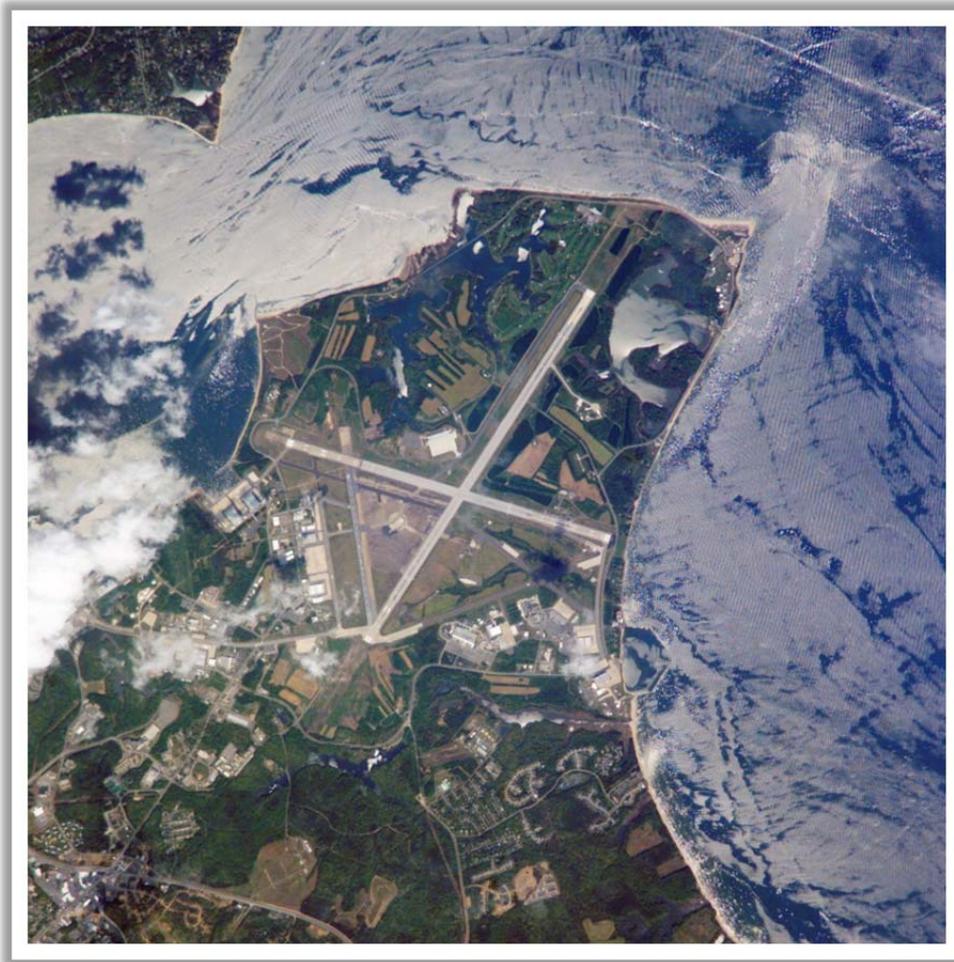


DRAFT

ENVIRONMENTAL ASSESSMENT

ADDRESSING IMPLEMENTATION OF ENHANCED USE LEASE

AT NAVAL AIR STATION PATUXENT RIVER, MARYLAND



SEPTEMBER 2014

Prepared by the U.S. Department of the Navy

In accordance with Secretary of the Navy Instruction 5090.6A and the Chief of Naval Operations Instruction 5090.1D, pursuant to National Environmental Policy Act of 1969 (NEPA) Section 102(2)(c)

DRAFT

**ENVIRONMENTAL ASSESSMENT ADDRESSING
IMPLEMENTATION OF ENHANCED USE LEASE
AT NAVAL AIR STATION PATUXENT RIVER, MARYLAND**

SEPTEMBER 2014

Lead Agency: U.S. Department of the Navy

Title of Proposed Action: Implementation of Enhanced Use Lease at Naval Air Station Patuxent River, Maryland

Designation: Environmental Assessment

Prepared by: Naval Facilities Engineering Command (NAVFAC) Washington
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ABSTRACT

Under the Proposed Action, the U.S. Department of the Navy (Navy) proposes to make available for lease non-excess real property at the Naval Air Station (NAS) Patuxent River, Maryland, under the authority of Title 10, United States Code (U.S.C.) Section (§) 2667 *Leases: non-excess property of military departments and Defense Agencies*. This authority allows for military departments to outlease land or facilities to a private or a public entity on a long-term basis where cash or in-kind consideration is received for use of the leased property. Under the Proposed Action, the Navy would enter into a 50-year EUL agreement with a developer in exchange for in-kind services involving construction, operation, and maintenance of a work campus development that accommodates approximately 3,000 employees with new administrative office space and parking. The work campus would comprise office spaces totaling 600,000 square feet (ft²) (55,742 square meters [m²]), and nearby parking facilities to accommodate a minimum of 70 percent of the employees that would work in the new facility for both action alternatives.

In this Environmental Assessment (EA), two action alternatives for executing the 50-year ground lease and the No Action Alternative are evaluated. Under Alternative 1, the Preferred Alternative, the developer would make use of EUL Sites 5, 6, and 7. The developer would demolish portions of two administrative buildings and one surface parking lot at EUL Site 5 and portions of wooded parcels of land identified as EUL Sites 6 and 7 would be cleared. Afterwards, a new work campus development that would comprise multiple-floor office buildings and associated parking lots and/or multiple-level parking structures would be constructed using all three sites. Under Alternative 2, EUL Sites 6 and 7 would be cleared and the work campus development and parking facilities would be constructed entirely on these two EUL sites.

The Council on Environmental Quality regulations under the National Environmental Policy Act (NEPA) also require the consideration of the No Action Alternative. Under the No Action Alternative, a work campus development would not be constructed, no structures would be demolished, and no land would be cleared. The Navy's goals for the EUL, to maximize use of property that is not currently needed for public use on NAS Patuxent River, would not be met. The No Action Alternative does not meet the purpose of and need for the Proposed Action. It does, however, serve as a baseline against which the impacts of the Proposed Action can be evaluated.

The intent of NEPA is to help decisionmakers make well-informed decisions based on an understanding of the potential environmental consequences of an action. The EA evaluates the potential environmental consequences of the Proposed Action and alternatives, including the No Action Alternative, on the following general impact topics: land use, traffic and transportation, infrastructure and utilities, air quality noise, coastal zone management, geology, biological resources, water resources, cultural resources, hazardous materials and wastes, socioeconomics and environmental justice, and human health and safety.

Non-significant, adverse impacts on traffic and transportation, air quality, noise, geology, biological resources, water resources, hazardous materials and waste, and human health and safety and would be expected as a result of construction activities. The effects associated with the construction activities would be short-term and primarily be localized to the immediate area of construction, and would subside following the end of construction activities in that area. All necessary permits and waivers would be acquired prior to commencement of construction activities. Non-significant, adverse effects on land use, traffic and transportation, infrastructure and utilities, air quality, noise, coastal zone management, geology, biological resources, water resources, biological resources, hazardous materials and waste, socioeconomics and environmental justice, and human health and safety would be expected as a result of operating the proposed EUL administrative complex and associated parking facilities. Non-significant impacts on traffic and transportation above existing conditions and other proposed development would include longer queue lengths, increased travel times, and an overall increase in traffic delay. Non-significant cumulative impacts are expected, and no effects on cultural resources are anticipated. The Navy would adhere to all agency management plans, policies, and procedures.

The overall environmental impacts associated with implementation of either Alternative 1 or 2 of the Proposed Action would range from no impact to no significant impact on the natural or man-made environment, and a Finding of No Significant Impact would be prepared.

DRAFT

**ENVIRONMENTAL ASSESSMENT
ADDRESSING IMPLEMENTATION
OF ENHANCED USE LEASE
AT
NAVAL AIR STATION PATUXENT RIVER,
MARYLAND**

**NAVAL FACILITIES ENGINEERING COMMAND
NAVFAC WASHINGTON
U.S. DEPARTMENT OF THE NAVY**



SEPTEMBER 2014

**DRAFT ENVIRONMENTAL ASSESSMENT ADDRESSING
IMPLEMENTATION OF ENHANCED USE LEASE AT
NAVAL AIR STATION PATUXENT RIVER, MARYLAND**

TABLE OF CONTENTS

ABSTRACT

ACRONYMS AND ABBREVIATIONS..... v

1. PURPOSE OF AND NEED FOR THE PROPOSED ACTION 1-1

1.1 INTRODUCTION 1-1
1.2 BACKGROUND 1-3
1.3 THE NEPA PROCESS 1-3
1.4 PURPOSE OF AND NEED FOR THE PROPOSED ACTION 1-4
1.5 PUBLIC INVOLVEMENT 1-4

2. PROPOSED ACTION AND ALTERNATIVES 2-1

2.1 DESCRIPTION OF THE PROPOSED ACTION 2-1
2.2 ALTERNATIVES ANALYSIS 2-1
2.3 SCREENING CRITERIA TO EVALUATE ALTERNATIVES 2-2
2.4 ALTERNATIVES CARRIED FORWARD FOR DETAILED ANALYSIS 2-2
2.4.1 Alternative 1 (EUL Sites 5, 6, and 7; Preferred Alternative) 2-2
2.4.2 Alternative 2 (EUL Sites 6 and 7) 2-11
2.4.3 No Action Alternative 2-13
2.5 ALTERNATIVES CONSIDERED BUT DISMISSED 2-13
2.5.1 Alternative to Build at EUL Site 1 2-13
2.5.2 Alternative to Build at EUL Site 2 2-13
2.5.3 Alternative to Build at EUL Site 3 2-14
2.5.4 Alternative to Build at EUL Site 4 2-15
2.5.5 Alternative to Build at EUL Site 5 Only 2-15
2.6 COMPARISON OF ALTERNATIVES 2-15

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES 3-1

3.1 LAND USE AND AIRSPACE 3-2
3.1.1 Definitions 3-2
3.1.2 Existing Conditions 3-2
3.1.3 Environmental Consequences 3-5
3.2 TRAFFIC AND TRANSPORTATION 3-6
3.2.1 Definitions 3-6
3.2.2 Existing Conditions 3-7
3.2.3 Environmental Consequences 3-11
3.2.4 Traffic Improvement Recommendations 3-18
3.3 INFRASTRUCTURE AND UTILITIES 3-19
3.3.1 Definitions 3-19
3.3.2 Existing Conditions 3-19
3.3.3 Environmental Consequences 3-21
3.4 AIR QUALITY 3-24
3.4.1 Definitions 3-24
3.4.2 Existing Conditions 3-27
3.4.3 Environmental Consequences 3-27
3.5 NOISE 3-31

3.5.1	Definitions	3-31
3.5.2	Existing Conditions	3-31
3.5.3	Environmental Consequences	3-32
3.6	COASTAL ZONE MANAGEMENT	3-34
3.6.1	Definitions	3-34
3.6.2	Existing Conditions	3-35
3.6.3	Environmental Consequences	3-35
3.7	GEOLOGY	3-36
3.7.1	Definitions	3-36
3.7.2	Existing Conditions	3-37
3.7.3	Environmental Consequences	3-38
3.8	BIOLOGICAL RESOURCES	3-39
3.8.1	Definitions	3-39
3.8.2	Existing Conditions	3-39
3.8.3	Environmental Consequences	3-42
3.9	WATER RESOURCES	3-45
3.9.1	Definitions	3-45
3.9.2	Existing Conditions	3-46
3.9.3	Environmental Consequences	3-48
3.10	CULTURAL RESOURCES	3-50
3.10.1	Definitions	3-50
3.10.2	Existing Conditions	3-51
3.10.3	Environmental Consequences	3-55
3.11	HAZARDOUS MATERIALS AND WASTE	3-59
3.11.1	Definitions	3-59
3.11.2	Existing Conditions	3-60
3.11.3	Environmental Consequences	3-60
3.12	SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE	3-61
3.12.1	Definitions	3-61
3.12.2	Existing Conditions	3-62
3.12.3	Environmental Consequences	3-65
3.13	HUMAN HEALTH AND SAFETY	3-67
3.13.1	Definitions	3-67
3.13.2	Existing Conditions	3-69
3.13.3	Environmental Consequences	3-70
4.	CUMULATIVE AND OTHER IMPACTS.....	4-1
4.1	CUMULATIVE EFFECTS	4-1
4.1.1	Projects Considered for Potential Cumulative Effects	4-1
4.1.2	Cumulative Effects on Resource Areas	4-3
4.2	COMPATIBILITY OF ALTERNATIVES WITH THE OBJECTIVES OF FEDERAL, REGIONAL, STATE, AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS	4-8
4.3	RELATIONSHIP BETWEEN SHORT-TERM USES OF MAN'S ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY	4-8
4.4	IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES	4-8
5.	REFERENCES	5-1
6.	LIST OF PREPARERS	6-1

FIGURES

1-1.	NAS Patuxent River and Surrounding Area	1-2
2-1.	Area Map of Potential EUL Sites	2-3
2-2.	Map of Alternative 1 (EUL Sites 5, 6, and 7).....	2-5
2-3.	Photos of Existing Buildings at EUL Site 5	2-7
2-4.	EUL Site 5 Conceptual Site Schematic Layout.....	2-8
2-5.	Proposed Site Access for EUL Sites 6 and 7.....	2-8
2-6.	Photos of Existing Conditions at EUL Sites 6 and 7	2-9
2-7.	Map of Alternative 2 (EUL Sites 6 and 7).....	2-12
3-1.	Natural Resources within the Project Area.....	3-4
3-2.	Cultural Resources on NAS Patuxent River.....	3-53
3-3.	Building 2272, View from the South.....	3-54
3-4.	View toward Building 2273, Facing East.....	3-54
3-5.	Building 536, Facing West	3-55
3-6.	View of the Naval Air Museum, Facing South from EUL Site 7.....	3-55
3-7.	Firehouse No. 2	3-57
3-8.	View from Firehouse No. 2 north toward EUL Site 5.....	3-57
3-9.	St. Nicholas Church (Building 428).	3-58
3-10.	View to the northwest and EUL Site 5 from St. Nicholas Church.	3-58
3-11.	Unemployment Data among Socioeconomic Spatial Levels.....	3-64

TABLES

2-1.	Comparison of Site Alternatives against Project Screening Criteria ¹	2-4
2-2.	Summary of Impacts.....	2-16
3-1.	Land Use Categories on NAS Patuxent River.....	3-3
3-2.	Summary of HCM LOS Thresholds.....	3-7
3-3.	Summary of AM Peak Hour Levels of Service.....	3-9
3-4.	Summary of PM Peak Hour Levels of Service.....	3-10
3-5.	AM Peak Average Travel Time (minutes)	3-12
3-6.	PM Peak Average Travel Times (minutes)	3-13
3-7.	Locations Where Queues Exceed Lane Capacity by Alternative-Scenario.....	3-14
3-8.	Summary of EUL Development-Generated Trips.....	3-16
3-9.	National and State Ambient Air Quality Standards, Effective October 2011	3-25
3-10.	NAS Patuxent River and Local and Regional Air Emissions Inventories (2011).....	3-27
3-11.	Estimated Air Emissions Resulting from Demolition and Construction Activities under Alternative 1 (2015, 2016, and 2017).....	3-29
3-12.	Estimated Air Emissions Resulting from Operational Activities under Alternative 1 (2017)	3-30
3-13.	Estimated CO ₂ Equivalent Emissions from the Proposed Action (metric tons).....	3-30
3-14.	Sound Levels and Human Response	3-32
3-15.	State of Maryland Maximum Allowable Noise Level (dBA)	3-32
3-16.	Predicted Levels for Construction Equipment.....	3-33
3-17.	Estimated Noise Levels from Construction Activities	3-33
3-18.	Federal-and State-Threatened and Endangered Species Known to Occur on NAS Patuxent River	3-41
3-19.	Architectural Resources Individually Eligible for Listing in the NRHP	3-52
3-20.	Population Estimates for Spatial Levels in 2000, 2010, and 2012	3-62
3-21.	Vacant Housing Units in the United States, Maryland, and St. Mary’s County, Maryland (2008 - 2012).....	3-63
3-22.	Employment Characteristics by Industry for 2008 to 2012.....	3-64
3-23.	Race, Ethnicity, and Poverty Characteristics in the United States, Maryland and St. Mary’s County, Maryland (2008–2012).....	3-65

APPENDICES

- A. Public Scoping Comments and EA Distribution List**
- B. Traffic Study**
- C. Air Quality Calculations**
- D. Coastal Consistency Determination**

ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials	ERP	Environmental Restoration Program
ACM	asbestos-containing material	ESA	Endangered Species Act
AICUZ	Air Installations Compatible Use Zones	ESD	Environmental Site Design
APE	Area of Potential Effect	ESQD	Explosive Safety Quantity Distance
APZ	Accident Potential Zone	EUL	Enhanced Use Lease
AQCR	air quality control region	FONSI	Finding of No Significant Impact
ATR	Atlantic Test Range	ft ²	square foot (feet)
BACT	Best Available Control Technology	GHG	greenhouse gas(es)
BMP	best management practice	ha	hectare(s)
CAA	Clean Air Act	HCM	Highway Capacity Manual
CCD	Coastal Consistency Determination	HERO	Hazards of Electromagnetic Radiation to Ordnance
CEQ	Council on Environmental Quality	IFOM	Installation Figure of Merit
CFR	Code of Federal Regulations	IPT	Integrated Product Team
CMP	Coastal Management Program	JD	Jurisdictional Determination
COMAR	Code of Maryland Regulations	km	kilometer(s)
CWA	Clean Water Act	LBP	lead-based paint
CZMA	Coastal Zone Management Act	LEED	Leadership in Energy & Environmental Design
dBA	A-weighted decibel	LID	low-impact development
DoD	Department of Defense	LOS	level of service
DoN	Department of Navy	m	meter(s)
EA	Environmental Assessment	m ²	square meter(s)
EIS	Environmental Impact Statement	MBTA	Migratory Bird Treaty Act
EISA	Energy Independence and Security Act	MDE	Maryland Department of the Environment
EO	Executive Order	MDNR	Maryland Department of Natural Resources
		mgpd	million gallons per day

mi	mile(s)	PPE	personal protective equipment
MOU	Memorandum of Understanding	PSD	Prevention of Significant Deterioration
NAAQS	National Ambient Air Quality Standards	RCRA	Resource Conservation and Recovery Act
NAGPRA	Native American Graves Protection and Repatriation Act	RDT&E	Research, Development, Testing, and Evaluation
NAS	Naval Air Station	ROI	Region of Influence
NATS	Naval Air Transport Service	SDS	Safety Data Sheet
NAVAIR	Naval Air Systems Command	SECNAVINST	Office of the Secretary of the Navy Instruction
NAVFAC	Naval Facilities Engineering Command	SHPO	State Historic Preservation Office
Navy	U.S. Department of the Navy	SMECO	Southern Maryland Electric Cooperative
NAWCAD	Naval Air Warfare Center Aircraft Division	STIP	Statewide Transportation Improvement Program
NEPA	National Environmental Policy Act	SWPPP	Stormwater Pollution Prevention Plan
NHPA	National Historic Preservation Act	TCP	Traditional Cultural Properties
NPDES	National Pollutant Discharge Elimination System	TMDL	Total Maximum Daily Loads
NRCS	Natural Resources Conservation Service	tpy	tons per year
NRHP	National Register of Historic Places	U.S.C.	United States Code
OPNAVINST	Office of the Chief of Naval Operations Instruction	USACE	U.S. Army Corps of Engineers
OSHA	Occupational Safety and Health Administration	USDA	U.S. Department of Agriculture
PCB	polychlorinated biphenyl	USEPA	U.S. Environmental Protection Agency
pCi/L	picoCuries per liter	USFWS	U.S. Fish and Wildlife Service
POV	privately owned vehicle	USGS	U.S. Geological Survey

1. Purpose of and Need for the Proposed Action

1.1 Introduction

The U.S. Department of the Navy (DoN; hereafter referred to in the text as the Navy) is facing unexpected strains on its resources, including budget shortfalls, rising fuel prices, and the costs of continuing worldwide counter-terrorism operations. In response to these factors, the Navy is using innovative business practices, such as Enhanced Use Lease (EUL), to seek facility cost savings and provide funding to accomplish its mission. Through EUL projects, developers can establish long-term relationships with private and government partners who are potential tenants with specific real estate needs.

This Environmental Assessment (EA) will evaluate the Navy's proposal to make available for lease non-excess real property at Naval Air Station (NAS) Patuxent River, Maryland (see **Figure 1-1**), under the authority of Title 10, United States Code (U.S.C.) § 2667, *Leases: Non-excess Property of Military Departments and Defense Agencies*. This authority allows for military departments to outlease land or facilities to a private or a public entity on a long-term basis where cash or in-kind consideration is received for use of the leased property. In-kind consideration could include the alteration, repair, or improvement of property or existing facilities; construction or acquisition of new facilities; facility leasing; payment of utility services; or real property maintenance services. Used in accordance with 10 U.S.C. § 2667, EULs are a tool that the Department of Defense (DoD) employs to leverage government-owned real estate assets (e.g., land and buildings) that are not currently needed for public use, available, and are not considered excess (i.e., unnecessary) to the military's needs (DoN 2010a). This EA focuses only on alternatives that employ the use of an EUL.

The EUL program provides the Navy with an opportunity to establish long-term partnerships with private industry by leasing available assets on the installation (DoN 2010a). The Navy identified several parcels of land at NAS Patuxent River that are currently available for development or redevelopment for land use improvements, such as office space, flightline and office spaces, hangar facilities, laboratories and research and development facilities, energy co-generation plants, hotels and temporary lodging, and conference centers. EUL projects cultivate meaningful support and improvement for the surrounding community by providing job opportunities and helping to stimulate further economic growth. Relationships between the Navy and the local community are also strengthened as EULs enable joint cooperation to accomplish mutual goals (NAS PAX 2010a). Upon entering into an EUL agreement at NAS Patuxent River, the Navy would grant the rights to finance, design, construct, operate, and maintain a work campus development with office spaces and parking that would accommodate up to 3,000 personnel. The work campus would be constructed in accordance with Executive Order 13423, the Energy Independence and Security Act (EISA) of 2007, and Leadership in Energy & Environmental Design (LEED) Silver requirements.

Specifically, the proposed EUL redevelopment on the installation would provide a modernized work campus that would support the installation's mission as the Navy's principal research, development, acquisition, testing, evaluation, engineering, and fleet support activity for naval aircraft, engines, avionics, aircraft support systems, and ship/shore/air operations (NAS PAX 2010a). The intended use of the proposed site would be as a work campus that would provide office space for various public and private tenants, which could include one or more combinations of active-duty and reserve military service members, government civilian workers, government contractors, or an entity other than the Federal government.

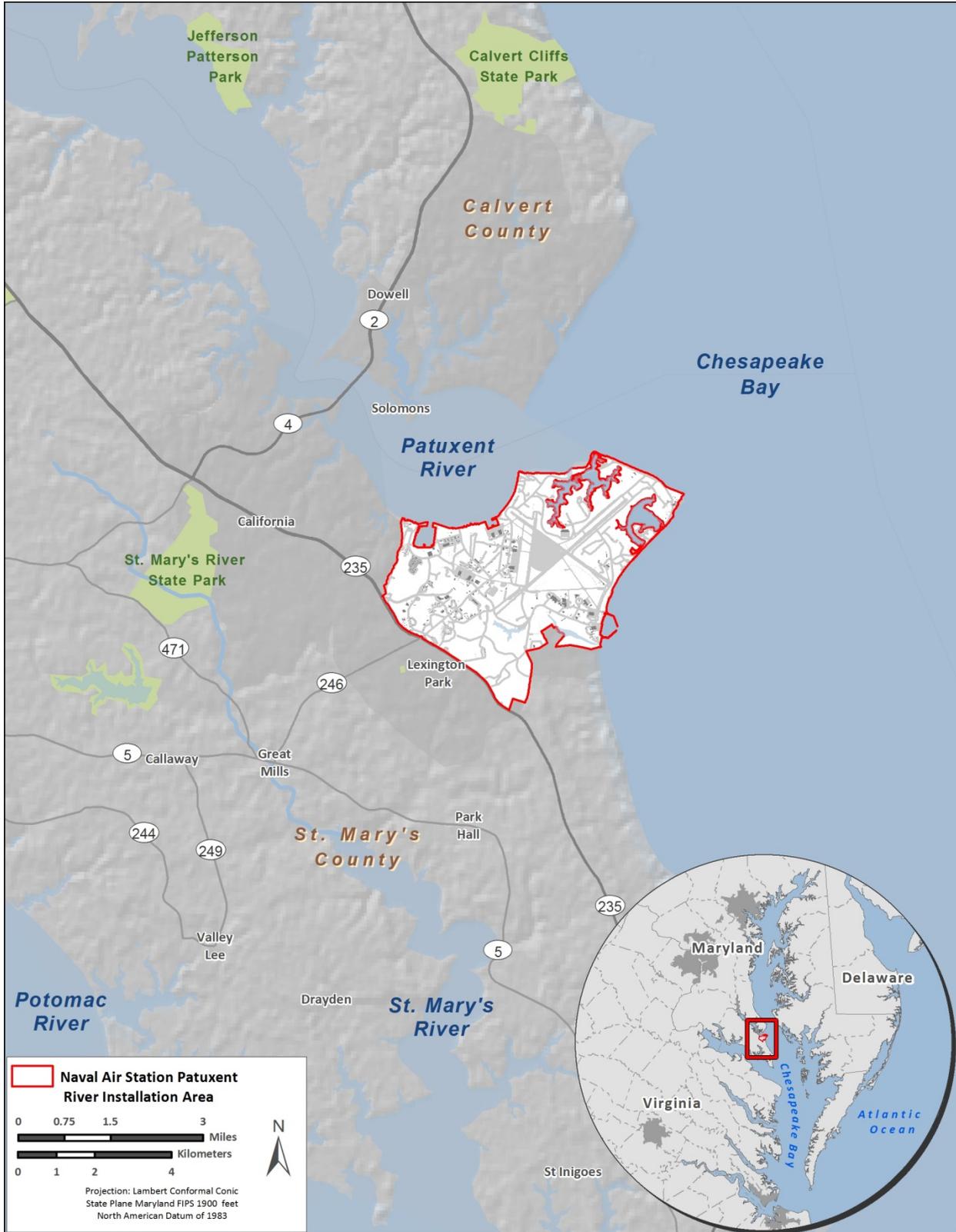


Figure 1-1. NAS Patuxent River and Surrounding Area

1.2 Background

NAS Patuxent River is located in southern Maryland in St. Mary's County, approximately 70 miles (mi) (113 kilometers [km]) southeast of the District of Columbia (Washington, D.C.). St. Mary's County is on Maryland's western shore of the Chesapeake Bay and consists of a peninsula surrounded by tidal water on all but the northwestern boundary. NAS Patuxent River occupies a small and broad headland peninsula at the confluence of the Patuxent River and the Chesapeake Bay (see **Figure 1-1**). The installation is bounded by the Patuxent River to the north; Chesapeake Bay to the east; and the town of Lexington Park, Maryland, to the south and west (NAVFAC Washington 2010). The size of the installation is 6,348 acres (2,569 hectares [ha]). NAS Patuxent River's mission is to serve as the Navy's principal research, development, test, evaluation, engineering, and fleet support activity for naval aircraft, engines, avionics, aircraft support systems, and ship/shore/air operations. NAS Patuxent River is home to the Naval Air Systems Command (NAVAIR) Headquarters, the Air Test Wing Atlantic, and Naval Air Warfare Center Aircraft Division (NAWCAD) Headquarters. The NAS Patuxent River Master Plan identified that the employee population at NAS Patuxent River in 2012 totaled 22,423 and included 2,826 active-duty service members, 3 military reserves members, 9,145 civil service employees, 10,053 defense contractor employees, and 396 non-appropriated-fund civilian employees (NAVFAC Washington 2012).

The installation is largely developed with aircraft runways, taxiways, hangars, and supporting structures and equipment. Residential communities, commercial properties, schools, churches, and recreational properties are also present both on the installation and outside the gates. Currently, only 55 percent of facilities on the installation are rated as adequate to support mission needs. The remaining 45 percent of facilities are rated as substandard or inadequate, indicating that they do not meet basic requirements to support the mission (NAVFAC Washington 2012). As a result, the Navy must maximize use of existing functional spaces, consolidate facility uses, and modernize and enhance assets to optimize efficiency, productivity, and resource use to meet the Navy's existing and future mission requirements (NAS PAX 2010b, DoN 2010b).

1.3 The NEPA Process

The National Environmental Policy Act (NEPA) of 1969 is a Federal statute requiring the identification and analysis of potential environmental impacts associated with proposed major Federal actions before those actions are taken. NEPA established the President's Council on Environmental Quality (CEQ), which was charged with the development of implementing regulations and ensuring Federal agency compliance with NEPA. The process for implementing NEPA is codified in Title 40 of the Code of Federal Regulations (CFR) Sections (§§) 1500–1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (i.e., CEQ NEPA regulations). According to CEQ NEPA regulations, the requirements of NEPA must be integrated “with other planning and environmental review procedures required by law or by agency so that all such procedures run concurrently rather than consecutively” (40 CFR § 1500.2). The NEPA process does not replace procedural or substantive requirements of other environmental statutes and regulations; it addresses them collectively in the form of an EA or Environmental Impact Statement (EIS), which enables the decisionmaker to have a comprehensive view of key environmental issues and requirements associated with a proposed action.

An EIS is prepared for those Federal actions that might significantly affect the quality of the natural or human environment. An EA is a concise document that provides sufficient analysis for determining whether the potential environmental impacts of a proposed action are significant, requiring the preparation of an EIS, or not significant, resulting in the preparation of a Finding of No Significant Impact (FONSI).

This EA is being prepared pursuant to Section 102(2)(c) of NEPA (42 U.S.C. §§ 4321–4370h), the regulations issued by the CEQ for implementing the procedural provisions of NEPA (40 CFR §§ 1500–1508), the Navy’s NEPA implementing regulations, *Procedures for Implementing the National Environmental Policy Act* (32 CFR § 775), Secretary of the Navy Instruction (SECNAVINST) 5090.6A – *Environmental Planning for Department of Navy Actions*, and Office of the Chief of Naval Operations Instruction (OPNAVINST) 5090.1D – *Environmental Readiness Program* and the OPNAV-Manual (OPNAV-M) 5090.1- *Environmental Readiness Program Manual*.

The EA will evaluate the potential impacts of implementing the Proposed Action on land use and airspace management, traffic and transportation, infrastructure and utilities, air quality, noise, geological resources, biological resources (e.g., vegetation, wildlife, and protected species), water resources (e.g., floodplains, wetlands, watersheds, rivers, coastal zone management, and water quality), cultural resources, hazardous waste management, socioeconomics (economy, population, housing, employment), environmental justice, and safety.

1.4 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is for the Navy to make the best use of real property with a new and efficient work campus to accommodate 3,000 personnel. The Proposed Action would be implemented by entering into a long-term (i.e., 50-year) lease with a private developer with the intent to construct and operate the work campus office development on real property not currently needed for public use (DoN 2010a). The Navy intends to advance the Proposed Action through the use of an EUL.

The Proposed Action is needed because NAS Patuxent River is currently operating with a general work space deficit of 2 million square feet (ft²) (185,806 square meters [m²]) that includes an office space deficit required to accommodate a total of approximately 3,400 staff (NAS PAX 2010b). This staff is currently working in inadequate and inefficient spaces that limit its ability to meet current and future mission needs at NAS Patuxent River. Installation managers face stark financial and resource limitations that inhibit its ability to address such space deficits. Implementation of an EUL would provide the Navy with added and much needed flexibility in meeting its budgetary and infrastructure requirements.

Two staffing scenarios representing the range of sources of personnel that could occupy the EUL development at NAS Patuxent River were assumed for each alternative addressed in this EA, as discussed in **Section 2.4.1**. One of the staffing scenarios reflects use of personnel not directly employed by NAS Patuxent River.

1.5 Public Involvement

Agency and public involvement in the NEPA process promotes open communication between the public and the government and enhances the decisionmaking process. All persons or organizations having a potential interest in the Proposed Action are encouraged to submit input into the decisionmaking process.

NEPA and implementing regulations from the CEQ and Navy direct agencies to make their EAs and EISs available to the public during the decisionmaking process and prior to actions being taken. The premise of NEPA is that the quality of Federal decisions will be enhanced if proponents provide information to the public and involve the public in the planning process.

Through the public involvement process, NAS Patuxent River notified relevant Federal, state, and local agencies of the Proposed Action and requested input on environmental concerns they might have regarding the Proposed Action. The public involvement process provides NAS Patuxent River with the

opportunity to cooperate with and consider state and local views in its decision regarding implementing this Federal proposal.

The Navy held an information meeting about the Proposed Action for its personnel at NAS Patuxent River on April 3, 2014. A public meeting was held on April 8, 2014, at the Bay District Fire Hall Lexington Park, Maryland. The purpose of the meetings was to foster open communication between the interested parties, including members of the public, and the project representatives. The meetings also provided an idea of the range of individuals, organizations, and agencies interested in the project. Attendees to the meetings were provided with comment cards, fact sheets, and visual displays. A total of 40 individuals attended the information meeting on April 3, 2014, and 12 people attended the public meeting on April 8, 2014. Comments received during the scoping process are provided in **Appendix A**, and the issues raised in the comments are summarized below and have been incorporated into this EA.

Issues raised during the scoping process include concerns about:

- Mix of personnel from on and off the installation
- Traffic study including the surrounding community
- Construction start date
- Adequate parking
- Need for an additional gate.

NAS Patuxent River is coordinating with agencies such as the U.S. Fish and Wildlife Service, Maryland Department of Natural Resources, Maryland Historical Trust, and other Federal, state, and local agencies as warranted.

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2. Proposed Action and Alternatives

This section describes the Proposed Action, alternatives to the Proposed Action, and the No Action Alternative. The NEPA process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action. Reasonable alternatives must satisfy the purpose of and need for the Proposed Action, as defined in **Section 1.4**. In addition, CEQ regulations also specify the inclusion of a No Action Alternative against which potential impacts can be compared. While the No Action Alternative would not satisfy the purpose of or need for the Proposed Action, it is analyzed in accordance with CEQ regulations.

2.1 Description of the Proposed Action

Under the Proposed Action, the Navy proposes to make available for lease real property at NAS Patuxent River, Maryland, under the authority of 10 U.S.C. § 2667. The Navy would enter into a ground lease of real property under EUL authority for a term not-to-exceed 50 years. Following successful execution of the lease, the lessee would construct, operate, and maintain a work campus office development at NAS Patuxent River. Construction of the new work campus would be expected to occur over a period of 18 months.

The objectives set for the EUL agreement include the following:

- Entering into a long-term ground lease with a responsible party who will provide good stewardship over the property
- Maximizing value to the Navy in the form of in-kind services, enhancing quality of life for Navy personnel, and providing benefit to the surrounding community
- Ensuring compatibility of the proposed EUL site lease with the operational and security requirements of the installation
- Successfully integrating development activities with cultural resources and environmental policy management requirements compatible with the mission of the installation
- Complying with all NEPA requirements
- Employing the best commercial practices for the benefit of both the Navy and the developer (DoN 2010a).

The work campus office buildings would be constructed to a maximum of 600,000 ft² (55,742 m²) of office space and would support up to 3,000 personnel on NAS Patuxent River. The work campus would comprise of multiple-story office buildings and privately-owned vehicle (POV) parking lots and/or multiple-level structures that would accommodate a minimum of 70 percent of the staff who would work there (DoN 2010a). The functions served in the existing facilities on the work campus site would ultimately be relocated by means of separate actions to more modern spaces that are adequate to meet the Navy's existing and future needs.

2.2 Alternatives Analysis

Under NEPA, reasonable alternatives to implement a proposed action must be considered in an EA. Considering alternatives helps to avoid unnecessary impacts and allows an analysis of reasonable ways to achieve the stated purpose. To warrant detailed evaluation, an alternative must be considered reasonable, which is described as capable of implementation and satisfactory with respect to the purpose of and need for the action.

