

Final Environmental Assessment



Construction of the Aircraft Prototype Facility at Naval Air Station, Patuxent River, Maryland

April 2007

EXECUTIVE SUMMARY

This Environmental Assessment (EA) has been prepared to address the effects of the Military Construction (MILCON) project for the Aircraft Prototype Facility at the Naval Air Station (NAS) Patuxent River, Maryland. The EA has been prepared in accordance with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA and 40 CFR Parts 1500-1508.

NEED AND PURPOSE OF THE PROPOSED ACTION

The purpose of the proposed action is to provide secure facilities to increase and improve naval aviation research, development, and test and evaluation (RDT&E) capabilities at the Naval Air Warfare Center, Air Division (NAWCAD), NAS Patuxent River, Maryland. The purpose is also to provide adequate secure facilities for collaborative science and technology (S&T) and test and evaluation (T&E), weapon system reliability and maintainability (R&M), and prototype demonstration/validation (DEM/VAL). These facilities would support classified Navy and Joint Service projects, and other activities involving unique aircraft systems, subsystems, and low observable (LO) technologies. Once completed, the proposed project would deliver advantages that are consistent with naval aviation goals to reduce costs and improve the process cycle time required to deliver mission critical combat systems to the Fleet.

The need for the action results from the lack of a secure facility of the needed size and capabilities to carry out the required testing activities of NAWCAD. Currently, the major test facilities funded and supported by Major Range and Test Facility Base (MRTFB) at NAS Patuxent River are the only facilities in the country that can provide the total RDT&E package for reduced signature (low observable) and other classified aircraft systems and subsystems. The lack of secure facilities has resulted in the deployment of program experts to other facilities and the creation of temporary remote detachments to complete assigned DEM/VAL tasks for classified programs. The deployment and creation of temporary detachments impacts program continuity, and creates unnecessary time and cost to already expensive programs. Currently, up to 14 programs and projects are impacted by these deployments annually at costs exceeding \$78 million per year.

NAS Patuxent River is home to national level experts in all competencies necessary to demonstrate, validate, and verify new aircraft design concepts, materials and technologies, and to improve the survivability of Navy and Joint Service technical aircraft and other air vehicles. No other single facility in the country can provide the total RDT&E package for reduced signature and other classified aircraft systems and subsystems. Even with the advantages offered by the MRTFB resources, a single facility to offer secure prototyping facilities with direct and immediate access to national level experts in survivability and vulnerability (S&V) and related materials technologies, and the full range of required T&E resources, capabilities, and services does not exist in the United States. The NAS Patuxent River location, which is currently home to extensive MRFTB resources, offers direct and immediate access to national level experts in survivability of required T&E resources, capabilities, and services that would be required for the proposed facility.

PROPOSED ACTION

NAS Patuxent River is proposing to construct an Aircraft Prototype Facility for carrier and rotary wing aircraft. This MILCON project would construct a secure multi-story building that has two

modified Type I hangars and a modified Type II hangar, in a three-phase process. Type I and II refer to the fire resistance rating for the building, with a Type I building not having any limits to height or square footage when the building meets code and with Type II having these limits. It would be supported by preparation bays, labs, office spaces/work areas for classified projects ranging in size from five to 40 people, and a secured video teleconference center (VTC), all incorporated together into the proposed Aircraft Prototype Facility. RDT&E activities that would be carried out in the proposed facility would include Network Centric Warfare (NCW), the Unmanned Combat Air Vehicle (UCAV), the Global War on Terrorism (GWOT), and compartmentalized and classified S&V programs. Other program requirements that would occur in the proposed facility include Multi-Spectral Operations Aircraft, airship programs, and classified NCW platforms. The facility would also support multiple classified Navy and Joint Service programs or projects at all stages of the acquisition process and life cycle. The total footprint of the proposed facility, including all three phases, would be approximately 26 acres (104,850 square meters). The following three alternatives were evaluated as a means of implementing the proposed action:

Alternative A: Construct the Aircraft Prototype Facility at Site A (Preferred Alternative)

Under Alternative A, the proposed Aircraft Prototype Facility would be constructed at NAS Patuxent River on a 26 acre (10.5 hectare) portion of an approximately 72-acre (29-hectare) site. The proposed site under Alternative A is located adjacent to, and to the south of, Taxiway A and is bounded by Switzer Road on the east, and Shaw Road on the south. This site is primarily forested and is located next to the existing South Engineering Center and the Robert N. Becker Laboratory. The majority of this site is designated as semi-improved lands in the installation's Integrated Natural Resource Management Plan (INRMP).

Alternative B: Construct the Aircraft Prototype Facility at Site B

The site being considered under Alternative B is located in the vicinity of the existing VQ-4 complex. The area to be evaluated is located to the south of Taxiway A in the vicinity of the installation garden plots and is bounded by Buck Road to the east, Buse Road to the southeast and south, Tate Road to the southwest, and Leader Road to the west. The proposed facility would require approximately 26 acres (10.5 hectares) of this site. The approximately 60-acre (25-hectare) site is currently composed of both forested and agricultural/open space uses. This site is designated as semi-improved and unimproved lands in the installation's INRMP.

No Action Alternative

Under the No Action Alternative, the proposed Aircraft Prototype Facility would not be constructed and the required testing activities would be carried out at a number of diverse locations to complete RDT&E tasks that could otherwise be carried out by the Aircraft Division personnel at NAS Patuxent River. The current shortage of secure hangar and support space for classified test programs would disperse test activities throughout many locations.

ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

Renovation/Modernization

Renovation and/or modernization of the existing facilities was considered as an alternative to constructing a new facility. This alternative was considered not to be viable because there are no available existing facilities with direct and immediate access to full airfield services, national level experts in survivability and vulnerability and related material technologies, and the full range of

required resources, capabilities, and services that could be renovated or modernized to serve the needs of NAWCAD personnel.

Construct the Aircraft Prototype Facility at Site C

Site C is located in the northern section of NAS Patuxent River just north of Runway 20. The site is bounded by Bronson Road on the north and east, Runway 20 and associated access road to the south, and Cedar Point Road to the west, and designated as semi-improved and unimproved lands by the INRMP. As set forth in the INRMP, lands designated as unimproved should be considered for development only after improved and semi-improved lands have been considered. This site is further encumbered by its designation as a clear zone, which are those areas located at the end of runways where development is prohibited and is located in known areas of hazardous waste materials. Because it is located in a designated clear zone, not consistent with the land management goals of NAS Patuxent River, and is known to contain hazardous materials, Site C was considered but not carried forward for detailed analysis.

ENVIRONMENTAL AND SOCIOECONOMIC CONSEQUENCES

The proposed action would involve the construction of the Aircraft Prototype Facility at NAS Patuxent River. Table ES-1 presents both the action alternatives and No Action Alternative and their potential impacts to the natural and human environments. In summary, the construction of the Aircraft Prototype Facility would be expected to fulfill the Navy's need for secure, consolidated RDT&E facilities. Expected impacts would include an increase in impervious surfaces, soil disturbance, increased stormwater runoff, impacts to wetlands, and increased noise during construction. These impacts would each be addressed by applying best management practices during construction and completing construction in accordance with applicable permits; therefore, the impacts would be minor, with the potential for moderate impacts to wetlands after all appropriate consultation with the U.S. Army Corps of Engineers and Maryland Department of Environment (MDE) is conducted.

Consultation was conducted with the U.S. Fish and Wildlife Service (USFWS) and the Maryland Department of Natural Resources (Md. DNR) for impacts to threatened and endangered species and impacts to the coastal zone. The USFWS identified one threatened species that is located on NAS Patuxent River property (northeastern beach tiger beetle) but this species is not found within the proposed alternative sites. The USFWS further stated that no other federally proposed or listed endangered or threatened species are known to exist within the project impact area. The MDE found that no State or Federal threatened or endangered species are known to occur with the proposed project site. NAS Patuxent River also submitted a Coastal Zone Consistency Determination to the MDE that found the project was consistent with the enforceable policies of Maryland's Coastal Zone Management Program. The MDE concurred with this determination. These correspondences can be found in Appendix A.

The cumulative impacts of the action alternatives to NAS Patuxent River or the surrounding communities would not be significant. The proposed action would not have any significant adverse effects on any environmental resources or socioeconomic conditions at NAS Patuxent River or to areas surrounding the installation.

CONCLUSION

The proposed action would not have any significant adverse effects on any environmental resources or socioeconomic conditions at NAS Patuxent River or to areas surrounding the installation. Potential moderate impacts exist from the need to fill 3.2 acres (1.3 hectares) of wetlands in the

proposed area of construction. These wetland areas cannot be avoided because construction of the facility must remain outside of adjacent clear zones associated with the airfield. If wetland areas are impacted, a Section 404 Clean Water Act permit would be obtained. Although not under the jurisdiction of the State of Maryland, NAS Patuxent River would comply with the Maryland Nontidal Wetland Protection Act of 1989 to the best of its ability, including needed permits. Alternative A is the preferred alternative because it provides the requirements for the proposed facility with the smallest impact to environmental resources and human health and safety. Although Alternative A would impact wetland areas, the impacts related to land use and human health and safety would be less than those under Alternative B.

TABLE ES-1: SUMMARY OF IMPACTS

Resource Areas	Alternative A: Construct the Aircraft Prototype Facility at Site A (Preferred Alternative)	Alternative B: Construct the Aircraft Prototype Facility at Site B	No Action Alternative
Water Resources	Site contains five wetland habitats encompassing 3.8 acres (1.5 hectares). Long-term moderate impacts to wetlands would occur as approximately 3.2 acres (1.3 hectares) of wetlands would be disturbed and would require and a Section 404 permit. Additional potential impacts could occur to wetland habitats from extension of the utilities to the proposed site. Wetland habitats would be avoided to the maximum extent possible and any unavoidable impacts would be minimized to the extent possible, and mitigated as required, resulting in moderate impacts to wetlands. There would be no impacts to surface waters or floodplains. Minor impacts to groundwater are possible from the proposed increase in impervious surfaces and the resulting increase in runoff. The MDE concurred with NAS Patuxent River that this alternative is consistent with the enforceable policies of Maryland’s coastal zone management program.	Site contains two wetland habitats encompassing 0.8 acres (0.3 hectares). Long-term minor impacts to wetlands from filling of up to 0.5 acres (0.2 hectares) of wetlands would occur and would require a Section 404 permit. Additional potential impacts to wetland habitats could occur from extension of the utilities to the proposed site. Wetland habitats would be avoided to the maximum extent possible and any unavoidable impacts would be minimized to the extent possible, and mitigated as required, resulting in moderate to minor impacts depending on the extent of wetland disturbance. There would be no impacts to surface waters or floodplains. Minor impacts to groundwater are possible from the proposed increase in impervious surfaces and the resulting increase in runoff. The MDE concurred with NAS Patuxent River that this alternative is consistent with the enforceable policies of Maryland’s coastal zone management program.	No impacts.
Geology, Topography, Soils	Minor short- and long-term impacts to topography. There would be no impacts to geologic resources. Site development would be in excess of one acre (0.4 hectares) and would require a stormwater management plan and erosion and sediment control plan. A National Pollution Discharge Elimination System (NPDES)	Impacts would be the same as under Alternative A for topography and geology. Because development would occur on soils designated as Prime Farmland, impacts to soils would be long-term and moderate. A National Pollution Discharge Elimination System (NPDES) Phase II permit would	No impacts.

Resource Areas	Alternative A: Construct the Aircraft Prototype Facility at Site A (Preferred Alternative)	Alternative B: Construct the Aircraft Prototype Facility at Site B	No Action Alternative
	Phase II permit would be required. Prime Farmland soils on this site would be avoided for development.	be required.	
Biological Resources (Wildlife and Wildlife Habitat, Vegetation, Threatened and Endangered Species)	Minor to moderate short- and long-term adverse impacts. In excess of 26 acres (10.5 hectares) of undeveloped land would be disturbed. Some habitat would be lost or disturbed. Consultation with U.S. Fish and Wildlife Service (USFWS) resulted in a finding that, except for transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the project impact area. The Md. DNR concluded that no State or Federal threatened or endangered species are known to occur within the proposed project area.	Impacts would be the same as under Alternative A.	No impacts.
Land Use	Development would be consistent with installation land and forest management goals as the land is designated at semi-improved and designated for development before any unimproved lands. Minor impacts would occur to land use.	Development would be inconsistent with installation land and forest management goals as land designated as unimproved would be developed. Site is located next to security sensitive land uses, resulting in conflicts. Minor impacts, but greater than those at Site A.	No impacts.
Air Quality	Area is in attainment for all criteria pollutants; General Conformity Rule applicability analysis is not required. Impacts from construction emissions would be short-term and minor.	Impacts would be the same as under Alternative A.	No impacts.
Noise	Short-term minor impacts would occur during construction.	Impacts would be the same as under Alternative A.	No impacts.
Infrastructure/Utilities	There would be sufficient electrical and sewer capacity. Depending on fire suppression requirements, an on-site water storage tank may be required. See "Wetlands" for potential impacts from the installation of new utility lines.	Impacts would be the same as under Alternative A.	No impacts.
Human Health and Safety	A large portion of Site A that is located within a clear zone would not be developed. All guidelines related to accident potential zones (APZs) and imaginary surfaces would be followed. There would be no impacts to or from airfield operations.	Impacts would be the same as under Alternative A.	No impacts.

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	ES-1
TABLE OF CONTENTS.....	TOC-1
1.0 Purpose and Need	1-1
1.1 Background	1-1
1.2 Purpose and Need	1-3
2.0 Proposed Action and Alternatives	2-1
2.1 Proposed Action	2-1
2.2 Alternatives	2-1
2.3 Alternatives Considered But Not Carried Forward	2-3
3.0 Affected Environment and Environmental Impacts	3-1
3.1 Water Resources	3-3
3.2 Geology, Topography, and Soils	3-12
3.3 Biological Resources	3-21
3.4 Land Use.....	3-28
3.5 Air Quality.....	3-30
3.6 Noise.....	3-32
3.7 Infrastructure/Utilities	3-34
3.8 Human Health and Safety.....	3-37
3.9 Cumulative Impacts.....	3-44
3.10 Unavoidable Adverse Impacts.....	3-44
3.11 Conclusion.....	3-45
4.0 References	4-1
5.0 List of Preparers.....	5-1
6.0 Acronyms	6-1
FIGURES	
FIGURE 1-1: NAVAL AIR STATION PATUXENT RIVER REGIONAL LOCATION.....	1-2
FIGURE 2-1: ALTERNATIVE A – SITE A LOCATION	2-4
FIGURE 2-2: ALTERNATIVE B – SITE B LOCATION	2-5
FIGURE 3-1: SITE A WETLANDS	3-5
FIGURE 3-2: SITE B WETLANDS	3-8
FIGURE 3-3: SITE A TOPOGRAPHY	3-14
FIGURE 3-4: SITE B TOPOGRAPHY	3-15
FIGURE 3-5: SITE A SOILS.....	3-16
FIGURE 3-6: SITE B SOILS.....	3-19

FIGURE 3-7: SITE A CLEAR ZONES AND APZ AREAS.....3-43

TABLES

TABLE ES-1: SUMMARY OF IMPACTS ES-4

TABLE 3-1: SITE A WETLAND STATISTICS.....3-6

TABLE 3-2: SITE B WETLAND STATISTICS.....3-8

TABLE 3-2: SITE B WETLAND STATISTICS.....3-7

TABLE 3-3: STATE AND FEDERALLY THREATENED OR ENDANGERED WILDLIFE SPECIES WITH KNOWN, EXPECTED, OR POSSIBLE OCCURRENCE ON NAS PATUXENT RIVER.....3-24

TABLE 3-4: STATE ENDANGERED OR THREATENED PLANT SPECIES KNOWN TO OCCUR ON NAS PATUXENT RIVER3-26

TABLE 3-5: AMBIENT AIR QUALITY STANDARDS FOR OZONE.....3-31

TABLE 3-6: COMMON NOISE LEVELS.....3-33

TABLE 3-7: AIR INSTALLATION COMPATIBLE USE ZONES SUGGESTED LAND USE COMPATIBILITY IN ACCIDENT POTENTIAL ZONES.....3-38

TABLE 3-8: SUMMARY OF IMPACTS.....3-46

APPENDIX A: AGENCY CORRESPONDENCE

1.0 PURPOSE AND NEED

1.1 Background

Established in 1943 as an effort to centralize widely dispersed air testing facilities, the Naval Air Station (NAS) Patuxent River serves as the Center of Excellence for naval aviation. The numerous functions of NAS Patuxent River include acquisition management, research and development, air and ground test and evaluation (T&E), aircraft logistics, and maintenance management. NAS Patuxent River employs approximately 19,100 military and civilian personnel, and provides administrative space to the Naval Air Systems Command (NAVAIR), the Naval Air Warfare Center Aircraft Division (NAWCAD), and approximately 50 other tenant activities.

The mission of NAS Patuxent River is to maintain and operate facilities and provide services and materials to support operations of NAWCAD and other activities and units as designated by the appropriate authority. This mission includes serving as a full-spectrum research, development, T&E, engineering, and Fleet support center for air platforms, supporting products throughout their life-cycles and providing Fleet customers and sponsors with a high quality service. Since its establishment, NAS Patuxent River has had a rich history of aeronautical development. Since World War II and continuing today, NAS Patuxent River performs a vital role in Naval operations and national defense.

NAS Patuxent River is located in southern St. Mary's County, Maryland, approximately 70 miles (113 kilometers) southeast of Washington, DC. Calvert County and Charles County are adjacent to St. Mary's County and the NAS Patuxent River. The installation is located on a peninsula where the Patuxent River flows into the Chesapeake Bay. The NAS Patuxent River Complex, including Webster Field Annex and Bloodsworth Island, encompasses 13,812 acres (5,590 hectares) of land, 935 buildings (including 10 hangars), 5 runways, and over 78 miles (126 kilometers) of roadways. With approximately 7,900 acres (3,197 hectares) of land within the NAS Patuxent River Complex, the NAS Patuxent River comprises 6,705 acres (2,713 hectares). The regional location of NAS Patuxent River is shown in Figure 1-1.

Test programs were established at NAS Patuxent River in 1945, creating both test and support functions on the facility. Test programs continued and expanded during the next two decades with the development of jet aircraft, supersonic travel, guided missiles, and airborne early warning squadrons. NAS Patuxent River continued to grow and in 1992, through Navy realignment actions, NAWCAD was established at the site (Navy, 2002a). Current NAWCAD capabilities include in-flight signature characterization, electronic warfare test and evaluation, electromagnetic environmental effects testing, and other aircraft system and subsystem testing. NAWCAD supports testing of Navy aircraft as well as other joint services, foreign military, and domestic and foreign commercial aviation interests.

This Environmental Assessment (EA) analyzes the potential impacts related to the proposed construction of the Aircraft Prototype Facility military construction (MILCON) project at NAS Patuxent River. The EA has been prepared pursuant to Section 102(2)(c) of the National Environmental Policy Act of 1969 (NEPA), (42 USC 4331 *et seq.*), the regulations of the Council on Environmental Quality (CEQ) that implement NEPA procedures (40 Code of Federal Regulations (CFR) 1500-1508), and the Navy's *Environmental and Natural Resources Program Manual*, Chief of Naval Operations Instruction (OPNAVINST) 5090.1B. This EA will consider the impacts from construction phase of the Aircraft Prototype Facility. Operational impacts are evaluated in the *Final Environmental Impact Statement for Flight and Related Operations in the Patuxent River Complex, Patuxent River Maryland* (1998).

FIGURE 1-1: NAVAL AIR STATION PATUXENT RIVER REGIONAL LOCATION



This Environmental Impact Statement evaluated the foreseeable mission requirements taking into consideration the facilities airfield and range capabilities, and the proposed Aircraft Prototype Facility falls within this analysis.

The information presented within this document will serve as the basis for deciding whether the proposed action would result in a significant impact to the environment, requiring the preparation of an Environmental Impact Statement, or that no significant impacts would occur, and therefore a Finding of No Significant Impact (FONSI) would be appropriate.

1.2 Purpose and Need

The purpose of the proposed action is to provide additional secure facilities to increase and improve naval aviation research, development, and test and evaluation (RDT&E) capabilities at the NAWCAD, NAS Patuxent River, Maryland. The purpose is also to provide adequate secure facilities for collaborative science and technology (S&T) and test and evaluation (T&E), weapon system reliability and maintainability (R&M), and prototype demonstration/validation (DEM/VAL). These facilities would support classified and unclassified Navy and Joint Service projects, and other activities involving unique aircraft systems, subsystems, and low observable (LO) technologies. Once completed, the proposed project is expected to deliver advantages that are consistent with naval aviation goals to reduce costs and improve the process cycle time required to deliver mission critical combat systems to the Fleet.

