DRAFT ENVIRONMENTAL ASSESSMENT

UTF, C-Field, and Henry (H) - Field Shoreline Stabilization

U.S. Army Garrison Aberdeen Proving Ground
Directorate of Public Works—Environmental Division

June 2022

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DRAFT ENVIRONMENTAL ASSESSMENT
UTF, C-Field, and Henry (H) - Field Shoreline Stabilization at
Aberdeen Proving Ground, Maryland

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FINDING OF NO SIGNIFICANT IMPACT
UTF, C-FIELD, AND HENRY (H) - FIELD SHORELINE STABLIZATION AT ABERDEEN PROVING GROUND, MARYLAND

Introduction

The U.S. Army Aberdeen Test Center (ATC), which is located on Aberdeen Proving Ground (APG), is a subordinate command to the U.S. Army Test and Evaluation Command and was established in World War I. Today, ATC is the Department of Defense's lead agency for land-combat, direct-fire, and live-fire vulnerability testing. ATC is a multi-purpose test center with diverse capabilities. ATC is a world-class testing, training, modeling, simulation, and experimentation facility that gives American Warfighters superior materiel and technology. With approximately 103 miles of shoreline, coastal erosion is a major threat to the installation and its mission. The Proposed Action, and the subject of this EA, involves the stabilization of approximately 13,000 linear feet of Bush River shoreline through the placement of stone revetment and the construction of living shorelines and breakwaters.

In accordance with both Council on Environmental Quality (CEQ) and Army National Environmental Policy Act (NEPA) regulations (40 Code of Federal Regulations [CFR] 1508.13 and 32 CFR Part 651.21, respectively), this Finding of No Significant Impact (FNSI) hereby incorporates the entire EA by reference.

1. Purpose and Need

The purpose of the Proposed Action is to protect the shoreline at APG for three areas with high erosion rates located within active testing ranges comprised of mission-critical infrastructure.

The Proposed Action is needed because APG is a Major Range and Test Facility Base (MRTFB) and is the leading agency for land-combat, direct-fire, and live-fire vulnerability testing for the U.S. Army. The shorelines within APG have been known to be experiencing significant levels of wave-induced erosion since 1841 (U.S. Army and U.S. Army Corps of Engineers [USACE] Joint Evaluation Meeting, April 2016).

The shoreline erosion threatens testing infrastructure at three active testing ranges, including moving target rails, roadways, test pads, ancillary structures, and a boat launch. Operational impacts due to shoreline erosion include loss of mission land, increased exposure to UXO, and overall degradation of the missionscape for Warfighter testing and training (APG, 2020c). The continued loss of land due to erosion along the shoreline would impact the ability for ATC mission-critical testing to continue; and there is no known additional land or alternative land location for ATC to utilize for testing purposes if the existing shoreline continues to erode. In addition, restoration and protection of the eroded shoreline allows APG to remain compliant with their Integrated Natural Resources Management Plan (INRMP), which influences the management of all-natural resources and habitats at APG, including wetlands, shorelines, uplands, tidal marshes, forests, Chesapeake Bay waters, floodplains, and grasslands.

2. Description of the Proposed Action and Alternatives

Chapter 3 of the EA presents a discussion of the alternatives evaluated. Several non-structural stabilization alternatives including establishment or restoration of wetland vegetation, bank grading, and/or fiber logs have been shown to be effective in stabilizing eroding shorelines. While non-structural alternatives may be suitable for use in lower energy environments, the high-energy wave environment resulting from the tidal nature of the area, and rapid rate of shoreline erosion precludes their use at APG. Therefore, the non-structural stabilization alternatives were dismissed as being a non-viable alternative that would be ineffective in this environmental setting, and were eliminated from further evaluation in this EA.

The No Action Alternative was also considered.

- **No Action Alternative -** The No Action alternative involves not implementing shoreline stabilization measures at the three project sites. Selecting the No Action alternative is equivalent to allowing the existing baseline environmental conditions identified in Section 4 of this document to continue.

- **The Proposed Action Alternative -** The Proposed Action, and the subject of this EA, involves the stabilization of approximately 13,000 linear feet of Bush River shoreline through the placement of stone revetment and the construction of living shorelines and breakwaters. The Proposed Action is planned for three discrete project areas: the Underwater Explosions Test Facility (UTF), C-Field, and Henry (H) - Field.

3. Environmental Analysis

Environmental Consequences and Comparison of Alternatives: Chapter 5 of the EA discusses the affected environment and potential environmental consequences for the Proposed Action by resource area. The No Action Alternative serves as a baseline from which to compare the potential impacts of the Proposed Action. Due to the nature of the Proposed Action and its effects, it was determined that negligible adverse effects would occur to the following Valued Ecosystem Components (VECs): airspace, and energy. These resource areas were not retained for further analysis within the EA.

The implementation of the Proposed Action is not anticipated to result in adverse significant environmental impacts. Potential permits, plans, and measures to reduce adverse impacts identified within the EA analysis are also included within the table and support the impacts determinations presented.

Cumulative Effects: For the purposes of this EA, and in accordance with CEQ Regulation 40 CFR 1508.1, as amended in April 2022, cumulative impacts result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable actions, regardless of who undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. Given the localized nature of the Proposed Action a Study Area has been defined for evaluation of potential impacts to human and natural resources within one-half mile of each of the subject ATC facilities. This constitutes the Proposed Action's Region of Influence (ROI) for cumulative effects. This ROI includes areas

where the Proposed Action's effects would most likely contribute to cumulative environmental effects.

Construction and continued development within the region would cause the potential for significant cumulative adverse impacts to the VECs analyzed within the EA. The resource categories for which the Proposed Action would have the potential for adverse impacts were reviewed in Chapter 5 of the EA to determine whether or not implementation of the Proposed Action would cause the potential for significant adverse cumulative effects. The cumulative effects analysis determined that the Proposed Action would not likely cause any appreciable significant cumulative impacts.

Proposed Impact Reduction Measures: Impacts resulting from the Proposed Action would be less than significant. Various permits, plans, and measures have been identified within the EA analysis that would be undertaken by APG to minimize adverse effects.

4. Public Review and Comment

The Draft EA/FNSI was made available for a 30-day public review and comment period. Documents were also made available at two local libraries (Harford County Public Library, Aberdeen Branch and the Harford County Public Library, Edgewood Branch). A Public Notice was published in two local newspapers (*Baltimore Sun* and the *Aegis*).