2.3 Screening Criteria to Evaluate Alternatives

The Navy, along with the proposed lessee developer (Hines, a real estate firm), evaluated seven parcels of land as potential alternative sites for the new work campus development at NAS Patuxent River (see **Figure 2-1**). The sites are identified herein as EUL Sites 1 through 7. A viable alternative would not have a negative impact on aircraft operations during the short-term or long-term phase. The following Screening Criteria were used to determine whether the alternative sites were considered reasonable (NAS PAX 2009):

1. The site should have aggregate developable acreage to accommodate the required square footage of office space (i.e., 600,000 ft² [55,742 m²]) for development of a work campus with parking facilities for a minimum of 70 percent of the proposed 3,000 personnel.
2. The site should have available utilities.
3. The site should not have environmental constraints.
4. The site should require minimal relocation of existing infrastructure, facilities, or functions.
5. The site should be compatible with existing adjacent land uses.

Table 2-1 provides a color-coded comparison of each potential alternative site against each of the 5 Screening Criteria. Relative to each criterion, the color green indicates that the site presents no development issues, yellow indicates that the site could present development issues, and red indicates that the site would likely present development issues. Sites are also evaluated with compatibility with the 2012 Master Plan for the installation, including whether they would fall into Research, Development, Acquisition, Test and Evaluation, Sailor and Family Support, or other future land use designations (NAVFAC Washington 2012). Sites that failed to meet the Screening Criteria were eliminated from further consideration. Results of the Screening Criteria evaluation presented in the table are discussed further in the subsections that follow.

2.4 Alternatives Carried Forward for Detailed Analysis

Use of a single EUL Site for the proposed action was determined not to be feasible (see **Table 2-1**). Therefore, the combined use of EUL Sites is required for the alternatives for this project and addressed in this EA. Two alternatives meet the screening criteria in **Section 2.3** and are carried forward for analysis in this EA. Alternative 1 (Preferred Alternative) would use EUL Sites 5, 6, and 7. Alternative 2 would only occur on EUL Sites 6 and 7.

2.4.1 Alternative 1 (EUL Sites 5, 6, and 7; Preferred Alternative)

Under Alternative 1, the Navy would enter into an EUL agreement for development of the new work campus among EUL Sites 5, 6, and 7 (see **Figure 2-2**). EUL Site 5 is located on the western side of Buse Road across from the NAVAIR Integrated Product Team (IPT) Building (i.e., Building 2272). This 15.4-acre (6.2-ha) parcel of partially developed land encompasses eight office and administrative buildings that were constructed in the 1940s and wooded land (NAVFAC Washington 2009). The total area of all eight buildings is approximately 72,949 ft² (7,474 m²). Each building and its approximate square footage are as follows:

- Building 433, Office Space, 6,845 ft² [636 m²]
- Building 435, NAS Counsel Office, 8,063 ft² [749 m²]
- Building 436, Facility/Industrial Hygiene, 6,946 ft² [646 m²]
- Building 437, NAS Business and Finance Management Office, 7,439 ft² [691 m²]

Table 2-1. Comparison of Site Alternatives against Project Screening Criteria ¹

EUL Site	Screening Criteria					
	1	2	3	4	5	
	Developable Acreage ²	Acreage to meet ft ² Requirement ³	Availability of Utilities	Environmental Constraints	Infrastructure/Facility Relocation Requirements	Use Compatibility Issues
1	7.8 (constrained)	No	Available	Wetlands present in the area surrounding parcel	Storage lot for boats and trailers	None; Compatible with Sailor and Family Support Future Land Use
2	5.4	No	Power lines would require relocation	Site is near a pond and wetlands	Site encompasses newly constructed ball fields, power lines, and a geothermal field ^{1,3}	None; Compatible with RDTA&E Future Land Use
3	8 (constrained)	No	Available	Within Noise Zone 2; sound attenuation might be required ⁴	Youth center, pool, and administrative buildings on parcel	Near Commissary and Navy Lodge; Compatible with RDTA&E Future Land Use
4	3.3	No	Available	Within Noise Zone 2; Sound attenuation might be required ⁴	None	Near Commissary and Navy Lodge; Compatible with Sailor and Family Support Future Land Use
5	15.4	Yes	Available	Site is partially within APZ-1; wetlands to northwest of developable portion of site ⁴	Administrative buildings and personnel on parcel	Adjacent to Visitor's Quarters and Health Clinic; Compatible with RDTA&E Future Land Use
6	4.8	No	Available	None ⁴	None; Building 536 to be demolished	Near Naval Air Museum; Compatible with RDTA&E Future Land Use
7	2.7	No	Available	Small wetland on parcel	None	Near Naval Air Museum; Compatible with RDTA&E Future Land Use
6/7 ⁵	7.5	Yes	Available	Small wetland on parcel	None; Building 536 to be demolished	Near Naval Air Museum; Compatible with RDTA&E Future Land Use
5/6/7 ⁵	22.9	Yes	Available	Within APZ-1; wetlands	Administrative buildings on parcel; Building 536 to be demolished	Located near Naval Air Museum; Compatible with RDTA&E Future Land Use

Sources: ¹NAVFAC Washington 2009, ²NAVFAC Washington 2013, ³Hines 2012, ⁴NAVFAC Washington 2010

Note: ⁵Sites 6 and 7 and Sites 5, 6, and 7 have been combined for comparison purposes as they are presented as alternatives carried forth for detailed analysis in this EA.

Key: Green cells indicate that the site presents no development issues; yellow indicates that the site could present development issues; and red indicates that the site would likely present development issues.

APZ = Accident Potential Zone

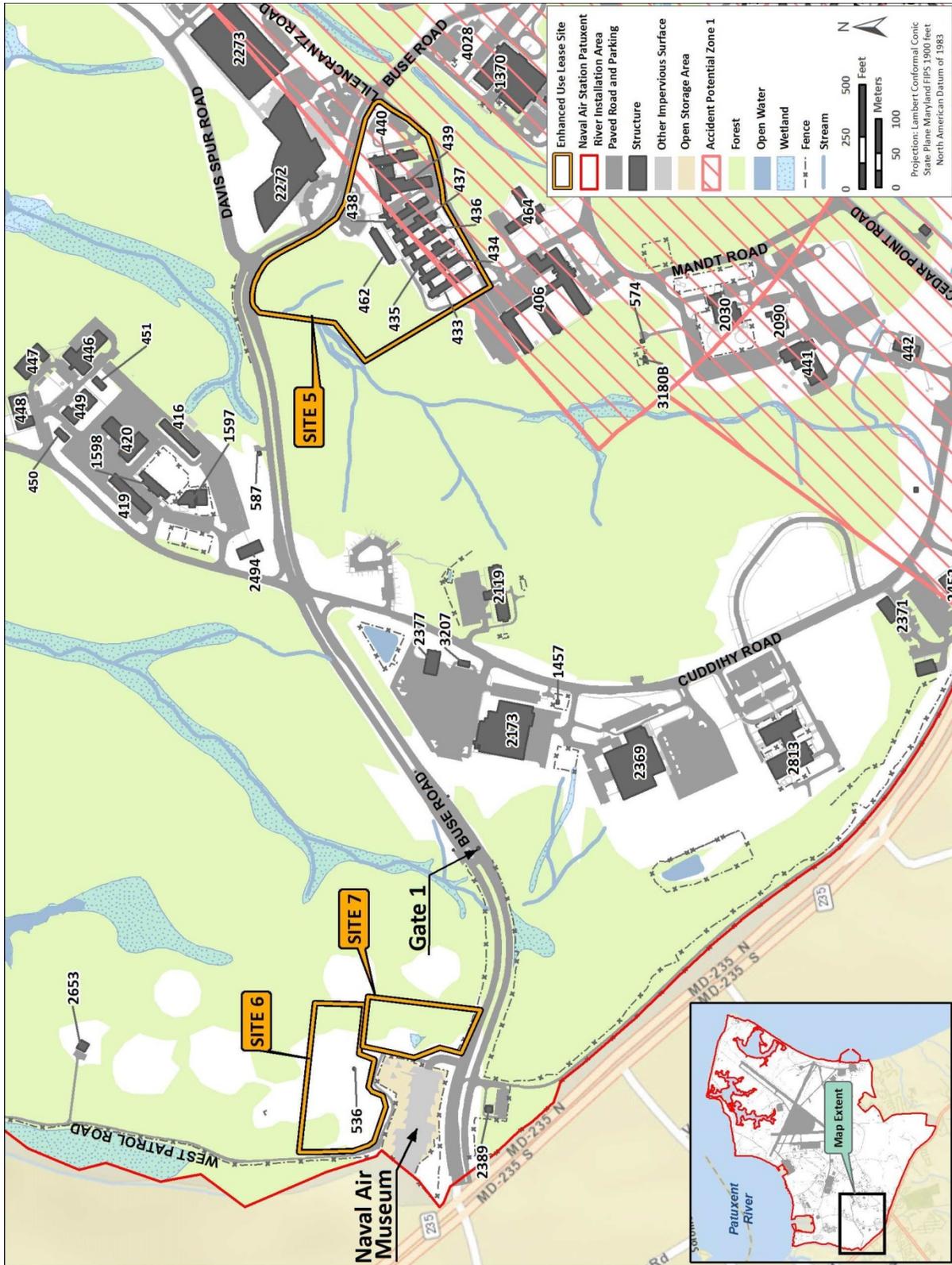


Figure 2-2 Map of Alternative 1 (EUL Sites 5, 6, and 7)

- Building 438, Counseling and Assistance Centers/Alcohol Rehabilitation Department Office (7,213 ft² [670 m²])
- Building 439, Comptroller Building (21,897 ft² [2,034 m²])
- Building 440, Administrative Building (8,652 ft² [804 m²])
- Building 462, Administrative Office Building (5,856 ft² [544 m²]) (NAVFAC Washington 2009; DoN 2010a).

All of the buildings on EUL Site 5 are constructed with a timber frame and vinyl siding. Building 437 was renovated in 2009; none of the other buildings have undergone renovation. The remaining area on the site is undeveloped and forested. Photographs of several of the existing buildings at EUL Site 5 are shown in **Figure 2-3**. Under Alternative 1, only Building 433 and Building 440 would be demolished to clear space for development of the parking lots. Access to this site would be provided from Buse Road, across from Building 2272 (see **Figure 2-4**).

EUL Site 6 (4.8 acres [2 ha]) and EUL Site 7 (2.7 acres [1.1 ha]) are adjacent to each other and located just north of the Gate 1 entrance, and east and north, respectively, of the Naval Air Museum (see **Figure 2-2**). Access to Sites 6 and 7 would be provided from a new access road from Buse Road, inside and east of Gate 1 (see **Figure 2-5**). These sites comprise open field and wooded land and are largely unimproved (NAVFAC Washington 2009) (see **Figure 2-6**). Apart from a small shed that houses a water pumping facility (Building 536), a ground antenna, and septic field on EUL Site 6, there are no existing buildings on these sites. These facilities would be demolished under this Alternative.

An assessment of EUL Sites 5, 6, and 7 determined that it has developable acreage, and the available area would be able to support more than three buildings of up to five stories with a maximum of 600,000 ft² (55,742 m²) of office space that could support 3,000 personnel, together with surface parking lots and/or multiple-level parking structures. For the purposes of this alternative, it is assumed that Site 5 would support up to 150,000 ft² (13,943 m²) of administrative space and 750 personnel, while Sites 6 and 7 would support up to 450,000 ft² (41,828 m²) and 2,250 personnel, with approximately 132,000 ft² (12,269 m²) of surface parking lots on Site 5 and either 396,000 ft² (24,538 m²) of floor space in surface parking lots or multiple-level parking structures on Sites 6 and 7. The new facilities would use existing utilities and infrastructure and would not conflict with land uses in the surrounding area since they would be located near other administrative buildings (Hines 2012).

As noted in **Table 2-1**, EUL Site 5 has potential development issues: administrative facilities occur on the parcel, the administrative functions currently provided at these facilities would require relocation, wetlands are present on a portion of the site, and the parcel partially overlaps APZ-1 associated with the airfield at NAS Patuxent River (see **Figure 2-2**). These potential issues are discussed further in the following paragraphs:

- Although the Screening Criteria indicated that the presence of these buildings would likely present development issues, the Navy determined that the continued use of Buildings 433, and 440 for administrative purposes is neither desirable nor meets the potential for optimal use of the land when compared with the installation's demand for office space and growing mission. Building 434 has already been demolished and Buildings 433 and 440 would be demolished under the Preferred Alternative. Through the EUL program, the Navy finds that redevelopment of this parcel of land to provide a modern work campus that meets the current and anticipated needs of the installation would be both reasonable and desirable. Furthermore, the functions served in these existing facilities would ultimately be relocated as required by means of separate actions to more modern spaces that are adequate to meet the Navy's existing and future needs. As a result, the development constraints identified for Site 5 in **Table 2-1** can be appropriately managed.



Figure 2-3. Photos of Existing Buildings at EUL Site 5

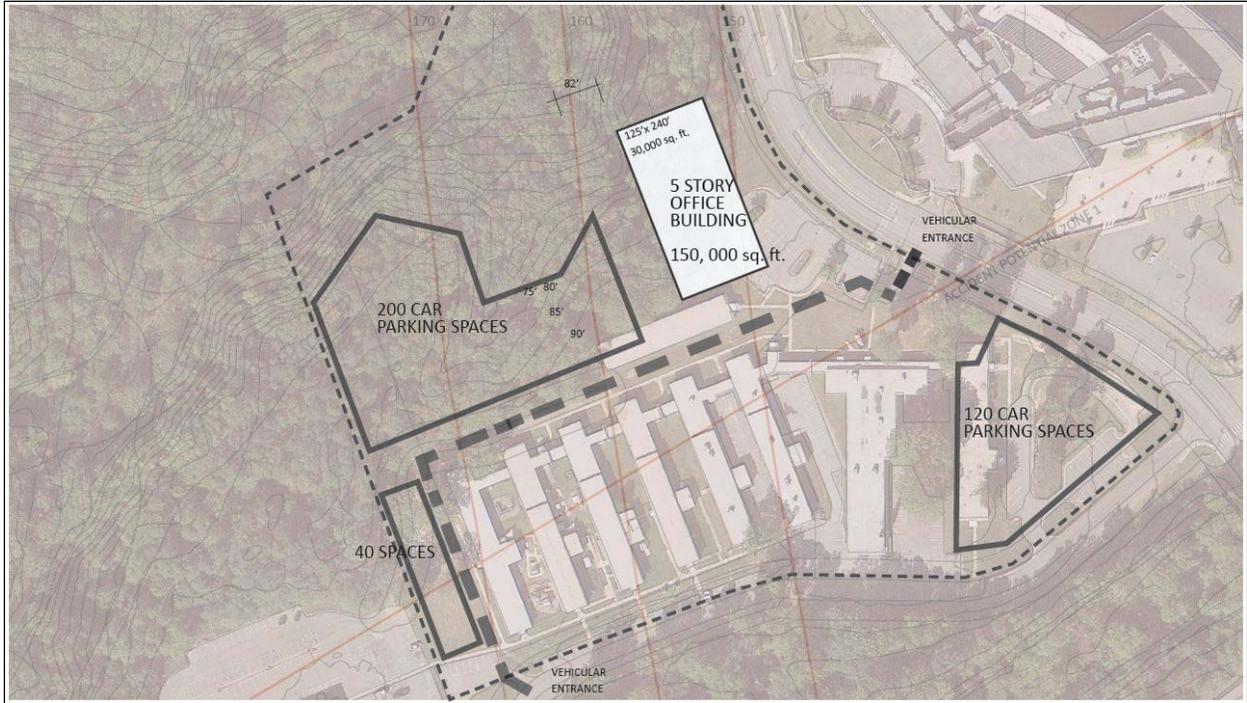


Figure 2-4. EUL Site 5 Conceptual Site Schematic Layout

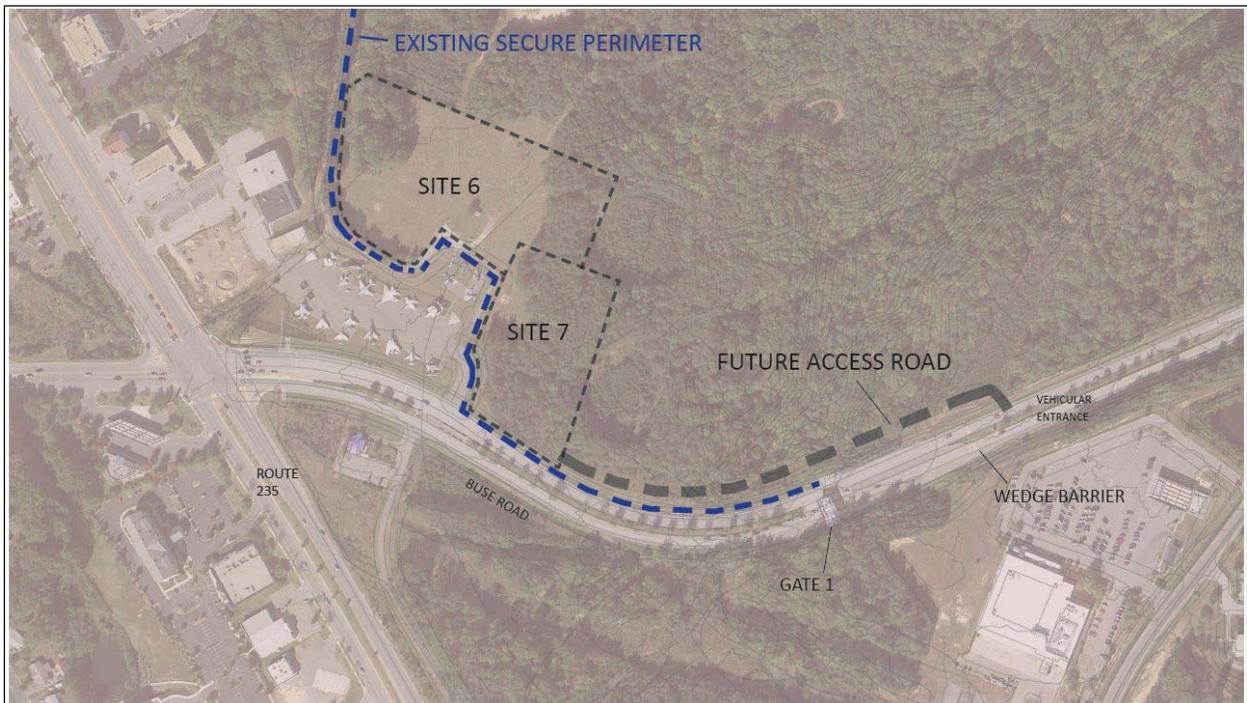


Figure 2-5. Proposed Site Access for EUL Sites 6 and 7



Figure 2-6. Photos of Existing Conditions at EUL Sites 6 and 7

- The NAVFAC Washington (2009) screening assessment included the presence of wetlands on or near a potential EUL site as an environmental constraint because development near them would require further analysis and mitigation to prevent impacts on them. Specifically, for any sites where wetlands were known to occur, the Navy would need to conduct wetland delineation and submit a formal wetland delineation report and Jurisdictional Determination (JD) Application to the Maryland Department of the Environment (MDE). Further, any development that would occur on the site would be required to mitigate potential adverse effects on the wetland. To meet these requirements, wetland delineations of EUL Site 5 conducted in 2013 resulted in identification of two small wetland areas and a stream within the site, and an additional stream located north of the site boundary (HDR 2014) (see **Figure 2-2**). A complete evaluation of the wetland and stream is being provided in a formal wetland delineation report and JD Application. Details on this wetland and potential measures to avoid or minimize impacts are provided in **Section 3**.
- On a naval air installation, there are designated areas surrounding the airfield that indicate the potential for aircraft accidents. The clear zone is the area immediately beyond an airfield that has the greatest potential for occurrence of aircraft accidents (CNO 2008). Extending beyond the clear zone are two APZs (i.e., APZ-1 and APZ-2). APZ-1 is the area immediately beyond the clear zone that still possesses a measurable potential for accidents relative to the clear zone. APZ-1 is provided under flight tracks that experience 5,000 or more annual fixed wing operations (i.e., departures or approaches, but not combined). APZ-2 is the area beyond APZ-1 that has a measurable potential for accidents relative to APZ-1. Generally, land use restrictions limit densities to 25 persons per acre and building heights to less than 150 feet (46 meters) in APZ-1 designated areas (CNO 2008). Appropriate uses in APZ-1 can include parking structures, storage, utilities, and stormwater management structures. Approximately 5.4 acres (2.2 ha) of EUL Site 5 occurs within APZ-1. To comply with the Navy's Air Installations Compatible Use Zones (AICUZ) program, only parking facilities for the new work campus development would be constructed in the area designated as APZ-1 (Hines 2012). By developing the land in accordance with the AICUZ program requirements, the Navy would also be able to avoid the environmental constraints indicated in **Table 2-1**.

Both EUL Sites 6 and 7 were determined to have potential environmental and land use constraints. These potential constraints are discussed further in the following paragraphs:

- The NAVFAC Washington (2009) screening assessment included the presence of wetlands on or near EUL Sites 6 and 7. These wetland areas present the same potential development constraints, involving requirements for analysis and mitigation, as noted for EUL Site 5. To meet these requirements, wetland delineations of EUL Sites 6 and 7 were conducted in November and December 2013 that resulted in identification of one small wetland on EUL Site 7 (HDR 2014) (see **Figure 2-6**). A complete evaluation of this wetland is in development and is being provided in a formal wetland delineation report and JD Application. Details on this wetland and potential measures to avoid or minimize impacts are provided in **Section 3**. Since appropriate measures are underway to evaluate and address mitigation on this Site with respect to wetlands, it was determined to meet Screening Criterion 3.
- Although the sites are proximal to the museum, the proposed work campus development would be consistent with land uses in the surrounding area. Therefore, these sites were subsequently determined to meet Screening Criterion 5.

Limited utilities are used on the sites so it is likely that some utility lines would have to be extended from existing infrastructure on the installation to support development on them. Since the areas are undeveloped, construction of the new work campus development on these parcels would not require the

relocation of infrastructure or facilities. Construction of a new roadway would likely be required to provide access to the development. Additionally, EUL Sites 6 and 7 are in proximity to an installation gate (i.e., Gate 1). Depending on the final design of the work campus development, entrance lanes to the gate might require alteration to ensure installation security is in compliance with DoD entry-control facility and security setback requirements.

The combination of EUL Sites 5, 6, and 7 meet Screening Criteria 1 through 5 discussed in **Section 2.3** because of the minimal amount of demolition and relocation associated with administrative Buildings 433 and 440 and the intended use for the area that falls within the APZ for EUL Site 5. Additionally, actions would be taken to address the presence of wetlands on all sites. Otherwise, relatively few environmental constraints and compatibility conflicts exist for EUL Sites 6 and 7. A combination of these sites provides the Navy more flexibility with design than any one site on its own. Therefore, a combination of EUL Sites 5, 6, and 7 is presented as the Preferred Alternative.

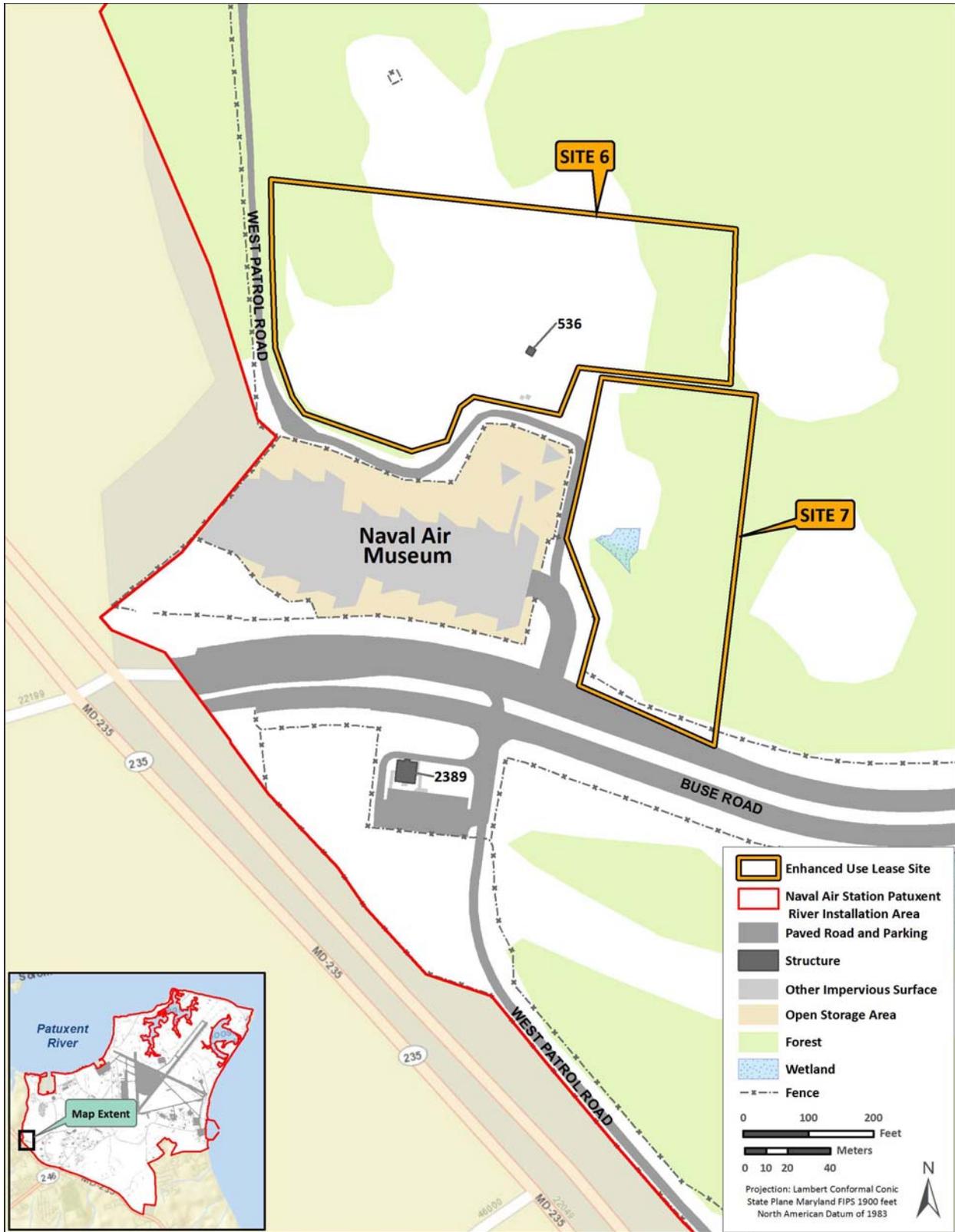
Two staffing scenarios representing the range of sources of personnel that could occupy the EUL development at NAS Patuxent River were assumed for each alternative addressed in this EA. Under Staffing Scenario A, 2,600 personnel already hold positions at NAS Patuxent River and would be consolidated into the new EUL development; the remaining 400 personnel would come from other positions that are currently off the installation. Under Staffing Scenario B, up to 3,000 personnel not currently working at NAS Patuxent River would be employed at the new EUL development. Staffing Scenario B could include personnel not directly employed by NAS Patuxent River.

2.4.2 Alternative 2 (EUL Sites 6 and 7)

Under Alternative 2, the Navy would enter into an EUL agreement for development of the new work campus on EUL Sites 6 and 7. Originally evaluated as separate potential locations for the work campus, it was determined that EUL Sites 6 and 7 individually were too small to meet the developable acreage requirements to implement the Proposed Action. However, they have been combined to form Alternative 2 because they are contiguous and together they meet the developable acreage requirements, therefore meeting Screening Criterion 1. Assessment of these sites determined that they have developable acreage and the available area would support multiple-floor office buildings to provide 600,000 ft² (55,742 m²) that could support 3,000 personnel and parking lots and/or multiple-level parking structures totaling 528,000 ft² (49,078 m²) of floor space (Hines 2012). These sites comprise open field and wooded land and are largely unimproved (NAVFAC Washington 2009) (see **Figure 2-7**). Building 536 would still be demolished under this alternative and the environmental constraints listed under Alternative 1 would still apply.

Utility lines would need to be extended into the sites from existing infrastructure and a new roadway would likely be required to provide access to the new development. Construction of the new work campus would not require the relocation of infrastructure or facilities. Entrance lanes to Gate 1 might require alteration to ensure security compliance with DoD entry-control facility and security setback requirements.

Considering the updated assessments of the sites' lack of environmental constraints and compatibility conflicts, and that the entire sites are developable, the Navy has determined that these sites meet Screening Criteria 1 through 5. Therefore, development of the work campus development across EUL Sites 6 and 7 is considered to be a reasonable alternative to the Proposed Action, and is carried forward as Alternative 2.



Sources: ESRI StreetMap USA 2010, Naval Air Station Patuxent River, Maryland Department of Planning, and HDR.

Figure 2-7. Map of Alternative 2 (EUL Sites 6 and 7)

2.4.3 No Action Alternative

Under the No Action Alternative, NAS Patuxent River would not enter into an EUL with a lessee to develop, operate, and maintain a work campus office development at NAS Patuxent River. No public private partnership would be developed between the Navy and the lessee at NAS Patuxent River. The Navy's objectives for the EUL, to enhance and optimize real property at NAS Patuxent River, would not be met and the Navy would continue to operate under current conditions within inadequate facilities. The ability to meet mission requirements would be difficult and inefficient.

2.5 Alternatives Considered But Dismissed

The Navy evaluated several additional alternative EUL site locations off-installation and within the footprint of NAS Patuxent River for initial screening. Of these, the Navy reconsidered and formally withdrew EUL Site 4 from the EUL program. In addition, a previous screening study evaluated other uses for the EUL and identified the preferred use as an administrative complex (NAS Patuxent River 2009); therefore, other uses are not considered in this EA. A brief discussion of the other EUL administrative complex sites that were considered but ultimately dismissed from further consideration is provided in the following subsections.

2.5.1 Alternative to Build at EUL Site 1

Under this alternative, the Navy would enter into an EUL agreement for development of the new work campus on EUL Site 1. EUL Site 1 includes 7.8 acres (3.1 ha) of land on the eastern side of Cuddihy Road, near its intersection with Tate Road. This area is currently used as an unpaved storage lot where boats, campers, and trailers are parked. Although this site has developable acreage, an initial assessment of the site determined that the developable acreage would only support one, multiple-floor, 240,000-ft² (22,297-m²) building that could accommodate 1,200 personnel, and one multiple-level parking structure (Hines 2012). Additionally, development in this area would have multiple environmental constraints. Wetlands surround the site to the north, east, and south, creating a "U" shape. The northernmost portion of the site is within 1,000 feet [328 meters] of tidal waters; therefore, the potential exists for construction activities at Site 1 to impact state coastal resources, and any tree removal could require mitigation replacement (NAVFAC Washington 2009, MDNR 2013). No utilities are used in this area, so all new construction would require installation or extension of existing utilities infrastructure to support any new development. Additionally, this site is currently used for storage of boats, campers, and trailers that would require relocation to another new or existing storage area elsewhere on the installation (NAVFAC Washington 2009). For these reasons, EUL Site 1 was considered too small and constrained and did not meet Screening Criteria 1, 3, and 4, and was therefore dismissed from further consideration.

2.5.2 Alternative to Build at EUL Site 2

Under this alternative, the Navy would enter into an EUL agreement for development of the new work campus on EUL Site 2. EUL Site 2 is a 5.4-acre (2.2-ha) parcel of land located on Cuddihy Road. An assessment of this site determined that, although it has developable acreage, the available area would support only one, multiple-floor, 210,000-ft² (19,510-m²) building that could accommodate 1,050 personnel, and one multiple-level parking structure and supplemental surface parking lot (Hines 2012). Currently, EUL Site 2 is occupied by two ball fields that are rated in good condition, transmission lines, and a geothermal field (NAVFAC Washington 2009, Hines 2012). These recreational facilities serve as the main playing fields at NAS Patuxent River. The ball fields are surrounded by steep slopes and wetlands. Additionally, the site is under a utilities easement with Southern Maryland Electric Cooperative (SMECO) for power lines located along its eastern boundary. Development of this parcel for

a work campus would require the relocation of the existing recreational facilities, a main electrical power transmission line, and an updated easement to ensure use-compatibility with SMECO into the future (NAVFAC Washington 2009). Although electrical utilities are available at the site, development would require extension of all other utility services to accommodate the new office buildings. Additionally, design of the work campus development at this site would require avoidance or relocation of an existing geothermal field, and the ball fields would not be required to be relocated. For these reasons, EUL Site 2 was considered too small and constrained and did not meet Screening Criteria 1 through 4, and was therefore dismissed from further consideration.

2.5.3 Alternative to Build at EUL Site 3

Under this alternative, the Navy would enter into an EUL agreement for development of the new work campus on EUL Site 3. EUL Site 3 is an 8.0-acre (3.2-ha) site located on the northeastern corner of Buse Road and Cuddihy Road. Assessment of this site determined that although it has developable acreage, the available area would only support two multiple-floor buildings to meet a maximum of 480,000 ft² (44,593 m²) that could accommodate 1,680 personnel, and one multiple-level parking structure. Another EUL site (e.g., EUL Site 4) could also be used for development of a supplemental surface parking lot (Hines 2012). Although this parcel meets the selection requirements, and is located along two major installation roads, EUL Site 3 encompasses active recreation facilities that serve youth and active-duty, retired, reserves, DoD employees and civilians, and administrative buildings (DoN 2010a). Specifically, EUL Site 3 includes the following:

- Building 1597 (constructed in 1976) comprises a Youth Center (7,640 ft² [710 m²]) and a bath house (4,870 ft² [452 m²])
- A 164-foot (50-meter), 8-lane, Olympic-sized outdoor pool (12,500 ft² [1,161 m²])
- Building 416 (constructed in 1943), NAVAIR Technical Data Office (17,200 ft² [1,598 m²])
- Building 419 (constructed in 1943), Engineering Support Office (17,600 ft² [1,635 m²])
- Building 2494 (constructed in 2000), Air Speed Project Office (5,500 ft² [511 m²]).

Under this alternative, these buildings and recreational facilities would be demolished and the work campus development would be constructed in their place. Since analyses concluded that the developable area for EUL Site 3 could only accommodate office buildings that measure less than the total required 600,000 ft² (55,742 m²) and development of the parking facilities would require use of an additional EUL site, the site did not meet Screening Criterion 1.

Additional to the size constraint, EUL Site 3 is subject to environmental constraints because it is located within Noise Zone 2 on the installation (DoN 2010a). Land use planning on a naval installation is done in accordance with AICUZ guidance (CNO 2008) specified for three noise zones (areas affected by aircraft noise). Noise Zone 1 includes areas where low or no effects from aircraft noise would be experienced. Noise Zone 2 includes areas where moderate aircraft noise impacts would be experienced and land use controls might be required. Noise Zone 3 includes areas that are the most severely impacted by aircraft noise and therefore require the greatest degree of compatible use controls. Per AICUZ guidance (CNO 2008), development within Noise Zone 2 should comply with land use compatibility and sound attenuation guidelines. Land uses that are considered compatible within Noise Zone 2 include manufacturing, industry, transportation, parking, services (e.g., warehousing), and trade (e.g., retail shopping). Consideration of sound attenuation could be required during the design of buildings and structures, and the Navy could require sound attenuation for construction projects. Since the site is subject to land use compatibility and sound attenuation requirements, it failed to meet Screening Criterion

3. For these reasons, EUL Site 3 was considered too small and constrained and therefore dismissed from further consideration.

2.5.4 Alternative to Build at EUL Site 4

Under this alternative, the Navy would enter into an EUL agreement for development of the new work campus on EUL Site 4. EUL Site 4 is located near the Navy Lodge and the installation commissary on the southeastern corner of the intersection of Buse Road and Cuddihy Road. This parcel measures 3.3 acres (1.3 ha). The Chaffee Court housing quarters were recently demolished and EUL Site 4 is vacant. Under this alternative, either a surface parking lot or parking structure would be constructed in place of the recently demolished buildings.

The assessment of EUL Site 4 determined that although it had developable acreage, the area would only be viable for development of parking facilities (e.g., parking structure or surface parking lot) (Hines 2012). Additional to the size constraint, EUL Site 4 is subject to environmental noise constraints because it is located within Noise Zone 2 on the installation. Therefore, any new development in this area must comply with AICUZ land-use compatibility and sound attenuation recommendations. For these reasons, EUL Site 4 was considered too small and constrained and did not meet Screening Criteria 1 and 3, and was therefore dismissed from further consideration (NAVFAC Washington 2009). Furthermore, the Navy reconsidered and formally withdrew this site from the EUL program as it was determined that the site was required for mission-related uses.

