located south of the Operations Building to allow construction of the building addition. Asphalt would be removed from the WCDAS by the construction contractor. If proper practices were used for the handling and disposal of construction waste, no significant impact to the environment would result. Provided that hazardous wastes are properly identified and separated for off-site disposal, no significant impacts would result.

If groundwater with evidence of petroleum contamination (e.g., hydrocarbon odor, hydrocarbon sheen) were encountered during excavation at Site 7, work would stop, and the NASA WFF Environmental Office would be contacted for direction on how to proceed. Additionally, prior to continuation of work at the site, NOAA/WCDAS staff and the construction contractor should prepare a Health and Safety Plan for their staff in conformance with Occupational Safety and Health Administration Regulations 29 CFR 1910.120 and 29 CFR 1926.65.

With employees using proper handling methods there would be no significant impact from the generation of waste materials during implementation of the Proposed Action or operation of the new facilities.

4.15.3 Mitigation

Waste materials generated during implementation of the Proposed Action would be separated into nonhazardous wastes and hazardous wastes for proper disposal. All solid waste, hazardous waste, and hazardous materials should be managed in accordance with all applicable federal, state, NASA WFF, and WCDAS environmental regulations and practices.

4.16 Radio-Frequency Spectrum

4.16.1 Existing Environment

The three proposed GOES antennas are radio-frequency (RF) transmit-and-receive systems and have the potential to interfere with RF operations of other antennas and RF systems on the NASA WFF and WCDAS, as well as introduce radiation hazards (RADHAZ) to personnel, fuel, and ordnance on the NASA WFF and WCDAS.

4.16.1.1 NASA WFF Explosive Hazard Zones

In January 2005, NASA WFF completed a Site-Wide EA that addressed RF radiation hazards on the WFF (URS, 2005). NASA WFF identified an Explosives Hazard Zone (EHZ) around two magazine storage areas located on the northern portion of the NASA WFF. The EHZ arcs of the magazine storage areas extend approximately 2,300 ft from each area. Candidate GOES antenna Sites 5 and 7 are located within the EHZs.

4.16.1.2 NASA WFF C-Band Range Instrument Radar

NASA WFF operates a C-band Range Instrumentation Radar (RIR) that provides precision tracking for airborne research programs operating at the WFF. The RIR is located at the NASA WFF Aeronautical Research Radar Complex, Building A-41. NASA WFF identified an RF quiet zone around the RIR to

protect it from possible RF interference by restricting the use of radio-transmitting devices, such as radios or cellular phones, within the quiet zone. WCDAS candidate antenna Sites 5 and 7 are located within the RF quiet zone.

4.16.2 Environmental Consequences—Proposed Action

4.16.2.1 NASA WFF EHZs

The NASA WFF Safety Office was contacted to determine the potential hazards of operating a GOES antenna within the EHZ. The Safety Office confirmed that operating the proposed GOES antennas at any of the candidate sites would not impact munitions within the EHZ (Personal communication with Glen Liebig of the WFF Safety Office; September 14, 2009).

4.16.2.2 NASA WFF C-Band RIR

An analysis of the potential for interference between the proposed GOES antennas at candidate Sites 5 and 7 and the RIR at NASA WFF was performed (Alion, 2008 and 2009). Site 5 is located approximately 650 ft northeast of the RIR, and Site 7 is located approximately 800 ft north-northeast of the RIR. The GOES transmissions would be below the RIR's waveguide cutoff frequency and would not propagate down the waveguide or impact the RIR receiver. A borderline potential for interference to the RIR receiver would be possible during the worst-case analysis conditions. These conditions would occur with the mainbeam gain of the RIR antenna, plus the maximum authorized GOES-transmitter power level of 400 W, as compared to the normal transmitter operating level of 10-20 W, plus the highest possible off-axis gains of the GOES antenna in the direction of the RIR. If the RIR-antenna mainbeam does not point directly at the GOES antenna, then the likelihood of interference is extremely remote. No interference to the GOES receivers is predicted from the RIR, even for worst-case coupling conditions.

4.16.2.3 RADHAZ

The separation distances for RADHAZ protection to fuels, personnel, and ordnance in the vicinity of the proposed GOES antennas was assessed (Alion, 2008 and 2009).

4.16.2.3.1 Hazard of Electromagnetic Radiation to Personnel, or HERP

The potential for the proposed GOES antennas to cause harmful effects to humans was assessed by using standards for maximum permissible exposure of personnel to RF energy from the American National Standards Institute, or ANSI; the Institute of Electrical and Electronics Engineers, or IEEE; and the Federal Communications Commission, or FCC. HERP calculations indicate that it is unlikely that ground-level exposure of personnel to RF energy from the proposed GOES-antenna transmitters will exceed established ANSI/IEEE and FCC thresholds during normal operations. Personnel working in elevated situations, such as those encountered while performing antenna maintenance, could be exposed to harmful levels of RF energy from the mainbeam of a GOES antenna when it is transmitting at above-normal transmitter power.