5. Finding of No Significant Impact

I have considered the results of the analysis in the EA, the comments received during the public comment period, and associated cumulative effects. Based on these factors, I have decided to proceed with the Proposed Action, a long-term solution that stabilizes approximately 13,000 linear feet of Bush River shoreline at the UTF, C-Field, and Henry (H)-Field and protects critical infrastructure at the adjacent test ranges by constructing a combination of stone shoreline protection structures, that along with specified permits, plans and measured identified above, will not have a significant impact on the quality of human life or natural environment. This analysis fulfills the requirements of the NEPA of 1969, as implemented by the CEQ regulations (40 CFR 1500-1508), as well as the requirements of the Environmental Analysis of Army Actions (32 CFR 651). Therefore, issuance of a FNSI is warranted, and an Environmental Impact Statement is not necessary.

_____ _____

Johnny M. Casiano
Colonel, U.S. Army
Commander, U.S. Army Garrison
Aberdeen Proving Ground

Date

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1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

The National Environmental Policy Act (NEPA) requires all federal agencies to consider the impact of their proposed actions on the environment, in compliance with regulations implementing NEPA as promulgated by the Council on Environmental Quality (CEQ; 40 Code of Federal Regulations [CFR] Parts 1500 to 1508). This Environmental Assessment (EA) was commissioned by the U.S. Army Aberdeen Test Center (ATC), in support of the Garrison Aberdeen Proving Ground (APG), Harford County, Maryland, pursuant to NEPA and 32 CFR Part 651, Environmental Analysis of Army Actions.

APG is a renowned research and development, testing and evaluation facility for military weapons, equipment and personnel. APG is the Department of Defense's (DoD's) Center of Excellence for land combat systems, chemical and biological defense, public health, and Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR). Administration of APG is the responsibility of the U.S. Army Garrison (USAG) Aberdeen Proving Ground with five management and control offices, six directorates, ten support offices, and more than 21,000 Army civilian, military, and contractor employees. Aberdeen Proving Ground encompasses more than 2,000 buildings with a combined footprint of approximately 17 million square feet of space. It is home to eleven major commands and supports more than 80 tenants, 20 satellites, 17 private activities (Potomac-Hudson Engineering, Inc. [PHE], 2014).

APG is located primarily in Harford County, Maryland, with two small sections on the western edge of the installation located in Baltimore County. The City of Baltimore is the closest major city, which is located approximately 34 miles southwest of the installation's Aberdeen Area (APG-AA). In its entirety, APG occupies approximately 72,500 acres of land and water. The Bush River divides the installation into two non-contiguous areas, commonly referred to as the APG-AA, which encompasses 27,600 acres, and the Edgewood Area (APG-EA), which encompasses 9,850 acres. Contiguous waters of APG account for an additional 33,000 acres. Other areas of APG not attached to the main installation account for the remaining acreage, which includes the Churchville Test Area, Van Bibber Water Treatment Plant, Atkisson Reservoir and Dam, and Pooles Island in Harford County, and Graces Quarters and Carroll Island in Baltimore County, Maryland (Aberdeen Proving Ground [APG], 2014), Adelphi Laboratory Center in Prince Georges and Montgomery Counties, and Blossom Point Research Facility in Charles County.

ATC, which is located on APG, is a subordinate command to the U.S. Army Test and Evaluation Command and was established in World War I. Today, ATC is the Defense Department's lead agency for land-combat, direct-fire, and live-fire vulnerability testing. ATC is a multi-purpose test center with diverse capabilities. ATC is a world-class testing, training, modeling, simulation, and experimentation facility that gives American Warfighters superior materiel and technology. With approximately 103 miles of shoreline, coastal erosion is a major threat to the installation and its mission.

The Proposed Action, and the subject of this EA, involves the stabilization of approximately 13,000 linear feet of Bush River shoreline through the placement of stone revetment and the construction of living shorelines and breakwaters.

1.2 PURPOSE AND NEED

The purpose of the Proposed Action is to protect the shoreline at APG for three areas with high erosion rates located within active testing ranges comprised of mission-critical infrastructure.

The Proposed Action is needed because APG is a Major Range and Test Facility Base (MRTFB) and is the leading agency for land-combat, direct-fire, and live-fire vulnerability testing for the U.S. Army. The shorelines within APG have been known to be experiencing significant levels of wave-induced erosion since 1841 (U.S. Army and USACE Joint Evaluation Meeting, April 2016). Operational impacts due to shoreline erosion include loss of mission land, increased exposure to UXO, and overall degradation of the missionscape for Warfighter testing and training (APG, 2020c). In addition, restoration and protection of the eroded shoreline allows APG to remain compliant with their Integrated Natural Resources Management Plan (INRMP), which influences the management of all-natural resources and habitats at APG, including wetlands, shorelines, uplands, tidal marshes, forests, Chesapeake Bay waters, and grasslands. The INRMP states that shoreline protection and stabilization would reduce excess nutrient contamination and siltation of the Chesapeake Bay and provide better habitat for living resources (APG, 2020c), and specifically recommends the implementation, maintenance, and/or monitoring of shoreline erosion control measures at the Underwater Explosions Test Facility (UTF), C-Field, and wetlands and deep-water habitat management at Henry (H) - Field (APG, 2020c). Additionally, the INRMP addresses the issue of floodplain management in reference to APG's compliance with Executive Order (EO) 11988, and states that APG avoids direct and indirect development of floodplains, and restores and preserves natural and beneficial values served by floodplains, in the implementation of land management, construction, and land use actions (APG, 2020c).

1.3 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

This EA has been prepared to analyze the potential environmental and social consequences associated with the activities required for shoreline stabilization for the U.S. Army ATC Facilities: UTF, C-Field, and Henry (H) - Field, in accordance with NEPA, the CEQ regulations (40 CFR 1500-1508), and 32 CFR 651. For purposes of this EA, a Study Area has been defined for evaluation of potential impacts to human and natural resources within one-half mile of each of the subject ATC facilities. An evaluation of potential beneficial and negative impacts on the human and natural environment resulting from the proposed development and alternatives is included herein.

Environmental effects would include those related to construction and maintenance of the Proposed Action. Section 2.0 contains a detailed description of the project proposed at the three sites. Section 3.0 contrasts the alternatives, Section 4.0 describes the existing conditions of the affected environment, Section 5.0 analyzes and summarizes the impacts of the alternatives, and Section 6.0 summarizes the findings and conclusions. Section 7.0 provides a list of references used to develop this EA and Section 8.0 includes acronyms and abbreviations found throughout the EA.

1.4 OTHER RELATED NEPA DOCUMENTATION

In accordance with CEQ regulations for implementing NEPA and with the intent of reducing the size of this document, the following materials relevant to the Proposed Action are incorporated by reference:

- Final Environmental Impact Statement (EIS), BRAC Actions at Aberdeen Proving Ground Harford and Baltimore Counties, Maryland, July 2007.

- Programmatic Environmental Assessment (PEA) for Contaminated Building Demolition at Aberdeen Proving Ground, Maryland, dated March 2017. (U.S. Army Garrison Aberdeen Proving Ground; Directorate of Public Works – Environmental Division).