2.5.5 Alternative to Build at EUL Site 5 Only

Under this alternative, the Navy would enter into an EUL agreement for development of the new work campus on EUL Site 5. An assessment of EUL Site 5 determined that it has developable acreage and the available area would support three multiple-floor buildings with a maximum of 600,000 ft² (55,742 m²) that could support 3,000 personnel and two multiple-level parking structures. The new facilities would use existing utilities and infrastructure and would not conflict with land uses in the surrounding area since they would be located near other administrative buildings (Hines 2012). However, development of the entire EUL work campus on Site 5 was subsequently determined to be constrained by the ravine to the north of the site and the presence of the APZ in the southern portion of the site. In addition, all of the buildings on Site 5 would be required to be demolished to clear space for development of the new work campus buildings and parking lots. This would require the relocation of all personnel within those buildings. The Screening Criteria indicate that the presence of these buildings would likely present development issues and the Navy determined that these developmental constraints cannot be appropriately managed for this action. Given the constraints and extensive amount of demolition and relocation of the administrative buildings, the Navy has determined that EUL Site 5 does not meet Screening Criteria 4. Therefore, development of the work campus development at EUL Site 5 only was dismissed from further consideration.

2.6 Comparison of Alternatives

Table 2-2 summarizes the potential environmental consequences of the Proposed Action, alternatives, and the No Action Alternative, based on the impact analyses presented in **Chapter 3**.

Table 2-2. Summary of Impacts

Resource	Alternative 1 (EUL Sites 5, 6, and 7)	Alternative 2 (EUL Sites 6 and 7)	No Action Alternative
Land Use and Airspace	<p>No significant adverse impacts on land use would be expected from the changes to the land use categories. No significant adverse impacts on APZ-1 on Site 5 would be expected under Alternative 1; only parking facilities would be constructed within the APZ. No APZ occurs at Sites 6 and 7, therefore no impacts would be expected.</p> <p>Non-significant impacts on visual resources would be expected from construction of the work campus on Sites 5, 6, and 7.</p>	<p>Impacts on land use, airspace, and visual resources under Alternative 2 would be the same as those described for Sites 6 and 7 under Alternative 1.</p>	<p>No impacts on land use, airspace, and visual resources would be expected from the No Action Alternative.</p>
Traffic and Transportation	<p>Non-significant impacts above existing conditions and other proposed development would include longer queue lengths, increased travel times, and an overall increase in traffic delay.</p> <p>On the installation, impacts would be greatest at the Buse Road intersections. Specifically, the intersections with Cuddihy Road, Davis Spur, Liljencranz Road, and Cedar Point Road would see impacts. Off the installation, these impacts are specific to intersections near Gates 1 and 2 and the eastbound Three Notch Road intersections.</p>	<p>Impacts on traffic and transportation would be similar to those described under Alternative 1. Because all the proposed development would be in close proximity to Gate 1 at Sites 6 and 7 rather than split across to Site 5 under this alternative, impacts would be more localized to the intersections of Buse Road, Three Notch Road and Gate 1, and Buse Road and the proposed Sites 6 and 7 driveway.</p>	<p>No significant impacts are expected. Queue lengths and travel times are increased slightly due to other surrounding development.</p>

Resource	Alternative 1 (EUL Sites 5, 6, and 7)	Alternative 2 (EUL Sites 6 and 7)	No Action Alternative
Infrastructure and Utilities	Non-significant impacts on electrical supply, water supply, wastewater, stormwater drainage, and solid waste management would be expected from construction and demolition activities and the potential increased number of personnel. Beneficial impacts on electrical supply, water supply, wastewater, and stormwater drainage would occur from the upgraded utility systems and from the demolition of inadequate buildings and construction of new, modern buildings.	Impacts on facility infrastructure and utility systems under Alternative 2 would be the same as those described under Alternative 1.	Non-significant impacts on utilities and infrastructure would continue from the use of inadequate buildings and utilities.
Air Quality	Temporary impacts from construction emissions and emissions during operations would be expected but would not be significant.	Impacts would be similar to but less than Alternative 1. Only impacts on Site 6 and 7 would be expected.	No impacts would be expected.
Noise	Temporary impacts from construction noise would be expected but would not be significant.	Impacts would be similar to but less than Alternative 1. Only impacts on Site 6 and 7 would be expected.	No impacts would be expected.
Coastal Zone Management	No significant impacts. All activities would be conducted in accordance with applicable laws, regulations, and policies regarding affected coastal resources and would therefore be consistent to the maximum extent practicable with the applicable Maryland CMP enforceable policies.	Impacts would be the same as those discussed under Alternative 1.	The EUL would not occur and there would be no construction and demolition activities. Therefore, a CZMA consistency determination would not be required. There would be no effects on any land use, water use, or natural resources of Maryland's coastal zone.
Geology	Impacts would result from soil disturbance and compaction related to construction and demolition. These impacts would not be significant.	Impacts would be similar to but less than Alternative 1. Only impacts on Site 6 and 7 would be expected.	No impacts would be expected.

Resource	Alternative 1 (EUL Sites 5, 6, and 7)	Alternative 2 (EUL Sites 6 and 7)	No Action Alternative
Biological Resources	<p>Temporary disturbances on wildlife from construction noise would be expected.</p> <p>No significant impacts on vegetation, wildlife, or rare, threatened, and endangered species would be expected.</p> <p>Long-term vegetation removal would occur. Habitat removal would be negligible and limited to a small amount of upland forest and old field areas.</p> <p>Vegetation clearing would occur outside of nesting season.</p>	<p>Impacts on vegetation, wildlife and rare, threatened and endangered species would be expected to be similar to those described for Alternative 1; however, a lower amount of upland forest and an greater amount of old field habitat would be removed.</p>	<p>No impacts would be expected.</p>
Water Resources	<p>No significant impacts on water resources would be expected. BMPs established in the installation SWPPP would be implemented to reduce impacts from groundwater recharge, and stormwater runoff. ESD would be used to maintain predevelopment runoff characteristics.</p> <p>Approximately 0.1 acre (0.04 ha) of wetlands could be impacted under Alternative 1. All impacts on wetlands would be mitigated as required. No impacts on floodplains would be expected.</p>	<p>Groundwater and stormwater impacts would be similar but more localized than those under Alternative 1.</p> <p>Approximately 0.05 acre (0.02 ha) of wetlands could be impacted under Alternative 2. Impacts on wetlands would be mitigated as required and no impacts on floodplains would be expected.</p>	<p>No impacts would be expected.</p>
Cultural Resources	<p>No effect.</p>	<p>No effect.</p>	<p>No effect.</p>
Hazardous Materials and Wastes	<p>No significant impacts. Minor amounts of hazardous materials and wastes would be used/generated during construction and demolition.</p>	<p>Impacts would be similar to Alternative 1. There would be two fewer building demolitions, which would likely reduce the amount of hazardous waste generated (ACM, LBP and PCBs) when compared to Alternative 1.</p>	<p>No impacts on would be expected.</p>

Resource	Alternative 1 (EUL Sites 5, 6, and 7)	Alternative 2 (EUL Sites 6 and 7)	No Action Alternative
Socioeconomics and Environmental Justice	No significant impacts would be expected. Increases in local taxes and receipts could stimulate the local economy. Demand for housing and labor would not be outstripped. Minority, low-income, and child populations would not be expected to be disproportionately impacted.	No significant impacts would be expected. Increases in local taxes and receipts could stimulate the local economy. Demand for housing and labor would not be outstripped. Minority, low-income, and child populations would not be expected to be disproportionately impacted.	No impacts would be expected. Population, housing, and labor rates would continue to increase at current rates and would not be impacted by the Proposed Action. Minority, low-income, and child populations would not be impacted.
Human Health and Safety	No significant impacts would result from demolition and construction activities work within APZs.	Impacts would be the same as those described under Alternative 1.	No significant impacts would result from the potential for exposure to contaminated materials. These impacts could be significant after long-term exposure.
Cumulative Effects	No significant cumulative impacts would be expected to any resource area.	Cumulative impacts under Alternative 2 would be similar but more localized than Alternative 1. Impacts would not be significant.	No significant cumulative impacts are expected.

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3. Affected Environment and Environmental Consequences

This section presents a description of the environmental resources and baseline conditions that could be affected from implementing the Proposed Action. In addition, this section presents an analysis of the potential environmental consequences of implementing Alternative 1 (Preferred Alternative), Alternative 2, and the consequences of selecting the No Action Alternative.

Affected Environment. All potentially relevant environmental resource areas were initially considered for analysis in this EA. In compliance with NEPA, CEQ, and 32 CFR § 775 guidelines, the discussion of the affected environment (i.e., existing conditions) focuses only on those resource areas potentially subject to impacts, and those with potentially significant environmental issues. This section includes noise, air quality, human health and safety, coastal zone management, geological resources, biological resources, water resources, utilities, infrastructure, transportation, hazardous materials and wastes, and cultural resources.

Environmental Consequences. This section presents an analysis of the potential direct and indirect effects of each alternative on the affected environment. The following discussion elaborates on the nature of the characteristics that might relate to resources. “Significantly,” as used in NEPA, requires considerations of both context and intensity. Context means that the significance of an action must be analyzed in several contexts such as society as a whole (e.g., human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of a proposed action. For instance, in the case of a site-specific action, significance would usually depend on the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant (40 CFR § 1508.27).

Intensity refers to the severity of impact. The following should be considered in evaluating intensity (40 CFR § 1508.27):

- Impacts that might be both beneficial and adverse. A significant effect might exist even if the Federal agency believes that on balance the effect will be beneficial.
- The degree to which a proposed action affects public health or safety.
- Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
- The degree to which the effects on the quality of the human environment are likely to be highly controversial.
- The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
- The degree to which the action could establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
- Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
- The degree to which the action could adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places (NRHP) or could cause loss or destruction of significant scientific, cultural, or historical resources.
- The degree to which the action could adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act (ESA).

- Whether the action threatens a violation of Federal, state, or local law or requirements imposed for the protection of the environment.

3.1 Land Use and Airspace

3.1.1 Definitions

The term land use refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. In many cases, land use descriptions are codified in installation master planning and local zoning laws. Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. However, there is no nationally recognized convention or uniform terminology for describing land use categories. As a result, the meanings of various land use descriptions, labels, and definitions vary among jurisdictions. Natural conditions of property can be described or categorized as unimproved, undeveloped, conservation or preservation area, and natural or scenic area. There is a wide variety of land use categories resulting from human activity. Descriptive terms often used include residential, commercial, industrial, agricultural, institutional, and recreational.

In appropriate cases, the location and extent of a proposed action needs to be evaluated for its potential effects on a project site and adjacent land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. Other relevant factors include matters such as existing land use at the project site, the types of land uses on adjacent properties and their proximity to a proposed action, the duration of a proposed activity, and its permanence. *Navy Shore Vision 2035* is the Navy's new vision for shore basing. It includes a substantial reduction of base infrastructure and a model of base layout that zones infrastructure along functional lines. The *Navy Shore Vision 2035* uses shore capability areas as categorization for land use areas on Navy installations (NAVFAC Washington 2012).

One particular component of airspace is relevant to the Proposed Action in this EA. Land use development also must be compatible with Accident Potential Zones (APZ) around a military airfield. APZ-1 is an area immediately beyond the clear zone (i.e., which is the area immediately beyond the end of the runway that extends outward for 3,000 feet [914 meters]) that still possesses a measurable potential for accidents relative to the clear zone. APZs are areas around an airfield where an aircraft mishap is most likely to occur (CNO 2008). APZs are not predictors of accidents nor do they reflect accident probability. DOD also identifies an APZ as a planning tool for local planning agencies.

Visual resources are related to land use and are defined as the natural and man-made features that give a particular setting or area its aesthetic qualities. These features define the landscape character of an area and form the overall impression that an observer receives of that area. Evaluating the aesthetic qualities of an area is a subjective process because the value that an observer places on a specific feature varies depending on his or her perspective.

3.1.2 Existing Conditions

Land use on NAS Patuxent River was assessed based on the 12 shore capability areas outlined in *Navy Shore Vision 2035* (NAVFAC Washington 2012). There are eight shore capability areas/land use categories that were applicable to NAS Patuxent River, as shown in **Table 3-1**.

Table 3-1. Land Use Categories on NAS Patuxent River

Land Use Category	Percentage of Total Installation Acreage
Airfield Operations	31%
Open Space	25%
Sailor and Family Support	20%
Research, Development, Acquisition, Test, and Evaluation (RDT&E)	16%
Supply and Storage Support	6%
Base Support	2%
Interim/Depot Level Maintenance Supply	0.3%
Training Support	0.4%

Source: NAVFAC Washington 2012

Note: Total may not be exactly 100% due to the rounding of values.

3.1.2.1 EUL Site 5

Land use. Land development and redevelopment activities at EUL Site 5 would occur in Research, Development, Testing, and Evaluation (RDT&E) and Open Space land uses and adjacent to a Sailor and Family Support Area (NAVFAC Washington 2012). RDT&E facilities are concentrated primarily around engineer complexes associated with the RDT&E hangars on the installation (see **Figure 3-1**). The RDT&E land use is one of the highest priorities towards meeting NAS Patuxent River's mission (NAVFAC Washington 2012). There are office and administrative buildings that were constructed in the 1940s on Site 5. Building 2272, NAVAIR Headquarters, is located northeast of Site 5 and is in the RDT&E land use. The Navy Gateway Inns and Suites, Buildings 406 and 464, are west/southwest of Site 5, and are in the Sailor and Family Support Area. A forested area with a small stream and beyond that the installation's Primary Care Clinic are to the south of the site. The Open Space land use on Site 5 consists of a forested area, two small wetland areas, and a stream. Information regarding the forested area and wetlands are provided in **Section 3.8**.

Airspace. APZ-1 on NAS Patuxent River extends southwest from Runway 6-24 and covers approximately 5.4 acres (2.2 ha) of the southeastern half of Site 5 (see **Figure 2-2**). Land use restrictions limit densities to 25 persons per acre and building heights to less than 150 feet (46 meters) in APZ-1 designated areas (CNO 2008). Appropriate uses in APZ-1 can include parking facilities, storage, utilities, and stormwater management facilities.

Visual Resources. The visual resources on Site 5 at NAS Patuxent River are typical of an administrative area on a military installation. Site 5 contains eight administrative buildings and a forested area. The buildings are in the southern portion of the site and are adjacent to other development.

3.1.2.2 EUL Sites 6 and 7

Land Use. Sites 6 and 7 are along the NAS Patuxent River installation boundary just north of Gate 1 and north and east of the Naval Air Museum off the installation, respectively. Sites 6 and 7 occur entirely within the Open Space land use and are adjacent to a Sailor and Family Support land use (NAVFAC Washington 2012). The Open Space consists of open field and wooded land on Sites 6 and 7. There is one small, unoccupied storage facility (Building 536) located on EUL Site 6 and one small wetland located on Site 7 (see **Figure 2-7**).

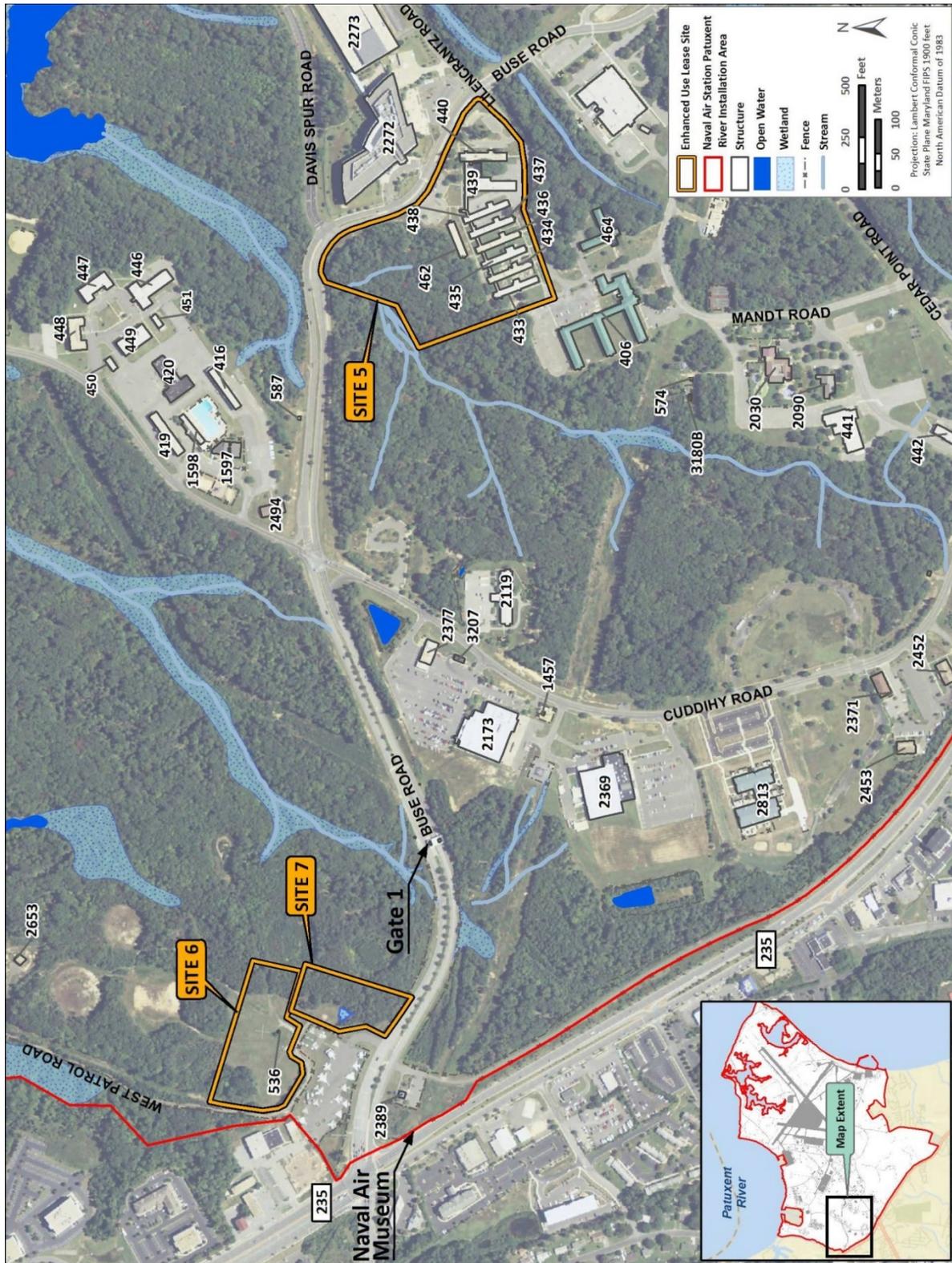


Figure 3-1-1. Natural Resources within the Project Area

Airspace. Sites 6 and 7 do not occur in a clear zone or an APZ.

Visual Resources. Sites 6 and 7 at NAS Patuxent River are largely unimproved open fields and wooded areas. Sites 6 and 7 are north of Gate 1 and east and north of the Naval Air Museum.

3.1.3 Environmental Consequences

3.1.3.1 Alternative 1 (EUL Sites 5, 6, and 7)

Land Use. Of the eight land uses that were identified on NAS Patuxent River, two, RDT&E and Open Space, would be affected under Alternative 1. The demolition of existing buildings on EUL Site 5 would occur in the RDT&E land use, and the demolition of the small storage facility on Site 6 would occur in Open Space. Construction of the work campus and associated parking facilities would occur in the RDT&E and Open Space on Site 5 and entirely within Open Space on Sites 6 and 7. The addition of these facilities in Open Space areas would require a change to the land use categorization. The changes to the land use categories would result in adjacent compatible land uses categorizations as defined by the *NAS Patuxent River Installation Master Plan* (NAVFAC Washington 2012). Therefore no significant adverse impacts on land use would be expected.

Airspace. Site 5 would be developed in accordance with the Navy's AICUZ program requirements. To comply with the AICUZ program, only parking facilities for the new work campus development would be constructed in the area designated as APZ-1 (Hines 2012). Therefore, no impacts on APZ-1 on Site 5 would be expected under Alternative 1. Additionally, no impacts on airspace or any APZ would be expected from development of the work campus on Sites 6 and 7.

Visual Resources. Impacts on visual resources would be expected from the removal of trees and construction of the work campus in open fields on Sites 5, 6, and 7 and construction of two parking lots associated with the EUL; however, relatively few trees would be removed. The amounts of open fields and forested areas on the installation would not be noticeably affected. Therefore, impacts on visual resources would not be considered significant. In addition, the inadequate buildings on Site 5 would be demolished and would be replaced with modern buildings. Therefore, beneficial impacts would also be expected to visual resources from the construction of modern buildings at the site.

3.1.3.2 Alternative 2 (EUL Sites 6 and 7)

Under Alternative 2, impacts on land use, and airspace would be similar to those described for EUL Sites 6 and 7 under Alternative 1, except that the density of development would be slightly greater under this Alternative to include construction of a parking facility. Impacts to visual resources would also be similar; however, only one building would be replaced, reducing the benefit of constructing modern buildings on the site.

3.1.3.3 No Action Alternative

Under the No Action Alternative, NAS Patuxent River would not enter into an EUL. The land use categorizations would remain unchanged under the No Action Alternative. No impacts on airspace or visual resources would be expected from the No Action Alternative.

3.2 Traffic and Transportation

3.2.1 Definitions

General Definition. This section documents the existing transportation systems, conditions, and travel patterns within and in the vicinity of NAS Patuxent River. Transportation systems consist of the road and pedestrian networks. Transportation infrastructure includes major and minor roadways that feed into the installation, security gates, roadways, and parking areas on the installation. Available capacity and performance of the transportation system indicate the conditions that commuters and other travelers encounter. The traffic network, vehicular traffic, travel patterns, circulation, and parking are described for the study area. This analysis evaluates traffic operations during the AM and PM Peak Hours, with emphasis on each modeled intersection's level of service (LOS), or ability for an intersection to manage the flow of traffic efficiently.

Traffic Study Methodology. The traffic study area includes the roadway network inside NAS Patuxent River and adjacent roadways and intersections. Approximately 5.5 miles (8.9 km) of Three Notch Road (MD 235), an arterial along the southwestern boundary of NAS Patuxent River, and approximately 0.5 miles (0.8 km) of Great Mills Road (MD 246) near the installation are included in the traffic study report. These two roadways are the main points of ingress and egress to the three NAS Patuxent River gates.

The traffic study analysis includes a comparison of the EUL proposed alternatives to the 2017 No Action Alternative, which reflects projected traffic levels at the time of commencement of EUL development operation. The 2017 No Action Alternative incorporates proposed surrounding development for comparison purposes with the EUL action alternatives. Traffic analyses follow four basic steps described below. Additional detail and the complete methodology are available in the full Traffic Study for the EUL program which is provided as **Appendix B**.

Data Collection. Field data were collected and used to develop peak hour volumes and existing conditions for key intersections throughout the study area. Turning movement counts and automatic traffic recorders were used to collect volumes various intersections and other roadways within the study area. Information to calculate travel time, initial unmet demand, saturation flow rate, storage lengths, and signal timings were also collected. In addition, lane configurations and gate operations were confirmed.

Based on field observations, it takes a vehicle approximately 4 to 5 seconds to clear security at the gates. To estimate the delay caused by each vehicle stopping at the gate, the gates were modeled as signalized intersections to reflect the stop and go condition.

2014 Baseline Conditions and 2017 No Action Alternative Volume Development. Once developed, the 2014 Baseline Conditions information was used to develop the 2017 No Action Alternative. The 2017 No Action Alternative AM and PM Peak Hour volumes were estimated by applying a 2 percent growth rate to the 2014 Peak Hour volumes. A growth rate of 2 percent was developed based on 2000 and 2010 census data for St. Mary's County and by information available from the county (St. Mary's County 2013).

Trip Generation and 2017 Alternative Volume Development. In order to develop the EUL alternatives, a trip generation and distribution analysis was performed. The trips generated by the EUL program were estimated using the Institute of Traffic Engineers **Trip Generation**, 9th Edition. Since the proposed development is for office space, Land Use 710 – General Office Space was used to estimate the trips generated by the EUL. AM and PM Peak Hour volumes for each alternative were developed by adding the number of trips generated in each alternative/scenario to the 2017 No Action Peak Hour volumes.

Capacity and Level of Service Analysis. Using Synchro software, Version 8, Build 804, Revisions 795, a model of the study area was developed based on existing lane configurations, signal phasing/timing, and data collected in the field to analyze the operations and LOS for those key intersections for the 2014 Baseline Conditions.

The *Policy on Geometric Design of Highways and Streets 2011* by the American Association of State Highway and Transportation Officials (AASHTO) provides guidelines for the selection of design LOS. For a suburban arterial, such as Three Notch Road (MD 235), the acceptable LOS is C or D. The criteria provided in the *Highway Capacity Manual* (HCM) were used to determine the LOS for the intersections in the study area. For signalized intersections, SimTraffic reports a delay and LOS for each movement, approach, and intersection. The signalized intersection LOS is based on a weighted average of the movement volumes and delays. At unsignalized intersections, SimTraffic reports the delay and LOS for the approaches controlled by the stop signs. All LOS results reported in this study are based on intersection LOS for signalized locations and the worst stop-controlled approach for unsignalized intersections.

The criteria provided in Exhibits 16-2, 17-2, and 21-1 of the HCM were used to determine the LOSs. **Table 3-2** provides a summary of the HCM thresholds.

Table 3-2. Summary of HCM LOS Thresholds

	Control Delay per Vehicle (s/veh ¹)		LOS Description
	Signalized Exhibit 16-2	Unsignalized ² /Roundabout Exhibit 17-2/21-1	
A	≤ 10	≤ 10	Free flow, insignificant delays
B	> 10–20	> 10–15	Stable operations, minimal delays
C	> 20–35	> 15–25	Stable operations, acceptable delays
D	> 35–55	> 25–35	Restricted flows, regular delays
E	> 55–80	> 35–50	Maximum capacity, extended delays. Volumes at or near capacity. Long queues form upstream from intersection.
F ³	> 80 or volume/capacity (v/c) > 1.0	> 50 or v/c .1.0	Forced flow, excessive delays. Represents jammed conditions. Intersection operates below capacity with low volumes. Queues might block upstream intersections.

Notes:

1. s/veh = seconds per vehicle
2. Unsignalized LOS is for the stop controlled minor approach.
3. Any v/c > 1.0 results in LOS F regardless of delay.

3.2.2 Existing Conditions

Existing Transportation Network. The study area includes approximately 5.5 miles (8.9 km) of Three Notch Road (MD 235), an arterial along the southwestern boundary of NAS Patuxent River, and approximately 0.5 miles (0.8 km) of Great Mills Road (MD 246). These two roadways are the main points of ingress and egress to the three NAS Patuxent River gates. Most intersections outside NAS Patuxent River have multiple turning lanes. Within the study area, Great Mills Road is a four-lane arterial with a two-way left-turn lane. Both sides of Great Mills Road have sidewalks.

On NAS Patuxent River, Buse Road and Cedar Point Road carry most of the traffic north through the base. Cuddihy Road runs parallel to Three Notch Road, carrying traffic between Buse Road and Cedar Point Road. Typically, most roads on the installation are two-lane roads that widen for turn lanes through the signalized intersections.

Three gates provide access to NAS Patuxent River. Below describes their locations and operations during the AM and PM Peak Hours.

- Gate 1 is located approximately 1,680 feet (512 meters) north of the intersection of Three Notch Road (MD 235) and Pegg Road. From 5:30 a.m. to 9:00 a.m. on weekdays, Gate 1 has four inbound lanes, one designated truck lane, and no outbound lanes. Outbound lanes are reopened at 9:00 a.m., returning the lane configuration to two inbound lanes and two outbound lanes.
- Gate 2 is approximately 0.8 miles (1.3 km) east of Gate 1 and just north of the intersection of Three Notch Road and Great Mills Road/Cedar Point Road. From 6:00 a.m. to 9:00 a.m. on weekdays, Gate 2 has three inbound lanes and one outbound lane. During these peak hours, security is moved north, past the Cedar Point Road and Cuddihy Road intersection, to provide additional storage capacity on Cedar Point Road for queued vehicles. The two lanes inbound and two lanes outbound configuration is reinstated at 9:00 a.m. The Gate 2 pass office, located just outside Gate 2, is open from 6:30 a.m. to 3:00 p.m. weekdays.
- Gate 3 is located east of Gate 2 and approximately 6,000 feet (1,829 meters) north of the intersection of Three Notch Road and Forest Park Road (MD 712). Gate 3 operates two inbound lanes and one outbound lane between 5:30 a.m. and 8:30 a.m. on weekdays and two outbound only lanes between 3:30 p.m. and 5:30 p.m.

Existing Public Transit. NAS Patuxent River has limited public transportation. The St. Mary's Transit System provides bus access in proximity to the main gates to the installation, but not on-installation. Public transit within NAS Patuxent River was discontinued in March 2013 due to budget cuts. There is no public rail service in proximity to NAS Patuxent River. Although some employees may carpool, it was assumed the reduction of trips as a result of carpooling would be minimal and therefore did not impact these analyses.

Existing Traffic Conditions (2014 Baseline Conditions). Based on the existing capacity analyses, it was determined that the intersections providing access to NAS Patuxent River currently operate at LOS E or F during the AM Peak Hour (see **Tables 3-3** and **3-4**). This poor LOS is due to the concentration of traffic entering the installation gates. During the peak hour, approximately 1,731, 1,213, and 1,103 vehicles pass through Gates 1, 2, and 3, respectively. Likewise, during the PM Peak Hour, these intersections operate poorly as traffic exits NAS Patuxent River onto Three Notch Road (MD 235) or Great Mills Road (MD 246). Figures 4-1 and 4-2 in **Appendix B** show volume and LOS values respectively for existing traffic conditions at intersections in the study area.

In general, the intersections at NAS Patuxent River operate well with the exception of those immediately adjacent to the gates. The Buse Road and Cuddihy Road intersection (just past Gate 1) operates at LOS C and F during the AM and PM Peak Hours, respectively. The Cedar Point Road and Buse Road (just past Gate 2) operates at LOS F and E during the AM and PM Peak Hours, respectively. This is due to the large number of vehicles being distributed to and from the roadway network within the installation through these intersections.

Although Three Notch Road between Chancellor's Run Road (MD 237) and NAS Patuxent River is six lanes wide with multiple left turn lanes at major intersections, the signalized intersections operate at LOS D or worse during the 2014 AM and PM Peak Hours.

1 **Table 3-3. Summary of AM Peak Hour Levels of Service**

Intersection	Signalized? ¹	2014	2017				
		Baseline Conditions	No Action Alternative	Alternative 1 Scenario A	Alternative 1 Scenario B	Alternative 2 Scenario A	Alternative 2 Scenario B
Off-Base Intersections							
Three Notch Road (MD 235) & Chancellor's Run Road	Y	F	F	F	F	F	F
Three Notch Road (MD 235) & Millstone Landing Road	Y	D	D	D	E	E	E
Three Notch Road (MD 235) & Buse Road	Y	F	F	F	F	F	F
Three Notch Road (MD 235) & Great Mills Road (MD 246)	Y	E	E	E	E	E	E
Three Notch Road (MD 235) & Forest Park Road (MD 712)	Y	E	E	E	E	E	E
Great Mills Road (MD 246) & Shangri-La Drive	Y	B	B	C	C	B	B
Great Mills Road (MD 246) & Midway Drive	Y	A	A	A	A	A	A
On-Base Intersections							
Gates 1, 2 and 3	N	n/a ²	n/a ²	n/a ²	n/a ²	n/a ²	n/a ²
Buse Road & Site 5 Driveway	N	n/a	n/a	F	F	n/a	n/a
Buse Road & Sites 6 and 7 Driveway	N	n/a	n/a	F	F	F	F
Buse Road & Cuddihy Road	Y	C	C	B	B	B	B
Buse Road & Davis Spur	Y	B	D	F	D	B	C
Buse Road & Building 464 D/W	N	F	F	F	F	C	F
Buse Road & Cedar Point Road	Y	F	F	F	F	E	E
Cuddihy Road & Cedar Point Road	N	n/a	n/a	n/a	n/a	n/a	n/a
Shaw Road/Forest Park Road & Tate Road (roundabout)	N	B	B	B	B	B	B

Notes: 1. LOS at unsignalized intersections is for the worst delay on the stop controlled approach.

2. The HCM does not define a methodology for calculating the LOS of a gated operation; therefore, no LOS is reported for Gates 1, 2, and 3.

1 **Table 3-4. Summary of PM Peak Hour Levels of Service**

Intersection	Signalized? ¹	2014	2017				
		Baseline Conditions	No Action Alternative	Alternative 1 Scenario A	Alternative 1 Scenario B	Alternative 2 Scenario A	Alternative 2 Scenario B
Off-Base Intersections							
Three Notch Road (MD 235) & Chancellor's Run Road	Y	D	D	D	D	D	D
Three Notch Road (MD 235) & Millstone Landing Road	Y	D	D	E	E	E	E
Three Notch Road (MD 235) & Buse Road	Y	F	F	F	F	F	F
Three Notch Road (MD 235) & Great Mills Road (MD 246)	Y	D	D	D	D	D	D
Three Notch Road (MD 235) & Forest Park Road (MD 712)	Y	D	D	D	D	E	E
Great Mills Road (MD 246) & Shangri-La Drive	Y	E	F	E	F	F	E
Great Mills Road (MD 246) & Midway Drive	Y	B	D	D	D	D	D
On-Base Intersections							
Gates 1, 2 and 3	N	n/a ²	n/a ²	n/a ²	n/a ²	n/a ²	n/a ²
Buse Road & Site 5 Driveway	N	n/a	n/a	F	F	n/a	n/a
Buse Road & Sites 6 and 7 Driveway	N	n/a	n/a	F	F	F	F
Buse Road & Cuddihy Road	Y	F	F	F	F	F	F
Buse Road & Davis Spur	Y	D	D	F	F	F	D
Buse Road & Building 464 Driveway	N	D	C	F	F	F	C
Buse Road & Cedar Point Road	Y	D	C	C	D	D	D
Cuddihy Road & Cedar Point Road	N	E	F	F	F	F	F
Shaw Road/Forest Park Road & Tate Road (roundabout)	N	C	C	C	C	C	C

Notes: 1. LOS at unsignalized intersections is for the worst delay on the stop controlled approach.

2. The HCM does not define a methodology for calculating the LOS of a gated operation; therefore, no LOS is reported for Gates 1, 2, and 3.

The intersections along Great Mills Road generally performed at LOS A and B, with the exception of the Great Mills Road with FDR Blvd and Great Mills Road with Shangri-La Drive intersections which operated at LOS D or F during the 2014 PM Peak Hour.

3.2.3 Environmental Consequences

3.2.3.1 No Action Alternative

Impacts on traffic conditions under the 2017 No Action Alternative would occur from other development in the region, but these impacts would not be considered significant above existing conditions. Impacts on capacity, travel time, and queuing length are discussed below. Figures 5-1 and 5-2 in **Appendix B** show volume and LOS values respectively at intersections in the study area under the No Action Alternative.

Capacity Analysis (see **Tables 3-3** and **3-4**). The signalized intersections along Three Notch Road (MD 235) are expected to operate at LOS E or F during the AM Peak Hour with the exception of the Millstone Landing Road intersection. During the PM Peak Hour, these intersections are expected to operate at LOS D with the exception of the Three Notch Road and Buse Road intersection which operates at LOS F. In general, the intersections which are located near the gates operate poorly during one or both peak hours. This is due to these intersections acting as funnels for the remaining roadway network on NAS Patuxent River. The intersections along Great Mills Road (MD 246) operate well.

Travel Time Analysis (see **Tables 3-5** and **3-6**). In general, as the traffic volumes increase in the corridor, the travel times increase due to the increased demand on the roadway network. When compared to the 2014 Baseline Conditions, due to surrounding development, drivers would be expected to experience a 1 to 3 minute increase in travel times to and from NAS Patuxent River during the AM Peak Hour. During the PM Peak Hour, the inbound travel times are expected to increase by 1 to 10 minutes while the outbound is expected to change by less than 1 minute. The three travel paths studied are discussed in **Appendix B** and listed below for reference:

- *Path #1:* Starting at the intersection of Three Notch Road (MD 235) and Town Creek Drive → Left at Cedar Point Road → Through Gate 2 → Stopping at the intersection of Cedar Point Road and Buse Road
- *Path #2:* Starting at the intersection of Great Mills Road and Westbury Boulevard → Straight through the intersection of Great Mills Road and Three Notch Road → Through Gate 2 → Stopping at the intersection of Cedar Point Road and Buse Road
- *Path #3:* Starting at the intersection of Three Notch Road and Town Creek Drive → Left at Buse Road → Through Gate 1 → Stopping at the proposed Site 6 and 7 driveway located inside Gate 1.