4.16.2.3.2 Hazard of Electromagnetic Radiation to Fuel, or HERF

The potential for the proposed GOES antennas to create sparks of sufficient magnitude to ignite flammable mixtures was assessed. Operation of the proposed GOES antennas at normal power levels at any of the three candidate sites is not expected to present an electromagnetic RADHAZ to fuels.

4.16.2.3.3 Hazard of Electromagnetic Radiation to Ordnance, or HERO

The potential for the proposed GOES antennas to induce currents of enough magnitude to initiate electroexplosive devices (EEDs) of weapon systems was assessed. For ordnance present on aircraft, required separation distances were calculated by using Air Force standards for ordnance installed onboard aircraft. U.S. Navy standards were calculated for susceptible ordnance. Required separation distances from NOAA antennas range from 6 m to more than 2.5 km. HERO calculations indicate that exposure of ordnance or EEDs to RF energy from GOES transmitters could exceed established thresholds under specific conditions. Since the GOES antennas will be pointed toward the geostationary arc, only ordnance/EEDs on aircraft flying through the mainbeam would generally have the potential to be affected. For Air Force EEDs that are properly installed onboard aircraft, the required safe separation distances would be 0.5 m or less. For Navy ordnance classified as susceptible, the required safe separation distance at maximum-rated transmitter power (1,000 W) for the CMD command uplink is 901 m.

The composite addition of the RF energy fields from the simultaneous operation of the GOES antennas and other antennas at WCDAS is negligible because of the lateral separation distances between each antenna and the very narrow antenna beamwidths. The mainbeams of the antennas will not illuminate the same region in space, and contributions from off-axis emissions of the antennas at the given points in space are negligible. On the ground, the off-axis contributions from the laterally separated antennas are small and add negligibly to the composite fields from any antenna of concern.

4.16.3 Mitigation

To avoid exposing personnel, fuel, or ordnance to harmful levels of RF energy from the GOES antennas, the required separation distances in the Table should be implemented. Distances given in the unshaded cells are based on RADHAZ criteria that correspond to the conditions expected during normal operations of the GOES ground facility. Specifically, it is assumed that any ordnance or EED will be properly installed and that maximum-rated power for the GOES transmitter is not used. The distances in the shaded cells are based on more restrictive HERO criteria that assume that the ordnance or EED has not been properly installed and may be in a damaged or partially disassembled condition or in storage or transit. These separation distances are greater because the ordnance or EED in these conditions has a greater susceptibility to RF energy. The distance values for the maximum-rated GOES transmitter power levels are also shaded in the Table, because it is not expected that maximum power levels will be used during normal operations.

Coordination with the NASA WFF airfield office is required whenever normal GOES-antenna power levels are expected to be exceeded. Similarly, procedures are recommended for the NASA WFF to notify the WCDAS when unsafe or unreliable ordnance is present.

Table. Proposed GOES-Antennas RADHAZ-Protection Separation Distances

				Hazard Category→	Personnel (c95.1-2005)	Fuel	EED Installed or onboard aircraft (AF)	Susceptible Ordnance (Navy)	Exposed EED (AF)	EED In Storage or Transport (AF) (non-metal container)	UnSafe Ordnance (Navy)
Link	**Frequency (Mhz)**	**Power (W)**	**Antenna Gain (dBi)**	**Main beam or On the Ground**	**(meters)**	**(meters)**	**(meters)**	**(meters)**	**(meters)**	**(meters)**	**(meters)**
EMWIN/HRIT	2027.4	13	49.5	Main beam	0	0	0	0	0	0	0
EMWIN/HRIT	2027.4	13	49.5	Horizontal	0	0	0	0	0	0	0
DCPC	2032.8	8	49.5	Main beam	0	0	0	0	0	0	0
DCPC	2032.8	8	49.5	Horizontal	0	0	0	0	0	0	0
DSN (Normal)	2036	50	49.5	Main beam	0	0	0	0	0	0	785
DSN (Normal)	2036	50	49.5	Horizontal	0	0	0	0	0	0	5
CMD (Normal)	2034.2	50	49.5	Main beam	0	0	0	0	0	0	788
CMD (Normal)	2034.2	50	49.5	Horizontal	0	0	0	0	0	0	5
DSN (Max Power)	2036	1000	49.5	Main beam	701	0	0	901	0	0	4062
DSN (Max Power)	2036	1000	49.5	Horizontal	5	0	0	6	0	0	21
CMD (Max Power)	2034.2	1000	49.5	Main beam	704	0	0	903	0	0	4066
CMD (Max Power)	2034.2	1000	49.5	Horizontal	5	0	0	6	0	0	21
GRB	7220	400	59.0	Main beam	0	0	0	0	0	0	0
GRB	7220	400	59.0	Horizontal	0	0	0	0	0	0	0
Not expeced in normal operations; Maximum certified power level									Ordnance conditions not expected		

Source: Alion report ESO-09-082, but with updates to the results that reflect an April 2010 revision in the frequency certification power levels and corresponding separation distances.

4.17 Cumulative Effects

4.17.1 Existing Environment

The environmental setting of the existing and proposed facilities is described by resource area in each previous section. NOAA/NESDIS proposes to implement capital improvements at the WCDAS to modernize and increase the efficiency and technical sophistication of its operations.