1.5 ENVIRONMENTAL LAWS AND REGULATIONS

Additional laws and regulations that may apply to specific activities associated with implementation of the Proposed Action could include the Clean Air Act (CAA), Clean Water Act (CWA), Toxic Substance and Control Act (TSCA), Noise Control Act, Endangered Species Act (ESA), Coastal Zone Management Act (CZMA), National Historic Preservation Act (NHPA), Archaeological Resources Protection Act (ARPA), Resource Conservation and Recovery Act (RCRA), EO 11593 (Protection and Enhancement of the Cultural Environment), EO 11988 (Floodplain Management), EO 11990 (Protection of Wetlands), EO 12088 (Federal Compliance with Pollution Control Standards), EO 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations), EO 13045 (Protection of Children from Environmental Health Risks and Safety Risks), and EO 13508 (Chesapeake Bay Protection and Restoration). Note that this list is not all-inclusive and other federal, state, and local regulations may apply.

1.6 PUBLIC INVOLVEMENT

Coordination with federal and state agencies including, but not limited to the U.S. Fish and Wildlife Service (USFWS), the Maryland Department of Natural Resources (MDNR), and the Maryland Historic Trust (MHT) was initiated for the Proposed Action via letters and/or Public Notice dated August 15, 2017. Additional consultation with USFWS was conducted through the Information for Planning and Consultation (IPaC) system in May 2019, and an additional Section 106 consultation letter was sent to MHT in January 2020 due to the extended project timeline. Copies of coordination letters and agency responses are located in Appendix A: Agency Coordination.

Public participation opportunities with respect to this EA and decision making on the Proposed Action are guided by 32 CFR Part 651. The EA will be made available to the public for 30 days in order to receive public comments. The Notice of Availability will be advertised in the Baltimore Sun and the Harford County Aegis. The EA will also be sent to federal, state, and local agencies for comment and agency responses will be located in Appendix A: Agency Coordination.

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2.0 DESCRIPTION OF THE PROPOSED ACTION

2.1 PROPOSED ACTION

APG occupies a land area of 113 square miles and is in northeastern Maryland along the Chesapeake Bay (Figure 2-1). Two small portions of the installation, Carroll Island and Graces Quarters, are located in Baltimore County to the west of the Gunpowder River. The majority of the installation is located in Harford County on two peninsulas separated by the Bush River. The northeastern portion is known as the Aberdeen Area and the southwestern portion is called the Edgewood Area (formerly known as the Edgewood Arsenal).

The Proposed Action is planned for three discrete project areas: the UTF, C-Field, and Henry (H) - Field (Figure 2-2). The UTF is located along the eastern shore of the Bush River in APG-AA. The limits of the UTF site extends southward from Chilbury Point approximately 4,000 linear feet to the jetty at the UTF boat basin. The C-Field and Henry (H) - Field sites are located along the western shore of the Bush River in APG-EA. The C-Field site extends from a point west of Wilson Point approximately 5,000 linear feet along the shoreline into Doves Cove. The Henry (H) - Field site extends southward from Leges Point approximately 4,000 linear feet.

As outlined in Table 2-1, since 1841 the shorelines along the project sites have been experiencing varying levels of erosion rates, which may jeopardize mission-critical testing (U.S. Army and USACE Joint Evaluation Meeting, April 2016). The unprotected shorelines of APG are known to be degrading annually, with loss estimated to be approximately 36 acres per year (APG, 2020c). It is estimated, based on Geographic Information Systems (GIS) data, that the following approximate amounts of linear feet of shoreline have been lost in the vicinity of each of the three project areas:

Table 2-1: Approximate Linear Feet of Shoreline Lost to Erosion

	UTF	C-Field	Henry (H) - Field
1846-1974	--- (no data)	200	250
1974-1994	--- (no data)	50	100
1976-1994	30	--- (no data)	--- (no data)

Source: MDiMAP, 2017

Figures 2-3, 2-5, and 2-7 show the approximate amounts of linear feet of shoreline lost over time. Please note that the U.S. Geological Survey (USGS) quadrangle base maps used in these figures represent the approximate present-day shoreline.

The Proposed Action was developed based on several criteria, including:

- existing shoreline condition (e.g. topography, adjacent habitats)
- effectiveness in preventing erosion
- cost
- environmental impact (e.g. wetlands, submerged aquatic vegetation [SAV])

- maintenance requirements

The Proposed Action will provide a long-term solution that stabilizes approximately 13,000 linear feet of Bush River shoreline at the UTF, C-Field, and Henry (H) - Field and protects critical infrastructure at the adjacent test ranges by constructing a combination of stone shoreline protection structures with living shorelines and breakwaters. The Proposed Action includes the placement of armor stone revetment along the shoreline, construction of rock sills with beach fill with marsh plantings, and the construction of continuous breakwater with flushing windows. Construction of the stabilization and protection measures at each site may take place by land or by water with a barge. As part of the Proposed Action, wetlands and SAV beds would be created as part of a living shoreline stabilization solution to the erosion issue. Wetlands provide several beneficial functions including supplying habitat for a variety of wildlife, storage and attenuation of floodwaters, trapping silts and other sediments during floods, and biologically filtering contaminates from surface waters (APG, 2020c). The importance of SAV is well known as a primary indicator of local water quality, nursery areas for fish and crustaceans, filters of nutrients and sediment, and a natural stabilization for shorelines (APG, 2020c). The Proposed Action will serve to not only protect APG's mission-critical land and infrastructure but will also serve to protect the Chesapeake Bay's coastal resources. Table 2-2 identifies the type and extent of stabilization approaches associated with the Proposed Action. Figures 2-4, 2-6, and 2-8 show the configuration stabilization approaches at the UTF, C-Field and Henry (H) - Field, respectively. Please note that the USGS quadrangle base map used in these figures are copyrighted in 2013; however, it is expected that this portion of mapping may not have been updated to reflect existing conditions on site.