The need for the action results from the lack of a secure facility of the needed size and capabilities to carry out the required testing activities of NAWCAD. Currently, the major test facilities funded and supported by Major Range and Test Facility Base (MRTFB) at NAS Patuxent River are the only facilities in the country that can provide the total RDT&E package for reduced signature (low observable) and other classified aircraft systems and subsystems. The lack of secure facilities has resulted in the deployment of program experts to other facilities and the creation of temporary remote detachments to complete assigned DEM/VAL tasks for classified programs. The deployment and creation of temporary detachments impacts program continuity, and creates unnecessary time and cost to already expensive programs. Currently, up to 14 programs and projects are impacted by these deployments annually at costs exceeding \$78 million per year.

NAS Patuxent River is home to national level experts in all competencies necessary to demonstrate, validate, and verify new aircraft design concepts, materials and technologies, and to improve the survivability of Navy and Joint Service technical aircraft and other air vehicles. No other single facility in the country can provide the total RDT&E package for reduced signature and other classified aircraft systems and subsystems. Even with the advantages offered by the MRTFB resources, a single facility to offer secure prototyping facilities with direct and immediate access to national level experts in survivability and vulnerability and related materials technologies, and the full range of required T&E resources, capabilities, and services does not exist in the United States. The NAS Patuxent River location, which is currently home to extensive MRFTB resources, offers direct and immediate access to national level experts in survivability of required T&E resources, capabilities, and services that would be required for the proposed facility.

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2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

NAS Patuxent River is proposing to construct an Aircraft Prototype Facility for carrier and rotary wing aircraft. This MILCON project would construct a secure multi-story building that has two modified Type I hangars and a modified Type II hangar, in a three-phase process. It would be supported by preparation bays, labs, office spaces/work areas for classified projects ranging in size from five to 40 people, and a secured video teleconference center (VTC), all incorporated together into the proposed Aircraft Prototype Facility. RDT&E activities that would be carried out in the proposed facility would include Network Centric Warfare (NCW), the Unmanned Combat Air Vehicle (UCAV), the Global War on Terrorism (GWOT), and compartmentalized and classified survivability and vulnerability (S&V) programs. Other program requirements that would occur in the proposed facility include Multi-Spectral Operations Aircraft, airship programs, and classified NCW platforms. The facility would also support multiple classified Navy and Joint Service programs or projects at all stages of the acquisition process and life cycle.

NAWCAD operations at NAS Patuxent River require adequate facilities for secure aircraft prototyping that support critical mission requirements for classified RDT&E, the rapid transition of new and specialized aircraft systems, subsystems, and technologies to Fleet tasking. T&E mission activities carried out by NAWCAD include capabilities to conduct in-flight signature characterization and measurements in an all weather environment. NAWCAD S&T missions include all aspects of air vehicle R&M, S&V, and world-class, cutting edge capabilities and experience in the development of special materials, composites, paints, and structures to reduce air vehicle signatures. RDT&E capabilities address all levels of the weapon system prototype process from requirements definition through the DEM/VAL process including proof tests, catapult tests, flight certification, S&V signature performance verification, and T&E Operational Evaluation (OPEVAL). The Aircraft Prototype Facility would provide these capabilities in secure facilities at NAS Patuxent River.

2.2 Alternatives

Alternatives for implementing the proposed action were determined based on the requirements to operate an Aircraft Prototype Facility. These factors include, but are not limited to, proximity to an existing taxiway without building in the clear zone, the availability of sufficient space and clearance for future expansion, and the need for security.

2.2.1 Elements Common to All Alternatives

Under all alternatives, the proposed structure would have common structural elements. Regardless of the site, this project would consist of three major components.

The first component, Phase I, would construct a modified Type I hangar module that includes adjacent technical and support areas, totaling 28,680 square feet (2,664 square meters). Type I and II, as stated below, refer to the fire resistance rating for the building, with a Type I building not having any limits to height or square footage when the building meets code and with Type II having these limits. The adjacent building would include a technical service laboratory (machine shop), assembly areas, tool crib, a secure VTC, a security control center, secure project and engineering workspaces for compartmentalized programs, and office and administrative spaces for support personnel. This

structure would consist of pile foundations, steel framing, concrete floors, concrete masonry and insulated metal panel walls, sliding hangar doors, a steel truss roof structure, and insulated roof system.

Operations in the Phase I component of the proposed action include accredited work areas for support of five or more classified projects annually. Proposed Phases II and III, as described below, would provide additional secure hangars, laboratories, and accredited work spaces to increase the capacity of the facility to support up to 14 classified programs annually. As space is available, the proposed facilities would be used to support testing for the F18E/F and UH-1 helicopter upgrades, and other RDT&E requirements for projects or special operations involving manned and unmanned air vehicles that require special security provisions or access restrictions. The Phase I facility would meet requirements for in-service engineering support necessary to quickly troubleshoot fleet problems and issues involving low observable/very low observable (LO/VLO) technologies, and would integrate specialized systems and subsystems into Navy platforms for Intelligence, Surveillance, and Reconnaissance (ISR) missions and special operations. The facilities under Phase I would have 42 occupants and are scheduled for construction in Fiscal Year (FY) 2008.

Phase II of the proposed action would construct an additional modified Type II hangar with a parking apron and taxiway access. Interior building mechanical systems under Phase II would be the same as those under Phase I. The Phase II structure would consist of pile foundations, steel framing, reinforced concrete floors, insulated metal panel walls, and sliding hangar doors on each end of the hangar. This phase of the project would provide a 72,830 square-foot (6,766 square-meter) hangar, fully integrated into Phase I and Phase III, and would provide secure hangar space for a single large aircraft or up to four smaller aircraft. With the completion of Phase II, the overall capacity of the combined facility would support 10 or more classified projects annually. Under this phase, the number of occupants would not increase. Phase II is scheduled for construction for FY 2009.

Phase III of the proposed action would include construction of a two-story addition to the Phase I facility, creating an additional 33,931 square feet (3,152 square meters) of area. This addition would include a modified Type I hangar module with a secure storage area for oversized materials, a parking apron, and taxiway access. Work space areas in the addition would include a materials laboratory, an automated data processing equipment laboratory, clean rooms, a non-destructive inspection area, a test control center, vault, a small conference room, sensitive compartmented information facilities, and support spaces. Interior building mechanical systems under Phase II would be the same as those under Phase I. The Phase III addition would also consist of pile foundations, steel framing, concrete floors, concrete masonry and insulated metal panel walls, sliding hangar doors, steel truss roof structure, and insulated roof system. The construction of Phase III would provide a fully-integrated addition to the facilities constructed under Phase I, including a second secure hangar module, test control facilities, specialized laboratories, and accredited work areas. The construction of the Phase III addition would double the capacity of the facility to support a total of 14 or more classified projects annually, supporting 42 occupants. Phase III is scheduled for construction for FY2009.

These three phases of the proposed action would require site improvements such as utility extensions, aircraft apron and taxiway access, jet blast barriers, vehicle parking and roadways, sidewalks, and landscaping. These areas would total approximately 489,585 square feet (45,484 square meters) of impervious surfaces.

The three components of this project would incorporate anti-terrorism/force protection (ATFP) design elements including security fencing and lighting, access control, video surveillance and intrusion detection systems, vehicle and personnel barriers, and perimeter access control. Sustainable design

would be integrated into the design, development, and construction of all three components of this proposed action.

2.2.2 Alternative A: Construct the Aircraft Prototype Facility at Site A (Preferred Alternative)

Under Alternative A, the proposed Aircraft Prototype Facility would be constructed at NAS Patuxent River on a 26 acre (10.5 hectare) portion of an approximately 72-acre (29-hectare) site, shown in Figure 2-1. The proposed site under Alternative A is located adjacent to, and to the south of, Taxiway A and is bounded by Switzer Road on the east, and Shaw Road on the south. Because of its location adjacent to the runway and within a clear zone (see page 3-37) a portion of this site is not available for development. This site is mainly forested lands with some agricultural use. The majority of the site is designated by the Integrated Natural Resources Management Plan (INRMP) as semi-improved lands (Navy, 2002a). The existing South Engineering Center and the Robert N. Becker Laboratory are located adjacent to the proposed site.

2.2.3 Alternative B: Construct the Aircraft Prototype Facility at Site B

The site being considered under Alternative B is located in the vicinity of the existing VQ-4 complex. The area to be evaluated is located to the south of Taxiway A in the vicinity of the installation garden plots and is bounded by Buck Road to the east, Buse Road to the southeast and south, Tate Road to the southwest, and Leader Road to the west. The proposed facility would occupy approximately 26 acres (10.5 hectares) of the site. The approximately 61-acre (25-hectares) site in which the 26 acre (10.5 hectare) facility could be located is mainly agricultural and open space and is designated by the INRMP as semi-improved and unimproved lands (Navy, 2002a). The location of Alternative B is shown in Figure 2-2.

2.2.4 No Action Alternative

Under the No Action Alternative, the proposed Aircraft Prototype Facility would not be constructed and the required testing activities would be carried out at a number of diverse locations to complete RDT&E tasks that could otherwise be carried out by the Aircraft Division personnel at NAS Patuxent River. The current shortage of secure hangar and support space for classified test programs would disperse test activities throughout many locations. With test aircraft being dispersed between multiple locations, test schedules would be longer and costs would increase.

2.3 Alternatives Considered But Not Carried Forward

2.3.1 Renovation/Modernization

Renovation and/or modernization of the existing facilities was considered as an alternative to constructing a new facility. This alternative was considered not to be viable because there are no available existing facilities with direct and immediate access to full airfield services, national level experts in survivability and vulnerability and related material technologies, and the full range of required resources, capabilities, and services that could be renovated or modernized to serve the needs of NAWCAD personnel.

FIGURE 2-1: ALTERNATIVE A – SITE A LOCATION

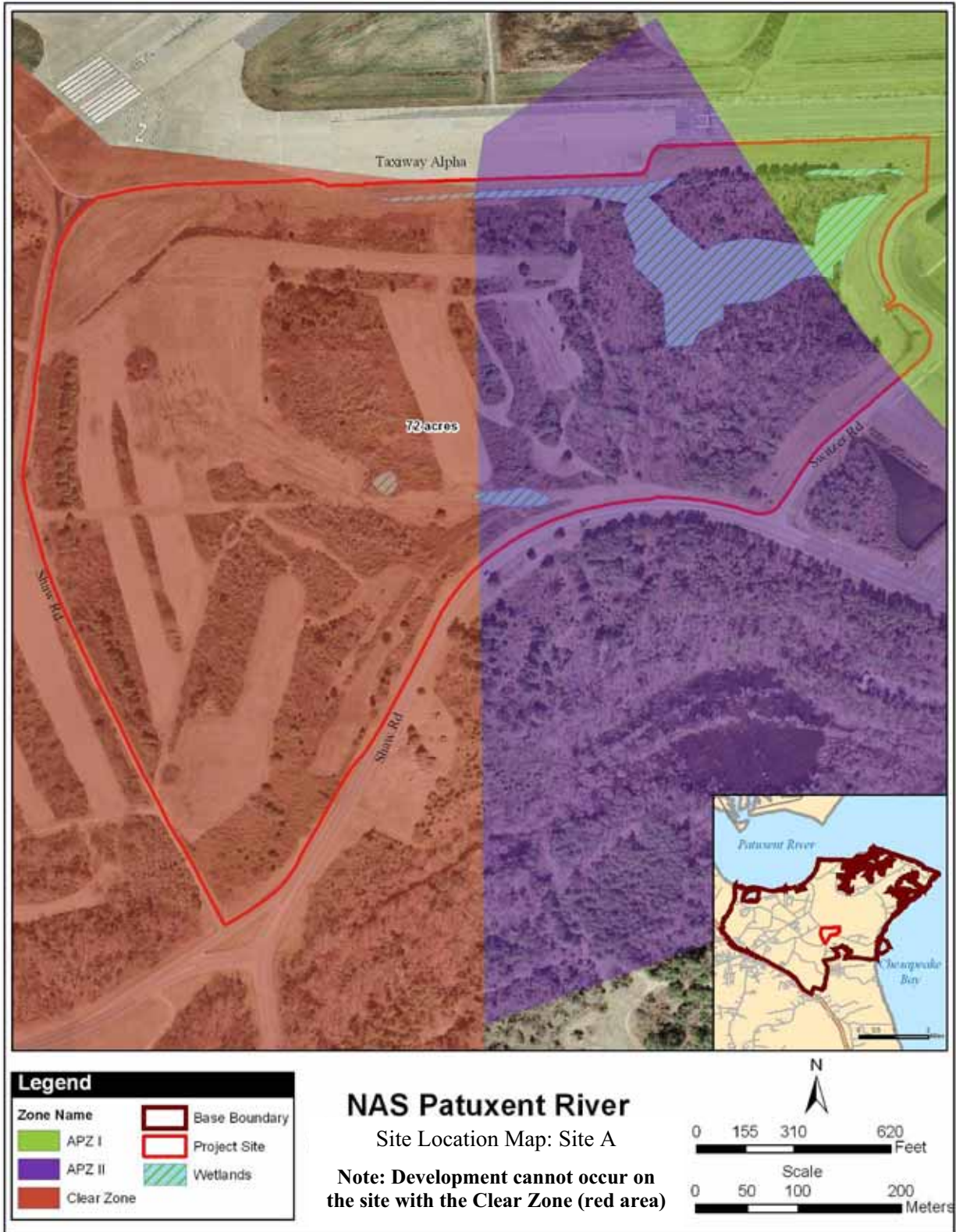


FIGURE 2-2: ALTERNATIVE B – SITE B LOCATION



2.3.2 Construct the Aircraft Prototype Facility at Site C

In addition to the two sites being carried forward for analysis, a third site (Site C) was considered for facility development. Site C is located in the northern section of NAS Patuxent River just north of Runway 20. The site is bounded by Bronson Road on the north and east, Runway 20 and associated access road to the south, and Cedar Point Road to the west. This site is mainly agricultural and forested lands and is designated by the INRMP as semi-improved and unimproved lands (Navy, 2002a). In accordance with the land management goals of NAS Patuxent River, as set forth in the INRMP, lands designated as unimproved should be considered for development only after improved and semi-improved lands have been considered. This site is further encumbered by its designation as a clear zone, which are those areas located at the end of runways where development is prohibited. This site is also located in the vicinity of installation restoration sites, or known areas of hazardous waste materials. Because it is located in a designated clear zone, not consistent with the land management goals of NAS Patuxent River, and is a known to contain hazardous materials, Site C was considered but not carried forward for detailed analysis.

3.0 **AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS**

This chapter describes the existing condition of environmental resources potentially affected by the proposed MILCON project. The boundaries of the affected environment vary according to the nature of the potential impact and the aspect of the environment under consideration. Certain potential impacts (*e.g.*, impacts on topography or drainage patterns) are site-specific and are likely to be contained entirely within the project boundaries. Other impacts (*e.g.*, a project that impacts the regional transportation network) may affect areas outside of the identified project areas.

This chapter also evaluates the potential environmental consequences of the action and No-Action alternatives. Implementation of the action alternatives would involve construction of the Aircraft Prototype Facility at the NAS Patuxent River, Maryland.

Potential impacts of the action alternatives are discussed in this chapter in terms of direct short- and long-term impacts as a result of construction activities, as well as indirect and cumulative impacts. Short-term impacts are those of a limited duration, such as the impacts that would occur during the building construction. Long-term impacts are those of greater duration, including those that would endure for the life of the proposed project and beyond, including impacts from construction that last beyond the construction period. Cumulative impacts for each alternative are described on 3-44. For impacts judged to be less than significant, a range is given to facilitate comparisons among the alternatives, using the terms of negligible, minor, and moderate. Operational impacts as a result of the proposed action are addressed in the *Final Environmental Impact Statement for Flight and Related Operations in the Patuxent River Complex, Patuxent River, Maryland* (1998), and not addressed in this EA.

Alternatives were evaluated based on, but not limited to, the following criteria:

- Proximity to an existing taxiway;
- The availability of sufficient space and clearance for future expansion;
- Location outside of the clear zone;
- The need for security;
- Minimal impacts to natural resources such as water resources, including wetlands, geology, topography, and soils;
- Land use compatibility;
- Minimal impacts to land use and from noise;
- Availability of and minimal disturbance from the installation of utilities and infrastructure; and
- No impacts to human health and safety.

An examination for applicability to the proposed action was made in regard to Navy regulations under NEPA. It was determined that certain environmental and socioeconomic resources that frequently

receive attention in NEPA analyses would not be applicable to the proposed action. The following are the resource areas that have been dismissed from analysis, and the reason for their dismissal:

- **Transportation:** Under the proposed action, a new facility would be constructed that would create new employment at NAS Patuxent River. Under the proposed action, 42 new employees would be added during Phase I and another 42 employees would be added during Phase II. Phase III would not create an increase in employment. The impact of the 84 new employees over two years would occur during the operation phase of the proposed facility. Impacts to existing and planned operations at NAS Patuxent River were evaluated in the *Final Environmental Impact Statement Increased Flight and Related Operation in the Patuxent River Complex* (Operations EIS) (1998). Although this new facility would add employment to the installation, it is expected that for the overall installation the permanent and transient employment base would be maintained, and therefore any impacts to the transportation network from employment generated by the proposed Aircraft Prototype Facility would be minimal (Navy, 1998).

Negligible short-term impacts would occur to the installation transportation network during the construction of the proposed facility. Site work would generate greater volumes of localized traffic due to workers arriving and departing the site, movement of materials and equipment, and removal of construction waste. Interruptions in local traffic patterns could be expected during the construction periods. These changes to local traffic patterns would be minimal and only last as long as construction activities, therefore impacts to transportation from construction of the proposed facility would be minimal.

- **Cultural Resources Including Historic Structures and Archaeological Resources:** There are no historical buildings on or adjacent to the proposed sites that would be impacted by implementation of the proposed action. The NAS Patuxent River does contain many prehistoric and historic archaeological sites. In 2001, a Phase I Archaeological Survey was conducted at the Preferred Alternative site (Site A). This survey did not find any definable archaeological sites and no further archaeological investigations were recommended (CRI, 2001). A second study of the site also found that there were no archaeological resources (Dutton, 2002). Based on correspondence with NAS Patuxent River personnel and a Phase I Archaeological survey of the site, it was determined that there are no archaeological sites located on Site B (pers. comm., Gray, 20 September 2005; Sara and Bergevin, 2004). Due to the absence of historic structures and archaeological sites at the two alternative sites, there would be no impacts to cultural resources.
- **Socioeconomic Resources:** The proposed Aircraft Prototype Facility would create minimal new employment at NAS Patuxent River and would not be expected to alter existing socioeconomic conditions, such as unemployment and housing characteristics. The employment of small crew of construction workers would not be expected to impact the socioeconomics of the area. All socioeconomic factors (unemployment, housing, income, population) are expected to remain unchanged once the action is implemented, therefore there would be no impacts to socioeconomic resources.
- **Environmental Justice and the Protection of Children:** The proposed action is not expected to impact socioeconomic factors or create disproportionately high and adverse human health or environmental effects to minority or low-income populations at NAS Patuxent River or in the surrounding area. Based on a review of 2000 U.S. Census Data, both the percent of minority population and population below the poverty level are below the standards set forth in the Council on Environmental Quality's Environmental Justice Guidance. Furthermore, the proposed action would not be expected to significantly impact the environmental health and safety risks that might disproportionately affect children at NAS Patuxent River or in the surrounding area. The restricted access at NAS Patuxent River would ensure that children living off the installation

would not be able to access construction areas or any other activities on the installation that might pose a health and safety risk.

Information in this chapter is derived from both primary and secondary sources, as noted. Primary sources of information involved site visits and analysis by project personnel, which are referenced as such. Secondary information includes documents such as the *Final Environmental Impact Statement Increased Flight and Related Operation in the Patuxent River Complex* and the *Integrated Natural Resources Management Plan for the Naval Air Station Patuxent River* (2002). In keeping with the CEQ NEPA statute, and the Council on Environmental Quality regulations directive to avoid unnecessary paperwork, delay, and bulk in environmental documents, this EA incorporates information from these environmental documents by reference wherever appropriate and relevant (see 40 CFR 1500.4(j) and 1502.21). Other secondary sources of information are referenced as appropriate.