Queue Length Analysis (see **Table 3-7**). Along with the poor LOS within the study area, several turn lanes are expected to experience either through block or queues which exceed the capacity of the turn lane. In general, these locations represent the predominant movement to and from the gates and are as follows:

- AM Peak Hour – Eastbound left-turn from Three Notch Road to Buse Road
- AM Peak Hour – Northbound left-turn from Great Mills Road to Three Notch Road
- PM Peak Hour – Southbound right-turn from Buse Road to Three Notch Road
- PM Peak Hour – Eastbound right-turn from Cuddihy Road to Buse Road.

1

Table 3-5. AM Peak Average Travel Time (minutes)

	Inbound				Outbound					
	2014 Baseline Condition	2017 No Action Alternative	Alternative - Scenario		Change in Travel Time	2014 Baseline Conditions	2017 No Action Alternative	Alternative - Scenario		Change in Travel Time
Route 1	10.6	17.3	1-A	18.3	1.1	8.2	8.1	1-A	8.3	0.1
			1-B	20.2	3.0			1-B	8.3	0.2
			2-A	20.0	2.8			2-A	8.3	0.2
			2-B	20.4	3.1			2-B	8.5	0.3
Route 2	10.3	11.9	1-A	12.7	0.9	7.2	6.5	1-A	6.5	0.0
			1-B	12.1	0.3			1-B	6.5	0.0
			2-A	10.6	-1.3			2-A	6.5	-0.1
			2-B	10.7	-1.2			2-B	6.6	0.0
Route 3	18.1	28.2	1-A	18.1	2.8	4.8	4.9	1-A	4.9	0.0
			1-B	31.8	3.6			1-B	4.9	0.0
			2-A	35.7	7.5			2-A	4.9	0.0
			2-B	34.4	6.2			2-B	4.9	0.0

Note: *Routes as described in Section 3.2.3.1.

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Table 3-6. PM Peak Average Travel Times (minutes)

	Inbound				Outbound					
	2014 Baseline Conditions	2017 No Action Alternative	Alternative - Scenario		Change in Travel Time	2014 Baseline Conditions	2017 No Action Alternative	Alternative - Scenario		Change in Travel Time
Route 1	9.9	12.1	1-A	9.5	-2.6	N/A	10.4	1-A	10.2	-0.2
			1-B	10.7	-1.4			1-B	11.4	1.0
			2-A	9.5	-2.6			2-A	10.6	0.2
			2-B	10.7	-1.4			2-B	10.1	-0.2
Route 2	7.4	10.6	1-A	9.9	-0.7	5.9	7.6	1-A	7.5	-0.1
			1-B	12.0	1.4			1-B	9.6	2.1
			2-A	11.6	1.0			2-A	8.5	0.9
			2-B	11.4	0.8			2-B	7.6	0.0
Route 3	5.6	6.3	1-A	6.7	0.4	13.1	14.3	1-A	14.9	0.6
			1-B	6.7	0.4			1-B	14.6	0.3
			2-A	7.1	0.8			2-A	14.7	0.4
			2-B	6.7	0.5			2-B	13.9	-0.4

Note: *Routes as described in Section 3.2.3.1.

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Table 3-7. Locations Where Queues Exceed Lane Capacity by Alternative-Scenario

	Available Storage (feet)	2017 AM Peak Hour					2017 PM Peak Hour				
		No Action Alternative	1-B	1-A	2-B	2-A	No Action Alternative	1-B	1-A	2-B	2-A
Chancellor's Run Road/Maple Road & Three Notch Road (MD 235)											
EB - Left	235	x	x	x	x	x				x	
WB - Left	475										
NB - Left	650										
SB - Left	200										
Pegg Road/Buse Road & Three Notch Road (MD 235)											
EB - Left	1,000	x	x	x	x	x					
WB - Left	300				x	x					
WB - Right	275										
NB - Left	370										
NB - Right	300										
SB - Right	700						x	x	x	x	x
Great Mills Road (MD 246)/Cedar Point Road & Three Notch Road (MD 235)											
EB - Left	525										
WB - Left	475										
WB - Right	350										
NB - Left	280	x	x	x	x	x					
SB - Left	180										
SB - Right	180										

	Available Storage (feet)	2017 AM Peak Hour					2017 PM Peak Hour				
		No Action Alternative	1-B	1-A	2-B	2-A	No Action Alternative	1-B	1-A	2-B	2-A
Cuddihy Road & Buse Road											
EB - Right	230						x	x	x	x	x
WB - Right	200										
NB - Left	275										
SB - Left	200										
SB - Right	225										
Cuddihy Road & Cedar Point Road											
EB - Right	300										
Gate 1¹											
Inbound	1,680										
Gate 2¹											
Inbound	700										
Gate 3											
Inbound	6,000										

Notes:

1. Although Synchro modeling does not report queue lengths that exceed the available storage length, queue lengths witnessed during field collection extended from the gate back to Three Notch Road.

- x Queue > Storage Length
- x Queue > Storage due to thru-block

3.2.3.2 Alternative 1 (EUL Sites 5, 6, and 7)

Impacts on traffic conditions under Alternative 1 would occur, but these impacts would not be considered significant above 2017 No Action Alternative levels. Impacts on capacity, travel time, and queuing length are discussed below. No impacts on other transportation resources including public transit would be expected.

Since the proposed development is for office space, Land Use 710 – General Office Space was used to estimate the trips generated by the EUL using the estimated employment of 3,000 employees. Based on the proposed number of employees, the trip generation analysis estimates how much traffic a new development would create (both entering and exiting vehicles). The estimated entering and exiting vehicles are summed for total trips generated by the development. As stated in **Section 2.4.1**, the development for Alternative 1 is separated into two locations. As a result, it was assumed EUL Site 5 would accommodate 750 employees and Sites 6 and 7 would accommodate 2,250 employees. These assumptions were used in the calculation of estimated generated trips for each alternative. **Table 3-8** summarizes the development-generated trips, and **Appendix B** provides the complete methodology.

Table 3-8. Summary of EUL Development-Generated Trips

Land Use 710 - General Office Building	Weekday (vpd)			Weekday AM Peak (vph)			Weekday PM Peak (vph)		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Alternative 1 (Site 5)	1,245	1,245	2,490	331	46	377	59	286	345
Alternative 1 (Sites 6 and 7)	3,735	3,735	7,470	950	130	1,080	176	859	1,035
Alternative 2 (Sites 6 and 7)	4,980	4,980	9,960	1,267	173	1,440	235	1,145	1,380

Although the EUL employment is estimated at 3,000 employees total, there are an estimated 9,960 trips to and from the development during a weekday. The trip generation rates include all trips generated by the site such as deliveries, visitors, mid-day trips by employees, thus projecting higher volumes than just employees to and from the EUL.

Two staffing scenarios representing the range of sources of personnel that could occupy the EUL development at NAS Patuxent River were assumed for each alternative addressed in this EA. Under Staffing Scenario A, 2,600 personnel already hold positions at NAS Patuxent River and would be consolidated into the new EUL development; the remaining 400 personnel would come from other positions that are currently off the installation. Under Staffing Scenario B, up to 3,000 personnel not currently working at NAS Patuxent River would be employed at the new EUL development. For each alternative and scenario, the trips were originated outside the study area and distributed through the intersections to the driveways of either Site 5 or Sites 6 and 7 as appropriate. This study is predicated upon Site 5 being accessed from a new driveway located on Buse Road with a secondary driveway located on Liljencrantz Road (see **Figure 2-4**). Access to Sites 6 and 7 would be provided from a new access road from Buse Road, inside and east of Gate 1 (see **Figure 2-5**).

In general, because the intersections already currently operate at such poor levels of service, the impacts of either staffing scenario would be minimal. The figures in Section 6 of **Appendix B** show volume and LOS values at intersections in the study area under Alternative 1.

Capacity Analysis (see **Tables 3-3** and **3-4**). Upon construction of Alternative 1, which includes development on EUL Sites 5, 6, and 7, the LOS are expected to be similar to the No Action Alternative; however, due to projected increased development at NAS Patuxent River unrelated to the EUL, the delays are expected to increase under the No Action Alternative as well as Alternative 1. As stated before, Sites 6 and 7's close proximity to Gate 1 places the most substantial impacts in that area.

In addition, due to peak hour traffic congestion on existing roadways, the stop-controlled minor approach at the new driveway intersections for Sites 5, 6, and 7 are expected to operate at LOS F during both the AM and PM Peak Hours. For this analysis, it was assumed these intersections would be unsignalized with stop-control on the driveway approaches.

Travel Time Analysis (see **Tables 3-5** and **3-6**). Increases to travel time, ranging from 0.3 to 3.6 minutes (8 to 52 percent increase), during the AM Peak Hour are expected for the inbound direction. The increase in travel time can be attributed to the additional vehicles in the queue. Although the volumes are expected to increase on the roads leading away from NAS Patuxent River when compared to 2017 No Action Alternative, only slight changes in travel time are expected during the PM Peak Hour. The change in travel time in the outbound direction when compared to the 2017 No Action Alternative is less than 4 percent. The PM outbound impacts are substantially smaller than the AM inbound impacts because the outbound has no delay at the security gates, which only occur under the inbound scenario).

Queue Length Analysis (see **Table 3-7**). Similar to the 2017 No Action, the following turn lanes are expected to experience through block or queues which exceed the storage capacity:

- AM Peak Hour – Eastbound left-turn from Three Notch Road to Buse Road
- AM Peak Hour – Northbound left-turn from Great Mills Road to Three Notch Road
- PM Peak Hour – Southbound right-turn from Buse Road to Three Notch Road
- PM Peak Hour – Eastbound right-turn from Cuddihy Road to Buse Road.

3.2.3.3 Alternative 2 (EUL Sites 6 and 7)

Impacts on traffic conditions under Alternative 2 would be similar to Alternative 1 except that all EUL traffic would ingress and egress only into EUL Sites 6 and 7, but these impacts would not be considered significant. Gate 1 would be most impacted by Alternative 2 due to its close proximity to Sites 6 and 7. Impacts on capacity, travel time, and queuing length are discussed below. No impacts on other transportation resources including public transit would be expected. The figures in Section 6 of **Appendix B** show volume and LOS values at intersections in the study area under Alternative 2 for both employment scenarios analyzed in this EA. As with Alternative 1, because the intersections already currently operate at such poor levels of service, the impacts of either staffing scenario would be minimal.

Capacity Analysis (see **Tables 3-3** and **3-4**). Upon construction of Alternative 2, which includes development on EUL Sites 6 and 7, most LOSs throughout the study area are expected to be similar to the No Action Alternative; however, the delays are expected to increase particularly along Buse Road due to the proposed Site 6 and 7 driveway location. Many of the intersections are expected to fail during the AM and PM Peak Hours. Of the six Buse Road intersections, starting with and including Buse Road with Three Notch Road to Buse Road with Cedar Point Road, three of these intersections are LOS F in the 2017 No Action Alternative (AM and PM). Under this alternative, four of the intersections are LOS F while the other two intersections are LOS D. This includes the new driveway for Sites 6 and 7 which is expected to operate at LOS F during both the AM and PM Peak Hours. For the analysis, it was assumed the Site 6 and 7 driveway would be unsignalized with stop-control on the driveway approaches.

Travel Time Analysis (see **Tables 3-5** and **3-6**). When being compared to the 2017 No Action Alternative scenario, travel times are expected to increase during the AM Peak Hour inbound. These increases range from 2.8 to 7.5 minutes (18 to 26 percent) depending on the route.

Volumes are expected to increase on the roads leading away from NAS Patuxent River as well. Increases in outbound travel time are expected to be less than 13 percent during the PM Peak Hour.

Queue Length Analysis (see **Table 3-7**). Similar to the 2017 No Action Alternative, the following turn lanes are expected to experience through block or queues which exceed the storage capacity. The left turn volume from Three Notch Road to Pegg Road would be low in the AM peak hour, but due to the through-movement queue backup on Three Notch Road, vehicles intending to turn left onto Pegg Road may not be able to get to the left turn lane in one traffic light cycle:

- AM Peak Hour – Eastbound left-turn from Three Notch Road to Buse Road
- AM Peak Hour – Westbound left-turn from Three Notch Road to Pegg Road
- AM Peak Hour – Northbound left-turn from Great Mills Road to Three Notch Road
- PM Peak Hour – Southbound right-turn from Buse Road to Three Notch Road
- PM Peak Hour – Eastbound right-turn from Cuddihy Road to Buse Road.

3.2.4 Traffic Improvement Recommendations

The implementation of the EUL does not require formal mitigation; however, the following recommendations could enhance the efficiency of the traffic network on and around NAS Patuxent River. These recommendations are specific to areas where implementation of recommendations could potentially minimize impacts caused by the EUL program.

Additional Study

- Signal Warrant Analysis
 - Site 5 and Sites 6 and 7 driveway intersections
 - Buse Road and Liljencranz Road intersection
- Signal Timing Study
 - Increase efficiency of all signalized intersections and reduce delay and travel time impacts.
- Gate Operations
 - Widen Buse Road near Gate 1 for additional lanes (see below)
 - Signing
- Add proper/additional signing along Three Notch Road and Great Mills Road to direct traffic into appropriate lanes and gates to best suit their destination on NAS Patuxent River
- Add overhead reversible lane signing for approach lanes to all gates as their lane configurations change throughout the day

Storage Length Extensions/Intersection Improvements

- Buse Road/Sites 6 and 7 Driveway near Gate 1
 - Widen Buse Road to allow for two inbound left turn lanes/two through lanes in the AM and four outbound lanes in the PM
- Buse Road/Site 5 Driveway
 - Consider making Site 5 Driveway to be two lanes (1 left turn, 1 through/right turn)

- Chancellors Run Road and Three Notch Road
 - Add eastbound left turn lane (Alternative 2B)
- Pegg Road and Buse Road
 - Add westbound left turn lane (Alternative 2A and 2B)
 - Southbound right turn lane (all alternatives)
- Great Mills Road and Three Notch Road
 - Add northbound left turn lane (all alternatives)
- Cuddihy Road and Cedar Point Road
 - Add eastbound right turn lane (all alternatives).

3.3 Infrastructure and Utilities

3.3.1 Definitions

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly man-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as “urban” or developed. The availability of infrastructure and its capacity to support growth are generally regarded as essential to the economic growth of an area. The components to be discussed in this section include facility infrastructure, utilities, and solid waste management.

Utilities include electrical supply, water supply, wastewater, natural gas supply, stormwater drainage, and liquid fuel supply. Solid waste management primarily relates to the availability of landfills to support a population’s residential, commercial, and industrial needs.

3.3.2 Existing Conditions

3.3.2.1 EUL Site 5

Facility Infrastructure

Eight office and administrative buildings that were constructed in the 1940s are located on EUL Site 5. All of the buildings on Site 5 were constructed with a timber frame and vinyl siding. Building 437, the NAS Business and Finance Management Office, was renovated in 2009; however, none of the other buildings have undergone renovation. Building 434, a former child care center, was recently demolished.

The facilities at NAS Patuxent River were evaluated using the Facility Readiness Evaluation System to calculate an Installation Figure of Merit (IFOM) for each facility. This is a readiness indicator of facility resource availability. The facilities on NAS Patuxent River were evaluated in terms of condition, configuration, and capacity, and given a rating (between 0-100). Fifty-five percent of facilities have an adequate IFOM rating, 33 percent have a substandard rating, and 12 percent have an inadequate rating. Of the eight buildings located on EUL Site 5, none were rated at a level indicating they were adequate to support the Navy’s existing or projected needs. One building was rated substandard and the remaining seven buildings were rated inadequate (the lowest rating possible) (NAVFAC Washington 2012).

Utilities

Electrical Supply. Electrical service on NAS Patuxent River was privatized in 2009 and is now operated by SMECO. The current level of service is fair to good and there is dual redundancy. There are four

substations on-installation and each have excess capacity to handle future expansion. Each substation has a 69-kilovolts transmission line and new buried service lines. The electric infrastructure network on-installation was upgraded to 13.8 kilovolts lines in 2012. All critical operations have an uninterrupted power supply and a generator backup. There are existing electrical lines running along Buse Road and to the existing buildings on Site 5 (NAVFAC Washington 2012).

Water Supply. NAS Patuxent River's water supply system is in fair to good condition. There are 28 wells in operation and water is drawn from three aquifers. The water mains are constructed from transite, plastic, and ductile iron. There are three water towers on the installation that store potable water. There are existing water lines running along Buse Road and to the buildings on Site 5 (NAVFAC Washington 2012).

Natural Gas Supply. Natural gas at NAS Patuxent River is provided, operated, and maintained by Washington Gas. Washington Gas provides 55 pounds of natural gas each day through a network of 6-inch distribution lines. Natural gas is used for heating and operations in some buildings. There are existing natural gas lines running along Buse Road and to the buildings on Site 5 (NAVFAC Washington 2012).

Wastewater. The on-installation wastewater system is operated by NAVFAC. The wastewater collection system at NAS Patuxent River consists of 37 wastewater lift stations, 25 miles (40 km) of gravity sewer lines, 7 miles (11 km) of force mains, 3 bioreactors, and 18 septic systems. There are existing wastewater lines running along Buse Road and to the buildings on Site 5 (NAVFAC Washington 2012).

NAS Patuxent River's wastewater is treated at an off-installation municipal plant, which is owned and operated by St. Mary's County Metropolitan Commission. The treatment plant has a total capacity of 6 million gallons per day (mgpd), with 20 percent of the capacity, or 1.2 mgpd, reserved for NAS Patuxent River. While the plant currently treats approximately 3 mgpd, over 90 percent of the total capacity of the plant is either in use or reserved for projects approved but not completed, including NAS Patuxent River. Approximately 50 percent of the 1.2 mgpd reserved for NAS Patuxent River is currently in use (NAVFAC Washington 2012).

Liquid Fuel Supply. Jet propellant-5 type fuel is delivered to NAS Patuxent River by a barge to the Fuel Supply Division pier (located along the Patuxent River shoreline, halfway between East and West Basins). There are two underground fuel supply pipelines that supply fuel to a small portion of the airfield operations area. No liquid fuel supply lines are in the vicinity of Site 5 (NAVFAC Washington 2012).

Stormwater Drainage. There are several small stormwater management facilities at NAS Patuxent River. However, much of the installation was built before such facilities were required or deemed necessary. There are very limited stormwater management facilities on Site 5 (NAS PAX 2013).

Solid Waste Management

NAS Patuxent River began a recycling program in the mid-1990s that is now outsourced to Melwood Horticultural Training Center, in Upper Marlboro, Maryland. There is a main recycling station, off Whalen Road, and three additional satellite recycling stations that recycle approximately 35 different commodities (NAVFAC Washington 2012). NAS Patuxent River generates approximately 3,400 tons of solid waste annually. Of that, 89 percent is incinerated and 11 percent is sent to the landfill.

3.3.2.2 EUL Sites 6 and 7

Infrastructure

There is one small, unoccupied storage facility (Building 536) located on EUL Site 6. Building 536 was constructed in 1943 and was not evaluated by the Facility Readiness Evaluation System (NAVFAC Washington 2011, NAVFAC Washington 2012).

Utilities

Sites 6 and 7 are undeveloped areas of the installation near Gate 1; therefore, utilities at the sites are limited. Existing installation-wide utility systems on NAS Patuxent River that might provide service to Sites 6 and 7 are the same as those described for Site 5 (see **Section 3.3.2.1**). Utility system infrastructure specific to Sites 6 and 7 are described in the following sections.

Electrical Supply. There are electrical lines along the western portion of Site 6 and south of Site 7, across Buse Road (NAVFAC Washington 2012).

Water Supply. There is one well on Site 6 (NAVFAC Washington 2012).

Natural Gas Supply. Natural gas lines are present along Buse Road, to the south of Sites 6 and 7 (NAVFAC Washington 2012).

Wastewater. There is an active septic system on Site 6. There are also two small wastewater lines and a wastewater pump station to the south and west of Sites 6 and 7 (NAVFAC Washington 2012).

Liquid Fuel Supply. No liquid fuel supply lines are in the vicinity of Sites 6 and 7 (NAVFAC Washington 2012).

Stormwater Drainage. There are no stormwater management facilities in the vicinity of Sites 6 and 7 (NAS PAX 2013).

Solid Waste Management

Solid waste management for Sites 6 and 7 is the same as described for Site 5 (NAVFAC Washington 2012).

3.3.3 Environmental Consequences

Evaluation of impacts is based on the capacity and compatibility of the Proposed Action with the existing infrastructure and utility network. A significant or major impact might be determined if a substantial disruption of utility supplies or increase in demand that would adversely impact capacity to support operations or normal community functions.

3.3.3.1 Alternative 1 (EUL Sites 5, 6, and 7)

Infrastructure

Seven of the eight existing buildings on Site 5 received an inadequate IFOM rating and one received a substandard rating. The development of the work campus on EUL Site 5 would include the demolition of Buildings 433 and 440 that are not properly configured to support future growth and development at NAS

Patuxent River. The unoccupied storage facility (Building 536) on Site 6 is unused and there are no facilities on Site 7. Beneficial impacts on facility infrastructure would occur from the demolition of the inadequate buildings on Sites 5 and 6, and the construction of modern administrative office space (up to 600,000 ft² [55,742 m²]) that would be designed and constructed to meet Navy energy goals and parking lots and/or structures under Alternative 1. The work campus would be constructed in accordance with EO 13423, EISA, and a LEED Silver certification. Modern infrastructure would also reduce long-term maintenance costs from infrastructure on the installation, creating additional cost savings for the Navy.

Utilities

Electrical Supply. A temporary increase in demand for electricity would be related to construction and demolition activities. The development of the work campus would result in a continued demand for and use of electricity because the work campus would replace the existing buildings on EUL Site 5. Impacts on the electrical system would be expected from the increased demand of electricity from up to 3,000 additional personnel under the worst case scenario; however, capacity of the current electrical supply system is available and coordination with the local utility provider would ensure that project demands on the system would not negatively affect the surrounding community.

Because utilities are limited on Sites 6 and 7, electrical lines would have to be extended from existing infrastructure on or off the installation to support development. New electrical utilities (i.e., lighting, transformers, and telecommunications) would be installed at Sites 5, 6, and 7 and tied into the existing electrical system. The new electrical infrastructure would be more efficient than those at existing facilities. Therefore, no significant impacts from the upgraded electrical system would be expected.

Water Supply. A temporary increase in demand for water would be related to construction and demolition activities. Use of the work campus would result in an increased demand for and use of water. Impacts on the water system would be expected from the increased demand of water from additional personnel; however, the increase on the water supply system would not exceed the capacity of the system.

Because utilities are limited on Sites 6 and 7, new water lines would be installed and tied into the existing system. New water lines would be installed at Sites 5, 6, and 7 and tied into the existing water supply system. The new water lines would be more efficient than those at existing facilities in accordance with *UFC 3-230-01, Water Storage, Distribution, and Transmission*, and other applicable standards. Therefore, no significant impacts from the upgraded water system would be expected.

Natural Gas Supply. Impacts on natural gas would be expected to be negligible and not significant because the construction and demolition at NAS Patuxent River would result in a minor increase the demand for natural gas. Long-term impacts on natural gas supply would be expected because of the added demand for natural gas to accommodate up to 3,000 additional personnel.

Since utilities are limited on Sites 6 and 7, new natural gas utility lines for the work campus would be connected to existing systems. New natural gas lines would be installed at Sites 5, 6, and 7 and tied into the existing system. The new natural gas supply lines would be more efficient than those at existing facilities. Therefore, no significant impacts from the upgraded natural gas system would be expected.

Wastewater. Negligible increases in wastewater would be expected from construction and demolition activities and from the potential increase in personnel. Projected wastewater treatment required for the EUL is 0.09 gallons per day per gross square feet of building area, or up to 0.054 mgpd, which would be less than 10 percent of the remaining capacity reserved for Navy use. The increased use of the wastewater system from additional personnel would not exceed the municipal treatment plant's capacity, which is currently operating at 50 percent.

The existing septic system on Site 6 would be demolished. Facilities that currently use the septic system, including the Gate 1 Pass Office, would be required to be added to the installation's existing wastewater network. New wastewater lines for the proposed infrastructure would also be connected to this network. There is existing wastewater infrastructure on Site 5; therefore some additional infrastructure would be installed and connected to the existing network. The new wastewater systems on each site would be more efficient than existing systems on site. Therefore, no significant impacts from the upgraded wastewater system would be expected.

Liquid Fuel Supply. No additional operations requiring liquid fuel are proposed under Alternative 1; therefore, no additional demand for fuels and no impacts on liquid fuel supply would be expected.

Stormwater Drainage. Impacts on stormwater management would be expected from the construction and demolition activities at NAS Patuxent River. Impacts on stormwater management would also be expected from the potential increase in up to 3,000 personnel and the net increase in up to 459,000 ft² (42,644 m²) of impervious surfaces.

Since stormwater drainage infrastructure is limited on Sites 6 and 7, new stormwater infrastructure for the work campus would be connected to the existing system. The new stormwater drainages would be constructed in accordance with EISA, LEED Silver and low-impact development (LID) design requirements. Therefore, no significant impacts from the upgraded stormwater drainage system would be expected.

Solid Waste Management. Increases in solid waste associated with the construction and demolition activities would be temporary, and would be disposed of in accordance with relevant Federal, state, and local regulations. Construction and demolition materials would be recycled or reused to the maximum extent practicable. Debris that could not be recycled or reused would be taken off-installation to an approved construction and demolition landfill within the vicinity of NAS Patuxent River. The potential increase in personnel would create additional solid waste; however, the majority of solid waste produced on NAS Patuxent River is either recycled or incinerated. Therefore, the increase in solid waste from additional personnel would not represent a significant impact on solid waste management.

3.3.3.2 Alternative 2 (EUL Sites 6 and 7)

Impacts from Alternative 2 on electrical supply, water supply, natural gas supply, wastewater, liquid fuel supply, stormwater drainage would be expected to be the same non-significant impacts described for Sites 6 and 7 under Alternative 1. Under Alternative 2, EUL Site 5 would not be redeveloped for an EUL. On Site 6, Building 536 would be demolished and would produce solid waste that would be recycled or reused to the maximum extent practicable. Debris that could not be recycled or reused would be taken off-installation to an approved construction and demolition landfill within the vicinity of NAS Patuxent River.

Additional lines and infrastructure would be installed and tied into the existing systems. The utility lines would be more efficient than those at existing facilities, and the proposed infrastructure would be constructed in accordance with EO 13423, EISA, and LEED Silver requirements. The existing septic field at Sites 6 and 7 would be removed in accordance with all applicable regulations. Therefore, no significant impacts from the utility systems would be expected.

Use of the work campus would result in an increased demand for and use of electricity, water, and natural gas from the increase of up to 3,000 personnel under the development scenarios. Impacts on the electrical, water, and natural gas systems would be expected from the increased demand from additional personnel; however, the increased demand on the electrical, water, and natural gas systems would not exceed the capacity of the systems.

3.3.3.3 No Action Alternative

Under the No Action Alternative, NAS Patuxent River would not enter into an EUL with a lessee to develop, operate, and maintain a work campus office development at NAS Patuxent River. The inadequate structures would continue to be used and impacts on facility infrastructure and utilities would continue because current facilities are not properly configured to support future growth and development and utilities would not be modernized.

3.4 Air Quality

3.4.1 Definitions

In accordance with Federal Clean Air Act (CAA) requirements, the air quality in a given region or area is measured by the concentration of criteria pollutants in the atmosphere.

Ambient Air Quality Standards. Under the CAA, the U.S. Environmental Protection Agency (USEPA) developed numerical concentration-based standards, or National Ambient Air Quality Standards (NAAQS), for pollutants that have been determined to affect human health and the environment. The NAAQS represent the maximum allowable concentrations for ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), respirable particulate matter (including particulate matter equal to or less than 10 microns in diameter [PM₁₀] and particulate matter equal to or less than 2.5 microns in diameter [PM_{2.5}]), and lead (Pb) (40 CFR Part 50). The CAA also gives the authority to states to establish air quality rules and regulations. The State of Maryland has adopted the NAAQS. **Table 3-9** presents the NAAQS.

Attainment Versus Nonattainment and General Conformity. The USEPA classifies the air quality in an air quality control region (AQCR), or in subareas of an AQCR, according to whether the concentrations of criteria pollutants in ambient air exceed the NAAQS. Areas within each AQCR are therefore designated as either “attainment,” “nonattainment,” “maintenance,” or “unclassified” for each of the six criteria pollutants. Attainment means that the air quality within an AQCR is better than the NAAQS; nonattainment indicates that criteria pollutant levels exceed NAAQS; maintenance indicates that an area was previously designated nonattainment but is now attainment; and an unclassified air quality designation by USEPA means that there is not enough information to appropriately classify an AQCR, so the area is considered attainment. USEPA has delegated the authority for ensuring compliance with the NAAQS in Maryland. The MDE, Air and Radiation Management Administration regulates air quality for the state of Maryland. In accordance with the CAA, each state must develop a State Implementation Plan, which is a compilation of regulations, strategies, schedules, and enforcement actions designed to move the state into compliance with all NAAQS.

The General Conformity Rule applies only to significant actions in nonattainment or maintenance areas. This rule requires that any Federal action meet the requirements of a State or Federal Implementation Plan. More specifically, CAA conformity is ensured when a Federal action does not cause a new violation of the NAAQS; contribute to an increase in the frequency or severity of violations of NAAQS; or delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS.

Table 3-9. National and State Ambient Air Quality Standards, Effective October 2011

Pollutant	Averaging Time	Primary Standard		Secondary Standard
		Federal	Maryland	
CO	8-hour ⁽¹⁾	9 ppm (10 mg/m ³)	Same as Federal	None
	1-hour ⁽¹⁾	35 ppm (40 mg/m ³)	Same as Federal	None
Pb	Rolling 3-Month Average ⁽²⁾	0.15 µg/m ³ ⁽³⁾	Same as Federal	Same as Primary
	Quarterly Average	1.5 µg/m ³ ⁽³⁾	Same as Federal	Same as Primary
NO ₂	Annual ⁽⁴⁾	53 ppb ⁽⁵⁾	Same as Federal	Same as Primary
	1-hour ⁽⁶⁾	100 ppb	Same as Federal	None
PM ₁₀	Annual (Arithmetic Mean)	None	None	None
	24-hour ⁽⁷⁾	150 µg/m ³	Same as Federal	Same as Primary
PM _{2.5}	Annual ⁽⁸⁾	12 µg/m ³	Same as Federal	15 µg/m ³
	24-hour ⁽⁶⁾	35 µg/m ³	Same as Federal	Same as Primary
O ₃	8-hour ⁽⁹⁾	0.075 ppm ⁽¹⁰⁾	Same as Federal	Same as Primary
	1-hour	0.12 ppm	Same as Federal	Same as Primary
SO ₂	1-hour ⁽¹¹⁾	75 ppb ⁽¹²⁾	Same as Federal	None
	Annual (Arithmetic Average)	0.03 ppm (80 µg/m ³)	Same as Federal	None
	24-hour	0.14 ppm (365 µg/m ³)	Same as Federal	None
	3-hour ⁽¹⁾	None	None	0.5 ppm (1300 µg/m ³)

Sources: COMAR 2014, USEPA 2014

Notes: Parenthetical values are approximate equivalent concentrations.

- Not to be exceeded more than once per year.
- Not to be exceeded.
- Final rule signed October 15, 2008. The 1978 lead standard (1.5 µg/m³ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved. EPA designated areas for the new 2008 standard on November 8, 2011.
- Annual Mean.
- The official level of the annual NO₂ standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of cleaner comparison to the 1-hour standard.
- 98th percentile, averaged over 3 years.
- Not to be exceeded more than once per year on average over 3 years.
- Annual mean, averaged over 3 years.
- Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years.
- Final rule signed March 12, 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, EPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.
- 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years.
- Final rule signed 2 June 2010. The 1971 annual (0.3 ppm) and 24-hour (0.14 ppm) SO₂ standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved. EPA designated certain areas for the new 2010 standard on July 25, 2013, with the remaining designations to occur in the future.

Key: ppm = parts per million; ppb = parts per billion; mg/m³ = milligrams per cubic meter; µg/m³ = micrograms per cubic meter

Federal Prevention of Significant Deterioration. Federal Prevention of Significant Deterioration (PSD) regulations apply in attainment areas to a major stationary source, (i.e., source with the potential to emit 250 tons per year [tpy] of any criteria pollutant), and a significant modification to a major stationary source, (i.e., change that adds 10 to 40 tpy to the facility's potential to emit depending on the pollutant). The 100 tpy PSD major source threshold is applied instead of 250 tpy because NAS Patuxent River has greater than 250 million British thermal units per hour in combined heat input capacity for all boilers. Additional PSD major source and significant modification thresholds apply for greenhouse gases (GHGs), as discussed in the Greenhouse Gas Emissions subsection. PSD permitting can also apply to a proposed project if all three of the following conditions exist: (1) the proposed project is a modification with a net emissions increase to an existing PSD major source, and (2) the proposed project is within 6 miles (10 km) of national parks or wilderness areas (i.e., Class I Areas), and (3) regulated stationary source pollutant emissions would cause an increase in the 24-hour average concentration of any regulated pollutant in the Class I area of 1 mg/m³ or more (40 CFR 52.21[b][23][iii]). A Class I area includes national parks larger than 6,000 acres (1,428 ha), national wilderness areas and national memorial parks larger than 5,000 acres (2,023 ha), and international parks. PSD regulations also define ambient air increments, limiting the allowable increases to any area's baseline air contaminant concentrations, based on the area's Class designation (40 CFR 52.21[c]).

Title V and Other Emissions Control Requirements. Title V of the CAA Amendments of 1990 requires states and local agencies to permit major stationary sources. A Title V major stationary source has the potential to emit criteria air pollutants and hazardous air pollutants at levels equal to or greater than Major Source Thresholds. Major Source Thresholds vary depending on the attainment status of an ACQR. The purpose of the permitting rule is to establish regulatory control over large, industrial-type activities and monitor their impact on air quality.

Greenhouse Gas Emissions. GHGs are primarily produced by the burning of fossil fuels and through industrial and biological processes. On September 22, 2009, the USEPA issued a final rule for mandatory GHG reporting from large greenhouse gas stationary emissions sources in the United States. The purpose of the rule is to collect comprehensive and accurate data on carbon dioxide (CO₂) and other greenhouse gas emissions that can be used to inform future policy decisions. In general, the threshold for reporting is 25,000 metric tons (27,557.8 short tons) or more of CO₂ equivalent (CO₂e) emissions per year, excluding mobile source emissions. GHG emissions also became regulated under PSD and Title V permitting programs, under a USEPA rulemaking issued on June 3, 2010 known as the GHG Tailoring Rule (75 *Federal Register* [FR] 31514). However, on June 23, 2014, the U.S. Supreme Court ruled that the USEPA may not treat GHG as an air pollutant for purposes of determining whether a source is a major source required to obtain a PSD or Title V permit. On July 24, 2014, the USEPA released a memorandum indicating if a new source triggers PSD for pollutants other than GHG, then the USEPA would apply the PSD Best Available Control Technology (BACT) requirements to GHG emissions if their potential to emit is 75,000 tpy or greater. The 75,000 tpy GHG threshold would also apply to a PSD modification, if a PSD major modification is first triggered by a non-GHG pollutant. These GHG thresholds may change based on the court ruling that the USEPA needs to justify these values, and the outcome of future court decisions. The 100,000 tpy Title V permit threshold for GHG no longer applies.

Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, was signed in October 2009 and required federal agencies to set goals for reducing GHG emissions. On August 26, 2010, the DoD released its implementation plan describing specific actions it will take to achieve its GHG reduction targets, reduce long-term costs, and meet the full range of goals of the Executive Order. This plan segregates GHG emissions into three categories: Scope 1, Scope 2, and Scope 3 emissions. Scope 1 GHG emissions are those directly occurring from sources that are owned or controlled by the agency. Scope 2 emissions are indirect emissions generated in the production of electricity, heat, or steam purchased by the agency. Scope 3 emissions are other indirect GHG emissions that result from agency activities but from sources that are not owned or directly controlled by the agency.

The GHG goals in the DoD plan include reducing Scope 1 and Scope 2 GHG emissions by 34 percent by 2020, relative to Fiscal Year 2008 emissions, and reducing Scope 3 GHG emissions by 13.5 percent by 2020, relative to Fiscal Year 2008 emissions.