Table 2-2: Breakdown of Stabilization Approach by Site

Stabilization Approach	UTF	C-Field	Henry (H) - Field
Armor stone revetment (LF)	2,750	725	4,035
Stone sill and living shoreline (LF)	2,050	1,500	---
Created tidal wetlands (acres)	2.8	1.7	---
Continuous breakwater with flushing windows without beach fill (LF)	---	1,860	---

NOTE:
LF = linear feet

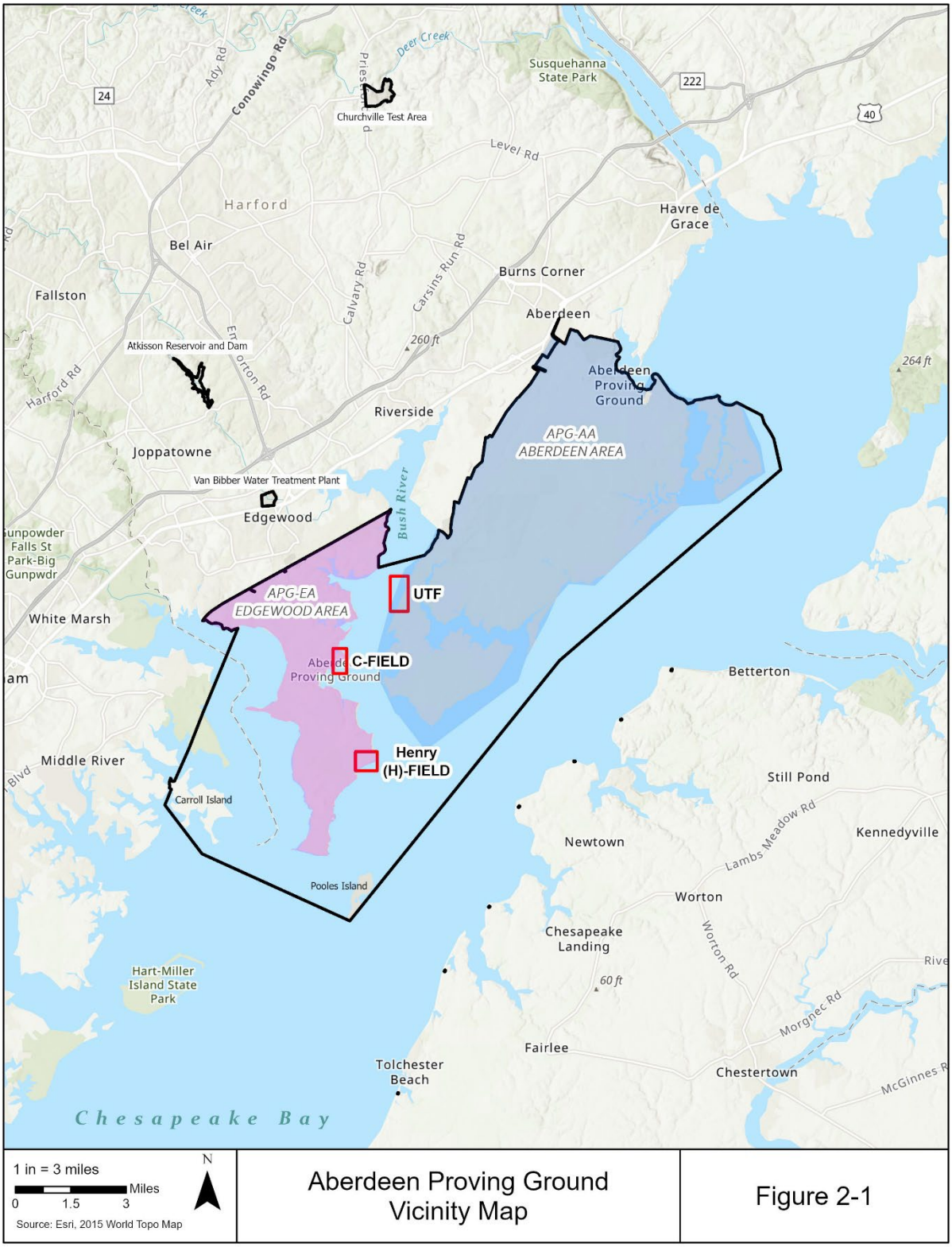


Figure 2-1: Vicinity Map

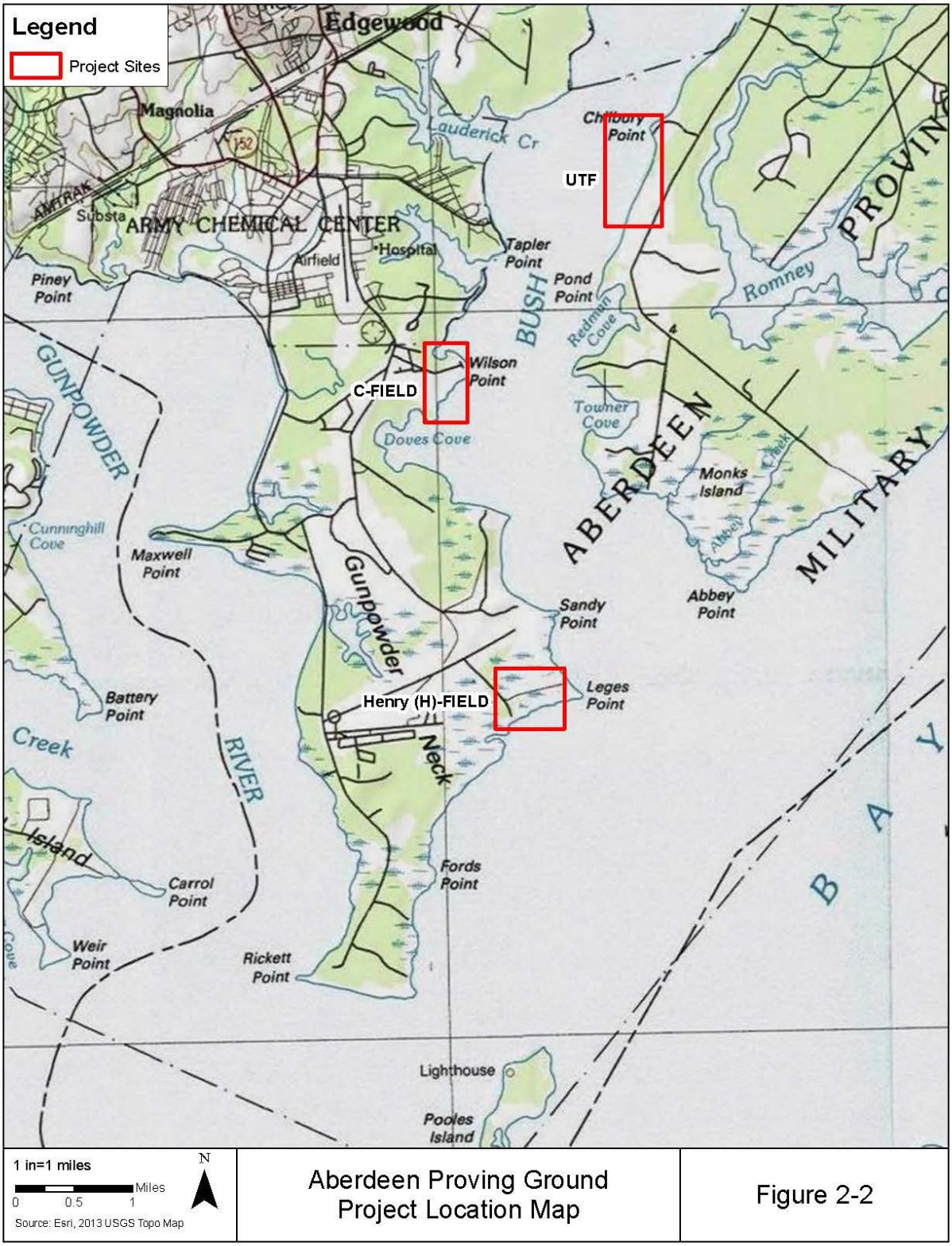


Figure 2-2: Project Location Map

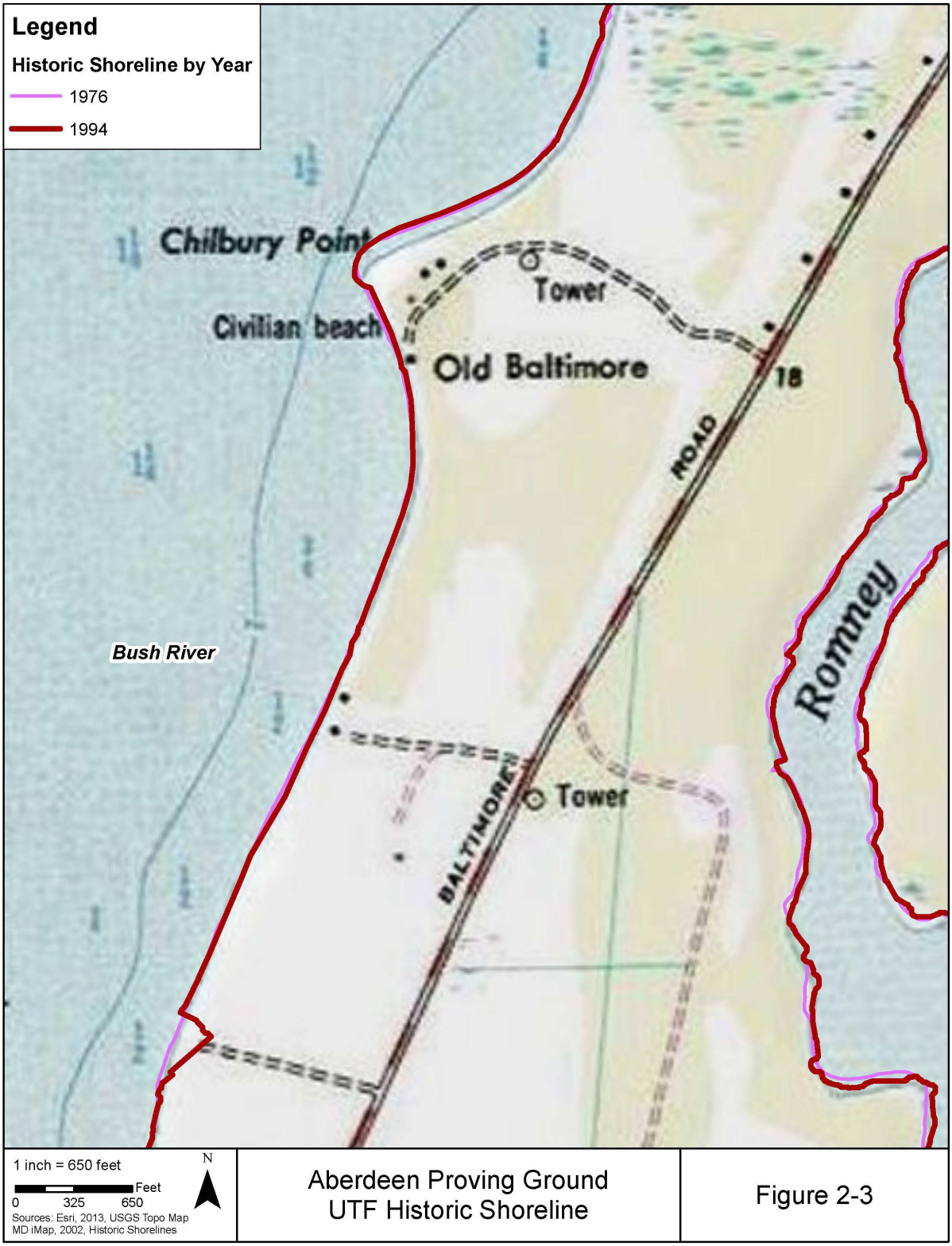


Figure 2-3: UTF Historic Shoreline

Figure 2-4: UTF Shoreline Stabilization

Figure 2-5: C-Field Historic Shoreline

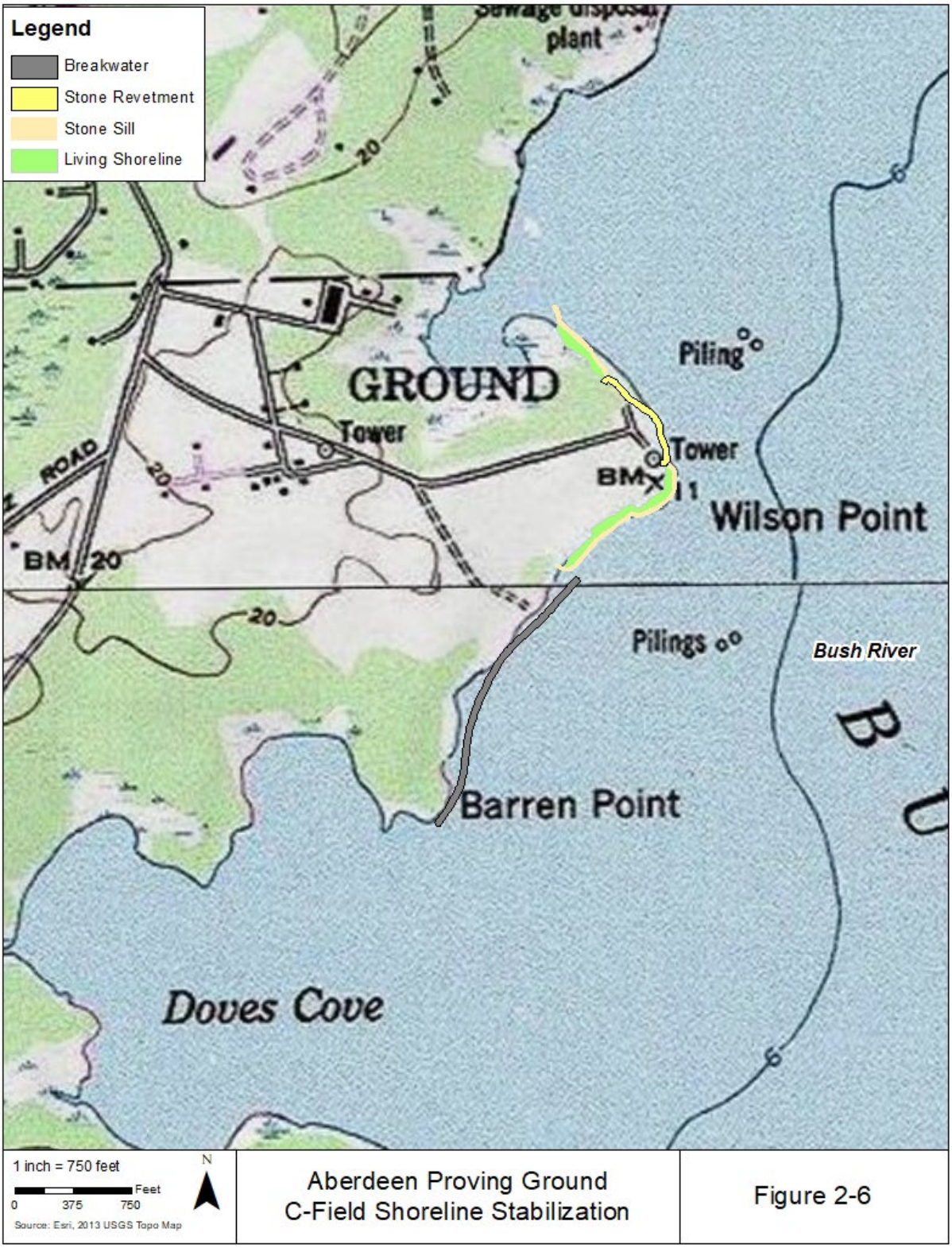


Figure 2-6: C-Field Shoreline Stabilization

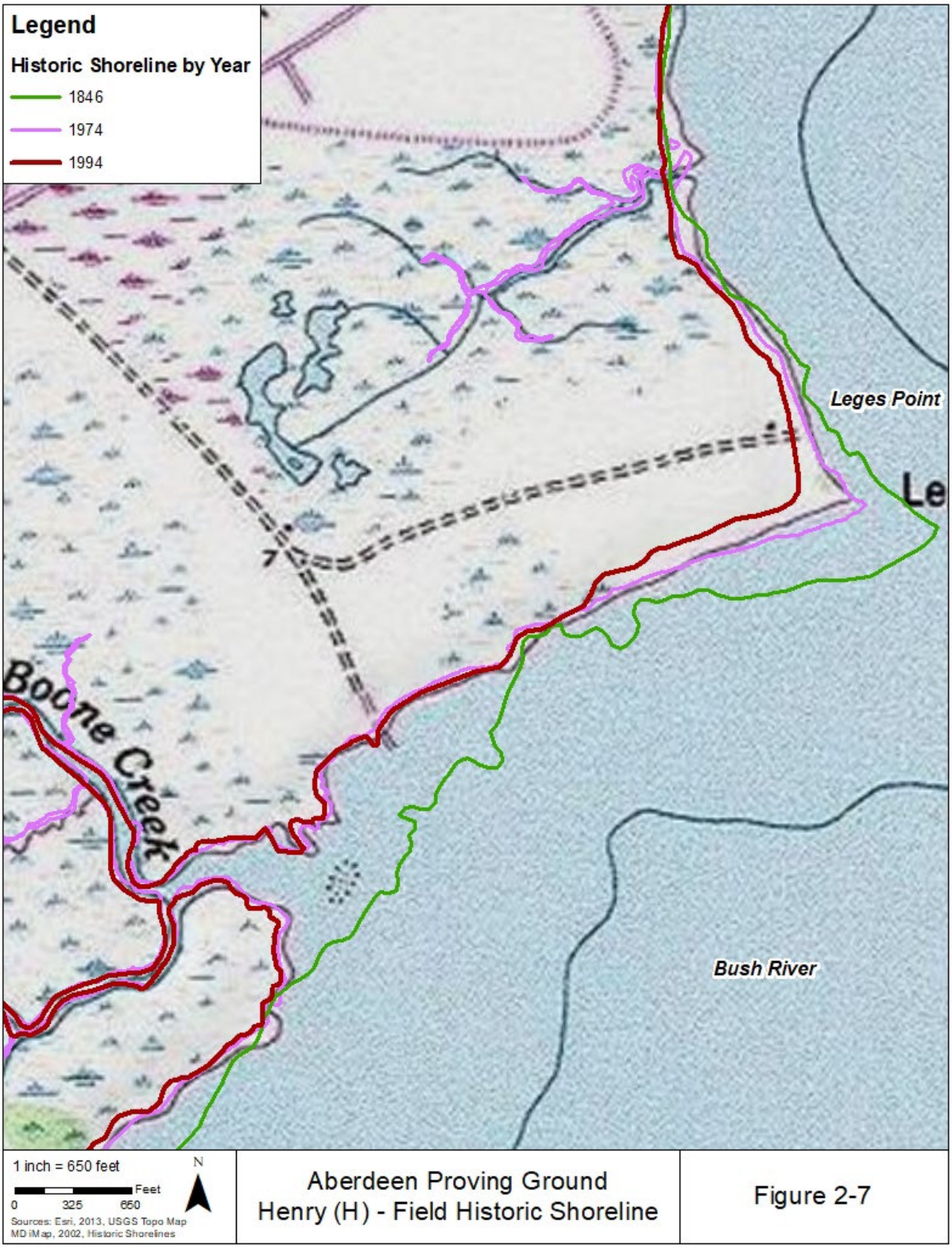


Figure 2-7: Henry (H) - Field Historic Shoreline

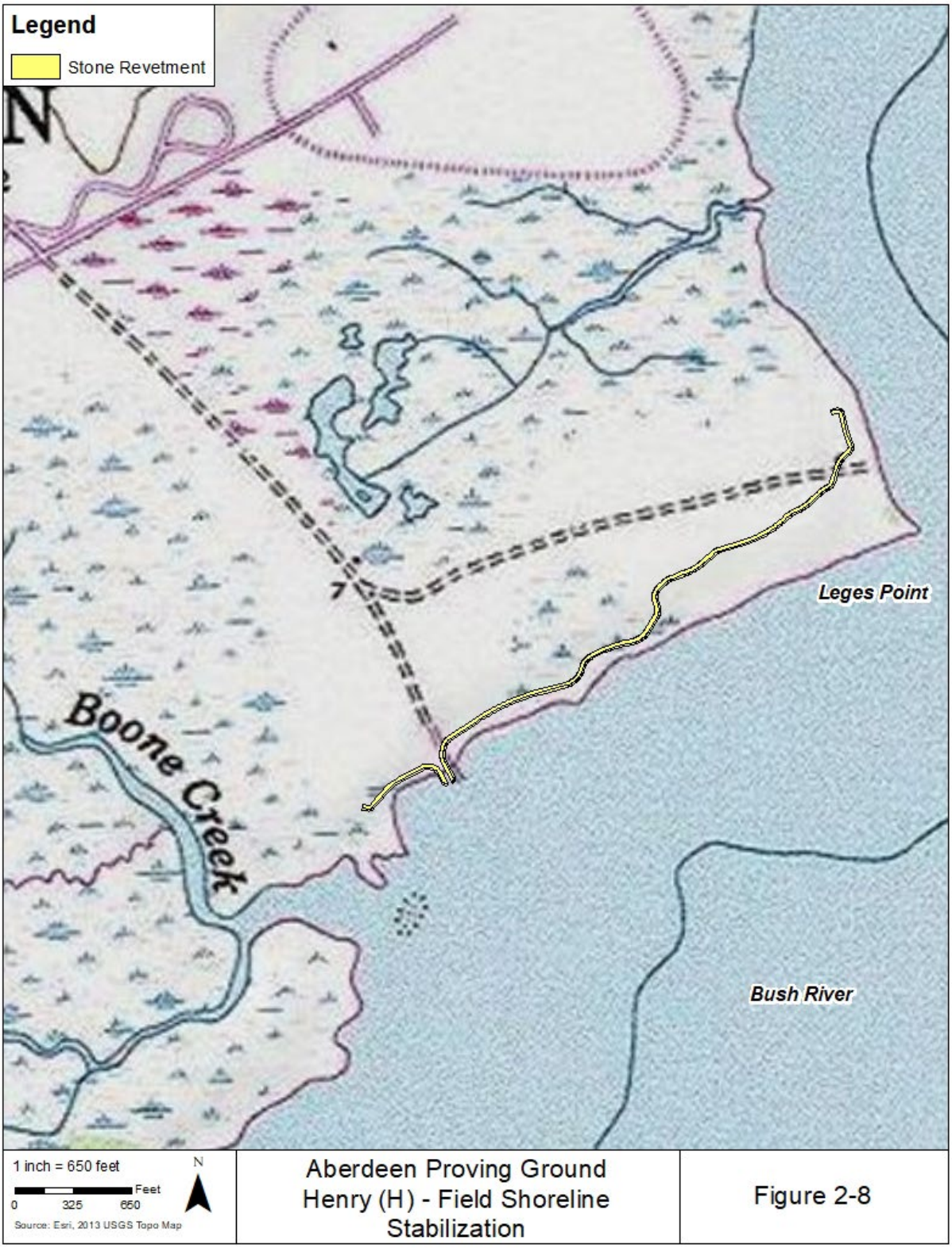


Figure 2-8: Henry (H) - Field Shoreline Stabilization

2.1.1 **UTF Location**