3.1 Water Resources

3.1.1 Affected Environment

3.1.1.1 Surface Water

Several surface water features occur on or adjacent to NAS Patuxent River. NAS Patuxent River is bordered on the northwest by the Patuxent River and on the north and east by the Chesapeake Bay. The Patuxent River drains a watershed of about 930 square miles (2,418 square kilometers) in Maryland. Other surface water features on NAS Patuxent River include Pine Hill Run, Goose Creek, Pearson Creek, Harper's Creek, and six freshwater ponds.

Site A

Only one permanent surface water feature occurs within the boundaries of Site A, a small pond (Wetland CE4) located on the western edge of the site. Several shallow depressions that are seasonally filled with water also occur in the central area of the site. A drain and associated ditch occurs adjacent to the forested area along the northern boundary of the site. A narrow ditch also borders the forested area along the eastern boundary of the site. These ditches provide drainage to the majority of the north and eastern sections of Site A.

Site B

The only surface water feature occurring on Site B is an intermittent stream that drains from northeast to southwest across the northwestern section of the site. The unnamed stream is located in a wooded area between Cedar Point Road and Leader Road. The stream flows under Tate Road via two concrete culverts, then drains to the southeast off of the site.

3.1.1.2 Wetlands

The U.S. Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (U.S. EPA) define jurisdictional wetlands as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR, Part 328.3). USACE regulates development in jurisdictional wetlands pursuant to Section 404 of the Clean Water Act and regulations contained in 33 CFR, Parts 320-330. Identification and delineation of jurisdictional wetlands is based on three parameters:

- Hydrophytic vegetation – the dominant vegetation consists of species capable of growing in water or on substrate that is at least periodically deficient in oxygen as a result of the presence of water.
- Hydric soils – soils are saturated, flooded or ponded for long enough during the growing season to develop anaerobic conditions that favor the growth of hydrophytic vegetation.
- Wetland hydrology – the area is inundated permanently or periodically, or the soil is saturated to the surface for sufficient duration during the growing season to support hydrophytic vegetation.

In July 2005, formal wetland delineations were conducted on Site A based on criteria established in the 1987 Corps of Engineers Wetland Delineation Manual. Reconnaissance level wetland delineations were also conducted on Site B to verify the boundaries of wetlands that were previously identified on the site and to determine if additional wetland habits, not previously delineated, occur on the site. The following text provides descriptions of wetland habitats that occur on Sites A and B.

Site A

The extent of jurisdictional wetlands occurring on Site A was determined based on criteria established in the 1987 USACE Wetlands Delineation Manual (Environmental Laboratory, 1987). Field investigations for the presence of wetlands and other Waters of the U.S. were conducted July 13 to 15, and on July 26, 2005. Investigations consisted of the assessment of two parcels (Parcels A and B) on Site A, and included an initial reconnaissance survey followed by the delineation of all wetland habitats occurring in the assessment areas. Wetlands occurring immediately adjacent to or extending outside of the designated study areas were also delineated. Landform, soil, vegetative, and hydrologic characteristics were assessed in the delineation areas to determine potential for the occurrence, and the extent of, wetland habitats.

Based on the field investigations, four wetlands were identified on Site A, Parcels A and B. An additional wetland was delineated to the east, outside of the Parcel B assessment area. Based on field investigations, there are approximately 3.68 acres (1.49 hectares) of jurisdictional wetland habitat on Site A. Table 3-1 provides information on wetland type, location, and acreage within the delineation areas on Site A. Wetlands identified on Site A are designated as wetlands CE 1 through CE 5 and their locations and extent are shown in Figure 3-1. Wetlands CE 2 and CE 3 are connected, but were designated as separate wetlands due to distinct differences in habitat characteristics. The following discussion provides descriptions of the general characteristics of wetlands delineated within the project assessment areas in Site A.

FIGURE 3-1: SITE A WETLANDS



TABLE 3-1: SITE A WETLAND STATISTICS

Wetland ID	Location	Wetland Type	Wetland Area		
			Total (Acres)	By Habitat Component (Acres)	
CE 1	Northeast corner of Parcel A	palustrine emergent	0.10	-	
CE 2	Northwest area of Parcel A	palustrine emergent; palustrine scrub shrub/forested	0.43	palustrine emergent	0.33
				palustrine scrub shrub/forested	0.10
CE 3	Central area of Parcel A	palustrine forested	2.98	-	
CE 4	Parcel B	palustrine open water	0.08	-	
CE 5	East of Parcel B	palustrine emergent	0.19	-	

Wetland CE 1. Wetland CE 1 is a 0.10 acre (0.04 hectare) seasonally saturated/flooded palustrine emergent habitat located along the northeast boundary of Site A. Wetland CE 1 occurs in a narrow depression (swale) and is bordered on the north by a narrow strip of upland meadow habitat located between Taxiway A and the wetland. Vegetation occurring in the wetland is characterized by lurid sedge (*Carex lurida*), bristlebracted sedge (*Carex tribuloides*), fox sedge (*Carex vulpinoidea*), soft rush (*Juncus effusus*), wool grass (*Scirpus cyperinus*), trumpet creeper (*Campsis radicans*), narrowleaf cattail (*Typha angustifolia*), and velvet panicum (*Dichanthelium scoparium*).

Wetland CE 2. Wetland CE 2 is a 0.43 acre (0.17 acre) complex seasonally saturated/flooded habitat consisting of 0.33 acres (0.13 hectares) of palustrine emergent and 0.10 acres (0.04 hectares) of palustrine scrub shrub habitat that is transitioning to palustrine forested habitat. Wetland CE 2 occurs in association with a linear depression (swale) along the northern boundary of Site A. The wetland is bordered to the north by a narrow strip of upland meadow habitat located between Taxiway A and the wetland. Wetland CE 2 is bordered on the south by forested habitat and is contiguous with palustrine forested wetland habitat associated with wetland CE 3, located in the north central area of Site A. Vegetation occurring in the palustrine emergent section of the habitat is characterized by lurid sedge, bristlebracted sedge, fox sedge, soft rush, wool grass, netted chain fern (*Woodwardia areolata*), and saplings of red maple (*Acer rubrum*). Vegetation occurring in the palustrine scrub shrub/forested habitat is characterized by red maple, black willow (*Salix nigra*), Japanese honeysuckle (*Lonicera japonica*), poison ivy (*Toxicodendron radicans*), lurid sedge, and soft rush.

Wetland CE 3. Wetland CE 3 is a 2.98 acre (1.21 hectare) seasonally saturated/flooded palustrine forested habitat located in the central area of Site A, Parcel A. Wetland CE 3 is bordered on the north by wetlands CE 1 and CE 2, to the south by forested upland habitat, to the east by mowed lawn habitat adjacent to the South Engineering Center and the Robert N. Becker Laboratory, and to the west by forested upland habitat. Wetland CE 3 occurs in association with the Othello silt loam, which is a hydric soil. Overstory vegetation occurring in the wetland is characterized by black gum (*Nyssa sylvatica*), sweet gum (*Liquidambar styraciflua*), red maple, loblolly pine (*Pinus taeda*), and willow oak (*Quercus phellos*). Understory species are characterized by American holly (*Ilex opaca*), high bush blueberry (*Vaccinium corymbosum*), sweet pepper bush (*Clethra alnifolia*), and common greenbriar (*Smilax rotundifolia*).

Wetland CE 4. Wetland CE 4 is a 0.08 acre (0.03 hectare) palustrine open water habitat characterized by a pond. The pond is located in the southwest section of Site A. Vegetation occurring in association with the pond is characterized by black willow (*Salix nigra*), phragmites (*Phragmites australis*), and duckweed (*Lemna* sp.).

Wetland CE 5. Wetland CE 5 is a 0.19 acre (0.08 hectare) seasonally saturated depressional palustrine emergent wetland located near the southeast corner of Site A. The wetland is bordered by forested habitat to the north, upland meadow and Shaw Road to the south, and upland meadow to the east and west. Vegetation in the wetland is characterized by soft rush, blunt spikerush (*Eleocharis obtuse*), bristlebracted sedge, umbrella sedge (*Cyperus strigosus*), and leathery rush (*Juncus coriaceus*).

Site B

Reconnaissance level wetland delineations were conducted at Site B on July 26, 2005 to verify the boundaries of wetlands that were previously identified on the site and to determine if additional wetland habits, not previously delineated, occur on the site. Two palustrine forested wetland habitats were identified on Site B. The following discussion provides descriptions of the general characteristics of the wetlands delineated in Site B. The locations of wetlands in the area of Site B are shown in Figure 3-2 and described in Table 3-2.

Wetland B1. Wetland B1 is a 0.09 acre (0.04 hectare) palustrine forested habitat located to the southeast of Building 503 and the northeast of Tate Road. Wetland B1 is a small depressional seep wetland that drains to a culvert under Tate Road. Vegetation in the wetland is characterized by red maple, sweet gum, willow oak, and black gum in the overstory, and black willow, Virginia creeper (*Parthenocissus quinquefolia*), common greenbriar, and poison ivy in the woody understory. Herbaceous vegetation in the wetland is characterized by fox sedge, wool grass, blunt spike rush, netted chain fern, and water plantain (*Alisma plantago*).

Wetland B2. Wetland B2 is a 0.66 acre (0.27 hectare) palustrine forested habitat associated with a stream in the forested area to the west of Leader Road. Vegetation in the wetland is characterized by red maple and sweet gum in the overstory with sweet pepper bush, and common green briar characterizing the woody understory. Herbaceous vegetation associated with the wetland is characterized by jewelweed (*Impatiens capensis*), lizard tail (*Saururus cernuus*), false nettle (*Boehmeria Cylindrica*), fox sedge, and water plantain.

TABLE 3-2: SITE B WETLAND STATISTICS

Wetland ID	Location	Wetland Type	Wetland Area	
			Total (Acres)	By Habitat Component (Acres)
B1	Southeast of building 503 and northeast of Tate Road	palustrine forested	0.09	-
B2	West of Leader Road	palustrine forested	0.66	-

FIGURE 3-2: SITE B WETLANDS



3.1.1.3 Floodplains

Site A and Site B are both located outside of the 100-year floodplain (Navy, 2002a). Floodplains are described as areas likely to be inundated by a particular flood. For example, a flood that has a one-percent chance of occurring in any one year is the 100-year flood. The 100-year floodplain includes some land areas that are flooded by small and often-dry watercourses. At the federal level, Executive Order (EO) 11988, *Floodplain Management* requires federal agencies to “avoid direct or indirect support of floodplain development wherever there is a practicable alternative.”

3.1.1.4 Groundwater

The primary confined groundwater aquifers in the area of NAS Patuxent River are the Aquia, which occurs at a depth of approximately 500 feet (152 meters) below mean sea level (bmsl), and the Piney Point Nanjemoy, which occurs at a depth of approximately 200 feet (61 meters) bmsl. Increased domestic and industrial groundwater pumping in the area has contributed to declining water levels in the Aquia aquifer since 1952, with a similar trend occurring in the Piney Point Nanjemoy aquifer (Navy, 1998).

Unconfined groundwater occurs at shallow depths on NAS Patuxent River. The depth to unconfined groundwater varies with the season and soil types.

Site A

Soils mapped on Site A include the Matapeake silt loam, 0 to 2 percent slopes, Mattapex silt loam, 0 to 2 percent slopes, Othello silt loam, and Sassafra sandy loam, 2 to 5 percent slopes, moderately eroded (see Section 3.2.1.3 for a description of these soils). Seasonal high groundwater in the Matapeake silt loam occurs at depths of greater than 4 feet (1.2 meters) bmsl; seasonal high groundwater in the Mattapex fine sandy loam occurs at 1.5 to 2.5 feet (0.45 to 0.76 meters) bmsl; seasonal high groundwater in the Othello fine sandy loam occurs at the surface; and seasonal high groundwater in the Sassafra sandy loam occurs at around 4 feet (1.2 meters) bmsl.

Site B

Soils mapped on Site B include the Bibb silt loam, Matapeake silt loam, 0 to 2 percent slopes, and the Matapeake silt loam, 2 to 5 percent slopes, moderately eroded (see Section 3.2.1.3 for a description of these soils). Seasonal high groundwater in the Bibb silt loam occurs at a depth of 0 to 1 feet (0 to 0.3 meters) and seasonal high groundwater in both phases of the Matapeake silt loam occurs at depths of greater than 4 feet (1.2 meters) bmsl.

3.1.1.5 Coastal Zone

The Coastal Zone Management Act of 1972 (11 USC 1451 et seq), as amended through the Coastal Zone Protection Act of 1996, requires review of actions in the coastal zone for impacts on coastal resources and for consistency with Maryland Coastal Zone Management Program (CZMP). Although military installations under exclusive federal jurisdiction are excluded from the legal definition of coastal zone, NAS Patuxent River consulted with the Maryland Department of the Environment (MDE) regarding the construction of the Aircraft Prototype Facility at NAS Patuxent River for review under the Maryland CZMP. In Maryland, the CZMP is based on federal laws, such as Section 404 of the Clean Water Act of 1977. This program also takes into account existing state laws and authorities, such as the Chesapeake Bay Critical Area Program, the Tidal Wetlands Act of 1970, the

Non-Tidal Wetlands Protection Act of 1989, and the state's authority under Section 401 of the Clean Water Act of 1977. Compliance with relevant state and federal regulatory programs constitutes consistency with the policies of Maryland's CZMP.

Critical Areas

The St. Mary's County Chesapeake Bay Critical Area Program implements comprehensive plans and policies to protect land and water resources in the Chesapeake Bay Critical Area. Development and land use controls in the critical area are directed to minimize adverse impacts to water quality associated with runoff from surrounding lands. Land use development standards and requirements established in the program are intended to foster more sensitive development activity for shoreline areas and minimize the adverse impacts of development and land use activities on water quality and natural habitats pursuant to the Natural Resources Article, Subtitle 18 of the Annotated Code of Maryland and COMAR 27.01. Both Site A and Site B are located outside of the Chesapeake Bay Critical Area.

3.1.2 Water Resources Environmental Consequences

Alternative A: Construct the Aircraft Prototype Facility at Site A (Preferred Alternative)

Under Alternative A, the proposed Aircraft Prototype Facility would be constructed adjacent to the Robert N. Becker Laboratory, just south of Taxiway A. Other than a 0.08 acre (0.03 hectare) pond located in the southwest corner of the site, there are no permanent surface water features on Site A.

Based on jurisdictional wetland delineations conducted in 2005, five wetland habitats, encompassing a total of 3.68 acres (1.49 hectares), occur across Site A in association with forested and open field areas. Based on preliminary estimates, approximately 3.2 acres (1.3 hectares) of wetlands would be impacted during the development of the Aircraft Prototype Facility and associated site improvements (e.g., utility extensions, aircraft apron and taxiway access, jet blast barriers, vehicle parking and roadways, and sidewalks) on the eastern portion of the site. Development of the facility could not occur in the western portion of the site, where more wetlands would be avoided, because the western portion of the site is a designated clear zone (see Figure 2-1) and no development can occur there.

As stated above, the wetlands on Site A are classified as nontidal wetlands. The wetlands on this site are isolated from other wetland habitats and, by themselves, do not provide any exemplary habitat beyond that of any successional upland forest. This formerly forested, upland area was timbered approximately 15 years ago. Once the water-absorbing trees were removed, the hydric (wetlands) soils on the site kept stormwater at the surface, permitting wetlands to form.

While this type of wetland generally provides excellent habitat, as the trees within this wetland mature and less water is left standing at the surface, the wetlands characteristics on this particular site would eventually be lost. This process, over time, would transform Site A from a wetland to an upland habitat. The vegetation succession and topography at Site A do not lend themselves to open-water habitat, which is the rarest wetlands form. Because the wetlands found on the site were created as a result of the area being timbered, and because these wetlands would eventually be transformed into upland habitat as trees become re-established, the filling of wetlands at Site A, with mitigation as required by Section 404 of the Clean Water Act, would have moderate long-term impacts. Although some forested habitat would be removed, the potential for forested habitat on this site would remain.

Long-term moderate impacts to wetland habitats would be expected to occur as a result of this development and associated site improvements. Coordination with USACE, Baltimore District and MDE would be conducted to ensure that any unavoidable impacts to wetlands on the site would be

minimized to the maximum extent possible. A Section 404 Clean Water Act Individual Permit may be required from USACE for unavoidable impacts to jurisdictional wetlands. In addition, the Maryland Nontidal Wetland Protection Act of 1989 requires a permit for any alterations of nontidal wetlands or a 25-foot (7.6-meter) buffer around the wetlands; thus, a Section 401 Water Quality Certification issued by MDE would also be required. Permit applications would be made through the Joint Permit Application process for concurrent federal and state project review.

Executive Order 11990 requires federal agencies to minimize the loss or degradation of wetlands. The Navy has also established a policy of no net loss of wetlands. The policy requires that impacts to wetlands be avoided if possible, and if unavoidable, that impacts be minimized. If wetlands are impacted then mitigation would be required. Any unavoidable impacts to wetland habitats would be mitigated based on coordination with USACE Baltimore District and MDE, minimizing the long-term impacts to wetland habitats on NAS Patuxent River.

Site A is located outside of the 100-year floodplain, so no floodplain impacts would occur.

No impacts to shallow unconfined groundwater in Site A would be expected. Development of the Aircraft Prototype Facility would result in an increase of impervious surfaces in excess of 624,651 square feet (58,032 square meters) to accommodate buildings and associated site improvements. Precipitation and runoff from impervious surfaces would be conveyed through stormwater control structures to the natural drainage system within the watershed allowing infiltration and groundwater recharge to continue to occur. The replacement of pervious ground cover with impervious surfaces would be expected to have minor impacts on groundwater recharge in the area of proposed development.

Cumulative impacts to surface water conveyance systems from the addition of this construction project on NAS Patuxent River are expected to be minor. The impacts will be minimized by obtaining and implementing approved permits and plans pertaining to the Clean Water Act from MDE. This will be achieved by submittal of a notice of intent for acquisition of a National Pollution Discharge Elimination System (NPDES) permit for construction activity exceeding one acre (0.40 hectares) in size. An MDE-approved stormwater management plan as well as an Erosion and Sediment Control permit would be obtained for this project prior to soil disturbance. These plans and permits utilize best management practices (BMPs) and technologically sound methods of protecting the aquatic environment from negative impacts due to construction activities. The development of a spill contingency plan for site development would ensure that potential impacts to shallow unconfined groundwater on the Site A would be minimized.

As a military installation under exclusive federal jurisdiction, NAS Patuxent River is excluded from the legal definition of coastal zone. Although excluded, NAS Patuxent River did submit a Consistency Determination to the State CZMP office (February 2006) for concurrence that Alternative A would be consistent with the enforceable policies and mechanisms of the Maryland CZMP. In correspondence dated May 12, 2006, the State concurred with NAS Patuxent River's finding of consistency with the CZMP. The state also noted that wetland disturbance, as discussed above, would require permits from the MDE and USACE. These correspondence are provided in Appendix A.

Alternative B: Construct the Aircraft Prototype Facility at Site B

Under Alternative B, minor impacts to surface waters and wetlands would be expected from the development of the Aircraft Prototype Facility and associated site improvements such as utility extensions, aircraft apron and taxiway access, jet blast barriers, vehicle parking and roadways, and sidewalks. Two palustrine forested wetlands encompassing approximately 0.75 acres (0.30 hectares)

occur in the western and southwestern sections of Site B. Both wetland habitats drain to the southwest under Tate Road. The palustrine forested wetland in the western section of Site B occurs in association with an intermittent stream. Although the proposed placement of the 26-acre (10.5 hectare) facility on the 61-acre (25-hectare) site has not been determined, filling of some wetland habitat could be necessary under this alternative to accommodate placement of the facility in this area and to bring utilities to the development site. Although some fill may be necessary, available land at this site would provide opportunities for avoidance and it is expected that not more than 0.50 acres (0.20 hectares) of wetlands would be filled. Wetland habitats would be avoided to the maximum extent possible and any unavoidable impacts would be minimized to the extent possible. Coordination with USACE Baltimore District and MDE would be conducted, as discussed under Alternative A, to ensure that any impacts to wetland habitats on the site would be minimized to the maximum extent possible. Additional impacts to offsite wetlands and surface waters resulting from downstream water quality degradation, scour, and sediment deposition would be expected if properly designed stormwater and erosion and sediment control BMPs were not implemented in the areas adjacent to the two wetlands.

No impacts to shallow unconfined groundwater in Site B would be expected. Development of the Aircraft Prototype Facility would result in an increase of impervious surfaces in excess of 624,651 square feet (58,032 square meters) to accommodate buildings and associated site improvements. Precipitation and runoff from impervious surfaces would be conveyed through stormwater control structures to the natural drainage system within the watershed allowing infiltration and groundwater recharge to continue to occur. The replacement of pervious ground cover with impervious surfaces would have minor impacts on groundwater recharge in the area of proposed development. The development of a spill contingency plan for site development would ensure that potential impacts to shallow unconfined groundwater on the Site B would be minimized.