4.17.2 Environmental Consequences—Proposed Action

NOAA/NESDIS's proposed upgrades to the WCDAS described herein represent several of the capital-improvement projects that are identified in the WCDAS Facility Master Plan (NOAA, 2008). The Proposed Action, combined with future capital-improvement projects, will accomplish the following objectives at the WCDAS:

- Expand mission capabilities
- Increase infrastructure capacity and reliability and system reliance
- Meet force protection and antiterrorism security guidelines
- Modify existing security features
- Offset facility requirements
- Correct system deficiencies in existing buildings
- Renovate/modernize core mission facilities retained for long-term use
- Reconfigure and add circulation improvements and pavements
- Upgrade design amenities

These capital-improvement projects include renovation and build-out of existing facilities and development of new facilities within WCDAS and to maintain the required operations and provide for future mission assignments. These projects are divided into project phases, and NOAA/NESDIS has accomplished several of these projects at the WCDAS as funding has become available over the past few years, including: relocation of the WCDAS parking lot, construction of the Operations Building entrance vestibule, and construction of the Office of Satellite Data Processing and Distribution Critical Infrastructure Protection backup facility.

Known actions proposed over the next five years at WCDAS include:

- Construction of new facilities, office space, and workforce support space and renovation of the Operations Building for new uses. These activities constitute the Proposed Action addressed in this EA that is currently in the design process.
- Facility improvement projects that will revitalize existing buildings and involve the construction of new administrative space. These projects could be initiated through fiscal years 2011-2014.

- Completion of the renovations of the Operations Building, construction of new logistics facilities, and removal of the existing logistics facilities. These projects could be initiated through fiscal years 2015-2018.
- Removal of the transmitter buildings located on the WCDAS. Additional projects would likely be added to this phase once additional programmatic needs and investments are realized. These projects could be initiated in fiscal year 2019 and later.

As an active installation, WCDAS undergo changes in mission and training requirements in response to agency policies, current threats, and tactical and technological advances, and as such, it requires new construction, facility improvements, infrastructure upgrades, and ongoing maintenance and repairs on a continual basis. Although such known construction and upgrades are a part of the analysis contained in this section, some future requirements cannot be predicted. As those requirements surface, future NEPA analysis would be conducted, as necessary.

The potential for direct and indirect environmental effects resulting from implementation of the Proposed Action would be short-term and minor. Future actions are expected to comply with all applicable federal environmental regulations and policies. Implementation of the Proposed Action would not individually cause significant adverse effects on sensitive environment resources, would not result in significant irretrievable and irreversible impacts on natural or depletable resources such as energy resources and mineral resources used for construction materials, nor would it add to effects from other reasonably foreseeable future actions at the WCDAS to cumulatively result in significant impacts to the environment. Therefore, it is anticipated that the cumulative effects of implementation of the Proposed Action would be insignificant.

4.17.3 Mitigation

Mitigation measures included in Sections 3.1 through3.17 would reduce the level of reasonably foreseeable individual and cumulative impacts to insignificant levels. No additional measures would be required to address cumulative impacts.

5.0 NO ACTION ALTERNATIVE

Under the No Action Alternative, the proposed WCDAS infrastructure improvements would not be implemented, and no individual or cumulative adverse effects on the natural and human environments would be anticipated. However, there could be long-term adverse operational effects on the WCDAS from selection of the No Action Alternative, as the lack of improvements and modernization of the WCDAS could result in its failure to maintain its current capabilities, increase its operational and functional efficiency, and attract new programs or missions in the future.

6.0 MITIGATION

No significant environmental effects would result from implementation of the Proposed Action. The following mitigation measures are recommended by NESDIS to ensure that no significant effects on the quality of the human environment will result from implementation of the proposed actions:

- Spray exposed areas of soil with water, and promptly removing spilled or tracked dirt or other materials and dried sediments from paved surfaces.
- Implement standard erosion-control measures and best management practices at all areas of soil disturbance, such as, but not limited to, installing temporary silt fences or hay bales at the boundaries of cleared areas to retain soil and promptly planting or hydroseeding areas of exposed soil to establish vegetative cover after construction is complete.
- Require that the engine-generator exhaust emissions meet EPA Tier-4 standards and all other federal, state, and local regulations.
- Suspend construction activities that could harm potentially significant artifacts and notifying the Virginia SHPO and NASA FHPO to assess the significance of the find, if artifacts are uncovered during construction activities.
- Separate waste materials generated during construction into nonhazardous wastes and hazardous wastes for disposal in accordance with all applicable federal, state, NASA WFF, and WCDAS environmental regulations and practices.
- Maintain required separation distances between harmful levels of RF energy from the GOES antennas and personnel, fuel, and ordnance.
- Coordinate with the NASA WFF airfield office whenever normal GOES-antenna power levels are expected to be exceeded. Similarly, procedures are recommended for the NASA WFF to notify the WCDAS when unsafe or unreliable ordnance is present.

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