The UTF shoreline stabilization (Figure 2-4) would include a combination of armor stone revetment and stone sill and living shoreline. Approximately 2,750 linear feet of armor stone revetment will be installed beginning at the existing jetty at the UTF boat basin and extending northward along the shoreline. The shoreline stabilization will then transition into 2,050 linear feet of stone sill and living shoreline, which will extend to Chilbury Point.

The UTF living shoreline will be created by filling behind the stone sill with sand obtained from an offshore borrow area. The sand will be placed to create a 44-foot-wide planting area from the mean low water line at the sill to the existing bank. Salt-tolerant native species and/or oligohaline water-tolerant native species will be planted. The establishment of a UTF living shoreline will create tidal wetlands.

2.1.2 **C-Field Location**

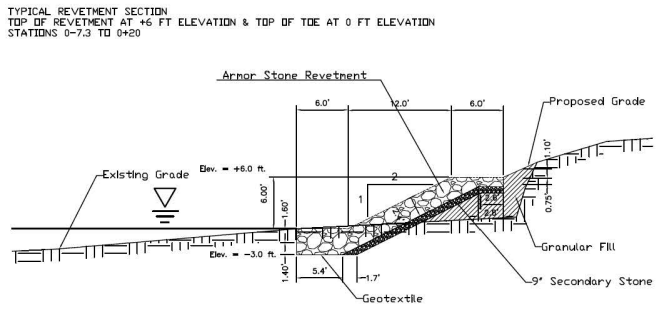