As a military installation under exclusive federal jurisdiction, NAS Patuxent River is excluded from the legal definition of coastal zone. Although excluded, NAS Patuxent River did submit a Consistency Determination to the MDE (February 2006) for concurrence that Alternative A would be consistent with the enforceable policies and mechanisms of the Maryland CZMP. In correspondence dated May 12, 2006, the MDE concurred with NAS Patuxent River's finding of consistency with the CZMP. The state also noted that wetland disturbance, as discussed above, would require permits from the MDE and USACE. These correspondence are provided in Appendix A.

No Action Alternative

Under the No Action Alternative, the Aircraft Prototype Facility would not be constructed and water resources on NAS Patuxent River would remain the same. There would be no impacts to water resources.

3.2 Geology, Topography, and Soils

3.2.1 Geology, Topography, and Soils Affected Environment

3.2.1.1 Geology

NAS Patuxent River and surrounding St. Mary's County are in the Coastal Plain Physiographic Province. The Coastal Plain Physiographic Province is composed of a wedge of sediments that increase in thickness toward the Atlantic Ocean. The lower two-thirds of the wedge, which rest upon Precambrian to Mesozoic rock, consist of clay, sand, and gravel sediments of late Jurassic and Cretaceous age. These sediments were deposited by rivers flowing eastward from the Appalachian

Mountains. The upper section of the wedge consists of Tertiary and Quaternary sand, silt, and clay sediments, which are predominantly of marine origin (William & Mary, 2002). The predominant landform in the Coastal Plain consists of a flat, weakly dissected alluvial plain formed by deposition of continental sediments onto a submerged, shallow continental shelf, which was later exposed by sea level subsidence. Fluvial deposition and shore zone processes are active in developing and maintaining beaches, swamps, and mud flats along the coast (USDA, 1994).

3.2.1.2 Topography

The topography at NAS Patuxent River rises gradually from the Chesapeake Bay shoreline westward to an elevation of 120 feet (36.6 meters) above mean sea level (amsl), with the majority of the installation fairly level at 40 feet (12 meters) amsl. The hilliest area of NAS Patuxent River is the southwest section of the installation. The present topography is drastically different from the original topography, which was regraded when the Navy acquired the property in the 1940s (Navy, 1998; Navy, 2002a).

Site A

Site A is characterized by nearly level topography with a gradual change in elevation from 20 feet (6.1 meters) amsl in the northeast corner of the property to 30 feet (9.14 meters) amsl on the western edge. There are man-made ditches on the north and east boundaries of the site, and the property generally drains in those two directions. The topography of Site A is shown in Figure 3-3.

Site B

Site B is characterized by nearly level topography with elevations ranging from 35 feet (10.7m) amsl near the southwestern boundary of the site to 45 feet (13.7m) amsl on the northeastern boundary. Several small 45-foot mounds occur in the central area of the site. Drainage on Site B is generally to the southwest. The topography of Site B is shown in Figure 3-4

3.2.1.3 Soils

Maryland Stormwater Management Guidelines for State and Federal projects require that projects exceeding a set limit of soil disturbance adhere to these guidelines. For construction projects with over 5,000 square feet (465 square meters) or 2,700 cubic feet (76.5 cubic meters) of land disturbance, an erosion and sediment control plan and a stormwater management plan are required. This plan should contain supporting computations, drawings, and sufficient information describing the manner, location, and type of measures in which stormwater runoff would be managed over the entire project (MDE, 2001). Projects that disturb over one acre (4,047 square meters) require a NPDES Phase II stormwater permit. These guidelines also apply to any reconstruction of, or new construction on, existing impervious area exceeding 5,000 square feet (465 square meters).

FIGURE 3-3: SITE A TOPOGRAPHY

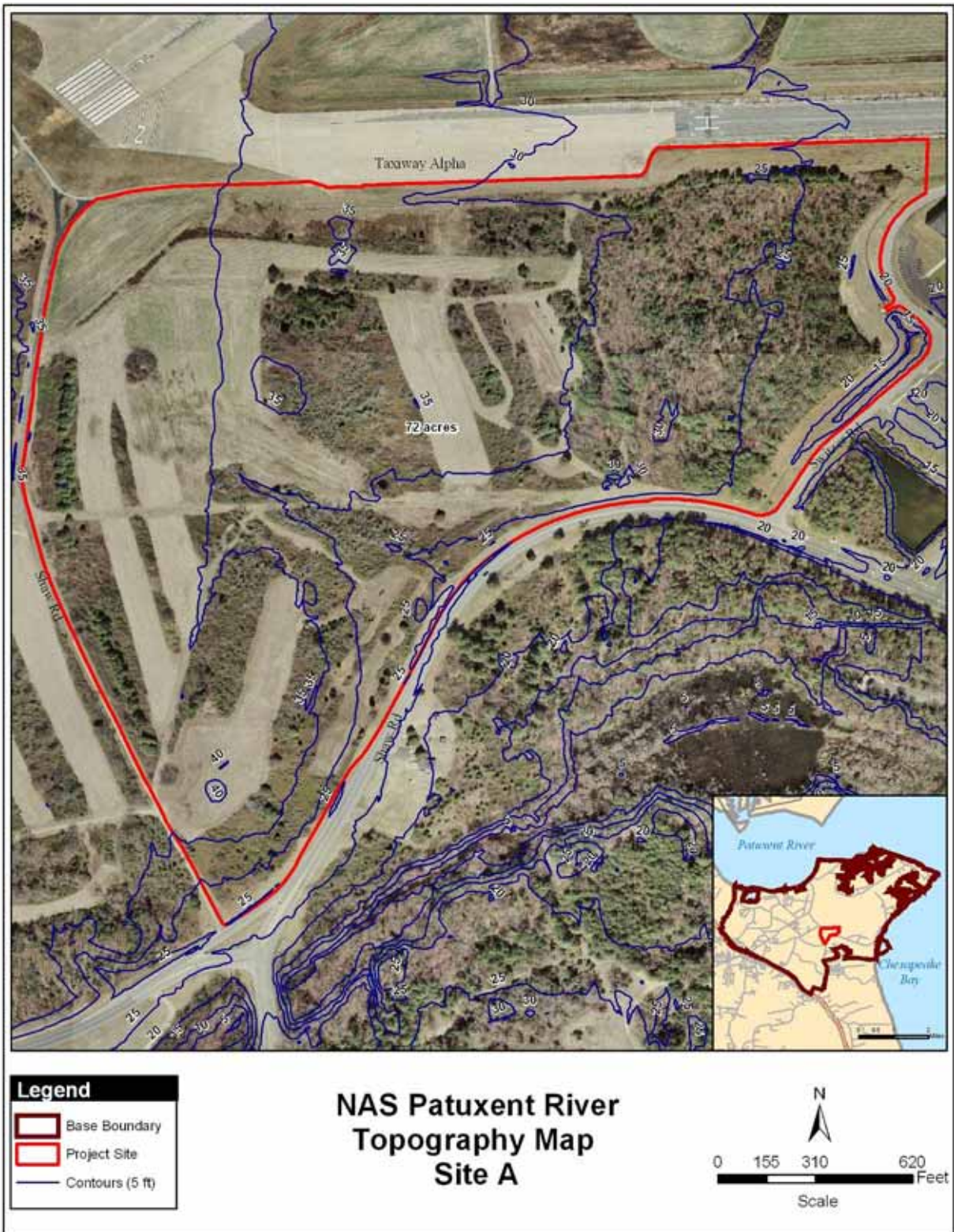
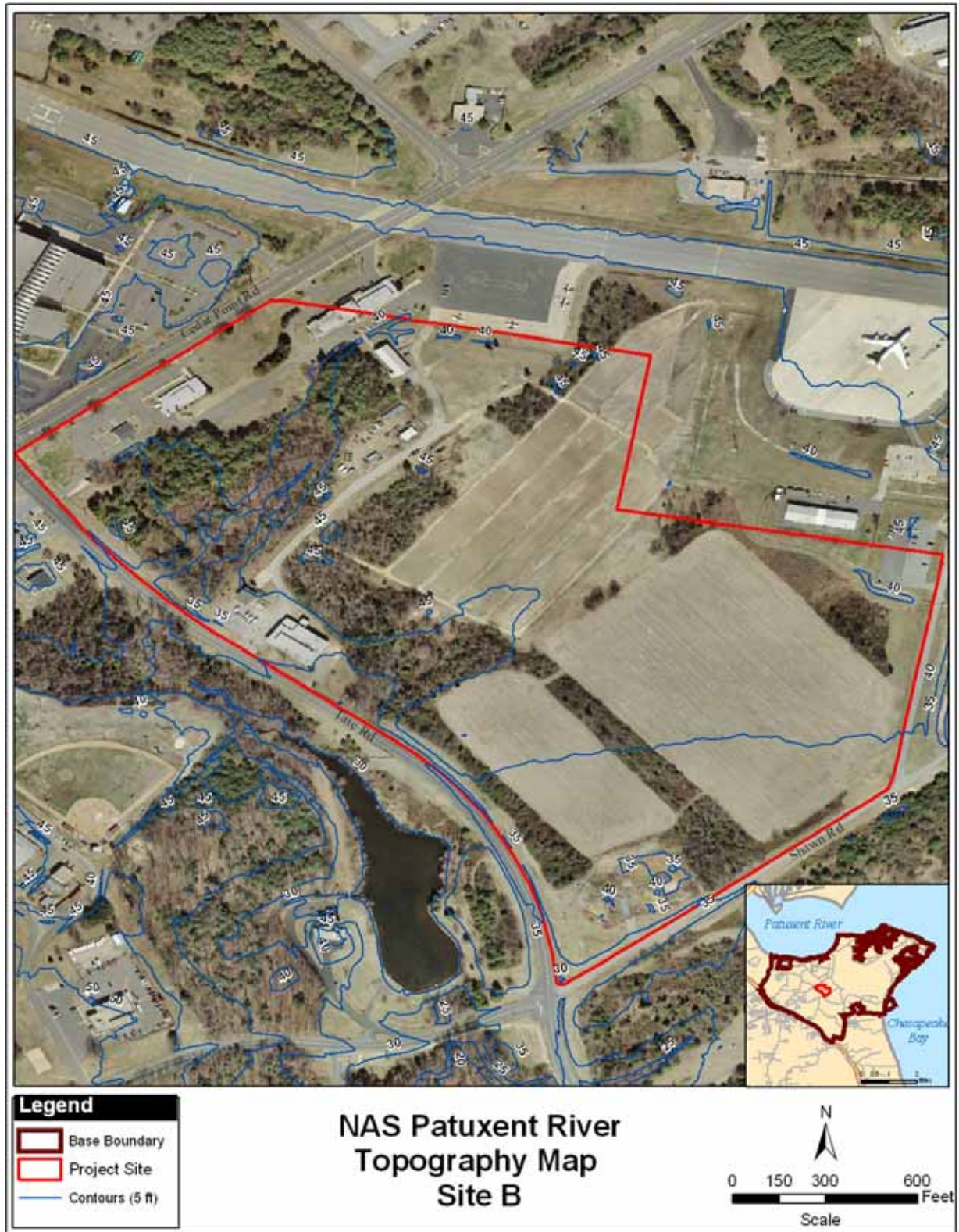


FIGURE 3-4: SITE B TOPOGRAPHY



The Maryland Erosion and Sediment Control Guidelines for State and Federal Projects, the Erosion and Sediment Control Regulations (COMAR 26.17.01), and the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control establish requirements and provide guidelines for submittal of erosion and sediment control plans by state and federal agencies to MDE's Water Management Administration for approval. The erosion and sediment control regulations require the preparation, approval, and implementation of an erosion and sediment control plan for all land clearing and grading activities that disturb greater than or equal to 5,000 square feet (465 square meters) of area, and involve less than 100 cubic yards (77 cubic meters) of earth movement. The purpose of the erosion and sediment control plan is to provide sufficient information, drawings, computations, and notes to describe how potential soil erosion and off-site sedimentation associated with a land-disturbing activity will be minimized.

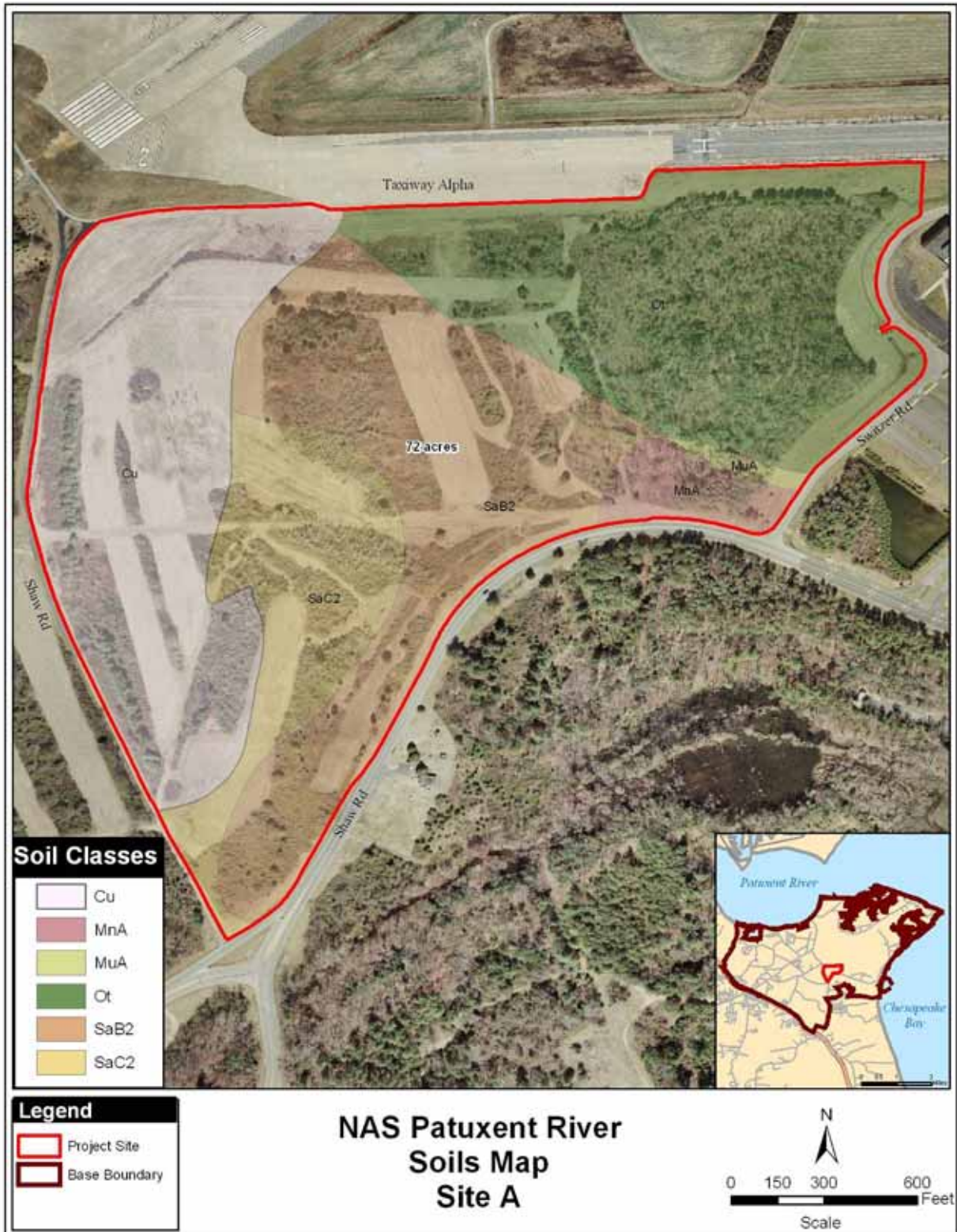
Site A

Based on the Soil Survey of St. Mary's County, Maryland (1978), there are four soil mapping units occurring on Site A. Soils mapped on the site include the Matapeake silt loam, 0 to 2 percent slopes; Mattapex silt loam, 0 to 2 percent slopes; Othello silt loam; the Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded; and Sassafras sandy loam, 5 to 10 percent, moderately eroded. The locations of soils occurring in the project area are shown in Figure 3-5. The following text provides general descriptions of the soil mapping units occurring in the area.

- Matapeake silt loam, 0 to 2 percent slopes (MnA) – The MnA mapping unit is a deep, well drained, level to moderately sloping soil that occurs on terraces above major rivers, and in some areas, on uplands. It has a high available water capacity and is moderately permeable. The hazard for erosion is none to slight. Some upland areas in this mapping unit are underlain by a discontinuous iron pan at a depth of about 4 to 5 feet (1.2 to 1.5 meters). The depth to high water table is greater than four feet (1.2 meters) and the shrink swell potential for the soil is low. This soil is designated as Prime Farmland soil in St. Mary's County.
- Mattapex silt loam, 0 to 2 percent slopes (MuA) – The MuA mapping unit is a moderately well drained, level to moderately sloping, deep soil that occurs mainly at lower elevations adjacent to major rivers and streams. A seasonally high water table and impeded drainage are the main limitations for nonfarm use. The hazard of erosion is none to slight. Seasonal wetness is a major management concern. The depth to high water table is 1.5 (0.46 meters) to 2.5 feet (0.76 meters). The shrink swell potential of the soil is low. There is a moderate limitation for development of buildings with basements and roads, due to a moderately high water table and moderately slow permeability.
- Othello silt loam (Ot) – The Ot mapping unit is a deep, poorly drained, nearly level soil that occurs on terraces adjacent to major rivers. It has a high available water capacity, and permeability is moderately slow. The hazard of erosion is none to slight. Wetness is the major management concern because the high water table occurs at the ground surface (0 feet). Where good drainage outlets are available, the soil is moderately difficult to drain, either by ditches or tile drains. The shrink swell potential of the soil is low. There is a severe limitation for development of buildings with basements and roads due to a high water table and poor natural drainage.

The Othello silt loam is classified as a hydric soil. Hydric soils are soils that are saturated, flooded, or ponded for long enough during the growing season to develop anaerobic (oxygen deficient) conditions in their upper part. Anaerobic soil conditions are conducive to the

FIGURE 3-5: SITE A SOILS



establishment of vegetation that is adapted for growth under oxygen-deficient conditions (hydrophytic vegetation) and is typically found in wetlands. On Site A, much of the area of the Ot soil unit has been identified as wetlands (see Figure 3-1).