3.4.2 Existing Conditions

NAS Patuxent River is located in St. Mary's County, Maryland, which is within the Southern Maryland Intrastate AQCR. St. Mary's County has been designated by the USEPA as unclassified/attainment for all criteria pollutants (USEPA 2013a). According to 40 CFR Part 81, no Class I air quality protection areas are located within 6 miles (10 km) of the NAS Patuxent River.

NAS Patuxent River maintains a Title V permit (Permit # 24-037-0017). Air emissions from the installation are primarily produced from fuel burning equipment (boilers, generators, jet engine test cells), storage tanks, painting operations, degreasers, gasoline filling stations, and abrasive blasting. NAS Patuxent River is not listed in any of Maryland's State Implementation Plans as having a specific conformity budget. Actual emissions for NAS Patuxent River in 2011 are listed below in **Table 3-10**. Also listed in **Table 3-10** are the most recent emissions inventories for St. Mary's County and the Southern Maryland Intrastate AQCR (USEPA 2013b).

Table 3-10. NAS Patuxent River and Local and Regional Air Emissions Inventories (2011)

	NO_x tpy	VOC tpy	CO tpy	SO₂ tpy	PM₁₀ tpy	PM_{2.5} tpy
NAS Patuxent River	15.14	18.27	12.33	0.14	0.02	0.16
St. Mary's County	4,039	3,193	17,503	926	1,128	398
Southern Maryland Intrastate AQCR (2011)	11,360	8,299	47,203	7,581	3,637	1,337

Source: NAS PAX 2010, USEPA 2013b

Key: tpy – tons per year; VOC – volatile organic compound

3.4.3 Environmental Consequences

The environmental consequences on local and regional air quality conditions from a proposed Federal action are determined based upon the changes in regulated air pollutant emissions, and upon existing conditions and ambient air quality. For this proposed action, the majority of emission increases are from temporary construction and demolition activity emissions due to mobile sources; therefore, air permitting impacts are not a major concern.

3.4.3.1 Alternative 1 (EUL Sites 5, 6, and 7)

Impacts on air quality would be expected from construction and demolition activities under Alternative 1; however, the impacts would be minor. The proposed construction and demolition activities would generate air pollutant emissions from site-disturbing activities and operation of construction and demolition equipment. Demolition and construction activities would also generate particulate emissions as fugitive dust from ground-disturbing activities and from the combustion of fuels in construction equipment. The quantity of uncontrolled fugitive dust emissions from a construction and demolition site is proportional to the area of land being worked and the level of activity. Emissions from construction and demolition activities would be produced only for the duration of construction and demolition activities, which, for the purposes of this air quality analysis, is assumed to be 240 workdays or 12 calendar months for demolition, and 360 workdays or 18 months for construction.

Demolition and construction activities would incorporate best management practices (BMPs) to minimize fugitive particulate matter emissions. Additionally, the work vehicles are assumed to be well-maintained and could use diesel particle filters to reduce emissions. Construction and demolition workers commuting daily to and from the job site in their personal vehicles would also create regulated pollutant air emissions.

Air emissions from construction and demolition activities under Alternative 1 are summarized in **Table 3-11**. **Appendix C** contains detailed calculations and the assumptions used to estimate air emissions. As construction and demolition schedules are not currently available; it was assumed that demolition activities would occur entirely in 2015. In addition, construction activities were assumed to occur over 18 months with 50 percent occurring in 2016 and the other 50 percent in 2017. Impacts on air quality would not be considered major as the estimated yearly emissions are well below 1 percent of the most recently available emission inventory of the Southern Maryland Intrastate AQCR. Therefore it is not expected that emissions would contribute to, or affect, local or regional attainment status with the NAAQS.

Operational Emissions. Impacts on air quality would occur from operational activities; however, the effects would be minor. Emissions associated with operation of Alternative 1 would be similar to, and consistent with, existing conditions at NAS Patuxent River. The emissions from stationary sources (i.e., boilers/heaters) would have minimal impact on the air quality at NAS Patuxent River. **Table 3-12** lists estimated emissions associated with proposed EUL personnel transit activities and estimated emissions associated with proposed new stationary sources at NAS Patuxent River. Even though additional commuters to the installation are likely already contributing to regional emissions, the commuter emissions presented in the table assumes that nearly all personnel would be above and beyond existing personnel as was analyzed under Staffing Scenario B (see **Section 3.2.3**).

General Conformity. As stated in **Section 3.4.2**, the installation is in an area that has been designated as unclassified/attainment for all criteria pollutants. Therefore, the General Conformity Rule requirements are not applicable. The proposed EUL development would generate emissions well below 1 percent of the emission inventory of the Southern Maryland Intrastate AQCR in 2015 and emissions would be temporary. Therefore, the proposed construction and demolition activities would not have major impacts on air quality at NAS Patuxent River or on regional or local air quality.

For PSD permitting, air emissions from the proposed boilers and heating equipment would be well below the PSD major modification and PSD major source thresholds for each PSD pollutant. As such, no effects from PSD air permitting would occur. The proposed boilers or heating equipment may need to be added to the installation's existing Title V operating permit. The proposed boilers and heating equipment could also necessitate the acquisition of state-level air quality construction permits from the MDE depending on their heat input capacity and fuel source.

Greenhouse Gas Emissions. Implementation of Alternative 1 or Alternative 2 would contribute directly to emissions of GHGs from the combustion of fossil fuels. Because CO₂ emissions account for approximately 92 percent of all GHG emissions in the United States, they are used for analyses of GHG emissions in this assessment. The U.S. Department of Energy, Energy Information Administration estimates that 2011 gross CO₂ emissions in Maryland and the United States were 63.8 million metric tons and 5,384 million metric tons, respectively (DOE/EIA 2014). **Table 3-13** summarizes the anticipated amount of CO₂ equivalent emissions from the construction and demolition activities associated with the proposed EUL development. These emissions would represent a negligible contribution towards the statewide GHG inventory and an extremely negligible contribution toward the national GHG inventory.

Table 3-11. Estimated Air Emissions Resulting from Demolition and Construction Activities under Alternative 1 (2015, 2016, and 2017)

Activity	NO _x tpy	VOC tpy	CO tpy	SO ₂ tpy	PM ₁₀ tpy	PM _{2.5} tpy	CO ₂ tpy
2015 Demolition							
Combustion Equipment	1.74	0.10	0.69	0.14	0.11	0.10	203.69
Fugitive Dust	-	-	-	-	26.11	2.61	-
Haul Truck On-Road	0.05	0.01	0.04	0.00	0.00	0.00	24.81
Worker Commuter	0.04	0.05	0.44	0.00	0.01	0.00	79.34
Total Emissions in 2015	1.84	0.16	1.16	0.14	26.22	2.72	307.84
Percent of Southern Maryland Intrastate AQCR Inventory (2011)	0.02%	0.002%	0.003%	0.002%	0.72%	0.20%	N/A
2016 Construction (nine months)							
Combustion Equipment	7.35	0.92	3.23	0.58	0.53	0.51	834.69
Fugitive Dust	-	-	-	-	17.41	1.74	-
Haul Truck On-Road	0.87	0.12	0.26	0.00	-	-	502.06
Worker Commuter	0.05	0.05	0.47	0.00	0.01	0.00	89.65
Total Emissions in 2016	8.27	1.10	3.96	0.59	17.95	2.26	1,426.40
Percent of Southern Maryland Intrastate AQCR (2011)	0.07%	0.013%	0.008%	0.008%	0.49%	0.17%	N/A
2017 Construction (nine months)							
Combustion Equipment	7.35	0.92	3.23	0.58	0.53	0.51	834.69
Fugitive Dust	-	-	-	-	17.41	1.74	-
Haul Truck On-Road	0.76	0.12	0.23	0.00	0.03	0.02	501.86
Worker Commuter	0.04	0.05	0.44	0.00	0.01	0.01	89.61
Total Emissions in 2017	8.15	1.09	3.90	0.59	17.98	2.28	1,426.16
Percent of Southern Maryland Intrastate AQCR (2011)	0.07%	0.013%	0.008%	0.008%	0.50%	0.18%	N/A

Source: USEPA 2013b

Notes: All activities generate emissions from mobile sources unless indicated as stationary sources.

Key: N/A = Not Applicable

Table 3-12. Estimated Air Emissions Resulting from Operational Activities under Alternative 1 (2017)

Activity	NO _x tpy	VOC tpy	CO tpy	SO ₂ tpy	PM ₁₀ tpy	PM 2.5 tpy	CO ₂ tpy
Boilers/Heaters	5.22	0.29	4.38	0.03	0.40	0.40	6,262.90
Total Operational Years, 2017 and thereafter (Stationary Source Emissions)	5.22	0.29	4.38	0.03	0.40	0.40	6,262.90
Personnel Commuters	5.54	6.49	58.09	0.12	1.02	0.67	11,947.77
Total Operational Years, 2017 and thereafter (Mobile Source Emissions)	5.54	6.49	58.09	0.12	1.02	0.67	11,947.77
Significance Criteria							
PSD Significance Criteria, Stationary Source Emissions	40⁽¹⁾	40⁽¹⁾	100⁽¹⁾	40⁽¹⁾	15⁽¹⁾	10⁽¹⁾	75,000⁽²⁾
Other Significance Criteria, Mobile Source Emissions ⁽³⁾	100	100	100	100	100	100	N/A

Notes: Italics indicates that air emissions are from, or significance criteria apply to, stationary sources only.

1. Assuming NAS Patuxent River has a potential to emit of 250 tpy or more for each criteria pollutant, the significance criteria for existing PSD major source criteria pollutants should be considered a major modification which increases potential emissions by the levels indicated in tpy.
2. Used for the purposes of establishing a conservative PSD significance criteria, if one of the other criteria pollutant thresholds is exceeded.
3. Criteria based on PSD major source thresholds for lack of a better threshold that applies to mobile source emissions in an attainment area for all criteria pollutants.

Table 3-13. Estimated CO₂ Equivalent Emissions from the Proposed Action (metric tons)

	CO ₂ Equivalent Emissions	Percent of Maryland's CO ₂ Emissions	Percent of U.S. CO ₂ Emissions
Alternatives 1 and 2 ¹ Demolition 2015	279.21	0.00044%	0.000005%
Alternative 1 and 2 ¹ Construction 2016	1,320.85	0.0021%	0.000025%
Alternative 1 and 2 ¹ Construction 2017	1,248.37	0.0020%	0.000023%
Alternative 1, and 2 ¹ Operational beginning 2017	11,654.32	0.018%	0.00022%

Source: DOE/EIA 2014

Note:

1. Alternative 2 emissions have not been calculated; however, due to their similarity to Alternative 1 with regard to activities generating emissions, their emissions are considered to be the same as Alternative 1.

3.4.3.2 Alternative 2 (EUL Sites 6 and 7)

Temporary impacts on air quality would be expected from construction and demolition activities under Alternative 2. Air emissions from construction and demolition activities under Alternative 2 are expected to be similar to those described for Alternative 1, **Section 3.4.3.1**.

3.4.3.3 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented. Existing conditions would remain the same as described in **Section 3.4.2**. No new effects on regional or local air quality would occur.

3.5 Noise

3.5.1 Definitions

Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Human response to increased sound levels varies according to the source type, characteristics of the sound source, distance between source and receptor, receptor sensitivity, and time of day. Affected sensitive receptors are specific (e.g., schools, churches, or hospitals) or broad (e.g., nature preserves or designated districts) areas in which occasional or persistent sensitivity to noise above ambient levels exists.

Noise Metrics and Regulations. Although human response to noise varies, measurements can be calculated with instruments that record instantaneous sound levels in decibels. A-weighted decibel (dBA) is used to characterize sound levels that can be sensed by the human ear. “A-weighted” denotes the adjustment of the frequency range to what the average human ear can sense when experiencing an audible event. The threshold of audibility is generally within the range of 10 to 25 dBA for normal hearing. The upper boundary of audibility is normally in the region of 135 dBA and can be painfully loud (USEPA 1981a). **Table 3-14** compares common sounds and shows how they rank in terms of the effects of hearing. As shown, a whisper is normally 30 dBA and considered to be very quiet while an air conditioning unit 20 feet away is considered an intrusive noise at 60 dBA. Noise levels can become annoying at 80 dBA and very annoying at 90 dBA. To the human ear, each 10 dBA increase seems twice as loud (USEPA 1981b).

3.5.2 Existing Conditions

Existing noise sources on NAS Patuxent River stem primarily from aircraft operations, including flight operations and engine maintenance operations or run-ups. Facilities with populations that could be sensitive to noise near the EUL sites include the Visitor’s Quarters and Health Clinic adjacent to Site 5 and the Naval Air Museum adjacent to Site 6.

The State of Maryland has transferred noise regulation authority to local jurisdictions; however, the state continues to be responsible for setting standards and general exemptions. **Table 3-15** lists maximum allowable noise levels for land use categories. Noise limits for construction and demolition activities include not exceeding 90 dBA during daytime hours at the property line. Nighttime construction and demolition noise limits are the same as listed in **Table 3-15**.

Table 3-14. Sound Levels and Human Response

Noise Level (dBA)	Common Sounds	Effect
10	Just audible	Negligible
30	Soft whisper (15 feet)	Very quiet
50	Light auto traffic (100 feet)	Quiet
60	Air conditioning unit (20 feet)	Intrusive
70	Noisy restaurant or freeway traffic	Telephone use difficult
80	Alarm clock (2 feet)	Annoying
90	Heavy truck (50 feet) or city traffic	Very annoying Hearing damage (8 hours)
100	Garbage truck	Very annoying
110	Pile drivers	Strained vocal effort*
120	Jet takeoff (200 feet) or auto horn (3 feet)	Maximum vocal effort
140	Carrier deck jet operation	Painfully loud

Source: USEPA 1981a

Note: * HDR extrapolation

Table 3-15. State of Maryland Maximum Allowable Noise Level (dBA)

	Daytime	Nighttime
Residential districts	65 dBA	55 dBA
Commercial and Mixed Use Districts	67 dBA	62 dBA
Industrial and Marine Districts	75 dBA	75 dBA

Source: St. Mary's County 2004, State of Maryland 2014

3.5.3 Environmental Consequences

3.5.3.1 Alternative 1 (EUL Sites 5, 6, and 7)

The sources of noise under Alternative 1 that could impact populations include demolition and construction activities, operational vehicular noise, and operational equipment. These noise sources are addressed in the following sections. Overall, as described further below, the impacts from noise would not be considered significant.

Noise construction activities vary depending on the type of construction equipment being used, the area that the action would occur in, and the distance from the noise source. Construction activities can cause a temporary increase in sound that is well above the ambient level. A variety of sounds are emitted from loaders, trucks, and other work equipment. **Table 3-16** lists noise levels associated with common types of construction equipment. Construction equipment usually exceeds the ambient sound levels by 20 to 25 dBA in an urban environment and up to 30 to 35 in a quiet suburban area. Individual equipment used for construction activities would be expected to result in noise levels comparable to those shown in **Table 3-16**. Noise from construction activities varies depending on the type of equipment being used, the

Table 3-16. Predicted Levels for Construction Equipment

Construction Category and Equipment	Predicted Noise Level at 50 feet (dBA)
Clearing and Grading	
Bulldozer	80
Grader	80–93
Truck	83–94
Roller	73–75
Excavation	
Backhoe	72–93
Jackhammer	81–98
Building Construction	
Concrete mixer	74–88
Welding generator	71–82
Pile driver	91–105
Crane	75–87
Paver	86–88

Source: USEPA 1981b

area the action would occur in, and the distance from the noise source. To predict how these activities would impact adjacent populations, noise from the probable equipment was estimated. For example, construction usually involves several pieces of equipment (e.g., bulldozers and trucks) that could be used simultaneously. For Alternative 1, the additive noise from the equipment during the busiest day was estimated to determine the total impact of noise from construction activities at a given distance. Examples of expected cumulative construction noise during daytime hours at specific distances are shown in **Table 3-17**. These sound levels were estimated by adding the noise from several pieces of equipment and then calculating the decrease in noise levels at various distances from the source.

Table 3-17. Estimated Noise Levels from Construction Activities

Distance from Noise Source	Estimated Noise Level
50 feet	90 to 94 dBA
100 feet	84 to 88 dBA
150 feet	81 to 85 dBA
200 feet	78 to 82 dBA
400 feet	72 to 76 dBA
800 feet	66 to 70 dBA
1,200 feet	< 64 dBA

Construction of the proposed facilities would occur entirely within the installation boundary. Sensitive resources near the EUL sites include the Visitor's Quarters, which is about 200 feet (61 meters) from EUL Site 5, where populations could experience outdoor noise levels of approximately 80 dBA. The Health Clinic is about 350 feet (107 meters) from Site 5 and could experience noise levels of

approximately 70 dBA. The Naval Air Museum is about 40 feet from the edge of Site 6; therefore, noise levels could reach approximately 95 dBA. Noise generation would last only for the duration of demolition and construction activities, would be intermittent, and could be minimized through measures such as the restriction of these activities to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.), and the use of equipment exhaust mufflers.

EUL Site 5 is within Noise Zone 2 on NAS Patuxent River. Navy guidance recommends promoting compatible development on the installation within noise zones (CNO 2008). Facilities proposed at Site 5 include parking lots and work campus buildings. Parking lots are compatible within Noise Zone 2. Government facilities, professional services, and commercial facilities are generally compatible within the 65 to 69 dBA portion of Noise Zone 2. Within the 70 to 74 dBA noise levels, these facilities should be constructed with noise level reduction measures. Based on the conceptual site schematic shown in **Figure 2-4**, the majority of Site 5 is within the 65 to 69 dBA portion of Noise Zone 2. The southwestern corner of Site 5 is within the 70 to 74 dBA portion, within which the only proposed portion of the EUL development would be a parking lot. Therefore, development on the site would generally be compatible with these noise zones. Sites 6 and 7 are outside of the noise zones at the installation.

Alternative 1 would not result in significant, adverse effects on the installation's noise environment due to an increase in vehicle traffic. Traffic levels in the area are already high, and it is likely the additive traffic from the EUL development, primarily during peak commuter travel hours, would not noticeably increase noise levels from traffic. This would also result in a long-term, negligible, adverse effect on the surrounding populations residing in the immediate area.

3.5.3.2 Alternative 2 (EUL Sites 6 and 7)

Noise levels associated with the proposed demolition, construction, and operational activities under Alternative 2 would be similar to those described in Alternative 1. Proposed noise levels would be expected to result in temporary impacts on the noise environment from construction and demolition equipment. Operational activities would be similar to existing activities at NAS Patuxent River; therefore, operational activities would not cause any significant impacts on the surrounding populations.

3.5.3.3 No Action Alternative

Under the No Action Alternative, proposed construction and demolition activities would not occur and the existing conditions would be unchanged. No adverse impacts on the ambient noise level would occur.

3.6 Coastal Zone Management

3.6.1 Definitions

The Coastal Zone Management Act (CZMA) of 16 United States Code § 1451 et seq., as amended, and 15 Code of Federal Regulations (CFR) § 921-930 provides assistance to states, in cooperation with Federal and local agencies, for developing land and water-use programs in coastal zones. When a state coastal management plan is federally approved, Federal agencies proposing actions with the potential to affect the state's coastal uses or resources are subject to review under the CZMA Section 307 Federal consistency determination requirement. Section 307 mandates that "federal actions within a state's coastal zone (or outside the coastal zone, if the action affects land or water uses or natural resources within the coastal zone) be consistent to the maximum extent practicable with the enforceable policies of the state coastal management plan" (16 United States Code § 1456(c)(1)(A)).

An enforceable policy is a state policy that is legally binding under state law (e.g., through constitutional provisions, laws, regulations, land use plans, ordinances, or judicial or administrative decisions), and by

which a state exerts control over private and public coastal uses and resources, and which are incorporated in a state's federally approved Coastal Management Program (CMP) [CZMA § 304(6a) and 15 CFR § 930.11(h)]. Enforceable policies are given legal effect by state law and do not apply to Federal lands, Federal waters, Federal agencies, or other areas or entities outside a state's jurisdiction, unless authorized by Federal law (the CZMA does not confer such authorization).

At the heart of Federal consistency is the "effects test." A Federal agency activity is subject to CZMA Federal consistency requirements if the action will affect a coastal use or resource, in accordance with National Oceanic and Atmospheric Administration regulations.

According to 15 CFR § 930.11(g), the term "effect on any coastal use or resource" means any reasonably foreseeable effect on any coastal use or resource resulting from a Federal agency activity or Federal license or permit activity (including all types of activities subject to the Federal consistency requirement under subparts C, D, E, F, and I of this part). Effects are not just environmental effects, but include effects on coastal uses. Effects include both direct effects which result from the activity and occur at the same time and place as the activity, and indirect (cumulative and secondary) effects which result from the activity and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects are effects resulting from the incremental impact of the Federal action when added to other past, present, and reasonably foreseeable actions, regardless of what person(s) undertake(s) such actions.

On May 8, 2013, the DoD and the State of Maryland signed a Memorandum of Understanding (MOU) concerning the Federal consistency requirements of the CZMA and the application and implementation of certain enforceable policies of Maryland's CMP. The MOU outlines how DoD facilities and projects will meet the Federal law requirements of the CZMA to ensure that their actions affecting these resources are consistent with state policies. The MOU also called for the development of a list of *de minimis* and environmentally beneficial activities, which absent no unusual circumstances, would not require an individual consistency determination (State of Maryland 2013).

3.6.2 Existing Conditions

Maryland has a federally approved CMP. Maryland's coastal zone is comprised of the land, water and subaqueous land between the territorial limits of Maryland in the Chesapeake Bay, Atlantic Coastal Bays and the Atlantic Ocean. The Maryland coastal zone extends from 3 miles out in the Atlantic Ocean to the inland boundaries of the 16 counties (including St. Mary's County where NAS Patuxent River is located) and Baltimore City that border the Atlantic Ocean, Chesapeake Bay and the Potomac River up to the District of Columbia (MDNR 2014). The CZMA excludes all Federal facilities including NAS Patuxent River from the legal definition of coastal zone. Federal actions undertaken at NAS Patuxent River that have reasonably foreseeable effects on a coastal use or resource must be consistent with Maryland's 19 enforceable policies. The enforceable policies relevant to Alternative 1 include water quality, non-tidal wetlands, and development (MDNR 2011).

3.6.3 Environmental Consequences

3.6.3.1 Alternative 1 (EUL Sites 5, 6, and 7)

Alternative 1 would be reasonably likely to affect the coastal uses or resources of Maryland because it would involve demolition and construction, result in an increase in impervious surface area, and in the development of Sites 5 and 7, which contain non-tidal wetlands; however, impacts would not be considered significant. Similarly, potential non-significant impacts on off-installation water quality would result from increased sedimentation and stormwater runoff from construction of buildings and parking lots and/or structures. Approximately 621,000 ft² (57,694 m²) of net new impervious surfaces

would be added under this alternative. Impacts would be less intense, potentially to the amount of 357,000 ft² (33,167 m²) of total net new impervious surfaces, if parking structures were used on Sites 6 and 7 instead. Potential impacts on non-tidal wetlands could also result from the filling of non-tidal wetlands (see **Section 3.9.3.1**). All Alternative 1 activities would be conducted in accordance with applicable laws, regulations, and policies governing erosion and sediment control, stormwater management, and non-tidal wetlands, and would therefore be consistent to the maximum extent practicable with the applicable Maryland CMP enforceable policies. See **Section 3.9** for further information on water quality and wetlands.

The actions contained in this alternative are not present on the list of *de minimis* activities nor would they be considered environmentally beneficial per the Maryland CMP MOU. Therefore, the Navy has developed a Coastal Consistency Determination (CCD) in accordance with 15 CFR 930.39 under the CZMA, and will submit the CCD to the Maryland Department of Environment, Wetlands and Waterways Program. The Maryland Department of Environment, Wetlands and Waterways Program will review the U.S. Navy's CCD and the state will decide whether it concurs with the Navy's determination that the activities proposed by NAS Patuxent River are consistent with the enforceable policies of the Maryland CMP. The state's decision will be based on the activities' compliance with the Maryland CMP authorities. **Appendix D** contains the CCD.

3.6.3.2 Alternative 2 (EUL Sites 6 and 7)

Impacts from this alternative would be similar to those described for Alternative 1. Alternative 2 would affect Maryland coastal resources, however, effects would not be considered significant. Approximately 648,000 ft² (60,203 m²) of net new impervious surfaces would be added under this alternative from construction of buildings and parking structures. Impacts would be less intense, potentially to the amount of 252,000 ft² (23,412 m²) of total net new impervious surfaces, if parking structures were used on Sites 6 and 7 instead. All activities would be conducted in accordance with applicable laws, regulations, and policies governing erosion and sediment control, stormwater management, and non-tidal wetlands and would therefore be consistent with Maryland CMP enforceable policies, as described in **Section 3.6.3.1**.

3.6.3.3 No Action Alternative

Under the No Action Alternative, the EUL would not occur and there would be no construction and demolition activities. Therefore, a CZMA consistency determination would not be required. There would be no impacts on any land use, water use, or natural resource of Maryland's coastal zone.

3.7 Geology

3.7.1 Definitions

Geological resources consist of the Earth's surface and subsurface materials. Within a given physiographic province, these resources typically are described in terms of topography and physiography, geology, soils, and, where applicable, geologic hazards.

Geology. Geology is the study of the Earth's composition and provides information on the structure and configuration of surface and subsurface features. Such information derives from field analysis based on observations of the surface and borings to identify subsurface composition.

Topography. Topography and physiography pertain to the general shape and arrangement of a land surface, including its height and the position of its natural features and human-made alterations of landforms.

Soils. Soils are the unconsolidated materials overlying bedrock or other parent material. Soils typically are described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink-swell potential, and erosion potential affect their abilities to support certain applications or uses. In appropriate cases, soil properties must be examined for their compatibility with particular construction activities or types of land use.

Prime Farmland. Prime farmland is protected under the Farmland Protection Policy Act of 1981. Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. The land could be cropland, pasture, rangeland, or other land, but not urban built-up land or water. The intent of the Farmland Protection Policy Act is to minimize the extent that Federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses.

Geologic Hazards. Geologic hazards are defined as natural geologic events that can endanger human lives and threaten property. Examples of geologic hazards include earthquakes, landslides, rock falls, ground subsidence, and mass wasting.

3.7.2 Existing Conditions

3.7.2.1 EUL Site 5

Geology. NAS Patuxent River is within the Atlantic Coastal Plain physiographic province of Maryland. This area is characterized by unconsolidated sediments, including gravel, sand, silt, and clay. The sediments in this area generally slope less than one degree toward the east and range in age from the Triassic to Quaternary. This area is underlain by southeastwardly thickening sequence of sediments composed of sand and gravel aquifers interlayered with silt and clay confining units (MGS 2014, MDNR 2005).

Topography. The topography at NAS Patuxent River has low relief, and rises generally from the Chesapeake Bay shoreline westward. Approximately 70 percent of NAS Patuxent River is level but fairly well drained. EUL Site 5 is generally flat, but relief drops approximately 50 feet along the northwest boundary toward a small stream to the west of the site (MDNR 2005, NAVFAC Washington 2012).

Soils. The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) has mapped the soils in the vicinity of Site 5 and the following three soil mapping units occur on the site:

- *Beltsville silt loam, 2 to 5 percent slopes, moderately eroded.* Beltsville silt loam is moderately well drained soil, with no frequency of flooding or ponding. This soil type comprises 56 percent of Site 5 and is found predominately under existing buildings.
- *Cut and fill.* Cut and fill land is soil that has previously been disturbed as a result of previous actions. The typical profile for this type of soil is variable. This soil type is common in urban and developed areas. Cut and fill soil comprises less than 1 percent of the soil at Site 5.
- *Evesboro-Westphalia complex, 20 to 45 percent slopes, moderately eroded.* The Evesboro-Westphalia complex is mostly comprised of roughly 3 feet of loamy sand on top of roughly 5 feet of sand resulting from sandy eolian deposits or fluviomarine sediments. This soil is excessively drained and generally no flooding or ponding occurs with this soil type. This soil type comprises approximately 43 percent of Site 5 and is located toward the west of the site.

Prime Farmland. No prime farmland soils have been mapped within EUL Site 5. No in-water work would be required for this project; therefore, marine sediments would not be affected and are not discussed further.

Geologic Hazards. Earthquakes occur in Maryland; however, they are not common. According to the U.S. Geological Survey (USGS), the hazard rating for St. Mary's County, Maryland, is very low at 0.04-0.08 percent g (the peak ground acceleration as a percentage of the force of gravity). Maryland's strongest earthquake registered 3.1-magnitude on the Richter scale in 1978 near Hancock in Washington County in northwestern Maryland. However, earthquakes of this magnitude are relatively minor. Most earthquakes that are felt within Maryland and at NAS Patuxent River have epicenters outside the state such as a 5.8-magnitude earthquake in Mineral, Virginia, in August 2011 (Reger 2003). The 2011 earthquake was the largest recorded earthquake in Virginia history and earthquakes of this magnitude are rare in the region. On average, Virginia experiences 6 earthquakes a year, which only one per year is felt at the surface (DMME 2014).

3.7.2.2 EUL Sites 6 and 7

Existing conditions for geology and geologic hazards for EUL Sites 6 and 7 are similar to those discussed under Site 5. Topography at Sites 6 and 7 is relatively flat, but gently slopes toward a small stream to the northwest of Site 6. There is slight relief toward the east of Site 7 as there is a naturally occurring stream that runs north-south approximately 600 feet (183 meters) from the Site 7 boundary. Soils in Sites 6 and 7 consist predominately of Beltsville silt loam, 2 to 5 percent slopes, moderately eroded. There is no prime farmland within Sites 6 and 7.

3.7.3 Environmental Consequences

3.7.3.1 Alternative 1 (EUL Sites 5, 6, and 7)

Impacts on geological resources would primarily be limited to the areas where ground disturbance would occur, which includes the sites of the buildings proposed for demolition and construction activities, and areas designated for utilities. Impacts would result from disturbance and compaction of soils in areas of Sites 5, 6 and 7 that are currently undeveloped, clearing of vegetation, excavation, trenching, grading, and paving. Soil erosion and sediment production would be minimized during construction by following appropriate BMPs and by complying with Section 438 of the EISA, which requires implementation of LID measures. The EUL development would require the development of an erosion and sediment control plan per MDE's erosion and sediment control regulations (COMAR 26.17.01, *Erosion and Sediment Control*). The *2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control* (MDE 2011) serve as the official guide for erosion and sediment control principles, methods, and practices. The impacts from Alternative 1 would not be expected to substantially alter geological conditions at Sites 5, 6 or 7. Based on the nature of these impacts, no significant impacts would be expected under Alternative 1.

3.7.3.2 Alternative 2 (EUL Sites 6 and 7)

Impacts from Alternative 2 would be similar to but less than as those discussed under Alternative 1. Although the footprint of development on EUL Sites 6 and 7 would be greater under this alternative, impacts from ground disturbance under Alternative 2 would only be expected at EUL Sites 6 and 7, since Site 5 is not included in Alternative 2. This Alternative would not have a significant impact on geological resources.

3.7.3.3 No Action Alternative

Under the No Action Alternative, NAS Patuxent River would not enter into an EUL with a lessee to develop, operate, and maintain a work campus office development at NAS Patuxent River. Under the No Action Alternative, there would be no construction or demolition of facilities.

3.8 Biological Resources

3.8.1 Definitions

Biological resources include native or naturalized plants and animals and the habitats (e.g., grasslands, forests, and wetlands) in which they exist. Protected and sensitive biological resources include listed (threatened or endangered) and proposed species under the ESA as designated by the U.S. Fish and Wildlife Service (USFWS), state-listed threatened or endangered species, and migratory birds. In Maryland, state-listed threatened or endangered species are protected under the Nongame and Endangered Species Conservation Act (Code of Maryland 10-2A-01) that is administered by the Maryland Department of Natural Resources (MDNR). Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. § 703–712) as amended, and Executive Order 13186. The Bald and Golden Eagle Protection Act (16 U.S.C. § 668–668c) as amended, prohibits “take” of bald eagles, including their parts, nests, or eggs.

Sensitive habitats include those areas designated by the USFWS as critical habitat protected by the ESA and sensitive ecological areas as designated by state or Federal rulings. Critical habitat is designated if the USFWS determines that it is essential to a threatened or endangered species’ conservation. Federal agencies are required to ensure that their activities do not adversely modify or destroy critical habitat to the point that it will no longer aid in the species’ recovery. Sensitive habitats also include wetlands, plant communities that are unusual or of limited distribution, and important seasonal use areas for wildlife (e.g., migration routes, breeding areas, crucial summer and winter habitats).

3.8.2 Existing Conditions

Vegetation. There are a variety of vegetative communities at NAS Patuxent River, including forests, agricultural fields, old fields, marshes, and scrub/shrub areas. These communities are dynamic, changing through inadvertent introduction of nonnative species and the natural decline of other species through succession. The majority of the project area is developed land or old fields. Upland forests and disturbed scrub/shrub areas are the most abundant vegetative communities along the perimeters of the project area (see **Figure 3-1**). Upland forests are within the western portion of EUL Site 5 (before the site descends to the ravine to the northwest) and most of Site 7 and sparsely populate the eastern and western boundaries of Site 6. Site 5 contains approximately 7.6 acres (3.1 hectares), Site 6 contains 1.4 acres (0.6 hectares), and Site 7 contains 1.9 acres (0.8 hectares) of forested areas. Upland forests on the installation include trees and woody vegetation dominated by hickory (*Carya* spp.), flowering dogwood (*Cornus florida*), sweetgum (*Liquidambar styraciflua*), white oak (*Quercus alba*), chestnut oak (*Q. prinus*) and American holly (*Ilex opaca*). Devil’s walking stick (*Aralia spinosa*), grapefern (*Botrychium* spp.), trumpet creeper (*Campsis radicans*), and clubmoss (*Lycopodium* spp.) are also readily abundant in forest communities on the installation (NAS PAX 2013). Several invasive species occur on the installation, including three species, porcelain-berry (*Ampelopsis brevipedunculata*), English ivy (*Hedera helix*), and kudzu (*Pueraria montana*), that are concerns for forested and forest edge areas. Black locust (*Robinia pseudoacacia*) tends to establish high numbers in old field habitat. Other notable invasive species include Japanese honeysuckle (*Lonicera japonica*), common reed (*Phragmites australis*), and multiflora rose (*Rosa multiflora*).

Scrub/shrub communities include a mix of herbaceous vegetation, shrubs, and young trees. Scrub/shrub communities within the project area occur within patches of forested habitat along West Patrol Road, primarily in EUL Site 7. This community will naturally progress to a young woodland system without management. Abundant species include red maple (*Acer rubrum*), broomsedge (*Andropogon virginicus*), dogbane (*Apocynum cannabinum*), trumpet creeper, Russian olive (*Elaeagnus angustifolia*), eastern red

cedar (*Juniperus virginiana*), sweetgum, black cherry (*Prunus serotina*), and goldenrods (*Solidago* spp.) (NAS PAX 2013).

The old field associated with Sites 6 and 7 is largely unimproved and dominated by perennial grasses, legumes (*Fabaceae* family), and sedges (*Cyperaceae* family). Other abundant species in old fields on the installation include meadow onion (*Allium canadense*), field garlic (*Allium vineale*), broomsedge (*Andropogon virginicus*), and perennial ryegrass (*Lolium perenne*) (NAS PAX 2013).

Wildlife. A wide variety of migratory and resident wildlife occurs at NAS Patuxent River because of its habitat diversity. Terrestrial habitats include mature forests, young woodlands, scrub/shrub-dominated land, old fields, marshes, and barren lands. The habitat within the Proposed Action is disturbed deciduous upland forest, old field, and successional scrub/shrub habitat as was described in the **Vegetation** section.

White-tailed deer (*Odocoileus virginianus*) and gray squirrels (*Sciurus carolinensis*) are the most common mammals observed within upland forest habitat. Smaller mammals such as gray fox (*Urocyon cinereoargenteus*), raccoon (*Procyon lotor*), opossum (*Didelphis virginia*), shorttail shrew (*Blarina brevicauda*), and eastern mole (*Scalopus aquaticus*), are relatively common, as are bat species including the red bat (*Lasiurus borealis*), little brown myotis (*Myotis lucifugus*), and tri-colored bat (*Pipistrellus subflavus*). Bird species include the pine warbler (*Dendroica pinus*), summer tanager (*Piranga rubra*), and common grackle (*Quiscalus quiscula*), among others. The wood frog (*Rana sylvatica*), American toad (*Bufo americanus*), spotted salamander (*Ambystoma maculatum*), and eastern ribbon snake (*Thamnophis sauritus*) are among the amphibians and reptiles commonly found in upland forests on the installation (NAS PAX 2013).