The C-Field shoreline stabilization (Figure 2-6) would include a combination of armor stone revetment, stone sill and living shoreline, and a continuous breakwater. Approximately 1,860 linear feet of continuous breakwater with flushing windows will be constructed from Barren Point extending to the northeast, outboard of an existing SAV bed. The shoreline protection will then transition to stone sill and living shoreline. The shoreline protection will then transition into approximately 725 linear feet of stone revetment, and then back into stone sill and living shoreline. It is anticipated that approximately 1,500 total linear feet of stone sill and living shoreline would be created.

The C-Field living shoreline will be created by filling behind the stone sill with sand obtained from an offshore borrow area. The sand will be placed to create a 50-foot-wide planting area from the mean low water line at the sill to the existing bank. Salt-tolerant native species and/or oligohaline water-tolerant native species will be planted.

2.1.3 **Henry (H) - Field Location**

The Henry (H) - Field shoreline stabilization (Figure 2-8) would include approximately 4,035 linear feet of armor stone sill. The revetment will begin at a tidal marsh near the existing boat ramp at the western end of the project site and continue to the east around Leges Point, to a tie-in location approximately 600 feet north of Leges Point, where the uplands transition into a tidal marsh.

The stone sills and armor stone revetment will be constructed of two layers of armor stone, each double the thickness of the median stone size (D50) for the structure, based on standard and accepted design practices. Bedding stone will be placed directly beneath the armor layers and a high strength geotextile fabric will be placed under the toe stones of the structures.



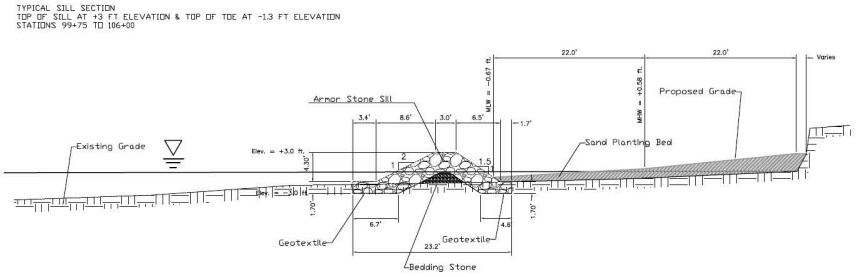
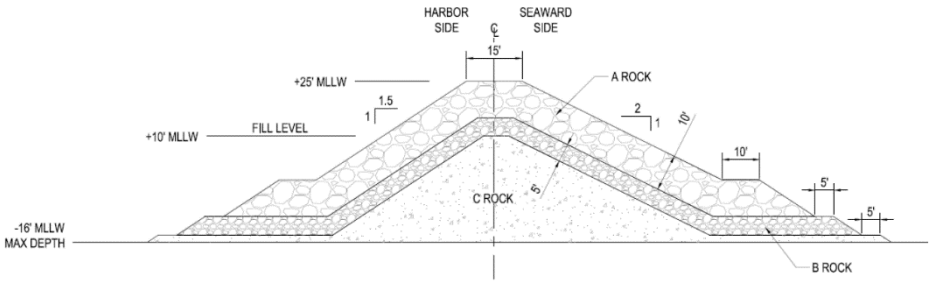