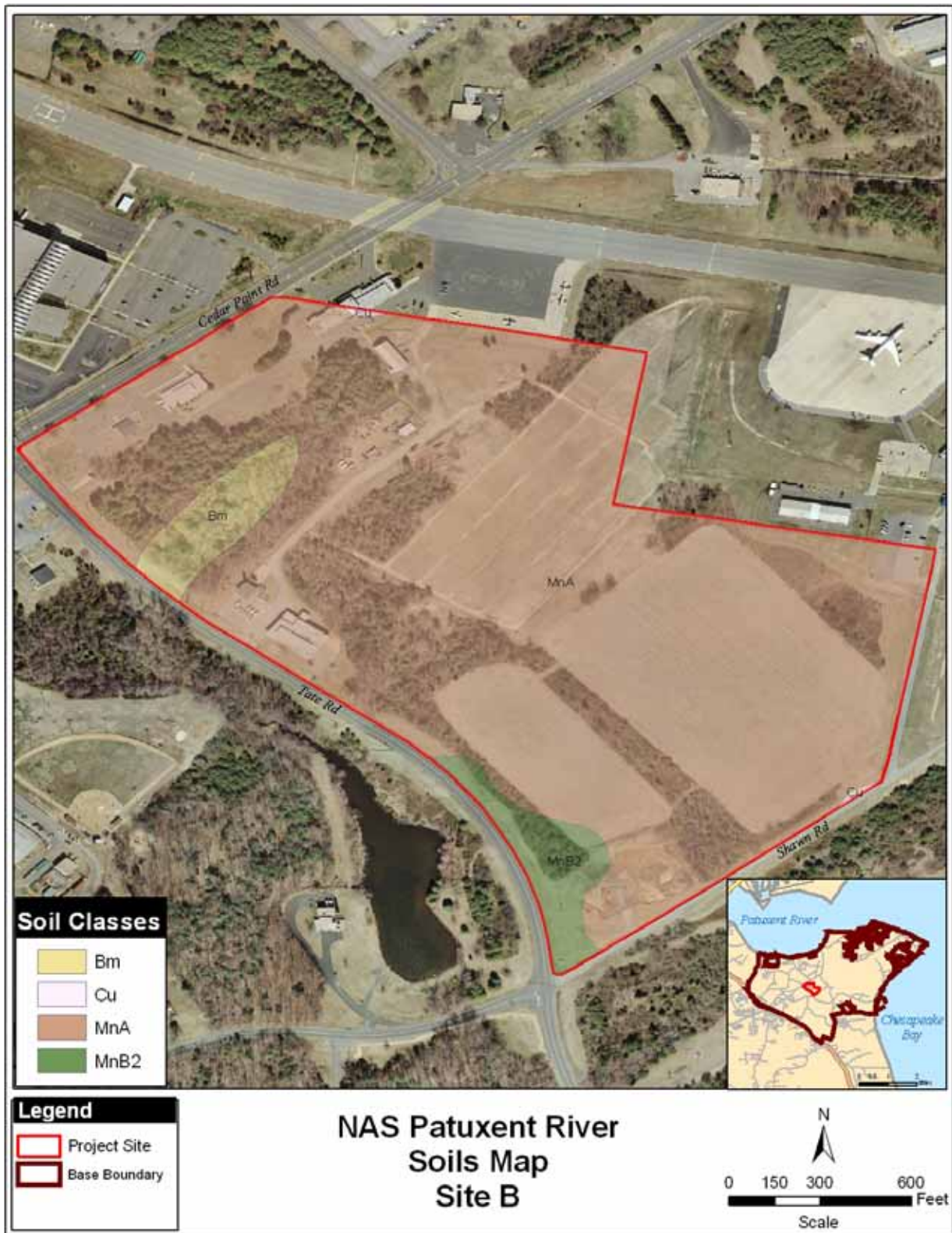
- Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded (SaB2) – The SaB2 mapping unit is a deep, well drained, nearly level to strongly sloping soil that occurs on uplands and lower terraces above major rivers. It has a moderate to high available water capacity and is moderately permeable. The soil is suited to practically all uses except where limited by slope, erosion, and, in a few places, an underlying discontinuous iron pan. The hazard for erosion is moderate. The depth to high water table is 4 feet (1.2 meters) and the shrink swell potential for the soil is low.
- Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded (SaC2) – The SaC2 mapping unit is deep and well drained. The soil unit has an available water depth of 60 inches with low shrink swell potential. This soil is not flooded or ponded and within a depth of 72 inches, there is no water saturation. This soil is not considered hydric.
- Cut and Fill (Cu) – The Cu mapping unit consists of areas where the soil has been cut by grading or similar operations, or where fill consisting of soils or other materials has been placed over the soil. Due to variability in this mapping unit, onsite investigations are necessary to determine uses and limitations (USDA, 1978).

Site B

Based on the Soil Survey of St. Mary's County, Maryland (1978), there are three soil mapping units occurring on Site B. Soils mapped on the site include the Bibb silt loam; Matapeake silt loam, 0 to 2 percent slopes (described under Site A); and Matapeake silt loam, 2 to 5 percent slopes, moderately eroded. Soils on Site B are shown in Figure 3-6.

- Bibb silt loam (Bm) – The Bm mapping unit is a poorly drained, level or nearly level soil that occurs on floodplains. The soil is moderately permeable and the available water capacity is high. The depth to high water table is 0 to 1 foot (0.3 meters) and the soil is subject to flooding at irregular intervals. The shrink swell potential is low. Poor natural drainage, a seasonally high water table, and the hazard of flooding are severe limitations for most nonfarm uses, including buildings with basements and roads. The Bibb silt loam is classified as a hydric soil, as described under Site A.
- Matapeake silt loam, 2 to 5 percent slopes, moderately eroded (MnB2) – The MnB2 mapping unit is a deep, well drained, level to moderately sloping soil that occurs on terraces above major rivers, and in some areas, on uplands. The soil is moderately permeable and has a high available water capacity. The hazard for erosion is moderate. Some upland areas are underlain by a discontinuous iron pan at a depth of about 4 to 5 feet (1.2 to 1.5 meters). The depth to high water table is greater than 4 feet (1.2 meters). The shrink swell potential of the soil is low. There is a moderate limitation for development of roads due to slope.

FIGURE 3-6: SITE B SOILS



3.2.2 Geology, Topography, and Soils Environmental Consequences

Alternative A: Construct the Aircraft Prototype Facility at Site A (Preferred Alternative)

Minor short- and long-term adverse impacts to topography and soils on Site A would be expected as a result of implementing Alternative A. No impacts to geologic resources would be expected. Project development would be expected to directly affect micro topography and soils as a result of grading, excavation, placement of fill, compaction, mixing, and augmentation. Additional effects could result from erosion and associated sedimentation where vegetative cover is removed during construction.

Site A contains Matapeake silt loam, 0 to 2 percent soils, which are designated as Prime Farmland in St. Mary's County. Prime Farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and must be made available for these uses. Further, these soils have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. On Site A, these soils occur on a small area in the southeastern portion of the site. During development, this small area of Prime Farmland would be avoided and there would be no impacts to this resource.

In excess of 1,128,596 square feet (104,850 square meters) of currently undeveloped land would be disturbed to accommodate buildings and associated site improvements, requiring an erosion and sediment control plan and a stormwater management plan. The stormwater plan would contain supporting computations, drawings, and sufficient information describing the manner, location, and type of measurements that would be implemented to manage stormwater runoff over the entire project (MDE, 2001). Since this project would disturb over one acre (4,047 square meters), a NPDES Phase II stormwater permit would also be required.

The Maryland Stormwater Management Guidelines for State and Federal Projects require that new development in St. Mary's County implement minimum controls such that the water quality volume, the recharge volume, and the channel protection storage volume sizing criteria shall be used to design BMPs according to the Design Manual to control the 24-hour, 10-year frequency storm event. Following these guidelines, impacts to topography, and soils from increased stormwater runoff would be minor.

To minimize impacts associated with the increased impervious surfaces from the 624,651 square feet (58,032 square meters) of development, both on-site and off-site, temporary and permanent erosion, sedimentation, and stormwater controls would be implemented. Project design and development for the Aircraft Prototype Facility would incorporate BMPs in compliance with the Maryland Stormwater Management Guidelines.

Alternative B: Construct the Aircraft Prototype Facility at Site B

Impacts similar to those discussed under Alternative A would be expected under Alternative B, as the same amount of area would be disturbed during construction. Erosion and sediment control and stormwater management plans, as well as a NPDES Phase II stormwater permit, would be required as discussed under Alternative A. The impacts during construction would be short-term and minor.

Site B contains Matapeake silt loam, 0 to 2 percent soils, which are designated as Prime Farmland in St. Mary's County. Prime Farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and must be made available for these uses. Further, these soils have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable

salt and sodium content, and few or no rocks. On Site B, these soils occur throughout the majority of the site and could not be avoided during construction activities. Since development would occur on a large area designated as Prime Farmland, impacts to soil resources would be long-term and moderate.

No Action Alternative

Under the No Action Alternative, the Aircraft Prototype Facility would not be constructed and the existing character of the geology, topography, and soils on NAS Patuxent River would remain the same. There would be no impacts to geology, topography, or soils.

3.3 Biological Resources

3.3.1 Biological Resources Affected Environment

This section describes the biological resources located in the area of each alternative. Vegetation and wildlife habitats were characterized based on both existing documentation and field observations. A reconnaissance of the project areas was conducted in July 2005 to verify the results of previous biological reports and gather additional information on vegetative communities, wildlife habitats, and habitat use adjacent to the project areas.

3.3.2 Vegetation and Wildlife Affected Environment

3.3.2.1 Vegetation

Site A

Site A is characterized by both upland forested habitat and wetland habitat with narrow surrounding fields and cleared areas. Red maple, loblolly pine, black gum, sweet gum, white oak (*Quercus alba*), and willow oak dominate the overstory in the forested area. American holly, sweet pepper bush, and highbush blueberry are dominant sub-canopy species, with common greenbrier, Japanese honeysuckle, multiflora rose (*Rosa multiflora*), and trumpet creeper (*Campsis radicans*) also present. Herbaceous species occurring in the non-forested wetland areas include several sedges such as lurid sedge, bristlebracted sedge, and fox sedge. The herbaceous wetland habitats are also characterized by soft rush, wool grass, trumpet creeper, narrowleaf cattail, netted chain fern, and velvet panicum. Open upland areas are characterized by unidentified mowed grasses, with some areas planted in corn (Navy, 2002a).

Site B

Site B is characterized by agricultural plots and garden plots in the eastern section of the site, and forested upland and wetland habitats in the western and southwestern section. Cleared areas occur in association with existing buildings and roads. The agricultural plots are planted primarily in corn. The garden plots are characterized primarily by crops such as tomatoes, corn, squash, peppers, etc. The forested areas are characterized by red maple, black gum, sweet gum, and willow oak in the overstory, with some red cedar (*Juniperus virginiana*) also present. Understory vegetation in the forested upland areas is characterized by American holly, flowering dogwood (*Cornus florida*), grapes (*Vitis* spp.), Japanese honeysuckle, poison ivy, trumpet creeper, Virginia creeper, and common greenbrier. Wetland habitats on Site B are characterized by red maple, black gum, and sweet gum in the overstory, with black willow, sweet pepperbush, jewelweed, lizard tail, fox sedge, wool grass, and netted chain fern characterizing the understory. The cleared areas adjacent to existing buildings and roads are characterized by mowed grasses and associated herbaceous vegetation (Navy, 2002a).

3.3.2.2 Wildlife

Wildlife species found on NAS Patuxent River are distributed based on their habitat needs and the location of available habitats. Habitats occurring on the facility provide some, or all of the conditions necessary for the survival of existing resident and migrating species. In general, habitats occurring on NAS Patuxent River include forests (deciduous, coniferous, mature, and successional), open land (mowed, agricultural, old-field), fresh and brackish wetlands, open waters including the Chesapeake Bay, and built-up areas. Wildlife occurring in the area may utilize one or several of the habitat types. Wildlife species potentially occurring on Sites A and B would be expected to be similar to those found in association with forested habitats on NAS Patuxent River.

Approximately 45 species of mammals occur on NAS Patuxent River and the surrounding area. Of these, about 25 species are considered common, and include species such as white-tailed deer (*Odocoileus virginianus*), eastern gray squirrel (*Sciurus carolinensis*), southern flying squirrel (*Glaucomys volans*), raccoon (*Procyon lotor*), beaver (*Castor canadensis*), river otter (*Lutra canadensis*), muskrat (*Ondatra zibethicus*), eastern cottontail rabbit (*Sylvilagus floridanus*), gray fox (*Urocyon cinereoargenteus*), red fox (*Vulpes fulva*), several bats (*Chiroptera* spp.), woodchuck (*Marmota monax*), opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), and smaller rodents such as the house mouse (*Mus musculus*), white-footed mouse (*Peromyscus leucopus*), eastern mole (*Scalopus aquaticus*), least shrew (*Cryptotis parva*), and meadow vole (*Microtus pennsylvanicus*). White-tailed deer, beaver, squirrels, muskrat, cottontail rabbit, grey fox, red fox, and skunk are managed on NAS Patuxent River. Through the Deer/Aircraft Strike Hazard (DASH) Program, white-tailed deer populations are managed with harvest and habitat controls to maintain a level that balances deer/aircraft strikes, aesthetics, and recreation and educational uses (Navy, 2002a).

Amphibians and reptiles likely to occur in forest habitats on NAS Patuxent River include American toad (*Bufo americanus*), wood frog (*Rana sylvatica*), redback salamander (*Plethodon cinereus*), spotted salamander (*Ambystoma maculatum*), northern red salamander (*Plethodon ruber*), eastern ribbon snake (*Thamnophis sauritus sauritus*), northern ringneck snake (*Diadolphis punctatus edwardii*), and redbelly snake (*Storeria occipitomaculata*). Amphibians and reptiles found in association with transitional old-field and shrub-dominated habitats include Fowler's toad (*Bufo fowleri*), corn snake (*Elaphe guttata guttata*), eastern garter snake (*Thamnophis sirtalis*), rough green snake (*Opheodrys aestivus*), northern black racer (*Coluber constrictor*), black rat snake (*Elaphe obsoleta*), eastern box turtle (*Terrapene carolina*), and various skinks (Navy, 2002a).

Surveys conducted on NAS Patuxent River have identified over 300 species of birds. Examples of common avian species occurring in forested and open developed habitats on the facility include mourning dove (*Zenaida macroura*), house sparrow (*Passer domesticus*), Carolina chickadee (*Parus carolinensis*), tufted titmouse (*Baeolophus bicolor*), wood thrush (*Hylocichla mustelina*), American robin (*Turdus migratorius*), grey catbird (*Dumetella carolinensis*), northern mockingbird (*Mimus polyglottos*), northern cardinal (*Cardinalis cardinalis*), blue jay (*Cyanocitta cristata*), American crow (*Corvus brachyrhynchos*), field sparrow (*Spizella pusilla*), song sparrow (*Melospiza melodia*), common grackle (*Quiscalus quiscula*), house finch (*Carpodacus mexicanus*), American goldfinch (*Carduelis tristis*), downy woodpecker (*Picoides pubescens*), red-bellied woodpecker (*Melanerpes carolinus*), hairy woodpecker (*Picoides villosus*), great blue heron (*Ardea herodias*), green heron (*Butorides virescens*), and Canada goose (*Branta canadensis*). In addition, several raptors including red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), Coopers hawk (*Accipiter cooperii*), and American kestrel (*Falco sparverius*) are common residents on the facility. The most common shorebirds on NAS Patuxent River are gulls. The more common gulls on the installation include laughing gull (*Larus atricilla*), herring gull (*Larus argentatus*), great black-backed gull (*Larus marinus*), and ring-billed gull (*Larus delawarensis*) (Navy, 2002a).

3.3.2.3 Rare, Threatened, and Endangered Species

The Endangered Species Act (16 USC 1531 et seq.) mandates that all federal agencies consider the potential affects of their actions on species listed as federally threatened or endangered. Section 7 of the Endangered Species Act requires federal agencies that fund, authorize, or carry out an action to ensure that their action is not likely to jeopardize the continued existence of any federally listed threatened or endangered species (including plant species) or result in the destruction or adverse modification of designated critical habitats. If NAS Patuxent River determines that an action may adversely affect a federally listed species, regulations require consultation with the USFWS to ensure minimization of potential adverse impacts to the species or its designated critical habitat. At NAS Patuxent River, no critical habitat is present; therefore consultation would address any potential impacts to species.

Informal consultation was initiated with the USFWS and the Maryland Department of Natural Resources (MDNR) Natural Heritage Program for information regarding species of special status with the potential to occur on, or in the near vicinity of Site A or Site B. The USFWS responded that the northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*) is known to occur at Fishing Point and Cedar Point on the NAS Patuxent River property. Except for occasional transient individuals, no other federally proposed or listed endangered or threatened species are known to exist within the proposed project areas. The MDNR stated that there are no state or federal records for rare, threatened, or endangered species within the proposed project areas (see Appendix A).

Although not known to occur within the proposed project areas, several federally listed endangered wildlife species have been documented to occur on or in habitats adjacent to NAS Patuxent River. The shortnose sturgeon (*Acipenser brevirostrum*) is found in the lower Chesapeake Bay. It is a fresh to brackish water fish capable of sustaining populations in the Patuxent and Potomac Rivers. The federally endangered leatherback sea turtle (*Dermchelys coriacea*) and Kemp's Ridley sea turtle (*Lepidochelys kempii*) are transient species that are also known to occur in the Chesapeake Bay and may utilize habitats in estuarine waters adjacent to the installation. Unobstructed access from the Atlantic Ocean to the waters around NAS Patuxent River makes the occurrence of oceanic cetaceans in the area possible. The federally endangered humpbacked whale (*Megaptera novaeangliae*) and North Atlantic right whale (*Balaena glacialis*) have been observed in the vicinity of the facility. The West Indian manatee (*Trichechus manatus*) is also known to very rarely occur in the Chesapeake Bay (Navy, 2002a).

Federally threatened wildlife species documented on NAS Patuxent River include the bald eagle (*Haliaeetus leucocephalus*), piping plover (*Charadrius melodus*), Atlantic loggerhead sea turtle (*Caretta caretta*), and the northeastern beach tiger beetle, as noted above by the USFWS.

The bald eagle is found throughout the Chesapeake Bay area with a healthy population occurring in the vicinity of NAS Patuxent River. Annual bald eagle nesting surveys are conducted by MDNR, the Natural Resources Branch of NAS Patuxent River, and the NAS Search and Rescue Unit. In 2006 a single bald eagle nest was discovered at NAS Patuxent River, but is not in the vicinity of the proposed project locations (pers. com., J. Smith, February 8, 2007). The occurrence of the piping plover on NAS Patuxent River is documented by a single occurrence in a migratory record dating from the 1960s (Navy, 2002a).

Several carcasses of the Atlantic loggerhead sea turtle have been documented to wash up on the shores of the facility. No live loggerheads have been observed on NAS Patuxent River (Navy, 2002a).

A few individuals of the northeastern beach tiger beetle have been documented on the facility. It is not known whether the beetles breed on the installation or if they were dispersed from known breeding sites across the Patuxent River in Calvert County (Navy, 2002a). Consultation with the USFWS shows that this species is known to occur at Fishing Point and Cedar Point, both of which are located outside the proposed project areas.

There are no known federally listed endangered or threatened plant species on NAS Patuxent River. There are 16 state-endangered animal species that are known or expected to occur on NAS Patuxent River. There are an additional four state-endangered species with a possibility of occurring on the facility, eight state-threatened animal species that are known or expected to occur on the installation, and one species that possibly occurs on the site (Navy, 2002a).

Table 3-3 provides a list of state-endangered or threatened wildlife species that are known, expected, or that could possibly occur on NAS Patuxent River.

There are eight state-endangered and four state-threatened plant species that are known to occur on NAS Patuxent River (Navy, 2002a). Table 3-4 provides a list of state-listed plant species known to occur on the installation along with a general description of habitat characteristics associated with the species.

3.3.3 Biological Resources Environmental Consequences

Alternative A: Construct the Aircraft Prototype Facility at Site A (Preferred Alternative)

Minor to moderate short- and long-term adverse impacts to vegetation and wildlife would be expected as a result of implementing Alternative A. Site A is characterized primarily by forested habitat with narrow surrounding fields. Approximately 26 acres (10.5 hectares) of currently undeveloped land on the 72 acre (29 hectare) site would be disturbed to accommodate buildings and associated site improvements at Site A.

Impacts to natural vegetation occurring on Site A would include direct long-term effects associated with removal and indirect short- and long-term effects associated with damage to species during, or as a result of, development. Development in areas currently maintained as fields would result in minimal impacts to natural vegetation. Development in the forested habitats in the eastern section of the site, where development would occur to avoid developing in the clear zone, would result in direct removal of trees and associated understory vegetation necessary to accommodate the facility footprint. Indirect damage to trees and understory vegetation would be expected to occur as a result of damage to root systems, soil compaction, and landscape modification associated with site development.