Scrub/shrub-dominated and old field habitat support native grassland species including the field sparrow (*Spizella pusilla*), eastern meadowlark (*Sturnella magna*), eastern bluebird (*Sialia sialis*), and indigo bunting (*Passerina cyanea*). Other bird species typically supported by this habitat include common yellowthroat (*Geothlypis trichas*), northern mockingbird (*Mimus polyglottos*), brown thrasher (*Toxostoma rufum*), and gray catbird (*Dumetella carolinensis*). Small mammals such as eastern cottontail (*Sylvilagus floridanus*), woodchuck (*Marmota monax*), eastern mole, and the shorttail shrew use this habitat for nesting and foraging. White-tailed deer and bobwhite (*Colinus virginianus*) are the predominant game species. Common reptile species include the eastern box turtle (*Terrapene carolina carolina*), black rat snake (*Elaphe obsoleta obsoleta*), eastern garter snake (*Thamnophis sirtalis sirtalis*), and northern black racer (*Coluber constrictor*) (NAS PAX 2013).

Rare, Threatened, and Endangered Species. No federally listed plants occur in St. Mary's County (USFWS 2014). Five state-listed threatened and endangered plant species have been found on the installation. These species are managed by the MDNR Natural Heritage Program and include devil's grandmother (*Elephantopus tomentosus*), sandplain flax (*Linum intercursum*), Guadeloupe cucumber (*Melothria pendula*), seaside knotweed (*Polygonum glaucum*), and swamp wedgescale (*Sphenopholis pennsylvanica*) (MDNR 2010, NAS PAX 2013, USFWS 2014). Habitat for these species is described in **Table 3-18**; however, none of these species have been documented within the project area (NAS PAX 2013).

Federally endangered species with the potential to occur in the waters surrounding at NAS Patuxent River include the shortnose sturgeon (*Acipenser brevirostrum*), leatherback turtle (*Dermochelys coriacea*), Kemp's Ridley turtle (*Lepidochelys kempii*), humpback whale (*Megaptera novaeangliae*), North Atlantic right whale (*Eubalaena glacialis*), and, rarely, the West Indian manatee (*Trichechus manatus*). These species are primarily associated with Chesapeake Bay and to a lesser extent the Patuxent River, which is outside of the project area. Therefore, these species are not discussed further (USFWS 2014, NAS PAX 2013). Federally threatened puritan tiger beetles (*Cicindela puritana*) could occur in St. Mary's County;

**Table 3-18. Federal-and State-Threatened and Endangered Species
Known to Occur on NAS Patuxent River**

Common Name	Scientific Name	Federal Status	State Status	Habitat
Birds				
Piping plover	<i>Charadrius melodus</i>	T	E	Wide, flat, open sandy beaches
Upland sandpiper*	<i>Bartramia longicauda</i>	–	E	Native prairie and other dry grasslands
Gull-billed tern	<i>Gelochelidon nilotica</i>	–	E	Gravelly or sandy beaches
Least tern	<i>Sternula antillarum</i>	–	T	Estuaries, lagoons, sandy or gravelly beaches, and banks of rivers or lakes
Royal tern	<i>Thalasseus maximus</i>	–	E	Shoreline
Black skimmer	<i>Rynchops niger</i>	–	E	Open, sandy beaches or saltmarsh
Northern goshawk*	<i>Accipiter gentilis</i>	–	E	Various forest types, particularly mature forest
Short-eared owl*	<i>Asio flammeus</i>	–	E	Open prairie, meadows, marshes, and open woodland
Olive-sided flycatcher*	<i>Contopus cooperi</i>	–	E	Coniferous forest edges and openings
Sedge wren	<i>Cistothorus platensis</i>	–	E	Dense, tall sedges and grasses in wet meadows
Loggerhead shrike*	<i>Lanius ludovicianus</i>	–	E	Open or brushy areas
Blackburnian warbler*	<i>Dendroica fusca</i>	–	T	Forest, mixed woodlands
Mourning warbler*	<i>Oporornis philadelphia</i>	–	E	Forest, second-growth woodlands
Henslow's sparrow*	<i>Ammodramus henslowii</i>	–	T	Large, flat fields with no woody plants and standing dead vegetation
Bald eagle** †	<i>Haliaeetus leucocephalus</i>	–	–	Forested areas adjacent to large bodies of water
Reptiles and Amphibians				
Atlantic loggerhead turtle	<i>Caretta caretta</i>	T	T	Ocean, bays, lagoons, marshes, mouths of large rivers
Eastern narrow-mouth toad*	<i>Gastrophryne carolinensis</i>	–	E	Woodland habitat near bodies of water
Fish				
Atlantic sturgeon	<i>Acipenser oxyrinchus oxyrinchus</i>	E	E	Coastal rivers and estuaries
Invertebrates				
Frosted elfin*	<i>Callophrys irus</i>	–	E	Open woods and forest edges, fields, or scrub
Northeastern beach tiger beetle	<i>Cicindela dorsalis dorsalis</i>	T	E	Long, wide dynamic beaches

Common Name	Scientific Name	Federal Status	State Status	Habitat
Plants				
Devil's grandmother*	<i>Elephantopus tomentosus</i>	–	E	Mowed lawn beneath trees and utility rights-of way
Sandplain flax*	<i>Linum intercursum</i>	–	T	Mowed, dry sandy and clayey powerline right-of-way
Guadeloupe cucumber*	<i>Melothria pendula</i>	–	E	Mesic shrub thickets, woodland edge
Seaside knotweed	<i>Polygonum glaucum</i>	–	E	Beach at the drift line
Swamp wedgescale*	<i>Sphenopholis pensylvanica</i>	–	T	Stream floodplain with open canopy and fresh marsh associated with pond

Sources: NAS PAX 2013, MDNR 2010, USFWS 2014, NOAA 2014, CLO 2014

Notes:

* Potential habitat within or adjacent to the project area

** Potential transient within or adjacent to the project area.

† Protected under the Bald and Golden Eagle Protection Act.

Key: E = Endangered; T = Threatened

however, they have not been documented on the installation and prefer narrow beach habitat adjacent to cliffs, which does not occur in the project area (USFWS 2014).

NAS Patuxent River has documented three federally threatened animal species—the Atlantic loggerhead turtle (*Caretta caretta*), piping plover (*Charadrius melodus*), the northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*)—and one federally endangered distinct population segment of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*); however, the Atlantic loggerhead and Atlantic sturgeon have never been observed alive on the installation and the piping plover has only been documented once on the installation in the 1960s. Adult northeastern beach tiger beetles have been observed occasionally; however, no larval beetles have been found on the installation (NAS PAX 2013). Additionally, the northeastern beach tiger beetles are found on long beach habitat with low human and vehicular activity. No beach habitat is within the project area (USFWS 2014).

There are 14 state-listed threatened and endangered terrestrial animal species that are known to occur on NAS Patuxent River (see **Table 3-18**) (MDNR 2010). Frosted elfin butterflies (*Callophrys irus*) are associated with the horseflyweed plant (*Baptisia tinctoria*), which is found in the cleared antenna area north of Site 6. Horseflyweed has not been found in the old field area in Site 6. A historic record of the eastern narrow-mouthed toad (*Gastrophryne carolinensis*) was documented from a single call event near Site 7, but has never been substantiated. Bald eagles (*Haliaeetus leucocephalus*) are not formally listed under the ESA but are protected on the Bald and Golden Eagle Protection Act and the MBTA. There are two documented bald eagle nests, one along Pearson Creek and another along Goose Creek, approximately 3.3 and 3.9 miles (5.3 and 6.3 km respectively) northeast of the project area (NAS PAX 2013).

3.8.3 Environmental Consequences

Ground disturbance and noise associated with construction activities have the potential to cause direct or indirect adverse effects on biological resources. Effects can include disturbance, injury, or mortality of individual plants or animals, as well as habitat removal, damage, or degradation. The context and

intensity of the effects to determine whether they were significant were evaluated based on the nature and location of activities relative to important biological resources, the magnitude of the effects, the number of species or individuals involved, amount of habitat affected relative to the total available habitat within the region and the type of stressors involved.

3.8.3.1 Alternative 1 (EUL Sites 5, 6, and 7)

Vegetation. No significant impacts on vegetation would be expected from the temporary disturbances during construction and demolition activities (e.g., trampling, crushing, and removal) and from the permanent removal of vegetation from the construction of new facilities. Up to 7.4 acres (3.0 hectares) of upland forest, as well as scrub/shrub habitat, would be cleared from portions of EUL Sites 5, 6, and 7 to accommodate construction; however, the vast majority of forested and scrub/shrub lands on the installation would remain intact. The old field area within Sites 6 and 7 north of the Naval Air Museum would also be further developed (see **Figure 3-1**).

A variety of nonnative and invasive vegetation occurs throughout NAS Patuxent River, including small patches within each EUL Site under Alternative 1. Disturbances to the canopy or ground surface in the forested habitat could also allow opportunities for nonnative and invasive species to establish or spread within forested habitat. BMPs such as the following would be implemented during and following construction and demolition activities to prevent the establishment or spread of nonnative species:

- Inspect and clean construction equipment to remove soil, plants, and seeds
- Stage equipment in areas free of nonnative plant species
- Use certified weed-free materials (e.g., grass seed, mulch, gravel, sand).

In addition, disturbed sites could be promptly revegetated with native plant species. Large trees (i.e., those that are preferred dominant natives, such as oaks) would be preserved to the greatest extent possible.

Wildlife. Temporary impacts on wildlife would be expected due to noise disturbances from construction and demolition activities, which include heavy equipment use. Loud noise events could cause wildlife to engage in escape or avoidance behaviors; however, these effects would be temporary. Increases in ambient noise can reduce communication, inhibit predator detection, and increase energy expenditures in wildlife species. Noise can also distort or mask bird communications signals (e.g., songs, warning calls, fledgling begging calls) and their ability to find prey or detect predators. If noise persists in a particular area, animals could leave their habitat and avoid it permanently. Wildlife species occurring in the area would be expected to be habituated to high levels of noise due to their proximity to the airfield. Most wildlife species would be expected to recover quickly from noise disturbance once the construction activities have ceased for the day and after the construction and demolition period is complete. Noises associated with construction and demolition activities would only be expected to affect individual animals within close proximity to the noise sources. As a result, population-level impacts would not be expected to occur.

Habitat removed under Alternative 1 would include upland forest, scrub/shrub, and old field. The vast majority of available forest and scrub/shrub habitat on the installation would remain intact and displaced wildlife would be expected to move to adjacent habitat. Therefore, no significant impacts on wildlife habitat would be expected.

Impacts on wildlife could also be expected from injury or mortality of smaller, less mobile wildlife species (e.g., reptiles, amphibians, rodents) that cannot avoid construction and demolition equipment or from wildlife species that nest or live within trees (e.g., squirrels, opossums) that are removed.

Rare, Threatened, and Endangered Species. No federally threatened or endangered species have been identified in or adjacent to the project area; therefore, no effects on federally listed threatened or endangered species would be expected from Alternative 1. No state-listed species have been identified in the project area; however, state-listed species such as upland sandpiper, Henslow's sparrow, and frosted elfin are present on the installation and have the potential to occur in the project area. Temporary impacts on rare, threatened, and endangered terrestrial state-listed species could occur from noise and ground disturbing activities associated with construction and demolition activities. Rare, threatened, and endangered terrestrial species on NAS Patuxent River would likely be habituated to high noise levels associated with the airfield. The contribution of noise disturbances from construction and demolition activities under Alternative 1 to the ambient noise environment would be negligible and temporary. Habitat removal would be minor and would not preclude the use of habitat by any rare, threatened or endangered species. Although very unlikely, if a population of state-listed species were discovered within the project area, it would be protected from disturbance to the greatest extent practicable. Therefore, no significant impacts on rare, threatened, and endangered species would be expected under Alternative 1.

The MBTA and Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, require Federal agencies to minimize or avoid impacts on migratory birds listed in 50 CFR 10.13. Unless otherwise permitted by regulations, the MBTA makes it unlawful to (or attempt to) pursue, hunt, take, capture, or kill any migratory bird, nest, or egg. It is anticipated that Alternative 1 would not result in take under the MBTA or have any measureable negative impacts on migratory birds (e.g., decrease in population size, decrease in fitness, repetitive nest failure). No nesting migratory birds have been historically documented on the project site. However, food and shelter for MBTA species exists within the vicinity of EUL Sites 5, 6, and 7. Impacts on migratory birds from long-term habitat removal would be similar to those previously discussed for wildlife (e.g., forest would be removed). BMPs, which are discussed as follows for migratory birds, are recommended for avoidance of impacts on migratory bird species within the project area, particularly since habitat would be removed.

Nesting season in the project area for migratory birds typically occurs from mid-March through August, starting when migratory birds return to the installation and ending after all young have fledged. Construction and demolition activities should occur outside of that time period to avoid take of migratory birds. At a minimum, vegetation clearing should occur outside of the nesting season. If nesting migratory birds are found on the project site during construction or demolition, buffer areas would be established around nests. Activities would be deferred in buffer areas until birds have left the nest.

3.8.3.2 Alternative 2 (EUL Sites 6 and 7)

No significant effects on biological resources would occur from Alternative 2. Construction and demolition activities would be limited to EUL Sites 6 and 7. Impacts on biological resources would be similar to those described for Alternative 1. Vegetation removal and habitat degradation would occur; however, a decreased amount of upland forest (up to 3.3 acres [1.3 hectares]) would be removed because EUL Site 5 would not be used for development and the undeveloped portions of Sites 6 and 7 are primarily old field with small portions of forested and scrub/shrub habitat. As a result, grassland-dependent species would be impacted more than forested species under this alternative. All Federal and state regulations and BMPs described under Alternative 1 would be implemented under Alternative 2, as necessary.

3.8.3.3 No Action Alternative

The No Action Alternative would not result in significant changes in biological resources if the Proposed Action were not implemented. No construction or demolition activities associated with the proposed work campus would occur at NAS Patuxent River, and no changes in operations on the installation would

take place. Therefore, no impacts on biological resources would be expected and biological resources would remain as described in **Section 3.8.2**.

3.9 Water Resources

3.9.1 Definitions

Water resources are natural and man-made sources of water that are available for use by and for the benefit of humans and the environment. Hydrology concerns the distribution of water resources through the processes of evapotranspiration, atmospheric transport, precipitation, surface runoff and flow, and subsurface flow. Hydrology is affected by climatic factors such as temperature, wind direction and speed, topography, and soil and geologic properties.

Surface Water. Surface water resources generally consist of wetlands, lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale. Waters of the United States are defined under Section 404 of the Clean Water Act (CWA), as amended, as (1) traditional navigable waters, (2) wetlands adjacent to navigable waters, (3) nonnavigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow perennially or have continuous flow at least seasonally (e.g., typically 3 months), and (4) wetlands that directly abut such tributaries. Waters of the United States are regulated by the USEPA and the U.S. Army Corps of Engineers (USACE). Section 303(d) of the CWA requires that Maryland establish a list to identify impaired waters and establish Total Maximum Daily Loads (TMDLs) for the sources causing the impairment. A TMDL is the maximum amount of a substance that can be assimilated by a water body without causing impairment. A water body can be deemed impaired if water quality analyses conclude that exceedances of water quality standards, established by the CWA, occur.

The CWA (33 U.S.C. Section 1251 et. seq., as amended) establishes Federal limits, through the National Pollutant Discharge Elimination System (NPDES) program, on the amounts of specific pollutants that can be discharged into surface waters to restore and maintain the chemical, physical, and biological integrity of the water. The NPDES program regulates the discharge of point (i.e., end of pipe) and nonpoint sources (i.e., stormwater) of water pollution. The Maryland NPDES stormwater program requires construction site operators engaged in clearing, grading, and excavating activities that disturb 1 acre or more to obtain coverage under an NPDES permit for their stormwater discharges. Construction or demolition that necessitates a permit also requires preparation of a Notice of Intent to discharge stormwater and a Stormwater Pollution Prevention Plan (SWPPP) that is implemented during construction.

In 2010, the USEPA issued a Final Rule for the CWA concerning technology-based Effluent Limitations Guidelines and New Source Performance Standards for the Construction and Development point source category. All NPDES stormwater permits issued by the USEPA or states must incorporate requirements established in the Final Rule. As of 1 February 2010, all new construction (or demolition) sites that disturb 1 or more acres of land are required to meet the non-numeric effluent limitations and effective erosion and sedimentation controls must be designed, installed, and maintained.

To prevent adverse impacts from stormwater runoff, the State of Maryland has developed performance standards that must be met at development sites, which apply to any construction activity disturbing 5,000 ft² (465 m²) or more of earth, including those on Federal properties. An approved Erosion and Sediment Control Plan and stormwater management plan, per MDE's erosion and sediment control regulations (Code of Maryland Regulations [COMAR] 26.17.01, Erosion and Sediment Control) and stormwater management regulations (COMAR 26.17.02, Stormwater Management), would be required. Maryland's Stormwater Management Act of 2007 requires establishing a comprehensive process for

stormwater management approval and implementing Environmental Site Design (ESD) to the maximum extent practicable. ESD uses onsite stormwater management practices to conserve or restore natural site hydrology. In addition, Section 438 of the Energy and Independence and Security Act (42 U.S.C. Section 17094) establishes stormwater design requirements for Federal development and redevelopment projects. Under these requirements, Federal facility projects larger than 5,000 ft² (465 m²) must “maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.”

Wetlands and Floodplains. The USACE defines wetlands as “those areas that are inundated or saturated by surface or ground water 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. Wetlands generally include swamps, marshes, bogs, and similar areas” (USACE 1987). Wetlands are currently regulated by the USACE under Section 404 of the CWA as a subset of all “waters of the United States.” The term “waters of the United States” has a broad meaning under the CWA and incorporates deepwater aquatic habitats and special aquatic habitats, including wetlands. Jurisdictional waters of the United States regulated under the CWA include coastal and inland waters, lakes, rivers, ponds, streams, intermittent streams, and “other” waters that, if degraded or destroyed, could affect interstate commerce.

Section 404 of the CWA authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredge or fill into wetlands and other waters of the United States. Any discharge into waters of the United States requires a permit from the local District of the USACE (Baltimore). In the State of Maryland, the MDE Tidal/Non-Tidal Wetlands Division maintains a cooperative permit process with the USACE for Section 404 activities. The nature of regulated activities is broadly interpreted and might include filling, grading, clearing, grubbing, excavation, and driving piles. It should be considered that any activity within a jurisdictional wetland area requires a permit from the USACE and MDE. In addition to the USACE, the MDE issues Water Quality Certificates under Section 401 of the CWA. Water quality certification is required for most wetland disturbances.

Floodplains are areas of low-level ground present along rivers, stream channels, large wetlands, or coastal waters. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, and nutrient cycling. Floodplains also help to maintain water quality and are often home to a diverse array of plants and animals. In their natural vegetated state, floodplains slow the rate at which the incoming overland flow reaches the main water body.

Floodplains are protected under Executive Order 11988, *Floodplain Management*. If action is taken that encroaches within the floodplain and alters the flood hazards designated on a National Flood Insurance Rate Map (e.g., changes to the floodplain boundary), an analysis reflecting any changes must be submitted to the Federal Emergency Management Agency. Flood potential is evaluated by the Federal Emergency Management Agency, which defines the 100-year floodplain as the area that has a one percent chance of inundation by a flood event in a given year. Certain facilities inherently pose too great a risk to be in either the 100- or 500-year floodplain, such as hospitals, schools, or storage buildings for irreplaceable records. Federal, state, and local regulations often limit floodplain development to passive uses, such as recreational and preservation activities, to reduce the risks to human health and safety.

Groundwater. Groundwater is water that flows or seeps downward and saturates soil or rock, supplying springs and wells. Groundwater quality and quantity are regulated under several statutes and regulations, including the Safe Drinking Water Act.

3.9.2 Existing Conditions

Surface Water. NAS Patuxent River is surrounded by the Chesapeake Bay to the east and Patuxent River to the north. On-installation bodies of water include Pine Hill Run, Goose Creek, Pearson Creek,

Harper's Creek, and six constructed freshwater ponds. NAS Patuxent River also has several miles of intermittent and perennial headwater streams that have been altered through land-grading, ditching, and channeling (NAVFAC Washington 2012). None of the major water bodies are within the project area; however, approximately 375 feet (114 meters) of an unnamed stream is within the northwestern portion of EUL Site 5 (see **Figure 3-1**) (NAS PAX 2014). Site 5 is also approximately 1,000 feet (305 meters) south of Gardiner's Pond and 2,600 feet (793 meters) southwest of Sacawaxhit Pond. The nearest body of water to EUL Sites 6 and 7 is Sacawaxhit Pond, approximately 1,000 feet (305 meters) north of Site 6. Sites 5, 6, and 7; Gardiner's Pond; and Sacawaxhit Pond are part of watersheds that eventually drain into the Patuxent River (NAS PAX 2013).

Alterations to hydrology have occurred throughout the installation, particularly near the East and West Patuxent Basins. Gardiner's Pond was a tidal creek prior to being filled. Runoff from the installation discharges into the Patuxent River, Chesapeake Bay, freshwater creeks, and ponds near wetlands, with all runoff eventually draining into the Chesapeake Bay. EUL Sites 5, 6, and 7 are within the Patuxent River watershed and drainage from the sites generally flows north towards the river. Low-lying areas at the installation help collect runoff and control discharge rates and downstream flooding (NAS PAX 2013).

The Chesapeake Bay TMDL passed by the USEPA in December 2010 establishes a portion of the nitrogen, phosphorus, and sediment load for each state along the bay to meet the goal (USEPA 2010). The MDE has required all counties to establish two-year milestones detailing their progress with the TMDL. NAS Patuxent River details its milestones for review prior to inclusion in St. Mary's County plans (NAS PAX 2013). The lower Patuxent River, which is adjacent to the installation but not the project area, is on the CWA 303(d) list of impaired waters for nitrogen, phosphorus, total suspended solids, and polychlorinated biphenyls (PCBs) in fish tissue; however, TMDLs for these impairments have not been established (USEPA 2010).

Stormwater management is important to maintain healthy aquatic resources and water quality. There are several stormwater management facilities within EUL Sites 5 and 6 associated with the storm sewer system. NAS Patuxent River established a SWPPP in 2009 that includes BMPs to reduce and prevent pollutants in stormwater runoff from entering water bodies associated with the installation. (NAS PAX 2013).

Wetlands and Floodplains. Broad wetland categories have been identified at NAS Patuxent River and include forested wetlands, scrub/shrub wetlands, freshwater tidal marshes, nontidal marshes, saline marshes, and open water/emergent marshes. Wetland delineations were conducted at EUL Sites 5, 6, and 7 in 2013. EUL Site 5 has a 0.01-acre (0.004 ha) palustrine forested/scrub shrub wetland within the northwestern boundary of the site and a 0.04-acre (0.02 ha) palustrine emergent wetland bordering the perennial stream along the northwest boundary of the site. EUL Site 7 has a 0.05-acre (0.02 ha) isolated palustrine forested/emergent wetland on the eastern portion of the site. No wetlands or streams are present within EUL Site 6 (see **Figure 3-1**). A Jurisdictional Determination is currently being sought from USACE (HDR 2014).

The 100-year floodplain on NAS Patuxent River is associated with the major water bodies on the installation, including the Patuxent River, Chesapeake Bay, Pine Hill Run, Harper's Creek, Pearson Creek, and Goose Creek. Development within the 100-year floodplain is considered high risk. Federal floodplain management regulations apply. The 500-year floodplain could be flooded by severe, concentrated rainfall coupled with poor drainage systems but is considered a low risk area that does not require insurance (FEMA 2014). EUL Sites 5, 6, and 7 are not within the 100-year floodplain.

Groundwater. There are several aquifers that supply groundwater used for drinking water at NAS Patuxent River including the Piney Point/Nanjemoy, Aquia, and Patapsco aquifers. The Aquia aquifer provides approximately 75 percent of the water for the installation and is generally stable. The Patapsco

aquifer provides approximately 25 percent of the installation's potable water and is in danger of reaching 80 percent of capacity in 40 to 50 years. The Piney Point/Nanjemoy aquifer provides a negligible amount of water to the installation (NAVFAC Washington 2012). Water quality within the aquifers is good, characterized by high carbonates and low sulfate-chlorides and iron (NAS PAX 2013). The Piney Point/Nanjemoy aquifer is recharged through percolation since it is not exposed. The Aquia and Patapsco aquifers are recharged along their outcrops (USGS 2007). The recharge zones for these aquifers are approximately 25 to 75 miles north and northeast of the installation (NAS PAX 2012). All groundwater wells are regularly monitored by the installation Public Works Department according to state and Federal safe drinking water sampling analysis standards and requirements (NAS PAX 2013).

There are 24 potable water wells on NAS Patuxent River that range from 300 to 900 feet (91 to 273 meters) deep, with one within the project area and two adjacent to the project area. Two wells are near EUL Site 5, one approximately 500 feet (152 meters) southeast of the site near Building 2030, and another approximately 500 feet (152 meters) northeast of the site and just north of Buse Road. EUL Site 6 has one active potable well north of West Patrol Road and south of Building 536 along the southern boundary of the site (NAS PAX 2013).

3.9.3 Environmental Consequences

3.9.3.1 Alternative 1 (EUL Sites 5, 6, and 7)

Alternative 1 would not result in significant effects on water resources. All activities under Alternative 1 would avoid the water resources constraints shown in **Figure 3-1** where possible.

Surface Water. Alternative 1 would result in a net increase in impervious surface of approximately 621,000 ft² (57,694 m²) from construction of buildings and parking lots and structures at EUL Sites 5, 6, and 7. Impacts would be less intense, potentially to the amount of 357,000 ft² (33,167 m²) of total net new impervious surfaces, if parking structures were used on Sites 6 and 7 instead. Natural drainage flows would be altered because of the removal of vegetation and the additional buildings and pavement constructed within EUL Sites 5, 6, and 7. The increase in impervious surfaces could be greatly reduced through use of ESD. ESD would be used to maintain the predevelopment runoff characteristics after development has occurred and to reduce stream channel erosion, pollution, siltation and sedimentation, and local flooding. Per the *Maryland Stormwater Design Manual*, the post development 10-year storm event peak discharge off the project area must not exceed the predevelopment peak discharge (MDE 2009). After construction and demolition are complete, applicable LID stormwater BMPs and practices established by the MDE regulation for stormwater management and erosion and sediment control would be implemented to reduce the volume and velocity of stormwater runoff to predevelopment conditions and prevent sedimentation and the introduction of pollutants into the Patuxent River watershed.

Under Alternative 1, BMPs that are outlined in the installation SWPPP would be used to ensure that soils disturbed during construction and demolition activities do not pollute nearby water bodies. The post-development average annual groundwater recharge volume must be equal to the predevelopment recharge volume; however, the distribution of groundwater recharge across the project area would change (e.g., recharge would be concentrated in infiltration areas). These changes in drainage would be highly localized, site-specific, and negligible. Alternative 1 would require the development of an erosion and sediment control plan and a stormwater management plan per MDE's erosion and sediment control regulations (COMAR 26.17.01, *Erosion and Sediment Control*) and stormwater management regulations (COMAR 26.17.02, *Stormwater Management*). The *2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control* (MDE 2011) serve as the official guide for erosion and sediment control principles, methods, and practices. The erosion and sediment control plan would describe the measures implemented to prevent soil erosion during construction by stormwater runoff and to prevent

sedimentation of storm sewer or receiving streams. Stormwater management, including ESD, would be designed according to MDE's *Maryland Stormwater Design Manual*, as amended, and MDE's *Environmental Site Design Process and Computations* (MDE 2009, MDE 2010).

Construction and demolition personnel would follow appropriate BMPs to protect against potential petroleum or hazardous material spills. In the event of a spill or leak of fuel or other construction-related products, there could be adverse impacts on surface water quality. Construction and demolition equipment would be maintained according to the manufacturer's specifications and fuels and other potentially hazardous materials would be contained and stored appropriately. If a spill or leak were to occur, BMPs identified in the SWPPP would be implemented to contain the spill and minimize the potential for, and extent of, associated contamination.

Wetlands and Floodplains. The project area surrounding EUL Sites 5, 6, and 7 is not within the 100-year floodplain and represents a minimal flood hazard. EUL Sites 5 and 7 contain approximately 0.05 acre (0.02 ha) of wetlands per site. A Jurisdictional Determination is currently being sought from USACE for these wetlands. Impacts on jurisdictional wetlands and other waters of the U.S. would be avoided, if possible. If impacts on jurisdiction wetlands or other waters of the U.S. could not be avoided, a joint state/federal wetlands permit application would be prepared and submitted. All impacts on wetlands would be mitigated as required. Implementation and proper maintenance of an erosion and sediment control plan and stormwater management practices along with strict adherence to Federal and state permit requirements would minimize the potential for indirect impacts. No impacts on floodplains would be expected because the project area is not within the 100-year floodplain.

Groundwater. Alternative 1 would result in a maximum net increase of approximately 621,000 ft² (57,694 m²) in impervious surfaces for the work campus buildings and parking lots. BMPs established in the installation SWPPP would be implemented to maintain the average annual predevelopment groundwater recharge volume for the sites. This could be accomplished by infiltrating runoff from impervious surfaces back into the groundwater through the use of nonstructural (e.g., filter strips, vegetative buffers, sediment traps, and minimization of impervious surfaces) and structural (e.g., bioretention cells, green roofs, and pervious pavement) methods, if necessary.

A spill or leak of fuel or other construction-related products could impact groundwater quality. Construction equipment would be maintained according to the manufacturer's specifications and fuels and other potentially hazardous materials would be contained and stored appropriately. Construction and demolition personnel would follow appropriate BMPs to protect against potential petroleum or hazardous material spills. Good housekeeping, maintenance of equipment, and containment of fuels and other potentially hazardous materials would be conducted to minimize the potential for a release of these fluids into groundwater. No significant impacts on groundwater would be expected under Alternative 1.

3.9.3.2 Alternative 2 (EUL Sites 6 and 7)

Under Alternative 2, construction and demolition activities would be limited to EUL Sites 6 and 7, with up to 648,000 ft² (60,203 m²) increase in impervious surfaces for the work campus buildings and parking structures. Impacts would be less intense, potentially to the amount of 252,000 ft² (23,412 m²) of total net new impervious surfaces, if parking structures were used on Sites 6 and 7 instead. Groundwater and surface water impacts would be less than and more localized than those described under Alternative 1 due to all impacts occurring only on Sites 6 and 7. BMPs established in the installation SWPPP would be implemented to maintain the average annual predevelopment groundwater recharge volume for the site and to minimize the threat of a spill. ESD and LID measures would be used to maintain the predevelopment runoff characteristics after development has occurred and to reduce stream channel erosion, pollution, siltation and sedimentation, and local flooding.

The potential for impacts on jurisdictional wetlands totaling less than 0.1 acre (0.02 ha) could occur in conjunction with the construction and demolition associated with EUL Site 7; therefore a joint state/federal wetlands permit application for alteration of any tidal or nontidal wetland or other waters of the United States would be prepared and submitted. All impacts would be mitigated as required. EUL Sites 6 and 7 are not within the 100-year floodplain and represent a minimal flood hazard. No significant effects on water resources would occur under Alternative 2.

3.9.3.3 No Action Alternative

Under the No Action Alternative, an EUL would not be granted and construction and demolition activities associated with the proposed work campus could not be completed and no changes in operations on the installation would occur. No impacts on water resources would be expected and water resources would remain as described in **Section 3.9.2**.

3.10 Cultural Resources

3.10.1 Definitions

Cultural resources is an umbrella term for many heritage-related resources, including prehistoric and historic sites, buildings, structures, districts, objects, or any other physical evidence of human activity considered important to a culture, a subculture or a community. Cultural resources are protected by several Federal laws and regulations, including the National Historic Preservation Act (NHPA) (1966), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (1979), and the NAGPRA (1990). Cultural resources are commonly subdivided into archaeological resources (prehistoric or historic sites where human activity has left physical evidence of that activity but no structures remain standing), architectural resources (buildings or other structures or groups of structures that are of historic architectural, or other significance), and traditional cultural resources (for example, traditional gathering areas).

The NHPA defines historic properties as resources listed or eligible for listing in the NRHP. The NRHP is the official listing of properties significant in U.S. history, architecture, or prehistory, and includes both publicly and privately owned properties. The NRHP list is administered by the National Park Service. Historic properties might be buildings, structures, prehistoric or historic archaeological sites, districts, or objects that are generally 50 years of age or older, are historically significant, and that retain integrity that conveys this significance. More recent resources, such as Cold War-era buildings or structures, might warrant listing if they have the potential to gain significance in the future or if they meet “exceptional” significance criteria. Buildings are defined as a structure created to shelter any form of human activity and include houses, churches, barns, and other similar construction, while a structure is a functional construction that is made for purposes other than creating human shelter, such as a pier or a bridge.

Section 106 of the NHPA requires agencies, in consultation with the appropriate State Historic Preservation Office (SHPO) (or Tribal Historic Preservation Officer), to take into account the effect of their undertakings on historic properties that are within the proposed project’s area of potential effect (APE), which is defined as the geographic area(s) “within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.” Compliance with Section 106 is accomplished in accordance with 36 CFR 800, regulations of the Advisory Council on Historic Preservation. Federally recognized Native American tribes are consulted in accordance with Executive Order 13175, *Consultation and Coordination With Indian Tribal Governments* (November 9, 2000) to develop ongoing relationships with the tribes on a government-to-government basis. Project-specific consultation with federally recognized Indian tribes is carried out pursuant to Section 106 of the NHPA, NEPA, and other authorities. No federally recognized tribes with historic ties have interests at NAS Patuxent River.

The Navy's cultural resources policy guidance is found in OPNAV-M 5090.1 (DoN 2014a) and OPNAVINST 11010.20H (DoN 2014b). Specifically, OPNAV-M 5090.1 states that "it is Navy policy to incorporate cultural resources planning and management considerations in all aspects" of the Navy's mission.

3.10.2 Existing Conditions

Early evidence of the first residents of Cedar Point, as the NAS Patuxent River land was known, consists of Archaic period archaeological sites (between 3,000 and 10,000 years ago) and Woodland period archaeological sites (3,000 years ago to 1634). By the time English settlers arrived in Maryland in 1634, the population of native Algonquian-speaking peoples had been decimated. In 1637, Jesuits established a settlement near Cedar Point later known as "Mattapanient Hundred." Successful tobacco production encouraged further settlement, and in 1663 Henry Sewall established Mattapany-Sewall Manor on Cedar Point. After Sewall's death, Colonial Governor Charles Calvert used Mattapany-Sewall Manor as his primary residence for several years, but the Sewall family eventually reacquired the plantation. By 1824, Cedar Point had a church, a mill, a boat landing, and a road system. The region remained rural and agricultural during the early 19th century, but, after the Civil War, oystering, canneries, and market gardening replaced tobacco farming. In 1937, the Navy had five aircraft testing sites at different installations, so to consolidate aircraft testing activities, the U.S. Navy Bureau of Aeronautics considered Cedar Point at the mouth of the Patuxent River as an aircraft testing site. In September 1941, a Navy board again looked at proposed sites, and in November the board recommended the selection of Cedar Point as the site of a Navy Flight Test Center. In December 1941, the Secretary of the Navy approved the site, land was purchased, and construction began in April 1942. In June 1942, the installation was named Naval Air Station Patuxent River. Commissioned in April 1943, NAS Patuxent River developed into the primary center for the research, development, testing, acquisition, and evaluation of naval aircraft. NAS Patuxent River has expanded to include the main installation, three major annexes (Webster Field, Navy Recreation Center Solomons, and Bloodsworth Island Range), and several small ancillary properties (NAVFAC Washington 2011).

Archaeological Resources. Since 1980, more than 50 archaeological surveys or archaeological site investigations have been conducted at NAS Patuxent River, and most of the main installation has been surveyed. A total of 129 archaeological sites have been identified, although not all archaeological resources have been evaluated for NRHP eligibility. Archaeological site 18ST390 (Mattapany-Sewall Site) is listed in the NRHP and six additional archaeological sites have been determined eligible for listing in the NRHP (NAVFAC Washington 2011). Although much of the main installation is highly developed, it includes and retains great potential for significant archaeological resources.