TABLE 3-3: STATE AND FEDERALLY THREATENED OR ENDANGERED WILDLIFE SPECIES WITH KNOWN, EXPECTED, OR POSSIBLE OCCURRENCE ON NAS PATUXENT RIVER

Common Name	Scientific Name	State Status	Occurrence
Birds			
Piping Plover	<i>Charadrius melodus</i>	Endangered	Known, Migrant – Note: single specimen seen in 1960
Upland Sandpiper	<i>Bartramia longicauda</i>	Endangered	Known, Migrant
Gull-billed Tern	<i>Sterna nilotica</i>	Threatened	Known, Migrant, rare occurrences only
Least Tern	<i>Sterna antillarum</i>	Threatened	Known, Breeder, Migrant

Common Name	Scientific Name	State Status	Occurrence
Royal Tern	<i>Sterna maxima</i>	Endangered	Known, Migrant
Black Skimmer	<i>Rynchops niger</i>	Threatened	Known, Migrant
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Threatened	Known, Breeder, Migrant
Northern Goshawk	<i>Accipiter gentiles</i>	Endangered	Known, Migrant
Northern Harrier	<i>Circus cyaneus</i>	Rare	Known, Migrant
Peregrine Falcon	<i>Falco peregrinus</i>	Endangered	Known, Migrant
Olive-sided Flycatcher	<i>Contopus borealis</i>	Endangered	Known, Migrant
Sedge Wren	<i>Cistothorus platensis</i>	Threatened	Known, Migrant
Loggerhead Shrike	<i>Lanius ludovicianus</i>	Endangered	Known, Migrant
Blackburnian Warbler	<i>Dendroica fusca</i>	Threatened	Known, Migrant
Mourning Warbler	<i>Oporornis Philadelphia</i>	Endangered	Known, Migrant
Swainson's Warbler	<i>Limnothlypis swainsonii</i>	Endangered	Known, Migrant
Henslow's Sparrow	<i>Ammodramus henslowii</i>	Threatened	Possible, Migrant
Mammals			
Humpback Whale	<i>Megaptera novaengliae</i>	Endangered	Expected, Migrant
Northern Atlantic Right Whale	<i>Balaena galcialis</i>	Endangered	Expected, Migrant
Reptiles			
Loggerhead Sea Turtle	<i>Caretta caretta</i>	Threatened	Known (dead), Migrant
Kemp's Ridley Sea Turtle	<i>Lepidochelys kempii</i>	Endangered	Known (dead), Migrant
Atlantic Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	Endangered	Expected, Migrant
Amphibians			
Eastern Narrow-mouthed Toad	<i>Gastrophryne carolinensis</i>	Endangered	Known
Eastern Tiger Salamander	<i>Ambystoma t. tigrinum</i>	Endangered	Possible
Fish			
Shortnose Sturgeon	<i>Acipenser brevirostrum</i>	Endangered	Possible, Migrant
Glassy Darter	<i>Etheostoma vitreum</i>	Endangered	Possible, Migrant
Insects			
Frosted Elfin	<i>Incisalia i. irus</i>	Endangered	Known, Breeder
Northeastern Beach tiger Beetle	<i>Cicindela d. dorsalis</i>	Endangered	Known

Source: Navy, 2002

TABLE 3-4: STATE ENDANGERED OR THREATENED PLANT SPECIES KNOWN TO OCCUR ON NAS PATUXENT RIVER

Common Name	Scientific Name	State Status	Habitat Description
Tabaccoweed (Devil's Grandmother)	<i>Elephantopus tomentosus</i>	Endangered	mowed lawn beneath trees and mowed utility rights-of-way
Claspingleaf St. Johnswort	<i>Hypericum gymnanthum</i>	Endangered	mowed wet clayey roadsides
Sandplain Flax	<i>Linum intercursum</i>	Threatened	mowed, dry sandy and clayey power line rights-of-way
Seabeach Knotweed	<i>Polygonum glaucum</i>	Endangered	beach at the drift line
Beach Plum	<i>Prunus maritima</i>	Endangered	edge of second growth mixed hardwoods
Shumard's Oak	<i>Quercus shumardii</i>	Threatened	wet areas of mature woods
Globe Beakrush	<i>Rhynchospora globularis</i>	Endangered	wet, cleared forest edge
Clustered Beakrush	<i>Rhynchospora glomerata</i>	Threatened	pond edge
Swamp Dock	<i>Rumex floridanus</i>	Endangered	shaded edge of brackish tidal wetlands
Swamp Wedgescale	<i>Sphenopholis pensylvanica</i>	Threatened	stream floodplain with open canopy and fresh marsh associated with ponds
Bladderwort	<i>Utricularia biflora</i>	Endangered	shallow freshwater areas

Source: U.S. Navy, 2002

Up to approximately 26 acres (10.5 hectares) of forest and field that provides habitat for wildlife could be permanently lost as a result of clearing for the proposed development. Construction activities would likely result in mortality of some less mobile fauna such as reptiles, amphibians, and small mammals. Most wildlife would be expected to relocate from areas within or immediately surrounding the construction area. Ability to relocate would be determined by availability of suitable adjacent habitats and connectedness to these habitats. Some species would be expected to move back into the area following the completion of construction, however, the change of habitat from a forested to urban environment and increased intensity in land use would preclude many species from returning to the area. Mobility of wildlife species in the area of the development could be affected as a result of habitat segmentation. Mortality of some species would be expected as a result of collision with vehicles following the completion of development.

Compliance with the provisions of Section 404 of the Clean Water Act (33 CFR, Parts 320-330) and the Maryland Nontidal Wetlands Act would minimize potential for adverse effects to wetland habitats and associated wildlife, where possible. Although military installations under exclusive federal jurisdiction and not required to comply with State of Maryland regulations such as the Nontidal Wetlands Act, NAS Patuxent River would comply with all applicable regulations to the greatest extent possible. As discussed on 3-10 (Water Resources Environmental Consequences), wetlands habitat would be lost under Alternative A. Loss of habitat, including wetland habitats, would result in long-term moderate impacts.

Informal consultation was initiated with USFWS and the MDNR Natural Heritage Program for information regarding species of special status with the potential to occur on, or in the near vicinity of Site A. In a letter dated December 13, 2005, the USFWS found that the northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*) is known to occur at Fishing Point and Cedar Point on the NAS Patuxent River property. Except for occasional transient individuals, no other federally proposed or listed endangered or threatened species are known to exist within the proposed project areas. In a letter dated November 21, 2005, the MDNR concluded that no state or Federal threatened or endangered species are known to occur within the proposed project area under alternative A (Appendix A).

Based on annual bald eagle nesting surveys conducted by MDNR, the Natural Resources Branch of NAS Patuxent River, and the NAS Search and Rescue Unit, a bald eagle nest was discovered at NAS Patuxent River in April 2006, but is not located in the vicinity of the proposed project areas (pers. com., J. Smith, February 8, 2007). State-listed plant species are documented to occur adjacent to Tate Road near the south central boundary of Site A. Implementation of erosion and sediment controls and stormwater BMPs both during and following site development, as well as restricting development in this area, would minimize the potential for any adverse effects to these species. No known rare fauna habitat occurs on Site A.

Implementation of Alternative A would result in the loss of up to 26 acres (10.5 hectares) of potential forest and field habitat, but would not impact any threatened or endangered species. Those species that currently utilize the habitat, identified under Wildlife on page 3-22, would be expected to relocate from the area, with some species being precluded from returning to the area, resulting in minor long-term impacts to wildlife and wildlife habitat.

Alternative B: Construct the Aircraft Prototype Facility at Site B

Minor to moderate short- and long-term adverse impacts to vegetation and wildlife would be expected as a result of implementing Alternative B. Site B is characterized by primarily forested habitat in the western section of the site, and agricultural fields and garden plots in the eastern section. Some existing development occurs along the western and southwestern boundaries of the site. In excess of 2.3 acres (0.93 hectares) of currently undeveloped land would likely be disturbed to accommodate buildings and associated site improvements on the approximately 60 acre (24 hectares) area of Site B.

Impacts to natural vegetation occurring in Site B would include direct long-term effects associated with removal and indirect short- and long-term effects associated with damage to species during, or as a result of, development. Development in areas currently maintained as agricultural fields or garden plots would result in minimal impacts to natural vegetation. Development in the forested habitats in the western section of the site would result in direct removal of trees and associated understory vegetation necessary to accommodate the facility footprint. Indirect damage to trees and understory vegetation would be expected to occur as a result of damage to root systems, soil compaction, and landscape modification associated with site development.

Approximately 2.3 acres (0.93 hectares) of forest and field that provides habitat for wildlife could be permanently lost as a result of clearing for the proposed development. Impacts to wildlife similar to those discussed under Alternative A would be expected under Alternative B. Compliance with the provisions of Section 404 of the Clean Water Act (33 CFR, Parts 320-330) and the Maryland Nontidal Wetlands Act would minimize potential for adverse effects to wetland habitats and associated wildlife.

Informal consultation was initiated with the USFWS and the MDNR Natural Heritage Program for information regarding species of special status with the potential to occur on, or in the near vicinity of Site B. In a letter dated November 21, 2005, the MDNR concluded that no State or Federal threatened or endangered species are known to occur within the proposed project area under alternative B (Appendix A). NAS Patuxent River is currently waiting for responses from the USFWS.

Based on annual bald eagle nesting surveys conducted by MDNR, the Natural Resources Branch of NAS Patuxent River, and the NAS Search and Rescue Unit, a bald eagle nest was discovered at NAS Patuxent River in April 2006, but is not located in the vicinity of the proposed project areas (pers. com., J. Smith, February 8, 2007). No state-listed flora species or rare fauna habitats are documented to occur on Site B (Navy, 2002a).

Implementation of Alternative B would result in the loss of 2.3 acres (0.93 hectares) of potential forest and field habitat, but would not impact any threatened or endangered species. Those species that currently utilize the habitat, identified under Wildlife on page 3-22, would be expected to relocate from the area, with some species being precluded from returning to the area, resulting in minor long-term impacts to wildlife and wildlife habitat.

No Action Alternative

Under the No Action Alternative, the Aircraft Prototype Facility would not be constructed and conditions affecting biological resources on NAS Patuxent River would remain the same. There would be no impacts to biological resources, including wildlife and vegetation.

3.4 Land Use

3.4.1 Land Use Affected Environment

Much of NAS Patuxent River is classified as urban land, comprising 38.6 percent of the land use or 2,586 acres (1,047 hectares), and forest comprising 37.9 percent or 2,539 acres (1,027 hectares). The remaining area is made up of agricultural land comprising 585 acres (236 hectares) or 8.74 percent, open water comprising 418 acres (169 hectares) or 6.3 percent, wetlands comprising 399 acres (162 hectares) or 6 percent, and barren land comprising 165 acres (67 hectares) or 2.5 percent (Navy, 2002a).

The *Integrated Natural Resources Management Plan*, Department of the Navy, Naval Air Station Patuxent River (2002) details the goals and recommendations in regards to land management decisions at NAS Patuxent River.

Goals for land management at NAS Patuxent River are:

- Effectively and economically maintain the grounds of NAS Patuxent River in an environmentally safe and sensitive manner that would compliment the military mission while protecting real estate and human health;
- Maintain compatibility between multiple land uses to the greatest extent practicable;
- Apply land management practices in a manner consistent with the ecosystem management approach; and

- Make station lands available for non-military productive uses.

Examples of recommendations pertinent to the construction of the Aircraft Prototype Facility include:

- Focusing development on the improved grounds and military use areas where intensive development already exists;
- Focusing new land development on improved grounds that are adjacent to other developed areas. Semi-improved grounds are the next land types to review;
- Reviewing natural or unimproved areas last for development; and
- Discouraging development in core forest areas to the maximum extent possible without compromising the military mission (Navy, 2002a).

Since both sites contain forested areas, objectives for forest management were also considered. Forest management at NAS Patuxent River recognizes and addresses the potential conflict that exists between ecosystem management for the purpose of achieving biodiversity and the installation's intent to maintain commercial forest service program. The forestry management plans call for forest areas to be selected to meet the biodiversity goal. These areas should include contiguous forest in which future development would be severely restricted or prohibited. The plan also calls for fragmented forest areas on NAS Patuxent River to be managed primarily for the principle needs of the surrounding land uses (Navy, 2002a). Land use around each alternative site is discussed below.

Site A

Site A is primarily forest bordered by narrow open fields, and is located just west of the existing South Engineering Center and the Robert N. Becker Laboratory. The NAS Patuxent River INRMP identifies this area as forested and in agriculture use, with the majority of the site being classified as semi-improved. This site also contains lands identified as in active agricultural use and those with the potential for agricultural use (Navy, 2002a). NAS Patuxent River has one agricultural lease with a term of five years. The policies which uses a competitive bidding process to issues the farmers a lease to use the lands are administered through NAVFAC Washington (Lister, 2005). Other land uses identified during site reconnaissance conducted in June 2005 include stormwater management features and a utility corridor.

Land uses adjacent to this site include Taxiway A bordering the site to the north, the Robert N. Becker Laboratory and associated parking to the east, Switzer Roads and Shaw Road to the east and south, and forested lands to the west.

Site B

Site B is mainly agricultural, primarily corn, and open space uses bordered by forested upland and wetland areas. The NAS Patuxent River INRMP identifies this area as a mix of agricultural, forested, wetland, and urban land uses and land covers, with the majority of the site in agriculture. Site B has been classified as a mix of semi-improved and undeveloped land (Navy, 2002a).

Land uses adjacent to Site B, identified during site reconnaissance conducted in June 2005, include community garden plots and Taxiway A to the north, Buck Road to the east, Buse Road to the southeast, Tate Road to the southwest, and forested area to the west. Land uses adjacent to this site also include secure facilities, known as VQ4, that require a buffer from other uses.

3.4.2 Land Use Environmental Consequences

Alternative A: Construct the Aircraft Prototype Facility at Site A (Preferred Alternative)

Under Alternative A, the proposed Aircraft Prototype Facility would be constructed adjacent to the Robert N. Becker Laboratory, just south of Taxiway A. The construction of this facility would occur on lands classified as semi-improved, and would be consistent with the land management recommendations set forth in the INRMP. This site is a fragmented area of forest and its development would also be consistent with the forest management goals detailed in the INRMP, as it would be managed primarily for the principle needs of the surrounding land uses. Furthermore, the proposed facility would be built on property already owned by the Navy and would be compatible with existing aircraft related operations adjacent to the site. The conversion of this forested area for construction of the proposed facility is consistent with land management and forest management goals and recommendations for NAS Patuxent River, resulting in minor long-term impacts to land use under this alternative.

Alternative B: Construct the Aircraft Prototype Facility at Site B

Under Alternative B, the proposed Aircraft Prototype Facility would be constructed at Site B on land that is currently primarily in agriculture. The construction of this facility would occur on lands classified as semi-improved and undeveloped. Under the INRMP land management goals, land classified as undeveloped should be considered last for development, resulting in greater impacts under Alternative B than Alternative A. This forested area of this site is fragmented and its development would be consistent with the forest management goals detailed in the INRMP, as it would be managed primarily for the principle needs of the surrounding land uses. The proposed facility would be built on property already owned by the Navy. Site B is located adjacent to a secure facility on NAS Patuxent River. This facility requires a buffer around it from other land uses that would limit the area where the Aircraft Prototype Facility could be developed on Site B and may create land use conflicts. Impacts to land use under Alternative B would be long-term and minor, but would be greater than those under Alternative A.

No Action Alternative

Under the No Action Alternative, the Aircraft Prototype Facility would not be constructed and land uses at NAS Patuxent River would remain the same. There would be no impacts to land use.

3.5 Air Quality

The EPA defines ambient air in 40 CFR Part 50 as “that portion of the atmosphere, external to buildings, to which the general public has access.” In compliance with the 1970 Clean Air Act (CAA) and the 1977 and 1990 Clean Air Act Amendments (CAAA), the EPA has promulgated ambient air quality standards and regulations. The National Ambient Air Quality Standards (NAAQS) were enacted for the protection of the public health and welfare, allowing for an adequate margin of safety. To date, the EPA has issued NAAQS for six criteria pollutants: carbon monoxide (CO), sulfur dioxide (SO₂), particles with a diameter less than or equal to a nominal 10 micrometers (PM₁₀), ozone (O₃), nitrogen dioxide (NO₂), and lead (Pb). Areas that do not meet NAAQS are called non-attainment areas.

3.5.1 Air Quality Affected Environment

The alternatives evaluated are located on the NAS Patuxent River in St. Mary’s County, Maryland, which is in attainment for all six criteria pollutants. The two adjacent counties, Calvert County and

Charles County, are located in the Washington DC-MD-VA region and are in severe non-attainment for ozone. The NAAQS for ozone is presented in Table 3-5.

To regulate the emission levels resulting from a project, federal actions located in non-attainment areas are required to demonstrate compliance with the general conformity guidelines established in 40 CFR Part 93 *Determining Conformity of Federal Actions to State or Federal Implementation Plans* (the Rule). The action alternatives are not located within an area designated by the EPA as a non-attainment area; therefore, a General Conformity Rule applicability analysis is not warranted.

TABLE 3-5: AMBIENT AIR QUALITY STANDARDS FOR OZONE

Pollutant	Federal Standard	Maryland Standard
Ozone (O ₃) ¹		
1-Hour Average	0.12 ppm	0.12 ppm
8-Hour Average	0.08 ppm	0.08 ppm

¹ Federal primary and secondary standards for this pollutant are identical.
Source: EPA, 2002

3.5.1.1 Ambient Air Quality

Ambient air quality is monitored in St. Mary's County by a network of stations meeting EPA's design criteria for State and Local Air Monitoring Stations (SLAMS) and National Air Monitoring Stations (NAMS). No monitoring stations for any criteria pollutants are located in St. Mary's County. There are ozone monitoring stations, one of the criteria pollutants, located in adjacent Calvert and Charles Counties. The Charles County monitor has been in operation since 1985 (MWCOG, 1984). This monitor is located at Southern Maryland Correctional Camp, in Hughesville, Maryland. On average, this monitor exceeded the standard for ozone one time in 2000, 2001, 2002, and 2004. In 2003 and 2005, the monitor recorded six days above the standard annually, and in 2006 there were 4 days where the monitor exceeded the standard. The Calvert County monitor has been active since 2005 and recorded two exceedences in that year and three in 2006. (EPA AirData, 2006)

3.5.1.2 Meteorology/Climate

Temperature is a parameter used in calculations of emissions for air quality applicability. Temperature data are from the Maryland State Climatologist Office and measured from Mechanicsville, Maryland in St. Mary's County (approximately 22 miles (35.4 km) northwest of NAS Patuxent River). The average temperature at this station is 56° F (13.3° C), with a low of 35° F (1.6° C) in January and a high of 77° F (25° C) in July.

3.5.2 Air Quality Environmental Consequences

Alternative A: Construct the Aircraft Prototype Facility at Site A (Preferred Alternative)

Emissions under this alternative would result for the use of heavy equipment and construction crew commuter traffic during the construction period. Construction emissions would include emissions from operation of construction equipment, construction crew vehicle traffic, and emissions from painting of interior surfaces and parking spaces. Construction emissions would be short-term in nature and occur only during construction activities, which are expected to last three years for completion of all three phases. Since St. Mary's County is in attainment for all six criteria pollutants, impacts to air quality would be minor and an applicability analysis for general conformity with guidelines established in 40 Code of Federal Regulations (CFR) Part 93 *Determining Conformity of Federal Actions to State or Federal Implementation Plans* is not warranted.

Alternative B: Construct the Aircraft Prototype Facility at Site B

Impacts under Alternative B would be the same as those under Alternative A.

No Action Alternative

Under the No Action Alternative, the proposed facility would not be constructed and there would be no construction emissions. No impacts to air quality would occur under the No Action Alternative.

3.6 Noise

Noise is any unwanted sound that can interfere with hearing, concentration, or sleep. The major sources of noise include transportation vehicles, heavy equipment, machinery, and appliances. The Noise Control Act of 1972, 42 USC 4901 et seq. was enacted to establish noise control standards and to regulate noise emissions from commercial products such as transportation and construction equipment. The Noise Control Act exempts noise from military weapons or equipment designated for combat use.

The standard measurement unit of noise is the decibel (dB), which represents the acoustical energy present and is an indication of the loudness or intensity of the noise. Noise levels are measured in A-weighted decibels (dBA), a logarithmic scale, which approaches the sensitivity of the human ear across the frequency spectrum. Therefore, the dBA accounts for the varying sensitivity of the human ear by measuring sounds the way a human ear would perceive it. The dBA measurement is used to indicate damage to hearing based on noise levels, and is the basis for federal noise standards. A 3-dB increase is equivalent to doubling the sound pressure level, but is barely perceptible to the human ear, but a 5-dB change in sound is very noticeable, and a 10-dB change in sound almost doubles the loudness. Table 3-6 illustrates common noise levels.

Because noise may be more objectionable at certain times, a measure known as Day-Night Average Sound Level (L_{dn} or L_{10}) has been developed. The L_{dn} or L_{10} is a 24-hour average sound level recommendation that includes a penalty, of 10 dB, to sound levels during the night (10 pm to 7 am). At NAS Patuxent River, aircraft noise is measured using the L_{dn} measurement. This measurement is often used to determine acceptable noise levels and is endorsed by agencies such as the EPA, the Federal Highway Administration, the Federal Aviation Administration, the U.S. Department of Housing and Urban Development, the Occupational Safety and Health Administration (OSHA), and the Department of Defense (DoD).

3.6.1 Noise Affected Environment

Aircraft operations and motorized vehicles are the major source of noise at NAS Patuxent River. Noise contours for an average day at the NAS Patuxent River were created for all areas on-station as part of the Aircraft Noise Study that was conducted in 1998 (Wyle, 1998). Site A is located within the 75 to 80 Ldn noise contour and Site B is located in the 70 to 75 Ldn noise contour (Wyle, 1998; Navy, 2004). At both of these sites, existing noise levels comply with the Navy standard of 84 dBA for 8 hours of constant noise and are also in compliance with OSHA standards of 90 dBA for an 8-hour duration and 140 dBA for an impulse noise.

TABLE 3-6: COMMON NOISE LEVELS

Source	Decibel Level	Exposure Concern
Soft Whisper	30	Normal safe levels
Quiet Office	40	Normal safe levels
Average Home	50	Normal safe levels
Conversational Speech	65	Normal safe levels
Highway Traffic	75	May affect hearing in some individuals depending on sensitivity, exposure length, etc.
Noisy Restaurant	80	May affect hearing in some individuals depending on sensitivity, exposure length, etc.
Average Factory	80-90	May affect hearing in some individuals depending on sensitivity, exposure length, etc.
Pneumatic Drill	100	May affect hearing in some individuals depending on sensitivity, exposure length, etc.
Automobile Horn	120	May affect hearing in some individuals depending on sensitivity, exposure length, etc.
Jet Plane	140	Noises at or over 140 dB may cause pain
Gunshot Blast	140	Noises at or over 140 dB may cause pain

Source: EPA Pamphlet, "Noise and Your Hearing," 1986.

3.6.2 Noise Environmental Consequences

Alternative A: Construct the Aircraft Prototype Facility at Site A (Preferred Alternative)

Under Alternative A, for the duration of construction for the proposed facility, short-term minor noise impacts associated with normal construction activities would be expected to occur. All applicable regulations would be followed and construction activities would be scheduled to create the least noise disturbance. This site is not located next to sensitive noise receptors such as residences or schools and would be in compliance with all applicable noise standards. Impacts to noise from construction would be short-term and minor.

Alternative B: Construct the Aircraft Prototype Facility at Site B

Under Alternative B, impacts would be the same as those under Alternative A.

No Action Alternative

Under the No Action Alternative, the proposed facility would not be constructed and no impacts from noise would occur.

3.7 Infrastructure/Utilities

3.7.1 Infrastructure/Utilities Affected Environment

Major utilities, with the exception of water, are provided by external sources to NAS Patuxent River. Electrical, water, wastewater, solid waste disposal, and telecommunications services would be required under the proposed action. This project would not require the use of natural gas.

Electrical

NAS Patuxent River receives electricity from the Southern Maryland Electrical Cooperative (SMECO). SMECO is a cooperative with a service area of 1,500 square miles (3,900 sq km), which includes all of St. Mary's County, the southern portions of both Prince George's and Charles counties, and all but the northern portions of Calvert County. In FY 2003, the total consumption of electrical power by NAS Patuxent River was roughly 176,500 megawatts-hour (MwH). Ongoing projects could increase the existing electrical power demand by approximately 10 megawatts. As required by EO 13123, *Greening the Government through Efficient Energy Management*, dated June 3, 1999, NAS Patuxent River has reduced energy demands over the past five years through the implementation of various energy conservation actions (e.g., installed energy efficient T-8 light fixtures, low flush toilets, modern boiler controls, and switched to natural gas for heating after demolishing the steam plant).

A 13.8 kilovolt (kv) electrical line exists in the vicinity of Site A, to the east of the sites across Switzer Road. In the vicinity of Site B, a 13.8 kv electrical line exists to the west of the site in the area of Cedar Point Road.

Wastewater

NAS Patuxent River is located in the Marlay-Taylor Sanitary District No. 8: a district of the St. Mary's Metropolitan Commission's (METCOM). The majority of the wastewater and sanitary sewage generated at NAS Patuxent River is treated at METCOM's Pine Hill Run Wastewater Treatment Plant (WWTP); however, a small portion of the wastewater produced at NAS Patuxent River is conveyed into 16 septic tanks with associated drain fields. The Pine Hill Run WWTP is located adjacent to NAS Patuxent River on the south side of Pine Hill Run along East Patrol Road. This wastewater treatment plant has the largest service area in the METCOM system. The Pine Hill Run WWTP was upgraded in 1997-1998 from 4.5 million gallons a day (mgd) to a 6.0 mgd treatment facility. Of the treatment facility's current 6.0 mgd design capacity, 1.2 mgd are reserved by contract for the NAS Patuxent River. The daily average flow from NAS Patuxent River is 0.750 mgd with peak flows of 1.5 mgd. In 2003, NAS Patuxent River exceeded a flow of 1.0 mgd 24 times as a result of heavy rain events. The NAS Patuxent River public works indicated that ongoing projects on the installation could increase wastewater conveyance by 0.225 mgd, increasing the average daily flow to 0.975 mgd (St. Mary's County, 2003). The wastewater conveyance system at NAS Patuxent River is composed of roughly 135,000 linear feet (10,500 linear meters) of sewer lines supported by 25 lift stations.

The main transfer site for the sanitary sewer system on NAS Patuxent River is located to the south of Site A, beyond Shaw Road. Also, to the east of that site, between Switzer Road and the Robert N. Becker Laboratory, is a lift station for the sanitary sewer system. At Site B, a 24 inch (61 centimeter) sewer main line exists to the southwest of the site, west of Tate Road.

Water

The NAS Patuxent River potable water system receives its raw water from 26 wells located on the installation. The potable water system, which is comprised of multiple systems, is capable of producing on average 0.923 mgd (St. Mary's County, 2003). At Site A, an 8 inch (20 centimeter) water line exists along Switzer Road in the vicinity of the Robert N. Becker Laboratory. At Site B, a 6 inch (15 centimeter) water lines exists southwest of the site, west of Tate Road.

NAS Patuxent River has in place a Water Conservation Plan in an effort to reduce future water demands on the installation. A major element of the plan is to incorporate water efficient fixtures in all existing and future development to reduce water consumption. Also, the installation has in place an Emergency Drinking Water Plan that provides for the needs of the Navy in case of a catastrophic event that could damage or impair the installation water system.

Solid Waste Disposal

The majority of the NAS Patuxent River's municipal solid waste (MSW) is transported by a contractor to various landfills or transfer stations within the southern Maryland region. MSW from the installation was disposed at the Andrew's Landfill in St. Mary's County until it was closed in 1998. Today, the majority of the MSW is taken to a privately-operated transfer station at the Calvert County's Appeal Landfill in Lusby. The Appeal Landfill was constructed in 1993 2 miles (3 kilometers) west of Lusby and 15 miles (24 kilometers) south of Prince Frederick. It was Maryland's first state-of-the-art landfill with a triple lined bottom to prevent groundwater contamination from landfill leachate. Until 1997, this landfill received roughly 40,000 tons of MSW per year. Today this landfill is inactive to maintain capacity for future generations. Currently, the Appeal Landfill serves as a transfer station for hauling MSW from Calvert County to other states.

Part of the NAS Patuxent River comprehensive pollution prevention plan addresses maximizing reuse and recycling of resources. As part of this plan the installation emphasizes the need for contractors to evaluate the possibility of recycling debris from construction and demolition work sites. In 1999, two major projects, underground storage tank removal and demolition of homes, resulted in the recycling of over 3,900 tons of construction and demolition debris. Materials recycled included concrete, steel, aluminum, and copper. Additionally, the installation diverts tree and yard waste from landfills. Examples of timber reuse include: firewood for the NAS Patuxent River Firewood Cutting Program, sales through the Government Timber Sales Program, and as mulch for installation hiking trails. This program also includes allowing contractors performing construction at NAS Patuxent River to purchase the timber, which is property of the US Government. If feasible, NAS Patuxent River attempts to commercially sell the timber generated from construction projects as part of solid waste management (Lister, 2005).

Telecommunications

NAS Patuxent River receives telephone service from Verizon. The majority of the telephone service at NAS Patuxent River is routed from a main hub located in Building 409 – NAS Administration Building.

3.7.2 Infrastructure/Utilities Environmental Consequences

Alternative A: Construct the Aircraft Prototype Facility at Site A (Preferred Alternative)

Under Alternative A, all utilities required for the proposed facility exist in the vicinity of the site and would be brought in to serve the Aircraft Prototype Facility. Electrical service would be brought in from the existing 13.8 kv electrical line located to the east of Site A. Sanitary sewer services and water would come from the east as well, with both currently located adjacent to Site A, east of Switzer Road in the parking area for the Robert N. Becker Laboratory. With these utilities entering the site from the east, there is a potential for impacts to wetlands as the majority of wetlands of the site are located in the wooded areas just west of Switzer Road and north of Shaw Road (see Figure 3-1: Site A Wetlands). If electrical, sewer, and water lines come directly west from their existing locations to Site A, these lines would most likely encounter wetland areas. However, based on the final design of the project, these wetlands would likely be avoided by routing the utilities along the road corridors and avoiding the wetland areas. Wetland habitats would be avoided to the maximum extent possible and any unavoidable impacts would be minimized to the extent possible. Coordination with the USACE, Baltimore District and MDE would be conducted to ensure that any impacts to wetland habitats on the site would be minimized to the maximum extent possible when routing utilities, and that any permit or mitigation requirements would be addressed.

Based on consultations with NAS Patuxent River personnel, it was determined that there is sufficient electrical and sewer capacity for the proposed facility. Water capacity is likely to be sufficient; however, depending on the fire suppression requirement, storage tanks may be needed (pers. comm W. Rose, 27 September 2005). Solid waste disposal and telecommunications services are supplied by private entities and it is expected that these entities would have sufficient capacity to serve the proposed facility. Under Alternative A, there would be no significant impacts to utility and infrastructure capacity. Impacts from the routing of utilities would be minor to moderate, depending on the location of the utilities in relation to the wetland areas.

Alternative B: Construct the Aircraft Prototype Facility at Site B

Under Alternative B, all utilities required for the proposed facility exist in the vicinity of the site and would be brought in to serve the Aircraft Prototype Facility. Electrical service would be brought in from the existing 13.8 kv electrical line located to the west of Site B, west of Cedar Point Road. Sanitary sewer services and water would come from the southwest, across Tate Road. In the vicinity of the water and sewer lines, a small wetland habitat exists to the southeast of Building 503. This wetland area is small and it is expected that both the water and sewer lines would be routed to avoid this wetland area. A larger wetland exists in the wooded area between Leader and Cedar Point Roads (see Figure 3-2: Site B Wetlands). If the electrical line were routed directly from its location to Site B, this line would go through this wetland area. However, based on the final design of the project, these wetlands would likely be avoided by routing the utilities along the Tate Road corridor and avoiding the wetland area. Wetland habitats would be avoided to the maximum extent possible and any unavoidable impacts would be minimized to the extent possible. Coordination with the USACE, Baltimore District and MDE would be conducted to ensure that any impacts to wetland habitats on the site would be minimized to the maximum extent possible when routing utilities, and that any permit or mitigation requirements would be addressed.

Based on consultations with NAS Patuxent River personnel, it was determined that there is sufficient electrical and sewer capacity for the proposed facility. Water capacity is likely to be sufficient; however, depending on the fire suppression requirement, storage tanks may be needed (pers. comm W. Rose, 27 September 2005). Solid waste disposal and telecommunications services are supplied by private entities and it is expected that these entities would have sufficient capacity to serve the

proposed facility. Under Alternative B, there would be no significant impacts to utility and infrastructure capacity. Impacts from the routing of utilities would be minor to moderate, depending on the location of the electrical lines in relation to wetland areas.

No Action Alternative

Under the No Action Alternative, the Aircraft Prototype facility would not be built and no additional utility lines would be installed in relation to this project. Utility demand would stay the same and there would be no impacts to natural resources from the installation of infrastructure and utilities.

3.8 Human Health and Safety

3.8.1 Human Health and Safety Affected Environment

Typical concerns related to human health and safety include the presence of hazardous materials and installation restoration sites, lead-based paint and asbestos, presence of unexploded ordnance, explosive quantity safety distance arcs, accident potential zones (APZs), adjacent aircraft operations, and ATRP requirements. The two proposed sites are not located within an explosive quantity safety distance arc or accident potential arc. Further, there is no known presence of unexploded ordnance (pers. comm., A. Gray, 23 September 2005) on either site and since there are no existing structures on either site there are no known issues related to lead-based paint or asbestos. There are no installation restoration sites on Site A and a small installation restoration area on Site B. The installation restoration site on Site B is located at the corner of Tate Road and Buse Road. Consultation with the NAS Patuxent River Installation Restoration Manager determined that this site could be paved over and would not be an issue for development (pers. comm., A. Gray, 7 November 2005). Because these issues are not applicable, the analysis of human health and safety focused on adjacent aircraft operations and ATRP requirements.

3.8.1.1 Aircraft Operations

Because NAS Patuxent River is an active air station, aircraft and runway operations are taken into consideration during construction projects. Issues of concern include clear zones, APZs, and imaginary surfaces. Site A is located at the end of Taxiway A, and the western half of this site is located within a designated clear zone of runway 06/24 and runway 02/20. As described below, clear zones must remain free of above ground objects, thus development cannot occur in this area. The remainder of the site is located in an area designated as Accident Potential Zone – I (pers. comm., L. Mattingly, 21 September 2005), with development restricted due to imaginary surfaces. Development and use for these areas is governed by the *Facility Planning Factor Criteria for Navy & Marine Corps Shore Installations Appendix E: Airfield Safety Clearances* (NAVFAC P-80.3) and *AICUZ Program Procedures and Guideline for Department of the Navy Air Installations* (OPNAV Instruction 11010.36B). Site B is not located in a clear zone or APZ, but is located in an area with restrictions due to imaginary surfaces.

Details of clear zones, APZs, and imaginary surfaces are dependent on the class of the runway. DoD fixed-wing runways are separated into two classes, Class A and Class B runways. Class A runways are used primarily by light aircraft and do not have the potential for intensive use by heavy or high-performance aircraft. Class B runways are used by all other fixed-wing aircraft. Operations at the sites evaluated would take into consideration runway 02/20, designated as a Class A runway, and runway 06/24, designated as a Class B runway.

Clear Zones

Navy guidance documents define the clear zone as the area immediately adjacent to the end of the runway that requires special restrictions to provide aircraft overrun areas and unrestricted visibility of airfield lighting. The clear zone is the area with the greatest potential for occurrence of aircraft accidents. Clear zones should be cleared, graded, and free of above ground objects (except airfield lighting) and should receive special ground treatment or pavement in the area designated as the runway overrun. No development can occur within a designated clear zone (Navy, 1982).

Accident Potential Zones

APZs are based on historical accident and operations data throughout the military and the application of margins of safety within those areas, which have been determined to be probable impact areas if an accident were to occur. The APZ-I designation indicates the area beyond the clear zone that still possesses a measurable potential for accidents relative to the clear zone. The Air Installations Compatible Use Zones (AICUZ) program provides design guidelines and compatible use recommendations for the APZ designations. DoD policy is to work toward promoting compatible land use development in the vicinity of air installations. Table 3-7 details the land uses permitted in the clear and APZ-I designated areas. The APZ is defined differently for Class A and Class B runways, both of which are present at NAS Patuxent River. APZ-I is defined for each class of runway as follows:

- Class A APZ-I: The rectangular area beyond the Clear Zone, which still has a measurable potential for aircraft accidents relative to the Clear Zone. APZ I is provided under flight tracks, which experience 5,000 or more annual operations (departures or approaches). APZ I is typically 1,000 feet in width by 2,500 feet in length and may be rectangular, or curved to conform to the shape of the predominant flight track. Runway 02/20 is designated as a Class A runway.
- Class B APZ-I Designation: The rectangular area beyond the Clear Zone, which still has a measurable potential for aircraft accidents relative to the Clear Zone. APZ I is provided under flight tracks, which experience 5,000 or more annual operations (departures or approaches). APZ I is typically 3,000 feet in width by 5,000 feet in length and may be rectangular, or curved to conform to the shape of the predominant flight track. Runway 06/24 is designated as a Class B runway.

TABLE 3-7: AIR INSTALLATION COMPATIBLE USE ZONES SUGGESTED LAND USE COMPATIBILITY IN ACCIDENT POTENTIAL ZONES

SLUCM NO.	LAND USE NAME	CLEAR ZONE Recommendation	APZ-I Recommendation
10	Residential		
11	Household units		
11.11	Single units: detached	N	N
11.12	Single units: semidetached	N	N
11.13	Single units: attached row	N	N
11.21	Two units: side-by-side	N	N
11.22	Two units: one above the other	N	N
11.31	Apartments: walk-up	N	N
11.32	Apartment: elevator	N	N
12	Group quarters	N	N
13	Residential hotels	N	N
14	Mobile home parks or courts	N	N
15	Transient lodgings	N	N
16	Other residential	N	N
20	Manufacturing		

SLUCM NO.	LAND USE NAME	CLEAR ZONE	APZ-I
		Recommendation	Recommendation
21	Food and kindred products; manufacturing	N	N
22	Textile mill products; manufacturing	N	N
23	Apparel and other finished products; products made from fabrics, leather, and similar materials; manufacturing	N	N
24	Lumber and wood products (except furniture); manufacturing	N	Y
25	Furniture and fixtures; manufacturing	N	Y
26	Paper and allied products; manufacturing	N	Y
27	Printing, publishing, and allied industries	N	Y
28	Chemicals and allied products; manufacturing	N	N
29	Petroleum refining and related industries	N	N
31	Rubber and misc. plastic products; manufacturing	N	N
32	Stone, clay, and glass products; manufacturing	N	N
33	Primary metal products; manufacturing	N	N
34	Fabricated metal products; manufacturing	N	N
35	Professional, scientific, and controlling instrument; photographic and optical goods; watches and clocks	N	N
39	Miscellaneous manufacturing	N	Y
40	Transportation, communication and utilities		
41	Railroad, rapid rail transit, and street railway transportation	N	Y ¹
42	Motor vehicle transportation	N	Y ¹
43	Aircraft transportation	N	Y ¹
44	Marine craft transportation	N	Y ¹
45	Highway and street right-of-way	N	Y ¹
46	Auto parking	N	Y ¹
47	Communication	N	Y ¹
48	Utilities	N	Y ¹
485	Solid waste disposal (Landfills, incineration, etc.)	N	N
49	Other transport, communication, and utilities	N	Y ¹
50	Trade		
51	Wholesale trade	N	Y
52	Retail trade – building materials, hardware, and farm equipment	N	Y
53	Retail trade – shopping centers	N	N
54	Retail trade – food	N	N
55	Retail trade – automotive, marine craft, aircraft, and accessories	N	Y
56	Retail trade – apparel and accessories	N	N
57	Retail trade – furniture, home furnishings, and equipment	N	N
58	Retail trade – eating and drinking establishments	N	N
59	Other retail trade	N	N
60	Services		
61	Finance, insurance, and real estate services	N	N
62	Personal services	N	N
62.4	Cemeteries	N	Y
63	Business services (credit reporting; mail, stenographic, reproduction; advertising)	N	N
63.7	Warehousing and storage services	N	Y
64	Repair services	N	Y
65	Professional services	N	N
65.1	Hospitals, nursing homes	N	N
65.1	Other medical facilities	N	N
66	Contract construction services	N	Y

SLUCM NO.	LAND USE NAME	CLEAR ZONE Recommendation	APZ-I Recommendation
67	Government services	N	N
68	Educational services	N	N
69	Miscellaneous	N	N
70	Cultural, entertainment and recreational		
71	Cultural activities	N	N
71.2	Nature exhibits	N	Y
72	Public assembly	N	N
72.1	Auditoriums, concert halls	N	N
72.11	Outdoor music shells, amphitheaters	N	N
72.2	Outdoor sports arenas, spectator sports	N	N
73	Amusements -fairgrounds, mini-golf, driving ranges; amusement parks, etc.	N	N
74	Recreational activities (including golf courses, riding stables, water recreation)	N	Y
75	Resorts and group camps	N	N
76	Parks	N	Y
79	Other cultural, entertainment, and recreation	N	Y
80	Resource production and extraction		
81	Agriculture (except livestock)	Y	Y
81.5, 81.7	Livestock farming and breeding	N	Y
82	Agriculture-related activities	N	Y
83	Forestry activities ¹¹	N	Y
84	Fishing activities ¹²	N	Y
85	Mining activities	N	Y
89	Other resource production or extraction	N	Y
90	Other		
91	Undeveloped land	Y	Y
93	Water areas	N	N
Key: SLUCM Standard Land Use Coding Manual, U.S. Department of Transportation Y (Yes) Land use and related structures are normally compatible without restriction. N (No) Land use and related structures are not normally compatible and should be prohibited. Notes: 1. No passenger terminals and no major aboveground transmission lines in APZ I. Source: Navy, 2002b			

Imaginary Surfaces

Aircraft operations can be constrained by the surrounding natural terrain and manmade features such as buildings, towers, poles, and other potential vertical obstructions to navigation. *Federal Aviation Administration (FAA) Regulation, CFR Title 14, Part 77, Objects Affecting Navigable Airspace, 1992* and *NAVFAC P-80.3 (1982)* identify a complex series of imaginary surfaces or planes used for siting facilities on and near military airfields and determining obstructions or hazards to air navigation for these airfields.