Architectural Resources. All of the built resources on the main installation at NAS Patuxent River constructed before 1965 have been surveyed and evaluated for NRHP eligibility; some of the late Cold War-era resources also have been evaluated for NRHP eligibility. Nine resources on the installation are individually eligible for listing in the NRHP, include five hangars built during the 1940s, the 1943 Administration Building, St. Nicolas Church (constructed in 1915) and cemetery, Firehouse No. 2 (1944), and the Frank Knox School (1944) (see **Table 3-19**). In addition to the building surveys, a 2009 historic landscape study recommended several elements of the landscape as eligible for listing in the NRHP as contributing features of other NRHP-eligible resources. The flagpole and drill field contribute to the adjacent Administration Building and St. Nicolas Cemetery contributes to St. Nicolas Church. The taxiways contribute to the Radio Test Landplane Concrete Hangar, the Electronics Test Shielded Hangar, and the two Naval Air Transport Service (NATS) Seaplane Hangars. The West Patuxent Seaplane Basin contributes to the third NATS Seaplane Hangar (NAVFAC Washington 2011).

Table 3-19. Architectural Resources Individually Eligible for Listing in the NRHP

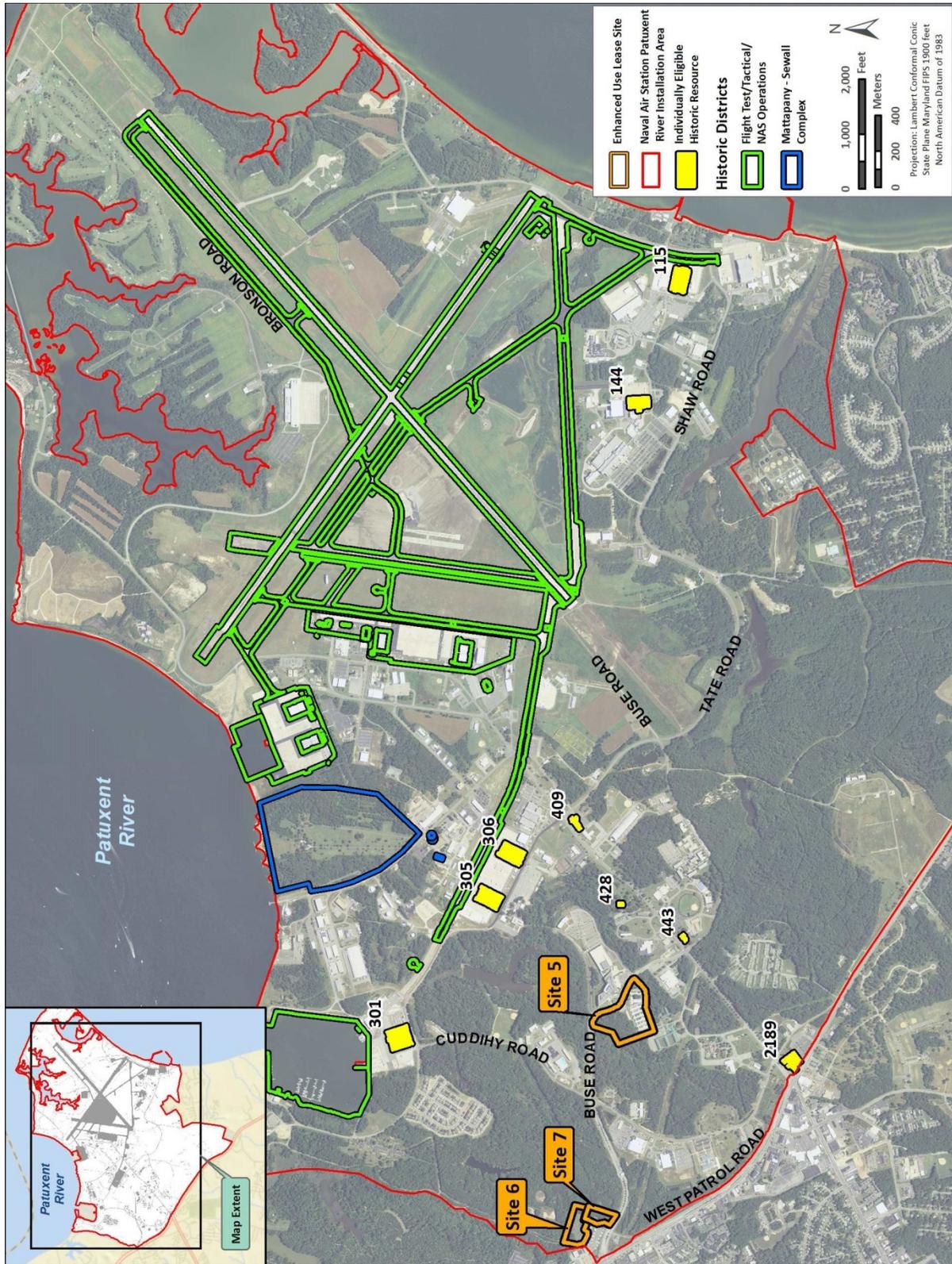
Building Number	Facility Name	Year Built	Associated NRHP-Eligible Landscape Features
115	Radio Test Landplane Concrete Hangar	1944	Taxiways
144	Electronics Test Shielded Hangar	1949	Taxiways
301	NATS Seaplane Hangar	1943	West Patuxent Seaplane Basin (Building 1174)
305	NATS Seaplane Hangar	1943	Taxiways
306	NATS Seaplane Hangar	1943	Taxiways
409	Administration Building	1943	Flag Pole (Building 844) Drill Field (Building 2427)
428	St. Nicolas Church	1915	St. Nicolas Cemetery
443	Firehouse No. 2	1944	None
2189	Frank Knox School	1944	None

Source: NAVFAC Washington 2011

Three historic districts at NAS Patuxent River have been determined eligible for listing in the NRHP, including the Armament Test/Electronics Test/Weapons Test Historic District (originally named the Armament Test Historic District and updated in 2005), the Flight Test/Tactical Test/NAS Operations Historic District, and the Mattapany-Sewall Complex Historic District. The Mattapany-Sewall Complex Historic District, sited on the Patuxent River, roughly between the East Patuxent River Seaplane Basin and the West Patuxent River Seaplane Basin, includes a circa 1740 house, eight ancillary structures, and the surrounding landscape that contribute to the district. The Armament Test/Electronics Test/Weapons Test Historic District is significant “for its association with the primary mission of NAS Patuxent River during World War II and the early Cold War period” (1943–1965) and for its “resources whose design is specific to, and particularly illustrative of, the testing facilities that supported the activities of the Armament Test Division in these decades.” This historic district includes a parcel on Chesapeake Bay and the installation’s runways and taxiways. The Flight Test/Tactical Test/NAS Operations Historic District, a divided NRHP-eligible district, is significant for its association with the primary mission of NAS Patuxent River during World War II and the early Cold War period (1943–1965). This district overlaps with the Armament Test/Electronics Test/Weapons Test Historic District (NAVFAC Washington 2011) (see **Figure 3-2**).

3.10.2.1 EUL Site 5

EUL Site 5 is in an area that has been surveyed for archaeological sites, and none have been identified on that parcel. There are eight buildings on EUL Site 5 and although these buildings were constructed between 1943 and 1948, all have been determined not eligible for listing in the NRHP. EUL Site 5 is not within any of the NRHP-eligible historic districts on the installation. The APE for EUL Site 5 includes both the 15.4 acres (6.2 ha) that would be directly disturbed as well as the viewshed of the potential buildings. Directly across the street to the east from EUL Site 5 is Building 2272 (see **Figure 3-3**), a multi-story office building, and Building 2273, an accompanying three-story parking structure (see **Figure 3-4**). Both were constructed in 1997. Within the viewshed southwest of EUL Site 5 is Building 406 (Visitor’s Quarters) constructed in 1946 and determined not eligible for listing in the NRHP. There are 200 feet (61 meters) of forested areas that obscure the view from Building 1370 southeast of EUL Site 5. Building 1370, the Naval Medical Clinic, opened in 1969 and has not been evaluated for NRHP eligibility. Forests also obscure the view southeast toward Building 405, which was constructed as a Mess Hall in 1943 and determined not eligible for listing in the NRHP (NAVFAC Washington 2011).



Sources: ESRI StreetMap USA, 2010; Naval Air Station Patuxent River, Maryland Department of Planning, and HDR.

Figure 3-2. Cultural Resources on NAS Patuxent River



Figure 3-3. Building 2272, View from the South.



Figure 3-4. View toward Building 2273, Facing East.

3.10.2.2 EUL Sites 6 and 7

EUL Sites 6 and 7 are on the western side of NAS Patuxent River, adjacent to the Naval Air Museum and a wooded area. EUL Sites 6 and 7 are in an area that has been surveyed for archaeological sites, and none have been identified on those parcels. There is only one building on EUL Site 6 and no buildings on EUL Site 7. Building 536, on EUL Site 6, a pump house constructed in 1943, has been determined not eligible for listing in the NRHP (see **Figure 3-5**). EUL Sites 6 and 7 are not within any of the NRHP-eligible historic districts. The APE for the contiguous EUL Sites 6 and 7 includes both the 7.5 acres (3.0 ha) that could be directly disturbed and the viewshed of the proposed EUL work complex buildings. Because of the sites' wooded surroundings, the viewshed is more restricted. The viewshed includes the current Naval Air Museum buildings (see **Figure 3-6**) which are not historic-age. Construction of a new visitor's center for the museum has begun. The museum includes a paved area with aircraft displays. The nearest building to the north, through over 800 feet (244 meters) of forested areas, is Building 2653, the H/F Land Comm Building, a small structure constructed in 2003. This building is not visible from EUL Sites 6 and 7. The viewshed to the south includes Building 2389, the North Gate Pass Office constructed in 1996 (NAVFAC Washington 2011). The view of the nearest building to the southeast, the naval exchange gas station constructed in 1996, is obscured by dense forested areas.



Figure 3-5. Building 536, Facing West



Figure 3-6. View of the Naval Air Museum, Facing South from EUL Site 7

3.10.3 Environmental Consequences

Impacts on cultural resources include potential effects on historic properties, cultural items as defined in the NAGPRA, archaeological resources as defined by the Archaeological Resources Protection Act of 1979, and archaeological artifact collections and associated records as defined by 36 CFR § 79.

Potential effects on historic properties are categorized by criteria established by Section 106 of the NHPA and its implementing regulations (36 CFR § 800). They are as follows:

- “No Historic Properties Affected” is defined as no historic properties present or that there are historic properties present but the undertaking would have no effect upon them as defined in 36 CFR § 800.16(i).
- “No Adverse Effect” is defined as when the undertaking’s effects do not meet the Criteria of Adverse Effect or the undertaking is modified or conditions are imposed to avoid adverse effects. A proposed action results in a “No Adverse Effect” determination when the impacts on a historic property are minimal but do not completely alter the historic characteristics that qualify it for eligibility in the NRHP.

- “Adverse Effect” is defined as when the undertaking could alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that could have been identified subsequent to the original evaluation of the property’s eligibility for the National Register.

The Navy has initiated the Section 106 process for the EUL project and consultation is ongoing.

3.10.3.1 Alternative 1 (EUL Sites 5, 6 and 7)

There are no NRHP-listed or -eligible resources on EUL Sites 5, 6, or 7; therefore, there would be no direct effect on historic properties. Furthermore, EUL Sites 5, 6, and 7 are over 3,000 feet (915 meters) from any of the NRHP-eligible historic districts and are not visible from any of those districts. The proposed construction at EUL Site 5 or EUL Sites 6 and 7 would not be expected to exceed the height of Buildings 2272 or 2273, which are modern multi-story structures east of EUL Site 5.

NRHP-eligible Firehouse No. 2 (Building 443) is approximately 1,100 feet (335 meters) from EUL Site 5 (**Figure 3-7**). The viewshed from Firehouse No. 2 toward EUL Site 5 is almost entirely obscured by Building 500 (constructed in 1998) and equipment (see **Figure 3-8**). Additionally, the viewshed north from Firehouse No. 2 has already been altered by the construction in 1997 of Buildings 2272 and 2273, a multi-story office building and parking structure. Therefore, the proposed use of EUL Site 5 would have no effect on Firehouse No. 2.

EUL Site 5 is over 1,300 feet (396 meters) southeast of the NRHP-eligible St. Nicholas Church (Building 423) (see **Figure 3-9**) and its accompanying cemetery, but the site is not visible from the church or cemetery (see **Figure 3-10**). Therefore, there would be no effect on St. Nicholas Church and cemetery.

EUL Sites 6 and 7 are over 4,500 feet (1,372 meters) from any of the resources that are individually eligible for listing in the NRHP. Therefore, there would be no effect on historic properties.

Should inadvertent discovery of archaeological or Traditional Cultural Properties resources occur during construction and demolition activities, work would cease and NAS Patuxent River would implement Standard Procedure 5: Emergency Procedures for Unexpected Archaeological Discoveries as outlined in the NAS Patuxent River Integrated Cultural Resources Management Plan (NAVFAC Washington 2011).

3.10.3.2 Alternative 2 (EUL Sites 6 and 7)

There are no NRHP-listed or -eligible resources within the APE for EUL Sites 6 or 7 including the viewshed; therefore, there would be no direct effect on historic properties from Alternative 2. Furthermore, as discussed under Alternative 1, EUL Sites 6 and 7 are not visible from any of the NRHP-eligible historic districts. Should inadvertent discovery of archaeological or Traditional Cultural Properties resources occur during this proposed undertaking, work would cease and NAS Patuxent River would implement Standard Procedure 5: Emergency Procedures for Unexpected Archaeological Discoveries as outlined in the NAS Patuxent River Integrated Cultural Resources Management Plan (NAVFAC Washington 2011).

3.10.3.3 No Action Alternative

Existing conditions would remain the same as described in **Section 3.10.2**. Therefore, no effects on cultural resources would occur.



Figure 3-7. Firehouse No. 2



Figure 3-8. View from Firehouse No. 2 north toward EUL Site 5.



Figure 3-9. St. Nicholas Church (Building 428).



Figure 3-10. View to the northwest and EUL Site 5 from St. Nicholas Church.

3.11 Hazardous Materials and Waste

3.11.1 Definitions

Hazardous Materials, Hazardous Wastes, and Petroleum Products. Hazardous materials are defined by 49 CFR § 171.8 as “hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR § 172.101), and materials that meet the defining criteria for hazard classes and divisions” in 49 CFR § 173.

Hazardous wastes are defined by the RCRA at 42 U.S.C. § 6903(5), as amended by the Hazardous and Solid Waste Amendments, as: “a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.” Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes and their associated regulatory requirements are specified in 40 CFR § 273.

Asbestos-Containing Materials. Asbestos is the generic term used to describe a group of naturally occurring silicate minerals that have the ability to separate into small, fine fibers. Asbestos has been used in building materials and is commonly found in older buildings (i.e., those constructed prior to 1980). Asbestos exists in a variety of forms and can be found in floor tiles, floor tile mastic, roofing materials, joint compound, wallboard, thermal system insulation, and boiler gaskets. Asbestos is regulated by the USEPA. Section 112 of the CAA regulates emissions of asbestos fibers to ambient air. Asbestos-containing materials at Navy facilities are managed in accordance with OPNAVINST 5100.23G, *Navy Safety and Occupational and Health Program Manual*.

Lead-Based Paint. Lead is a heavy, ductile metal commonly found simply as metallic lead or in association with organic compounds, oxides, and salts. The federal government banned the use of most lead based paint (LBP) in 1978; therefore, all buildings constructed prior to 1978 are assumed to contain LBP. The Residential LBP Hazard Reduction Act of 1992, Subtitle B, Section 308 (commonly called Title X), passed by Congress on 28 October 1992, requires federal agencies to comply with applicable federal, state, and local laws relating to LBP activities and hazards.

Polychlorinated Biphenyls. Polychlorinated biphenyls are man-made chemicals that persist in the environment and were widely used in construction materials and electrical products prior to 1978. Congress banned the manufacture and use of PCBs in 1976, and PCBs were phased out in 1978, except in certain limited uses. PCBs could be present in light ballasts; transformers; and caulk used in windows, door frames, masonry columns, and other masonry building materials in many buildings built or renovated between 1950 and 1978. The USEPA is concerned about the potential for building occupants to become exposed to PCBs, because PCBs can migrate from the caulk into air, dust, surrounding materials, and soil (USEPA 2011).

Radon. Radon is a naturally occurring radioactive gas found in soils and rocks. Radon has the tendency to accumulate in enclosed spaces that are usually below ground and poorly ventilated (e.g., basements). Radon is an odorless, colorless gas that has been determined to increase the risk of developing lung cancer. In general, the risk increases as the level of radon and length of exposure increase.

Environmental Restoration Program. The DoD established the ERP in 1975 to address hazardous waste sites on military property. The mission of the ERP is to identify, characterize, and clean up contamination

on military installations resulting from formerly accepted use and disposal practices of hazardous waste to protect human health and the environment. Depending upon the circumstances, ERP sites are identified, investigated, and cleaned up in accordance with RCRA, the Comprehensive Environmental Response, Compensation, and Liability Act, or with an integrated approach based on both laws.

3.11.2 Existing Conditions

Hazardous Materials, Hazardous Wastes, and Petroleum Products. Everyday activities at the installation require the use, handling, and storage of hazardous materials and petroleum products, including oils, lubricants, cleaners, hydraulic fluids, pesticides, and liquid fuels (i.e., gasoline, jet propellant-8, and diesel). The primary hazardous materials storage facilities include Buildings 619, 653, 666, 1693, 2101, and 2385 (NAVFAC Washington 2012); however, lesser, local storage areas are found throughout the installation. Industrial activities also generate various quantities of hazardous and petroleum wastes, such as used oils, waste fuels, lubricants, hydraulic fluids, paint, paint thinners, cleaners, degreasers, solvents, and batteries. The installation has one central hazardous waste storage warehouse at Building 619 and 49 satellite accumulation areas (NAVFAC Washington 2012). Hazardous wastes generated at the installation are managed in accordance with the installation's Regulated Waste Management Plan (NAS PAX 2011).

There are no hazardous material, petroleum product, or hazardous waste storage areas at any of the EUL sites. Building 436, the Environmental Health Center near EUL Site 5, may generate small amounts of medical waste such as used bandages, syringes, swabs, etc.

ACM, LBP, and PCBs. Buildings 433 to 440 and 462 on Site 5 and Building 536 on Site 6 were constructed in the 1940s and in use before the use of ACM, LBP, and PCBs were phased out, and could therefore possibly contain these materials.

Radon. The USEPA has established a guidance radon level of 4 picoCuries per liter (pCi/L) in indoor air for residences. Radon gas accumulations greater than 4 pCi/L are considered to represent a health risk to occupants. St. Mary's County, Maryland, is designated by the USEPA to be Radon Zone 2, which has a predicted average indoor radon screening level between 2 and 4 pCi/L (USEPA 2012).

Environmental Restoration Program. There are 46 ERP sites on the installation. None of the EUL sites are located on or adjacent to an ERP site.

3.11.3 Environmental Consequences

3.11.3.1 Alternative 1 (EUL Sites 5, 6, and 7)

Hazardous Materials, Hazardous Wastes, and Petroleum Products. No significant impacts from hazardous materials, hazardous wastes, and petroleum products would occur. The proposed construction and demolition activities would require the delivery and use of minimal amounts of hazardous materials and petroleum products and would generate minimal amounts of hazardous and petroleum wastes. Contractors would be responsible for the management of hazardous materials, hazardous wastes, and petroleum products during construction, demolition, and maintenance activities. These products would be handled in accordance with Federal, state, and local regulations and would not be expected to increase the risks of exposure to workers and the public.

Operation of the proposed office buildings and parking facilities would not significantly increase the long-term (i.e., post demolition and construction) use of hazardous materials and petroleum products or increase the amounts of hazardous wastes generated at the installation. Minor amounts of these materials

would be expected to be used or generated from facility maintenance and upkeep. These products would be handled in accordance with Federal, state, and local regulations and would not be expected to increase the risks of exposure to workers and the public.

ACM, LBP, and PCBs. Appropriate surveys for these materials would be taken prior to demolition activities. In accordance with Navy policies and procedures, demolition plans would be reviewed by installation personnel to ensure that appropriate measures are taken to reduce the potential exposure to and release of these materials. Any waste generated from demolition that contains ACM, LBP or PCBs would be disposed of at USEPA-approved landfills.

Radon. Based on the indoor radon screening level in St. Mary's County, it is unlikely that radon would be encountered inside of the buildings proposed for construction; therefore, no significant impacts would occur from radon.

Environmental Restoration Program. None of the installation's ERP sites would be disturbed during construction or demolition. However, if any contaminated soil was discovered during demolition or construction, the contractor would immediately stop work, report the discovery to the installation, and implement appropriate safety measures. Demolition or construction would not commence until the issue was investigated and resolved.

3.11.3.2 Alternative 2 (EUL Sites 6 and 7)

Impacts under Alternative 2 would be similar to those described for Alternative 1. There would be two fewer building demolitions, which would reduce the amount of hazardous waste generated (i.e., ACM, LBP and PCBs) when compared to Alternative 1.

3.11.3.3 No Action Alternative

The No Action Alternative would result in the continuation of the existing hazardous materials and wastes conditions as described in **Section 3.11.2**. ACMs, LBP, and PCBs could still be present within buildings at Sites 5 and 6, but no impacts would be expected if these materials remain undisturbed.

3.12 Socioeconomics and Environmental Justice

3.12.1 Definitions

Socioeconomics. Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly characteristics of population and economic activity. Demographics, employment characteristics, and housing occupancy status data provide key insights into socioeconomic conditions that might be affected by a proposed action.

Environmental Justice. EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that Federal agencies' actions substantially affecting human health or the environment do not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. EO 12898 was created to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, tribal, and local programs and policies.

Consideration of environmental justice concerns includes race, ethnicity, and the poverty status of populations in the vicinity of a proposed action. Such information aids in evaluating whether a proposed action would render vulnerable any of the groups targeted for protection in the EO.

Protection of Children from Environmental Health and Safety Risks. EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, states that each Federal agency “(a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and (b) shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.”

3.12.2 Existing Conditions

For the purposes of this socioeconomic analysis, three different spatial levels are used: (1) the Region of Influence (ROI), defined as Calvert, Charles, and St. Mary’s counties surrounding NAS Patuxent River (which resides in St. Mary’s County); (2) the State of Maryland; and (3) the United States.

The ROI best illustrates the socioeconomic characteristics for the areas adjacent to the installation and the geographic areas where most impacts from the Proposed Action would occur. Calvert, Charles, and St. Mary’s counties represent the areas that would be directly affected by the Proposed Action; therefore, they are included in the analysis. Data for the State of Maryland provide baseline comparisons for the ROI. Data for the United States are included to provide an additional baseline level for comparison.

Demographics. 2000 and 2010 population data for the analyzed spatial levels are presented in **Table 3-20**. Five-year estimates from 2008 to 2012 are provided to offer a more precise estimate of current conditions. All of the spatial levels have population increase rates considerably higher than the United States baseline since 2000. Population growth within the ROI, and particularly St. Mary’s County, has grown considerably due to its proximity to the Washington, D.C., area, its high percentage of high-tech employment, and the relative abundance of military and Federal organizations (St. Mary’s DECD 2010; Charles County 2011).

Table 3-20. Population Estimates for Spatial Levels in 2000, 2010, and 2012

Location	2000	2010	2012*	Percent Change 2000 to 2010	Percent Change 2000 to 2012*
Calvert County	74,563	88,737	88,774	16.0	16.0
Charles County	120,546	146,551	147,107	17.7	18.0
St. Mary’s County	86,211	105,151	105,528	22.0	22.4
ROI Summary	281,320	340,439	341,409	17.3	17.7
Maryland	5,296,486	5,773,552	5,785,496	9.0	9.2
United States	281,421,906	308,745,538	309,138,711	9.7	9.8

Sources: U.S. Census Bureau 2000, U.S. Census Bureau 2010, U.S. Census Bureau 2012a

Note: *2012 data represents 5-year estimates from 2008 to 2012 and are meant to provide a more precise estimate of current conditions across all spatial levels.

Housing data indicate that vacant housing units within the ROI number approximately 11,173 (8.6 percent) of all housing units, with 2,877 vacant units in Calvert County, 4,204 vacant units in Charles County, and 4,092 vacant units in St. Mary’s County. The State of Maryland (10.1 percent) and the United States (12.5 percent) have vacancy numbers higher than those within the ROI (see **Table 3-22** for a summary of vacant housing data).

Table 3-21. Vacant Housing Units in the United States, Maryland, and St. Mary's County, Maryland (2008 - 2012)

Location	Total Units	Vacant Units	Percentage Vacant
Calvert County	33,793	2,877	8.5%
Charles County	55,049	4,204	7.6%
St. Mary's County	41,444	4,092	9.9%
ROI Summary	130,286	11,173	8.6%
Maryland	2,378,932	240,126	10.1%
United States	131,642,457	16,415,655	12.5%

Source: U.S. Census Bureau 2012b

Employment Characteristics. The total workforce within the ROI is approximately 171,900 people (U.S. Census Bureau 2012c). As of 2012, approximately 2 percent of the workforce in the ROI is employed in the armed forces, much higher than Maryland (0.6 percent) or the United States (0.5 percent) due to the relative abundance of military installations. Public administration is the most abundant occupation within the ROI; however, education, health, and social services are slightly higher in Calvert and St. Mary's counties. The most common occupations within Maryland and the United States are education, health, and social services, with slightly more emphasis on these positions and less emphasis on public administration than within the ROI (U.S. Census Bureau 2012c). **Table 3-22** presents information regarding employment by industry from 2008 to 2012.

Annual unemployment rates within the ROI have been consistently below and well below the state and national percentages, respectively (see **Figure 3-11**). Annual unemployment between 2004 and 2014 has ranged between a low of 2.8 percent for Charles County in 2007 to a high of 6.8 percent for St. Mary's County in 2010. These numbers contrast lows of 3.4 percent unemployment for Maryland in 2007 and 4.6 percent for the United States in 2007 and 2008 to highs of 7.9 and 9.6 percent unemployment in Maryland and the United States respectively, both in 2010 (BLS 2013).

Environmental Justice and Protection of Children. Within the ROI, Calvert (80 percent) and St. Mary's (77 percent) counties have relatively high white populations compared to Charles County (49 percent), the State of Maryland (55 percent), and the United States (64 percent). Calvert (14 percent) and St. Mary's (13 percent) counties have Black or African American populations similar to the national population (12 percent). Maryland (29 percent) and Charles County (40 percent) have Black or African American populations well above the national data (see **Table 3-23**). Asian and Hispanic or Latino populations are generally much lower in the ROI than Maryland and United States populations (U.S. Census Bureau 2012a).

Median household income between 2008 and 2012 within the ROI is well above the national median (\$53,046) and Maryland median (\$72,999), with Calvert, Charles, and St. Mary's counties median incomes at \$92,395, \$93,063, and \$85,032, respectively. Families living below the poverty line are similarly low within the ROI, with Calvert (3.4 percent), Charles (4.9 percent), and St. Mary's (5.4 percent) counties well below the national (10.9 percent) and state (6.5 percent) rates.

The percentage of children representing the total population (i.e., individuals under 18 years of age) living within the ROI is 26 percent, slightly higher than the United States (24 percent) and the State of Maryland (23 percent) (U.S. Census Bureau 2012c). The nearest housing areas with populations of children are at least 0.25 miles away from the EUL sites under consideration.

Table 3-22. Employment Characteristics by Industry for 2008 to 2012

Industry	Calvert County	Charles County	St. Mary's County	ROI Summary	Maryland	United States
Percent of civilian population 16 years old and over in the labor force	69.9	71.2	66.8	69.5	69.0	64.2
Percentage of Employed Persons in the Armed Forces	1.3	1.2	3.3	1.9	0.6	0.5
Agriculture, forestry, fishing and hunting and mining	0.4	0.2	0.8	0.4	0.5	1.9
Construction	10.8	8.2	8.6	9.0	7.0	6.5
Manufacturing	4.3	3.1	4.7	3.9	5.1	10.6
Wholesale Trade	2.2	1.9	1.3	1.8	2.1	2.8
Retail Trade	10.0	10.4	9.8	10.1	9.7	11.6
Transportation and warehousing, and utilities	5.6	6.2	4.7	5.6	4.4	5.0
Information	2.4	1.8	1.5	1.9	2.4	2.2
Finance, insurance, real estate, and rental and leasing	4.0	4.6	3.3	4.1	6.4	6.7
Professional, scientific, management, administrative, and waste management services	11.7	14.0	16.2	14.0	14.9	10.7
Education, health, and social services	19.9	16.9	18.4	18.2	23.0	22.9
Arts, Entertainment, recreation, accommodation, and food services	8.2	6.8	7.4	7.4	7.8	9.2
Other services (except public administration)	5.0	5.2	5.1	5.1	5.4	4.9
Public administration	15.5	20.7	18.2	18.5	11.2	4.9

Source: U.S. Census Bureau 2012c

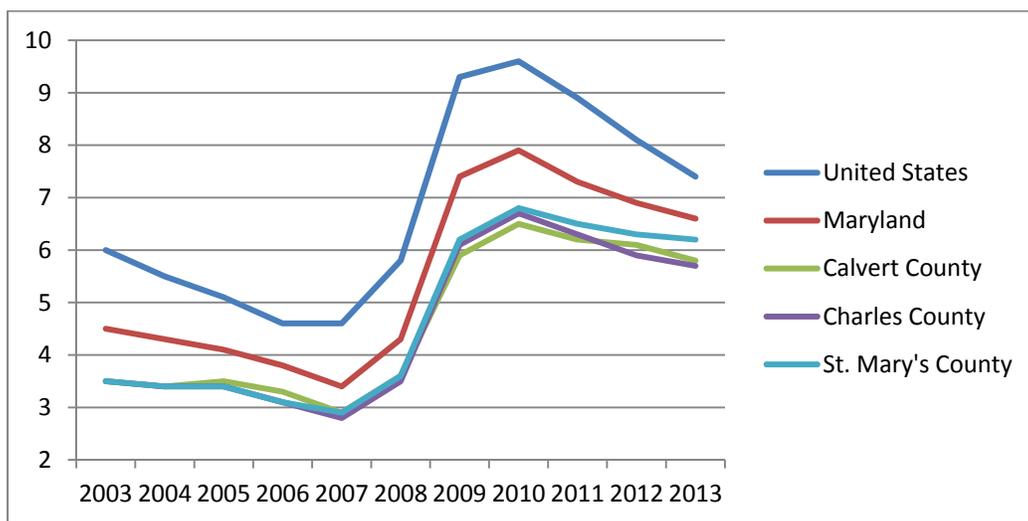


Figure 3-11. Unemployment Data among Socioeconomic Spatial Levels

Table 3-23. Race, Ethnicity, and Poverty Characteristics in the United States, Maryland and St. Mary's County, Maryland (2008–2012)

Race and Origin	Calvert County	Charles County	St. Mary's County	ROI Summary	Maryland	United States
Total Population	88,774	147,107	105,528	341,409	5,785,496	309,138,711
Percent Under 18 Years of Age	26	26.3	26	26.1	23.3	23.9
Percent over 65 Years of Age	11.0	9.6	10.4	10.2	12.4	13.2
Percent White	79.7	48.5	76.5	65.5	54.7	63.7
Percent Black or African American	13.6	40.3	13.4	25.0	29.0	12.2
Percent American Indian and Alaska Native	0.2	0.8	0.3	0.5	0.2	0.7
Percent Asian	1.3	3.3	2.3	2.5	5.6	4.8
Percent Native Hawaiian and Other Pacific Islander	0.0	0.0	0.0	0.0	0	0.2
Percent Other Race	0.0	0.1	0.1	0.1	0.2	0.2
Percent Two or More Races	2.4	2.7	3.5	2.9	2.2	2.0
Percent Hispanic* or Latino	2.8	4.4	3.8	3.8	8.2	16.4
Median Household Income	\$92,395	\$93,063	\$85,032	N/A	\$72,999	\$53,046
Percent of Families Living Below Poverty	3.4	4.9	5.4	4.7	6.5	10.9

Source: U.S. Census Bureau 2012c; U.S. Census Bureau 2012a

Key: * = Percent Hispanic of any race.

3.12.3 Environmental Consequences

Socioeconomics. The significance of socioeconomic effects is assessed in terms of direct and indirect effects on the local economy and related effects on other socioeconomic resources (e.g., income, housing, and employment). The magnitude of potential effects can vary greatly, depending on the location of a proposed action. For example, implementation of an action that creates 10 employment positions might be unnoticed in an urban area, but could have significant effects in a rural community.

Environmental Justice. Ethnicity and poverty data are examined for the local area and compared to appropriate statistics to determine if a low-income or minority population could be disproportionately affected by the Proposed Action. This section also evaluates effects from the Proposed Action on children's environmental health and safety risks.

3.12.3.1 Alternative 1 (EUL Sites 5, 6, and 7)

Socioeconomics. For the purposes of the EA, a range of EUL staffing scenarios of up to 3,000 personnel was analyzed to address potential impacts on socioeconomics. Under Staffing Scenario A, 2,600 personnel already hold positions at NAS Patuxent River that would be consolidated into the EUL

development, and 400 personnel would come from other positions that are currently off the installation. This would represent a 0.1 percent increase of the total population within the ROI.

Under Staffing Scenario B, up to 3,000 personnel not currently working at NAS Patuxent River could move into the area. This scenario could include personnel not currently directly employed by NAS Patuxent River. This represents at worst an increase of approximately 0.9 percent of the total population within the ROI, and it is possible that a number of the positions are already present in the ROI. Therefore, no significant adverse impacts on demographics would occur under Alternative 1.

For the purposes of the EA analysis, under Staffing Scenario A, 2,600 of the 3,000 personnel staffing the EUL development would come from positions already held on NAS Patuxent River. There is more than sufficient housing vacancy in the ROI to accommodate the remaining personnel who would need housing. Housing requirements for these 400 personnel would account for 3.6 percent of the vacant homes within the ROI (U.S. Census Bureau 2012b).

Under Staffing Scenario B, up to 3,000 personnel could obtain non-Navy housing off-installation within the ROI. No additional Navy housing is proposed to be constructed. According to census data, the housing requirements for up to 3,000 personnel could account for 27 percent of the vacant housing supply in the ROI (U.S. Census Bureau 2012b). Increases in housing requirements would result in the reduction of current vacant housing stock and, subsequently, increases in property tax receipts and potential increases in the value of houses. Therefore, no significant adverse impacts on the housing market within the ROI would be expected under Alternative 1.

Staffing Scenario B could include personnel from the private sector not directly employed by NAS Patuxent River or through government contracting. NAS Patuxent River is typically exempt from local or county property taxes because it is federally owned land. The loss of tax revenue to St. Mary's County would be offset by an in-lieu payment made by the developer. Therefore, no impacts on tax revenue would be expected under Alternative 1.

Employment Characteristics. Construction activities under Alternative 1 would stimulate the local economy through increases in payroll taxes, sales receipts, and the indirect purchase of goods and services. Construction workers likely would come from within the ROI. As of 2012, approximately 15,500 personnel (9 percent of the workforce) are considered construction workers in the ROI. As a result, the local workforce would sufficiently meet demand for construction activities. Short-term increases in local business volume within the local economy would be expected due to the purchase of construction materials, supplies, and other related services; however, the impacts from construction activities would be temporary and not significant.

The total workforce within the ROI is approximately 171,900 personnel. Under Staffing Scenario A, up to 400 additional personnel would be employed on NAS Patuxent River, representing a 0.2 percent addition to the workforce. Under Staffing Scenario B, the addition of up to 3,000 personnel to the proposed NAS Patuxent River EUL work campus would represent an approximately 1.7 percent increase in the local workforce. The increase in personnel would result in an increase in payroll taxes that would further stimulate the local economy; however, the impacts would not be significant.

Environmental Justice and Protection of Children. Construction and demolition activities would occur entirely within NAS Patuxent River. Noise from construction activities and operational vehicle use would likely be the only source of potential impact to populations. Noise would not generally extend to residential areas off the installation. Additionally, construction activities would be restricted to normal working hours. Therefore, Alternative 1 would not disproportionately impact any minority or low-income populations present off the installation. Similarly, with the implementation of safety measures to be implemented during construction activities and that the nearest housing areas are at least

0.25 miles (0.4 km) away from the EUL sites, there are no environmental health and safety risks identified that would adversely affect populations of children. Therefore, no significant impacts on environmental justice would be expected under Alternative 1.

3.12.3.2 Alternative 2 (EUL Sites 6 and 7)

Under Alternative 2, socioeconomic and environmental justice impacts would be similar to those described in Alternative 1 because the increase in personnel would be identical. The construction window could potentially be shorter under Alternative 2 because construction activities would only occur at Sites 6 and 7; however, variations in construction activities between alternatives are expected to be relatively minimal. The increase in personnel, housing demand, and construction personnel would be insignificant. Demand on the housing market would increase property tax receipts and result in potential increases to the value of houses. Construction and demolition activities would stimulate the local economy through increases in payroll taxes, sales receipts, and the indirect purchase of goods and services. Once development of the EUL work campus was complete, the increase in operational personnel would result in an increase in payroll taxes that would stimulate the local economy, particularly under Staffing Scenario B.

Construction activities would occur entirely within NAS Patuxent River and would be restricted to normal working hours. Noise would not generally extend to residential areas off the installation. Therefore, minority and low-income populations would not be expected to be disproportionately impacted. Similarly, there are no environmental health and safety risks identified that would adversely affect populations of children. Therefore, no significant impacts on environmental justice would be expected under Alternative 2.

3.12.3.3 No Action Alternative

Under the No Action Alternative, an EUL would not be granted and construction and operational activities associated with the work campus would not be completed and no changes in operations on the installation would change. No change in demographics would occur and population growth rates would continue at their current pace. Potential benefits to increased taxes and receipts would not occur. Housing and construction labor demand would not be impacted and would continue following current economic trends. No impacts on minority, low income, or child populations would occur. Therefore, no impacts on socioeconomic and environmental justice populations would be expected under the No Action Alternative.

3.13 Human Health and Safety

3.13.1 Definitions

A safe environment is one in which there is no, or optimally reduced, potential for death, serious bodily injury or illness, or property damage. Human health and safety addresses public safety during construction, demolition, and renovation activities; and during subsequent operations of those facilities. Various stressors in the environment can affect human health and safety. Identification and control or elimination of these stressors can reduce risks to health and safety to acceptable levels or eliminate risk entirely.

Contaminated Materials. Contaminated materials commonly found at Navy installations include asbestos, lead, 8-RCRA metals, and PCBs. Metals that are included in the 8-RCRA are arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Asbestos is regulated by USEPA. Identification of ACMs in installation facilities is regulated by the *Occupational Safety and Health Act*,

29 U.S.C. §§ 669 et seq. Section 112 of the CAA regulates emissions of asbestos fibers to ambient air. Building materials in older buildings are assumed to contain asbestos. Lead is a heavy, ductile metal commonly used in house paint until the Federal government banned the use of most LBP in 1978. PCBs are man-made chemicals that persist in the environment and were widely used in construction materials (e.g., caulk) and electrical products prior to 1978. Congress banned the manufacture and use of PCBs in 1976, and PCBs were phased out in 1978, except in certain limited uses.

Accident Potential Zones. Accident potential zones are land use designations that are areas in the vicinity of airfield runways where an aircraft mishap is most likely to occur. While the likelihood of an accident happening is remote, the Navy recommends that construction within APZ be minimal and buildings be low density in order to ensure the maximum protection of public health.

Ordnance. OPNAVINST 8020.14, *Department of the Navy Explosives Safety Policy*, defines the Navy Explosives Safety Program. The program includes several elements, including explosive handling guidelines, reporting requirements, inventory management, and disposal procedures (DoN 1999).

Hazards of Electromagnetic Radiation to Ordnance. The Navy's Hazards of Electromagnetic Radiation to Ordnance (HERO) program addresses the potential for electromagnetic radiation to unintentionally initiate electro-explosive devices contained within current Navy and Marine Corps ordnance items (Mikoleit 1994). Radio and radar transmitting equipment produce high-intensity electromagnetic fields. Such fields can cause premature initiation of electro-explosive devices contained in ordnance systems. Per OPNAVINST 8023.2C, *U.S. Navy Explosives Safety Policies, Requirements, and Procedures*, planned transmitting and antenna installations must be regularly reviewed, and installations that handle ordnance must identify potential HERO problem areas.

Explosive Safety Quantity Distance. Fundamentally, Explosive Safety Quantity Distance (ESQD) arcs determine the distance between ordnance storage, facilities, and inhabitable areas. ESQD arcs are hazard zones that have been established by the DoD for the storage or handling of various quantities and types of ammunition and explosives. OPNAVINST 8020.14, *U.S. Department of the Navy Explosives Safety Policy*, identifies basic munitions and explosives safety standards and minimum ESQD criteria.

Worker Health and Safety. Construction site and worker safety is largely a matter of adherence to regulatory requirements imposed for the benefit of employees and implementation of operational practices (e.g., industrial hygiene) that reduce risks of illness, injury, death, and property damage. Industrial hygiene programs address exposure to hazardous materials, use of personal protective equipment (PPE), and availability of Safety Data Sheets (SDSs). The health and safety of onsite military and civilian workers are safeguarded by DoD and Navy regulations designed to comply with standards issued by the Federal Occupational Safety and Health Administration (OSHA), USEPA, and state occupational safety and health agencies. These standards specify the amount and type of training required for industrial workers, the use of protective equipment and clothing, engineering controls, and maximum exposure limits for workplace stressors.

Emergency Services and Safety. Emergency services are organizations which ensure public safety and health by addressing different emergencies. The three main emergency service functions include police, fire and rescue service, and emergency medical service. Many agencies will engage in community awareness and prevention programs to help the public avoid, detect, and report emergencies effectively. The availability of emergency services depends very heavily on location.

3.13.2 Existing Conditions

3.13.2.1 EUL Site 5

Contaminated Materials. It is assumed that all structures constructed prior to 1978 potentially contain ACMs, 8-RCRA metals, LBP, and/or PCB-containing materials (e.g., caulk). All the buildings proposed for demolition on EUL Site 5 were built prior to 1978 and would therefore be assumed to contain contaminated materials.

NAS Patuxent River is listed on the USEPA's National Priorities List; however, the National Priorities List site boundary does not overlap with Site 5. There are also no Environmental Restoration Projects that overlap Site 5 (NAVFAC Washington 2012).

Accident Potential Zones. A 5.4-acre (2.2-hectare) portion of APZ-1 intersects the southeast portion of Site 5 (see **Figure 2-2**). APZ-1 is associated with the longest runway at NAS Patuxent River, Runway 6-24, which runs north-south on the installation.

Ordnance. Ordnance at NAS Patuxent River is stored in 142 ammunition storage areas on the installation. NAS Patuxent River has established measures and programs for the handling, storage, and transportation of ordnance to ensure it is conducted in compliance with Federal and state environmental laws and regulations. There are no munitions storage areas near or within Site 5 (NAVFAC Washington 2012).

Hazards of Electromagnetic Radiation to Ordnance. NAS Patuxent River has equipment that emits electromagnetic radiation. The electromagnetic environments of installation facilities can change with new or modified radar, electronic warfare, communications, and navigation transmitter installations. Changes could also occur to ordnance configuration, inventories and operations. The HERO Program at NAS Patuxent River is managed in accordance with the Navy Technical Manual: NAVSEA OP 3565/NAVAIR 16-1-529 Volume 2 *Electromagnetic Radiation Hazards (U) (Hazards to Ordnance) (U)*. This document prescribes operating procedures and precautions to prevent initiation of electro-explosive devices in ordnance from electromagnetic radiation. EUL Site 5 is entirely encompassed within the HERO areas.

Explosive Safety Quantity Distance. There are a total of 33 ESQD arcs at NAS Patuxent River. There are no ESQD arcs that overlap Site 5.

Worker Health and Safety. All contractors performing construction activities at NAS Patuxent River are responsible for following ground safety regulations and workers compensation programs and are required to conduct construction activities in a manner that does not pose any risk to workers or personnel. Industrial hygiene programs address exposure to hazardous materials, use of PPE, and availability of SDSs. Industrial hygiene is the responsibility of contractors, as applicable. Contractor responsibilities are to review potentially hazardous workplace operations; to monitor exposure to workplace chemicals (e.g., asbestos, lead, hazardous material), physical hazards (e.g., noise propagation), and biological agents (e.g., infectious waste); to recommend and evaluate controls (e.g., ventilation, respirators) to ensure personnel are properly protected or unexposed; and to ensure a medical surveillance program is in place to perform occupational health physicals for those workers subject to any accidental chemical exposures. The Department of Public Safety at NAS Patuxent River is responsible for enforcing OSHA standards on the installation. The NAVFAC Safety Officer is responsible for safety during construction and demolition activities. The contractor is required to have a safety plan approved by NAVFAC prior to any construction or demolition activities occurring.

Emergency Services and Safety. The Department of Public Safety is responsible for administering law enforcement, fire response services, the rescue/disaster preparedness program, and the occupational safety and health program. There are two fire stations (Buildings 103 and 443) at NAS Patuxent River that are operated by a total of 64 personnel. Response time to anywhere on the base must be within 5 minutes (NAVFAC Washington 2012).

3.13.2.2 EUL Sites 6 and 7

Existing conditions for ordnance, hazards of electromagnetic radiation on ordnance, and worker health and safety would be the same as described for Site 5. Neither Sites 6 nor 7 intersect an APZ. There is only one building proposed for demolition on Site 6. This building was built in 1943 and would be expected to contain contaminated materials.

3.13.3 Environmental Consequences

3.13.3.1 Alternative 1 (EUL Sites 5, 6, and 7)

Contaminated Materials. Buildings proposed for demolition under Alternative 1 could contain ACM, LBP, or PCBs or various 8-RCRA metals because the buildings were constructed prior to 1978. Contamination present in buildings slated for demolition on Sites 5 and 6 would be handled in accordance with applicable policies and procedures, including inspection by a state-certified inspector prior to commencement of demolition activities. Demolition plans would be reviewed by installation civil engineering personnel to ensure appropriate measures were taken to remove ACMs, 8-RCRA metals, LBP, and PCB-containing materials, and reduce potential exposure to, and release of, asbestos, lead, and PCBs. Construction materials (e.g. caulk) containing PCBs could be disposed of at a non-hazardous waste landfill. Construction and demolition contractors would be required to adhere to Federal and state regulations in addition to installation management plans during handling of potentially contaminated materials. Beneficial impacts would be expected from the removal or demolition of buildings containing contaminated materials by reducing potential personnel exposure. No significant impacts on human health and safety would be expected from contaminated materials.

Accident Potential Zones. Impacts on worker safety from work being conducted within an APZ, although highly unlikely, could occur. Work that must occur in the APZ would be coordinated with installation personnel responsible for aircraft management and safety. Facilities constructed within the APZ would be limited to parking lots in order to minimize potential impacts on installation personnel and contractors using the proposed EUL site. Impacts on human health and safety from APZs would not be expected to be significant.

Ordnance. There are no munitions currently stored on Sites 5, 6 or 7. No impacts on human health and safety would be expected from ordnance.

Hazards of Electromagnetic Radiation to Ordnance. Since no new sources of electromagnetic radiation are proposed under Alternative 1 and there are already existing sources of electromagnetic radiation covering the project area, it is assumed that no additional impacts on human health or safety would be expected from electromagnetic radiation.

Explosive Safety Quantity Distance. No ESQD arcs overlap Sites 5, 6 or 7; therefore, no impacts from ESQD arcs would be expected.

Worker Health and Safety. Construction and contractor personnel working under Alternative 1 would be exposed to increased demolition and construction related hazards during the average workday. All

demolition and construction contractors would be required to follow and implement OSHA and Navy safety standards to establish and maintain a safe working environment. Workers would be required to wear appropriate PPE including ear protection, steel-toed boots, hard hats and gloves. Proposed demolition or construction would not be expected to pose any new or unacceptable safety risks to workers. Workers would also be potentially exposed to contaminated materials (ACM, LBP, PCBs etc.) during demolition activities. If contaminated materials are discovered then they would be characterized and removed by a certified removal specialist and disposed of in a USEPA-approved disposal site. Demolition and construction sites would be appropriately marked and fenced off in order to protect construction workers and aircraft when working near the airfields. Airfield and construction activities would be coordinated to avoid or minimize impacts on construction or installation personnel. No significant impacts on worker health or safety would be expected as a result of demolition and construction related to Alternative 1.

Emergency Services and Safety. No impacts on emergency services and safety would be expected from Alternative 1. Since emergency services for NAS Patuxent River are located within the boundary of the installation, no impacts would be expected because the ability to reach Sites 5, 6 and 7 would remain unchanged.

3.13.3.2 Alternative 2 (EUL Sites 6 and 7)

Impacts from ordnance, hazards of electromagnetic radiation to ordnance and ESQD arcs on human health and safety would be the same as those mentioned under Alternative 1. Impacts from contaminated materials and impacts on worker health and safety would be less than Alternative 1 because Alternative 2 only has one building that was built prior to 1978 that is proposed for demolition. As a result, fewer potential impacts from contaminated materials would be expected. Impacts on worker health and safety during demolition activities are also less intense because only one small building is scheduled for demolition. Since there are no APZs associated with Site 6 or 7, no impacts from APZs would be expected under this alternative. Impacts from contaminated materials and demolition/construction on worker health and safety and human health and safety would not be expected to be significant. Impacts on emergency services would be the same as those mentioned under Alternative 1.

3.13.3.3 No Action Alternative

Under the No Action Alternative, NAS Patuxent River would not enter into an EUL with a lessee to develop, operate, and maintain a work campus office development as NAS Patuxent River and no construction or demolition associated with the work campus would occur. No impacts on human health and safety from the construction and operation of a work campus would occur; however, impacts could be anticipated from increased installation personnel exposure to buildings containing contaminated materials mentioned under **Section 3.13.1**, but these impacts would not be considered significant.

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4. Cumulative and Other Impacts

4.1 Cumulative Effects

Federal regulations implementing NEPA (40 CFR § 1500–1508) and Navy procedures for implementing NEPA (32 CFR § 775), as described in OPNAVINST 5090.1D, require that the cumulative effects of a proposed action be assessed. CEQ regulations implementing the procedural provisions of NEPA define cumulative effects as follows (40 CFR § 1508.7):

The impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.

A cumulative effect could be additive (i.e., the net adverse cumulative effects are strengthened by the sum of individual effects), countervailing (i.e., the net adverse cumulative effect is less as a result of the interaction between beneficial and adverse individual effects), or synergistic (i.e., the net adverse cumulative effect is greater than the sum of the individual effects). Cumulative effects could result from individually minor, but collectively significant actions that take place over time. Accordingly, a cumulative effects analysis identifies and defines the scope of other actions and their interrelationship with the alternatives if there is an overlap in space and time. Cumulative effects are most likely to occur when there is an overlapping geographic location and a coincidental or sequential timing of events.

For the purposes of this analysis, it is assumed that demolition activities and construction for either EUL development Alternative 1 or 2 would begin in 2015 and would be complete in 2017. For most resources, the spatial area for consideration of cumulative effects is limited to the installation on which an activity would occur. Past actions are those actions, and their associated impacts, that occurred within the geographical extent of cumulative effects that have shaped the current environmental conditions of the project area. CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions (Connaughton 2005). The effects of past actions are now part of the existing environment and are included in the affected environment described in **Section 3**. However, recent past actions with continuing ongoing effects that are germane to cumulative impacts are discussed with present and reasonably foreseeable future actions.

4.1.1 Projects Considered for Potential Cumulative Effects

4.1.1.1 On-Installation Projects

IPT Work Space/Town Center Plan. The *Naval Base 2035 Vision Plan* proposes nine development areas at NAS Patuxent River (NAVFAC Washington 2012). The vision for NAS Patuxent River is to separate mission-critical and non-mission-critical functions and create a delineation of public versus private areas of the installation. One of these areas is called the Integrated Product Team (IPT) Work Space/Town Center Plan and includes the area of EUL Site 5 and is adjacent to Site 7. The IPT Work Space would include the construction of an IPT building and parking structure and additional office space and parking structure. The Town Center would include construction of a Naval Health Clinic, Youth Center, Multi-Purpose Bowling and Entertainment Center, and Child Development Center; replacement of Q4 Bachelor Enlisted Quarters; and consolidation of the Fleet & Family Readiness Center (NAVFAC Washington 2012).

Rotary Wing Testing and Evaluation Hangar Replacement. This project includes the proposal to construct a hangar complex to support rotary-wing aircraft RDT&E. The proposed hangar would provide

a new facility to support operations currently conducted in Hangar 111. The new hangar would support Navy and Marine Corps aircraft and would accommodate approximately 358 personnel in offices, 297 aircraft maintenance personnel, and 21 rotary-wing aircraft. Construction would begin in April 2017 and would be complete in April 2019 (NAVFAC Washington 2014).

Construct Aircraft Prototype Facility. This project would provide secure facilities to augment and improve naval aviation RDT&E capabilities to correct and improve Naval Aviation RDT&E survivability and vulnerabilities. The project would provide a secure hangar, specialized laboratories, and accredited work areas for the support of classified projects and Special Access Programs delivering mission critical combat systems to the Fleet. The project would provide approximately 108,000 ft² (10,000 m²) of secure hangar space to increase the overall capacity of the combined facility to support nine or more classified programs annually (NAVFAC Washington 2012). Phase I of the project is complete. Phase II construction would begin in 2014 and additional phases are proposed for the future (Krasnesky 2014).

Naval Base Exchange Expansion. This includes the construction of a 28,400 ft² (2,638 m²) addition to the existing 56,800 ft² (5,279 m²) Navy Exchange. The project scope includes renovation of the existing retail, services, and administration areas. Construction will begin in 2015 (Krasnesky 2014).

Construct Atlantic Test Range Addition. This project includes the construction of modern command and control facilities and mission test cells for the Atlantic Test Range (ATR) at NAS Patuxent River. The new facility would be 17,062 ft² (1,585 m²) and would support integrated test operations and joint testing with linkages to other open air ranges and instrumented test facilities for new combat systems (NAVFAC Washington 2012, Krasnesky 2014). The ATR currently supports thousands of flight tests per year, and collects thousands of hours of data in support of these tests. It is anticipated that this rate will increase at a rate of about five percent per year through 2014 (NAVFAC Washington 2012). Construction would begin in 2016 (Krasnesky 2014).

Construct Unaccompanied Housing. This project includes the replacement of seven unaccompanied housing buildings. This project includes the construction of a multi-story unaccompanied housing (UH) facility (108,823 ft² [10,110 m²]) to provide housing for E1-E4 permanent party personnel. The facility would provide Market Style apartment modules that will include sleeping and living areas, a kitchen, bathrooms, closets, and in-module laundry facilities. The facility would also provide administrative offices, building support areas, and common use spaces, such as a multi-purpose room and vending areas. The project also includes the construction of an Alert Facility (10,226 ft² [950 m²]) adjacent to Building 2199 to support administrative and training spaces for the VQ-4 Squadron currently located in Unaccompanied Housing Facility 468, which would be demolished. If awarded, construction would begin in 2017 (Krasnesky 2014).

Medical and Dental Clinics. This project provides a new modern medical clinic footprint to replace the existing undersized and obsolete Naval Health Clinic at NAS Patuxent River. The Medical Clinic would be 90,102 ft² (8,371 m²) and the Dental Clinic would be 8,798 ft² (817 m²). If awarded, construction would begin in 2019 or 2020 (Krasnesky 2014).

Construct UCLASS RDT&E Hangar. This project includes the construction of a hangar complex to support the RDT&E of Unmanned Carrier Launched Aerial Surveillance Systems (UCLASS). The hangar complex includes hangar bays, maintenance shops, crew spaces, storage areas, offices and laboratory space for Integrated Test Team personnel. A hangar complex is required to support UCLASS programs scheduled for development, test and evaluation phases at NAS Patuxent River in 2018 and an Early Operational Capability in 2020. If awarded, construction would begin in 2017 (Krasnesky 2014).

Naval Air Museum Exhibit and Display Center. Construction of a new Patuxent River Naval Air Museum building is underway directly south of EUL Site 6. The new building is designed to become the primary facility for the museum's artifacts and displays. Construction is scheduled for completion in 2015 (PRNAMA 2014).

EUL In-Leasing. Independent future private tenant in-leases to be requested by the developer and the Navy for the proposed administrative complex EUL, should the Navy choose not to occupy part or all of the EUL development, would be competitively bid.

4.1.1.2 Off-Installation Projects

The Maryland Statewide Transportation Improvement Program (STIP) (MDOT 2014b) and the 2010 St. Mary's County Comprehensive Plan (St. Mary's County 2010), which incorporates the Lexington Park Development District Master Plan, along with other sources of information, were reviewed to identify off-installation projects that might result in cumulative impacts when combined with the proposed EUL program at NAS Patuxent River. The relevant projects are described below.

Point Lookout Road Bridge Replacement. This project includes the replacement of the Point Lookout Road (MD 5) Bridge over Eastern Branch approximately 2.5 miles (4.0 km) southwest of the installation. The bridge was constructed in 1936 and is nearing the end of its useful service. The new bridge would have wider shoulders to match approaching roadways. Both lanes of traffic will be maintained during the construction of the new bridge. Construction is scheduled to begin in the fall of 2014 (MDOT 2014a).

Point Lookout Road Improvements. This project would implement roadway improvements along Point Lookout Road (MD 5) from Three Notch Road (MD 246) to MD 471 and is currently in the planning phase. Construction dates have not been projected (MDOT 2014a).

Lexington Park Development Projects. St. Mary's County Department of Land Use and Growth Management has identified nine active developments that occur within a 2-mile (3.2-km) radius of NAS Patuxent River. Two of these projects (construction of a car dealership and renovation of a pharmacy) occur along Three Notch Road, approximately 1.5 miles (2.4 km) west of NAS Patuxent River. Three other projects that occur near NAX Patuxent River include projects along Gunston Drive, Strickland Road, and Flower of the Forest Road, west, southwest, and south of the installation, respectively. These three projects relate to the development and construction of minor subdivisions or additions to existing subdivisions. Four projects off of Norris Road and Rutherford Boulevard southwest of the installation are associated with the development of or additions to major subdivisions (St. Mary's County 2014).

4.1.2 Cumulative Effects on Resource Areas

The following analysis examines the cumulative effects on the environment that would result from the incremental impacts of the Proposed Action, in addition to other past, present, and reasonably foreseeable future actions. This analysis assesses the potential for an overlap of impacts with respect to project schedules or affected areas. This section presents a qualitative analysis of the cumulative effects.

Under the No Action Alternative, there would be no change in the baseline conditions for any resource areas. Therefore, the No Action Alternative would not contribute to cumulative effects.

4.1.2.1 Land Use and Airspace

The construction of the proposed facilities would require a change in the Open Space land use category at Sites 5 and 6. The changes to the land use categories would result in adjacent, compatible, land uses

categorizations as defined by the *NAS Patuxent River Installation Master Plan*. If changes in a land use category are necessary for one of the cumulative projects, it would be in accordance with the categorizations defined in the *NAS Patuxent River Installation Master Plan*. No significant, cumulative effects on land use at NAS Patuxent River are expected.

The southeastern half of EUL Site 5 is in APZ-1. EUL Sites 6 and 7 are not located in clear zone or an APZ. A cumulative project could occur in an APZ, especially if they are near the flightline. Any construction or demolition activity in an APZ would be developed in accordance with the Navy's AICUZ program requirements. The AICUZ program provides land use restrictions that limit building densities to 25 persons per acre and building heights to less than 150 feet (46 meters) in these areas.

Impacts on visual resources would be expected from the removal of trees under the Proposed Action and additional cumulative projects; however, the demolition of inadequate buildings and construction of modern buildings would also result beneficial impacts on NAS Patuxent River. Cumulatively, the construction of new, modern buildings at NAS Patuxent River would result in a beneficial impact on the visual environment, and such impacts would not be considered significant.

4.1.2.2 Traffic and Transportation

The existing traffic network inside and adjacent to NAS Patuxent River functions poorly during the AM and PM peak commute hours. The implementation of the EUL program would increase traffic volumes throughout the network depending on whether the personnel for the EUL development already work on NAS Patuxent River. The Traffic Study for the proposed EUL development (see **Appendix B**) addressed 2017 No Action and action alternatives that included consideration of other cumulative development in the region. Cumulative impacts from the EUL development combined with other proposed development in the area include an increase in traffic volumes, vehicle delay, travel times along Three Notch Road and Great Mills Road, and increased queue lengths at signalized intersections. With the added delay, travel times are expected to increase between 0.3 and 7.5 minutes from the EUL program alone, with potentially greater delays from other proposed development in the absence of any local road improvement projects. Queue lengths as a result of the EUL program could increase between 50 feet (15 meters) and 2,800 feet (854 meters), depending on the intersection and peak hour.

4.1.2.3 Infrastructure and Utilities

Beneficial impacts would be expected from the demolition of inadequate buildings that are not properly configured to support future growth under the Proposed Action and the additional cumulative projects. Cumulatively, construction-related activities could result in increased use of utilities or possibly brief periods when services are interrupted for utility interconnections; however, it is not expected to be significant because construction activities would occur at varying times. Under Alternatives 1 or 2 there would be a localized increase in the demand for utilities beyond current levels. The additional projects proposed at NAS Patuxent River would also cause a negligible increase in the demand for utilities. New utility lines and systems would be installed where necessary which would be more efficient than existing lines.

4.1.2.4 Air Quality

The estimated yearly emissions under either Alternative 1 or 2 would be well below 1 percent of the yearly emission inventory of the Southern Maryland Intrastate AQCR. Construction activities from additional projects occurring at the same time and in the same vicinity could have cumulative effects. These activities could collectively increase emissions of criteria air pollutants in the area temporarily, but variations in the timing of cumulative projects, and the relatively short duration of project effects, would

distribute impacts over space and time. Once construction and renovation activities are complete, operation of either Alternative 1 or 2 would result in a negligible impact on regional air emissions from the increase of personnel transit activities and estimated emissions associated with proposed new stationary sources at NAS Patuxent River. However, these impacts would not be significant cumulative effects on air quality.

The anticipated amount of CO₂ equivalent emissions from the proposed construction and demolition activities of the Proposed Action and the additional cumulative projects would represent a negligible contribution towards the statewide GHG inventory and an extremely negligible contribution toward the national GHG inventory. The additional cumulative projects would vary in timing and location so the impacts would be distributed over space and time.

4.1.2.5 Noise

No operational changes would occur under Alternatives 1 or 2 and no significant impacts on the noise environment would occur from construction and demolition activities. Construction-related activities from the additional projects at the installation could collectively increase noise levels in the area temporarily, but variations in the timing and locations of cumulative projects, and the relatively short duration of these effects would distribute impacts over space and time. EUL Site 5 is located in Noise Zone 2 of NAS Patuxent River. EUL Sites 6 and 7 are located outside of the noise zones at the installation. Noise generation would last only for the duration of demolition and construction activities, would be intermittent, and could be minimized through measures such as the restriction of these activities to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.), and the use of equipment exhaust mufflers. Consequently, construction activities occurring at the same time and in the same vicinity could have cumulative effects; however, they would not be significant.

4.1.2.6 Coast Zone Management

The Proposed Action and the additional cumulative projects could reasonably affect the coastal uses or resources of Maryland if it involves demolition and construction, results in an increase in impervious surface area, and includes development of areas that contain non-tidal wetlands. Potential effects to off-installation water quality would result from increased sedimentation and stormwater runoff. Potential effects to non-tidal wetlands would result from the filling of non-tidal wetlands.

A CCD has been developed for the Proposed Action and will be developed for any of the additional projects at NAS Patuxent River that would affect the coastal uses or resources of Maryland. The CCD has been developed in accordance with 15 CFR 930.39 under the CZMA, as well as with the MOU between DOD and the State of Maryland. No significant cumulative effects on the coastal zone are expected from the Proposed Action or the additional projects.

4.1.2.7 Geological Resources

Impacts would result from disturbance and compaction of soils, clearing of vegetation, excavation, trenching, grading, and paving in areas of the Proposed Action and additional cumulative projects. Soil erosion and sediment production would be minimized during construction by following BMPs and by complying with Section 438 of the Energy Independence and Security Act, which requires implementation of LID measures. Many areas and soils at NAS Patuxent River have been previously disturbed from past development activities. Construction activities occurring at the same time and in the same vicinity could have cumulative effects on soil resources from disturbance and a potential increase in erosion; however, these effects would be minimized by following appropriate BMPs. As a result, no significant cumulative effects on geological resources are expected.

4.1.2.8 Biological Resources

Construction activities from additional cumulative projects occurring at the same time and in the same vicinity could have cumulative effects on vegetation and wildlife resources from habitat removal and noise disturbances. Upland forest and scrub/shrub habitat would be cleared from portions of Sites 5, 6, and 7 to accommodate construction; however, the vast majority of forested and scrub/shrub lands on the installation would remain intact. There is minimal habitat available due to the developed and urban environment at the installation and most species present are adapted to the noisy environment. In addition, planned construction projects would occur at varying times and locations across the installation. Therefore, no significant cumulative effects on biological resources at NAS Patuxent River are expected under Alternatives 1 or 2.

No Federal- or state-listed threatened or endangered animal or plant species have been documented within Sites 5, 6, and 7. However, Federal- or state-listed animal and state-listed plant species exist at NAS Patuxent River. If a listed species is discovered during the design or construction phase of an additional project at the installation, it is assumed that the necessary actions would be taken according to the appropriate Federal or state regulations.

4.1.2.9 Water Resources

Implementation of the Proposed Action and other additional cumulative projects would result in a minor increase in impervious surfaces and stormwater runoff. Use of BMPs and implementation of an Erosion and-Sediment Control Plan and SWPPP during construction activities would minimize cumulative effects on water resources. Stormwater design requirements for Federal development and redevelopment projects larger than 5,000 ft² (0.1 acres) must “maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.” There are two wetlands on EUL Site 5 and one wetland on EUL Site 7. Other wetlands may be present in the areas of the additional cumulative projects. A Jurisdictional Determination is currently being sought from USACE for the Proposed Action and if necessary, for the additional cumulative projects. If a potential would exist for impacts on wetlands to occur in conjunction with the construction and demolition, a joint state/federal wetlands permit application for alternation of any tidal or nontidal wetland would be prepared and submitted. No significant cumulative effects on water resources at NAS Patuxent River are expected.

4.1.2.10 Socioeconomics and Environmental Justice

Implementation of the Proposed Action could result in up to 3,000 new personnel not currently working at NAS Patuxent River, under the worst case scenario. This represents an increase of approximately 0.9 percent of the total population within the ROI, and it is possible that a number of the positions are already present in the ROI. The additional cumulative projects could also result in increases in personnel; however it is unlikely that it would be significant increase. Therefore, no significant adverse impacts on demographics would occur under Alternative 1.

Increases in housing requirements for the additional personnel would result in the reduction of current vacant housing stock and, subsequently, increases in property tax receipts and potential increases in the value of houses. Therefore, no significant adverse impacts on the housing market within the ROI would be expected.

Construction activities of the Proposed Action and the additional cumulative projects would stimulate the local economy through increases in payroll taxes, sales receipts, and the indirect purchase of goods and services. Construction workers likely would come from within the ROI and short-term increases in local

business volume within the local economy would be expected due to the purchase of construction materials, supplies, and other related services.

Construction and demolition activities of the Proposed Action and the additional cumulative projects would occur entirely within NAS Patuxent River. Noise from construction activities and operational vehicle use would likely be the only source of potential impact to populations. Noise would not generally extend to residential areas off the installation. Additionally, construction activities would be restricted to normal working hours. Therefore, the Proposed Action and the additional cumulative projects would not disproportionately impact any children, minority, or low-income populations.

4.1.2.11 Cultural Resources

There are no NRHP-listed or -eligible resources on EUL Sites 5, 6, or 7; therefore, there would be no direct effect on historic properties. Furthermore, EUL Sites 5, 6, and 7 are over 3,000 feet (915 meters) from any of the NRHP-eligible historic districts and are not visible from any of those districts. Therefore, no impacts on historic buildings or districts are expected under the Proposed Action. The additional cumulative projects could impact historic buildings or districts if the construction or demolition activities occur in or near NRHP-listed or -eligible resources. If new structures are constructed within the historic district, they would be considered non-contributing structures and would diminish the integrity of the district; however, currently there are numerous non-contributing structures on the installation. Consultation with the SHPO should be initiated prior to the commencement of the additional projects to minimize potential indirect visual effects within the historic districts.

4.1.2.12 Hazardous Materials and Wastes

The use of hazardous materials and petroleum products would not increase under Alternatives 1 or 2. In addition, the amounts of hazardous wastes generated at the installation would not increase. The proposed construction and demolition activities would require the delivery and use of minimal amounts of hazardous materials and petroleum products and would generate minimal amounts of hazardous wastes. Although other projects involving construction would have similar impacts, these projects would not occur at the same time. In addition, the phasing of individual projects over several years, as is currently anticipated, would further minimize cumulative construction-related impacts. The removal of ACMs, LBP, 8-RCRA metals, and PCBs during demolition activities would cumulatively reduce potential exposure to these materials. Therefore, significant cumulative effects on hazardous materials and wastes at NAS Patuxent River are not expected.

4.1.2.13 Human Health and Safety

For any project that would occur at the installation, ACMs, 8-RCRA metals, LBP, and PCB-containing materials present in the buildings slated for demolition would be handled in accordance with applicable policies and procedures, including inspection by a state-certified inspector prior to commencement of demolition activities. Construction-related activities, including identification and removal of ACMs, LBP, and PCBs, would comply with Federal and state regulations and applicable installation management plans. The removal of ACMs, LBP, 8-RCRA metals, and PCBs would reduce the potential exposure to personnel accessing facilities that contain these materials. No significant cumulative effects on human health and safety at NAS Patuxent River are expected.

Impacts to worker safety from work being conducted within an APZ could occur. Work that must occur in the APZ would be coordinated with installation personnel responsible for aircraft management and safety. Impacts on human health and safety from APZs would not be expected to be significant.

4.2 Compatibility of Alternatives with the Objectives of Federal, Regional, State, and Local Land Use Plans, Policies, and Controls

No potential conflicts are anticipated between NAS Patuxent River and any of the installation master plans, policies, or controls. The Proposed Action and the additional cumulative projects would occur entirely on Federal property. Because ownership and management of the land would remain under the authority of the Federal government, county- or city-level plans or policies are not applicable. No off-installation land uses would be affected by implementation of the Alternatives.

4.3 Relationship Between Short-Term Uses of Man's Environment and Maintenance and Enhancement of Long-Term Productivity

NEPA requires consideration of the relationship between short-term use of the environment and the impacts that such use could have on the maintenance and enhancement of long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. Such impacts include the possibility that choosing one alternative could reduce future flexibility to pursue other alternatives, or that choosing a certain use could eliminate the possibility of other uses at the site. Short-term uses of the biophysical components of the human environment include direct impacts, usually related to construction activities, which occur over a period of less than 5 years. Long-term uses of the human environment include those impacts that occur over a period of more than 5 years, including permanent resource loss.

Construction activity under the Proposed Action would be expected to result in short-term effects on infrastructure and utilities, air quality, noise, geology, biological and water resources, hazardous materials and waste, and human health and safety; however, these effects would not be considered significant. Implementation of either alternative of the Proposed Action would result in considerable long-term military productivity by allowing the Navy to continue their mission at NAS Patuxent River.

4.4 Irreversible and Irrecoverable Commitment of Resources

NEPA (42 U.S.C. 4332 Section 102[2][C][v]) as implemented by CEQ regulation 40 CFR 1502.16 requires an analysis of significant, irreversible effects resulting from implementation of a proposed action. An irreversible or irretrievable commitment of resources refers to impacts on or losses to resources that cannot be reversed or recovered, even after an activity has ended. Resources that are irreversibly or irretrievably committed to a project are those that are typically used on a long-term or permanent basis; however, those used on a short-term basis that cannot be recovered (e.g., non-renewable resources such as metal, wood, fuel, paper, and other natural or cultural resources) also are irretrievable. Human labor is also considered an irretrievable resource. All such resources are irretrievable in that they are used for a project and, thus, become unavailable for other purposes.

An impact that falls under the category of the irreversible or irretrievable commitment of resources is the destruction of natural resources that could limit the range of potential uses of that resource. Implementation of the Proposed Action would result in an irreversible commitment of building materials; vehicles and equipment used during construction, renovation, or demolition activities; and human labor and other resources. Energy (i.e., electricity and natural gas), water, and fuel consumption; and demand for services would not increase significantly as a result of the implementation of either alternative. Overall, consumption of energy resources would not place a significant demand on their availability in the region. The commitment of these resources is undertaken in a regular and authorized manner and does not represent a significant impact.

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