Before the imaginary surfaces can be determined, the classes of runways are determined. At NAS Patuxent River runway 06/24 is designated as Class B runways and runway 02/20 is designated as a Class A runway. Both of these runways are located in the vicinity of the proposed project areas. Per the P-80.3 guidance, specific criteria are provided for the following areas:

- The *Primary Surface* is a surface on the ground or water centered lengthwise on the runway and extending 200 feet beyond each end of the runway. The width is 1,000 feet or 1,500 feet per runway, for Class A or B respectively. The Primary Surface is normally highly protected and free of all obstructions.

- The *Clear Zone* is located immediately adjacent to the end of the runway and extends 3,000 feet outward along the runway centerline for both Class A and B runways.
- *Approach-Departure Clearance Surfaces* extend from the primary surfaces at a 40:1 and 50:1 inclined plane, for Class A or B runway respectively. When the surface reaches an elevation of 500 feet, the surface becomes a horizontal plane for both Class A and B runways.
- *Horizontal Clearance Surfaces* include one at 150 feet above airfield elevation extending to 7,500 feet from the runway, and another at 500 feet above airfield elevation extending from 14,500 feet to 44,500 feet from the runway end for both Class A and B runways.
- *Conical and other Transitional Surfaces* connect the Horizontal Surfaces to the Approach/Departure Clearance Surfaces and the Primary Surfaces.

In general, no above ground structures are permitted in the primary surface and clear zone areas. The height of structures should be controlled to prevent penetration of the transitional surfaces and approach departure surfaces. These height restrictions limit the height of structures as the distance from the runway surface decreases. As one approaches the runway surface and its corresponding flight path, more stringent height limitations are imposed.

3.8.1.2 *Anti-terrorism/Force Protection*

Construction activities under the action alternatives would be guided by the 2003 Unified Facilities Criteria (UFC) DoD Minimum Antiterrorism Standards for Buildings that seek to find effective ways to minimize the likelihood of mass casualties from terrorist attacks against DoD personnel. By incorporating these standards into the planning process, the DoD can be proactive in preventing, and reacting to, terrorist incidents as well as other emergencies. UFC construction standards attempt to improve safety through maximizing standoff distances, preventing building collapse, minimizing hazardous flying debris, providing effective building layout, limiting airborne contamination, providing mass notification, and facilitating future installation upgrades.

UFC requirements apply to new construction including all MILCON projects starting with the FY 2004 program and all projects funded by sources other than MILCON for the FY 2004 program. Existing structures must also apply UFC standards when a major investment is made, the building use is converted, window or door glazing replacement projects, building additions are constructed, or buildings are leased. Site planning regulations center around minimum standoff distances from surrounding structures and roadways. Under these regulations, the proposed facility would be considered primary gathering building, which is defined as inhabited buildings, or portions thereof, where 50 or more DoD personnel routinely gather, and family housing with 13 or more family units per building. Since NAS Patuxent River has a controlled perimeter, the following standoff distances for the proposed facilities apply:

- The perimeter must be at least 148 feet (45 meters) away from a primary gathering structure.
- Parking and roadways should be 82 feet (25 meters) away from primary gathering structures.
- Inhabited structures (buildings or portions of buildings routinely occupied by five or more DoD personnel with a population density of greater than one person per 430 feet (40 meters)) must be at least 33 feet (10 meters) from primary gathering structures.
- Trash containers must be at least 82 feet (25 meters) from primary gathering structures.
- Adjacent primary gathering structures must be at least 33 feet (10 meters) apart.
- Unobstructed space of at least 33 feet (10 meters) must surround a primary gathering structure.

In addition to site planning requirements, these guidelines also include construction requirements that incorporate additional structural issues into building designs to ensure that buildings do not experience progressive collapse.

3.8.2 Human Health and Safety Environmental Consequences

Alternative A: Construct the Aircraft Prototype Facility at Site A (Preferred Alternative)

A large portion of western half of Site A is located within the designated clear zone, as shown in Figure 3-7. Development of the proposed Aircraft Prototype Facility would not be permitted to occur within this clear zone and there would be no impacts to the facility or aircraft operations. The portion of Site A that is not within a clear zone is located with an APZ-I area. As detailed in Table 3-7, allowed uses in APZ-I areas include aircraft transportation and warehousing and storage services. The proposed construction and use of the Aircraft Prototype Facility would be considered a compatible use in the APZ-I area. During construction of the facility, imaginary surfaces would be taken into consideration and the facility would be constructed following all guidelines for development near an airfield. Following all applicable Navy instructions and guidelines, there would be no impacts to or from aircraft operations under Alternative A.

Under Alternative A, the proposed facility would be constructed in accordance with ATRF requirements. Where applicable, the minimum setback distances would be achieved and design guidelines followed. Other features, beyond what is required, would include additional security fencing, jet blast barriers, security lighting, access control, video surveillance, and intrusion detection systems, resulting in beneficial impacts.

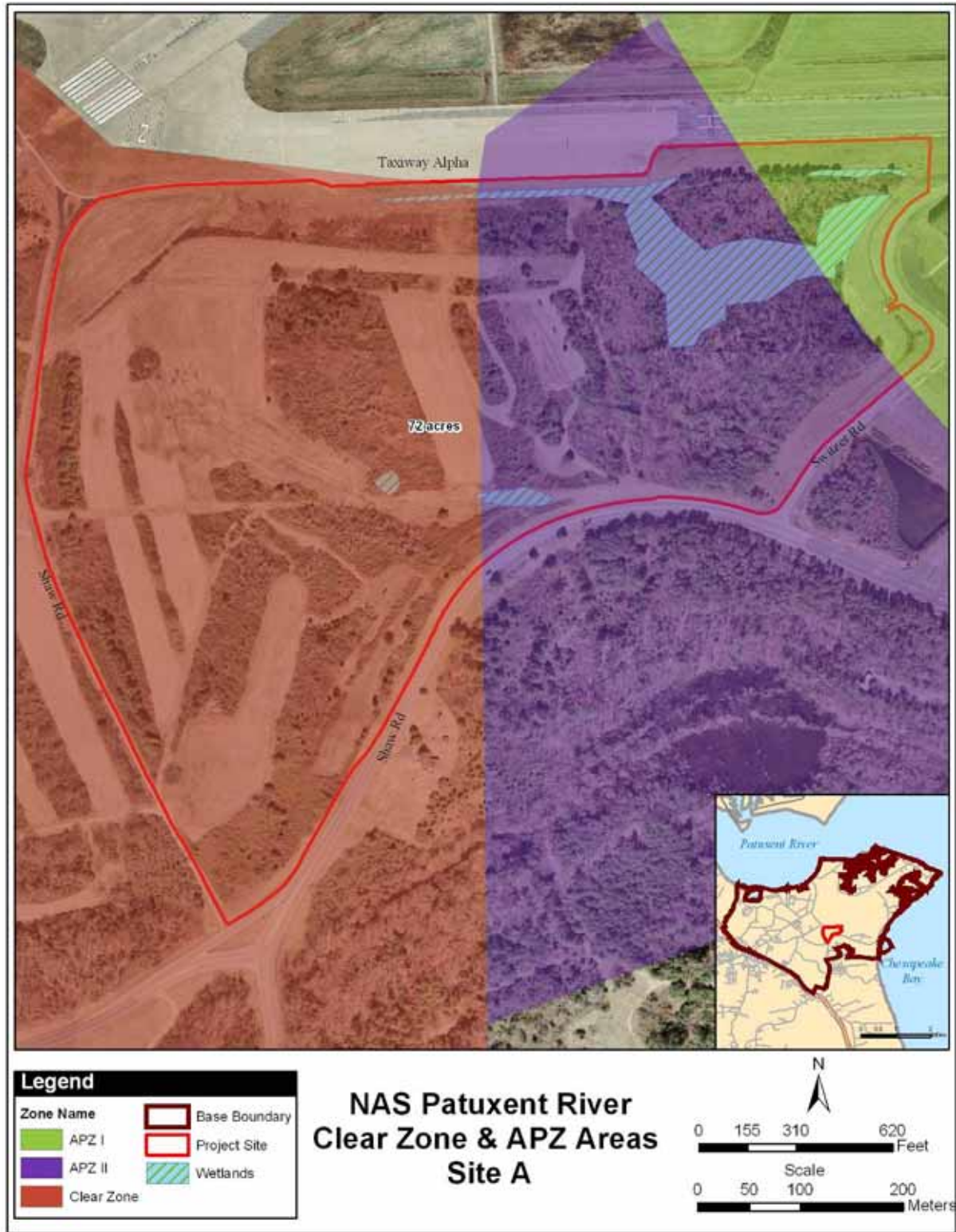
Alternative B: Construct the Aircraft Prototype Facility at Site B

Under Alternative B, the site is not located in a clear zone or APZ. Site B is located in close enough proximity to airfield operations that all guidelines related to imaginary surfaces would be followed and implemented into building design. Under Alternative B, there would be no impacts to the proposed facility from aircraft operations. ATRF compliance would be the same as under Alternative A.

No Action Alternative

Under the No Action Alternative, the proposed Aircraft Prototype Facility would not be constructed and there would be no impacts to human health and safety.

FIGURE 3-7: SITE A CLEAR ZONES AND APZ AREAS



3.9 Cumulative Impacts

A cumulative impact is defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7). This section goes on to note “such impacts can result from individually minor but collectively significant actions taking place over a period of time.” Cumulative impacts associated with implementation of the action alternatives would include any impacts from other “actions” that would be incremental to the impacts of constructing the Aircraft Prototype Facility at NAS Patuxent River.

The installation’s INRMP provides procedures and processes for minimizing the conflict between wildlife and military activities, while balancing the maintenance and management of natural resources and biological diversity. Project planning and activities at the base are conducted in compliance with the INRMP. Recently completed projects that would contribute to cumulative impacts would include the Joint Strike Fighter Hangar and the Army National Guard Facility. The Presidential Helicopter T&E Facility, which includes an air traffic control tower, and the Multi-Mission Maritime T&E Support Facility are ongoing projects that would contribute to cumulative impacts. Future projects that would contribute to cumulative impacts include the Aircraft Research Support Facility as part of the Base Realignment and Closure process.

Action Alternatives

The impacts from construction of the above mentioned projects in combination with the construction of the proposed Aircraft Prototype Facility would be expected to create cumulative impacts to air emissions, noise, vegetation removal, soils disturbance, and wetland disturbance. Impacts from construction would be short-term in nature and last only as long as the construction period. Such short-term impacts would include increased noise and air emissions. Long-term moderate impacts to wetlands would be expected.

These cumulative impacts are expected to be minimal and managed through the use of BMPs, such as stormwater management plans and sediment control and erosion plans, as well as coordination with the USACE and MDE regarding potential wetland issues. Although military installations under exclusive federal jurisdiction and not required to comply with State of Maryland regulations, NAS Patuxent River would comply with all applicable regulations to the greatest extent possible. With implementation of BMPs, as discussed in the EA, any cumulative impacts from past, present, and reasonably foreseeable future planning efforts would be minor.

No Action Alternative

Implementation of the No Action Alternative would avoid new impacts that could interact with the impacts of other past, present, or reasonably foreseeable future actions. Therefore, there would be no cumulative impacts associated with the No Action Alternative.

3.10 Unavoidable Adverse Impacts

Unavoidable impacts are those impacts that NAS Patuxent River would experience if the proposed construction of the Aircraft Prototype Facility occurred under the action alternatives (the No Action Alternative would not involve any new impacts). These would include impacts to soils, wetlands, and aircraft operations. The actions discussed below would be employed to minimize these and other potential adverse impacts.

- Configuring hangers to minimize potential impacts. Hanger design would minimize the use of concrete where possible to reduce impervious surfaces.
- Utilizing Erosion and Sediment Control Law BMPs during construction to prevent erosion and sedimentation from harming nearby water bodies in compliance with the Maryland Stormwater Guidelines for State and Federal Projects.
- Developing a Stormwater Management Plan in accordance with Maryland Stormwater Management Guidelines and obtaining a NPDES Phase II Stormwater permit.
- Coordinating with the USACE, Baltimore District and MDE in regards to wetlands issues, and would attempt to avoid wetlands through building design and utility placement where possible.
- Following all height and location restrictions as detailed in NAVFAC P-80.3 and OPNAV Instruction 11010.36B in regards to development in the clear zone and APZ-I.

3.11 Conclusion

Alternative A is the preferred alternative for implementation of the proposed action, construction of the Aircraft Prototype Facility. A summary of impacts for all alternatives evaluated is provided in Table 3-8. This alternative would not have any significant adverse effects on any environmental resources or socioeconomic conditions at NAS Patuxent River or to areas surrounding the installation. Potential moderate impacts exist from the need to fill approximately 3.2 acres (1.3 hectares) of wetlands in the proposed area of construction. These wetland areas cannot be avoided because construction of the facility must remain outside of adjacent clear zones associated with the airfield, which accounts for the western half of Site A. A Section 404 Clean Water Act permit would be obtained to address impacts to wetlands, as well as a permit in accordance with the Maryland Nontidal Wetland Protection Act of 1989. Although Alternative B would have the potential to disturb less wetland area (up to 0.5 acres or 0.2 hectares), the impacts from conflicting land uses, conversion of prime farmland soils for development, and the development of land classified as unimproved were determined to have a greater impact by creating issues with land use and human health and safety. Further, because of its classification as an APZ-1 zone, the proposed Aircraft Prototype Facility is considered a compatible use with Site A where potential land use conflicts would not be present.

Overall, Alternative A was determined to be the preferred alternative because it provides the requirements for the proposed facility. Although there will be some impacts to environmental resources, specifically wetlands, it had the least amount of impact to soils, land use, and human health and safety, as shown in Table 3-8.

TABLE 3-8: SUMMARY OF IMPACTS

Resource Areas	Alternative A: Construct the Aircraft Prototype Facility at Site A (Preferred Alternative)	Alternative B: Construct the Aircraft Prototype Facility at Site B	No Action Alternative
Water Resources	<p>Site contains five wetland habitats encompassing 3.8 acres (1.5 hectares). Long-term moderate impacts to wetlands would occur as approximately 3.2 acres (1.3 hectares) of wetlands would be disturbed and would require a Section 404 permit. Additional potential impacts could occur to wetland habitats from extension of the utilities to the proposed site. Wetland habitats would be avoided to the maximum extent possible and any unavoidable impacts would be minimized to the extent possible, and mitigated as required, resulting in moderate impacts to wetlands. There would be no impacts to surface waters or floodplains. Minor impacts to groundwater are possible from the proposed increase in impervious surfaces and the resulting increase in runoff. The MDE concurred with NAS Patuxent River that this alternative is consistent with the enforceable policies of Maryland's coastal zone management program.</p>	<p>Site contains two wetland habitats encompassing 0.8 acres (0.3 hectares). Long-term minor impacts to wetlands from filling of up to 0.5 acres (0.2 hectares) of wetlands would occur and would require a Section 404 permit. Additional potential impacts to wetland habitats could occur from extension of the utilities to the proposed site. Wetland habitats would be avoided to the maximum extent possible and any unavoidable impacts would be minimized to the extent possible, and mitigated as required, resulting in moderate to minor impacts depending on the extent of wetland disturbance. There would be no impacts to surface waters or floodplains. Minor impacts to groundwater are possible from the proposed increase in impervious surfaces and the resulting increase in runoff. The MDE concurred with NAS Patuxent River that this alternative is consistent with the enforceable policies of Maryland's coastal zone management program.</p>	No impacts.
Geology, Topography, Soils	<p>Minor short- and long-term impacts to topography. There would be no impacts to geologic resources. Site development would be in excess of one acre (0.4 hectares) and would require a stormwater management plan and erosion and sediment control plan. A National Pollution Discharge Elimination System (NPDES) Phase II permit would be required. Prime Farmland soils on this site would be avoided for development.</p>	<p>Impacts would be the same as under Alternative A for topography and geology. Because development would occur on soils designated as Prime Farmland, impacts to soils would be long-term and moderate. A National Pollution Discharge Elimination System (NPDES) Phase II permit would be required.</p>	No impacts.
Biological Resources (Wildlife and Wildlife Habitat, Vegetation, Threatened and Endangered Species)	<p>Minor to moderate short- and long-term adverse impacts. In excess of 26 acres (10.5 hectares) of undeveloped land would be disturbed. Some habitat would be lost or disturbed. Consultation with U.S. Fish and Wildlife Service (USFWS) resulted in a finding that, except for transient individuals, no federally proposed or listed</p>	<p>Impacts would be the same as under Alternative A.</p>	No impacts.

Resource Areas	Alternative A: Construct the Aircraft Prototype Facility at Site A (Preferred Alternative)	Alternative B: Construct the Aircraft Prototype Facility at Site B	No Action Alternative
	endangered or threatened species are known to exist within the project impact area. The Md. DNR concluded that no State or Federal threatened or endangered species are known to occur within the proposed project area.		
Land Use	Development would be consistent with installation land and forest management goals as the land is designated at semi-improved and designated for development before any unimproved lands. Minor impacts would occur to land use.	Development would be inconsistent with installation land and forest management goals as land designated as unimproved would be developed. Site is located next to security sensitive land uses, resulting in conflicts. Minor impacts, but greater than those at Site A.	No impacts.
Air Quality	Area is in attainment for all criteria pollutants; General Conformity Rule applicability analysis is not required. Impacts from construction emissions would be short-term and minor.	Impacts would be the same as under Alternative A.	No impacts.
Noise	Short-term minor impacts would occur during construction.	Impacts would be the same as under Alternative A.	No impacts.
Infrastructure/Utilities	There would be sufficient electrical and sewer capacity. Depending on fire suppression requirements, an on-site water storage tank may be required. See "Wetlands" for potential impacts from the installation of new utility lines.	Impacts would be the same as under Alternative A.	No impacts.
Human Health and Safety	A large portion of Site A that is located within a clear zone would not be developed. All guidelines related to accident potential zones (APZs) and imaginary surfaces would be followed. There would be no impacts to or from airfield operations.	Impacts would be the same as under Alternative A.	No impacts.

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6.0 ACRONYMS

AICP	American Institute of Certified Planners
AICUZ	Air Installations Compatible Use Zone
Amsl	Above Mean Sea Level
APZ	Accident Potential Zone
ATFP	Anti-terrorism Force Protection
BMP	Best Management Practice
Bmsl	Below Mean Sea Level
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CPSS	Certified Professional Soil Scientist
CZMP	Coastal Zone Management Program
dB	Decibel
dBA	A-weighted decibel
DEM/VAL	Demonstration/Validation
DoD	Department of Defense
EA	Environmental Assessment
EO	Executive Order
EPA	Environmental Protection Agency
FIRM	Federal Insurance Rate Map

FONSI	Finding of No Significant Impact
FY	Fiscal Year
GIS	Geographic Information Systems
GWOT	Global War on Terrorism
INRMP	Integrated Natural Resources Management Plan
ISR	Intelligence, Surveillance, and Reconnaissance
Kv	Kilovolt
Ldn	Day-Night Average Sound Level
LO/VLO	Low Observable/Very Low Observable
METCOM	St. Mary's Metropolitan Commission
MDE	Maryland Department of the Environment
Md. DNR	Maryland Department of Natural Resources
MILCON	Military Construction
Mgd	Million Gallons per Day
MRTFB	Major Range and Test Facility Base
MSW	Municipal Solid Waste
MwH	Megawatts per House
NAAQS	National Ambient Air Quality Standards
NAMS	National Air Monitoring Stations
NAS	Naval Air Station
NAVAIR	Naval Air Systems Command
NAWCAD	Naval Air Warfare Center Aircraft Division
NCW	Network Centric Warfare
NEPA	National Environmental Policy Act

NPDES	National Pollution Discharge Elimination System
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
O ₃	Ozone
OHSA	Occupational Health and Safety Administration
OPEVAL	Operational Evaluation
OPNAVINST	Chief of Naval Operations Instruction
Pb	Lead
PM ₁₀	Particulate Matter <10 microns
RDT&E	Research, Development, Test, & Evaluation
R&M	Reliability & Maintainability
SEMCO	Southern Maryland Electrical Cooperative
SLAMS	State and Local Air Monitoring Stations
SO	Sulfur Dioxide
S&T	Science & Technology
S&V	Survivability & Vulnerability
SWPP	Stormwater Pollution Prevention Plan
T&E	test and evaluation
UCAV	Unmanned combat Air Vehicle
UFC	United Facilities Criteria
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
VTC	Video Teleconferencing
WWTP	Waste Water Treatment Plant

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