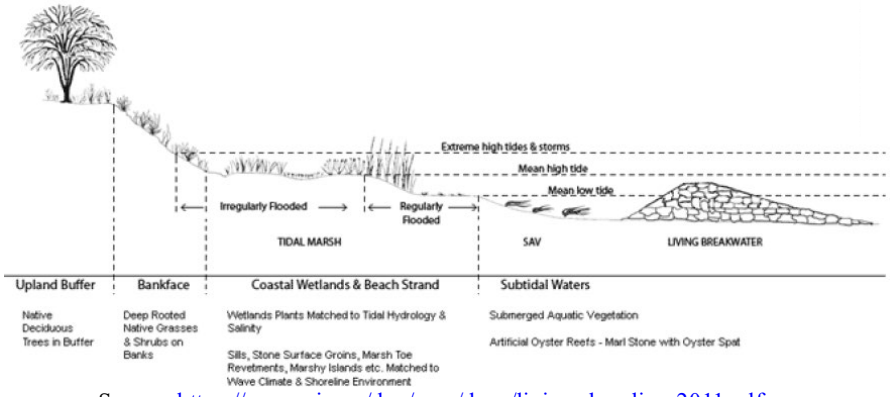
Photo Sources:
St. Clair Region Conservation Authority
Hardaway and Byrnes

Aberdeen Proving Ground

Figure 2-9

Figure 2-9: Typical Stone Revetment and Stone Sill





Source: https://www.nj.gov/dep/cmp/docs/living-shorelines2011.pdf
(New Jersey Coastal Management Office, 2009)

	Aberdeen Proving Ground	Figure 2-10

Figure 2-10: Typical Breakwaters and Living Shoreline

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3.0 ALTERNATIVES CONSIDERED

3.1 PREFERRED ALTERNATIVE

The Preferred Alternative is to execute the Proposed Action.

3.2 NO ACTION ALTERNATIVE

The CEQ requires the analysis of the No Action Alternative even if the agency is under legislative command to act. Analysis of the No Action Alternative provides a benchmark for enabling decision-makers to compare the magnitude of environmental effects of the other action alternatives.

The No Action alternative provides the basis under NEPA for comparison to other alternatives and is required by CEQ regulations. The No Action alternative is generally either a "no change" or "do nothing" alternative relative to the Proposed Action. Although it would not satisfy the purpose of and need for this project, the No Action Alternative does establish the baseline to which the Action Alternatives can be compared.

The No Action alternative involves not implementing shoreline stabilization measures at the three project sites. Selecting the No Action alternative is equivalent to allowing the existing baseline environmental conditions identified in Section 4 of this document to continue.

Under the No Action alternative, erosion along the shoreline would continue at approximately 2 to 4 feet per year, causing the loss of SAV beds, of tidal wetland habitats, and of associated fish, wildlife, and human benefits. The No Action Alternative is not feasible for the following reasons:

1) The continued loss of land due to erosion along the shoreline would impact the ability for ATC mission-critical testing to continue, increase the potential for exposure to unexploded ordinances (UXO); and
2) There is no known additional land or alternative land location for ATC to utilize for testing purposes if the existing shoreline continues to erode.

The full impacts of the No Action alternative and the Proposed Action are described in Section 4.

3.3 ALTERNATIVES ELIMINATED FROM FURTHER STUDY

As required by NEPA, potential alternatives to the Proposed Action must be considered. Alternatives to be evaluated must be economically feasible, able to be implemented and meet the purpose and need for the Proposed Action.

One alternative considered was moving the location to another Operational Test Command (OTC) location where there is no danger of shoreline erosion; however, the water access is needed for testing. Also, the Safety Danger Zones currently established for ranges at APG would be cost prohibitive to establish at a new location. This alternative was eliminated from further evaluation in this EA.

Several non-structural stabilization alternatives including establishment or restoration of wetland vegetation, bank grading, and/or fiber logs have been shown to be effective in stabilizing eroding

shorelines. While non-structural alternatives may be suitable for use in lower energy environments, the high-energy wave environment resulting from the tidal nature of the area, and rapid rate of shoreline erosion precludes their use at APG. Therefore, the non-structural stabilization alternatives were dismissed as being a non-viable alternative that would be ineffective in this environmental setting, and were eliminated from further evaluation in this EA.

4.0 EXISTING CONDITIONS

This section of the EA describes the existing conditions of the natural and socioeconomic resources affected by the Proposed Action. Each environmental, cultural, and social resource category typically considered in an EA was reviewed for its applicability to be affected by the Proposed Action. For the purpose of describing existing conditions and environmental effects, the area of influence encompasses each of the three project areas previously described for shoreline stabilization (Figure 2-2), plus a one-half mile radius surrounding each of three areas.

4.1 LAND USE

APG encompasses approximately 72,500 acres of land and water in Maryland at the northern end of the Chesapeake Bay. The majority of APG lies within Harford County with two small sections on the western edge of the installation which are located in Baltimore County. The Bush River divides the installation into the two main noncontiguous areas, commonly referred to as APG-AA, encompassing approximately 27,600 acres, and APG-EA, encompassing approximately 9,850 acres. Contiguous waters of APG account for approximately 33,000 acres. Four areas not attached to the installation proper include the Churchville Test Site and Poole's Island in Harford County, and Carroll Island and Graces Quarters in Baltimore County. These four areas combined account for the remaining acreage. Interstate Route 95, U.S. Route 40, and the Northeast Corridor rail line, utilized by Amtrak and Norfolk Southern, run parallel to the northwest boundary of the installation. Maryland Route 22 and U.S. Route 40 are the primary access routes to the APG-AA, and Maryland Routes 24, 755, and 152 provide direct access to APG-EA. The installation is predominantly surrounded by residential areas, commercial centers, light industrial use, and open space.

Land use at APG-AA includes a Garrison Headquarters, cantonment area, research area, a training and support area and test ranges. Land uses within the APG-EA include an industrial area, training area, research and development area and test range. Land use in the surrounding areas outside the installation includes residential, commercial, industrial and agricultural uses. APG's facilities include more than 17 million square feet of building space in more than 2,000 buildings (including offices, administrative and training facilities, and warehouses, barracks, and family housing). There are more than 40 miles of vehicle test track, nearly 200 range firing positions, 8 medical research laboratories, 10 chemical laboratories, 2 physics laboratories, 5 human engineering laboratories, a materials research laboratory, C5ISR facilities, as well as Phillips Army Airfield and Weide Army Aviation Support Facility.

Within the UTF Study Area, land use is comprised of ranges and wetlands. The C-Field Study Area is comprised of ranges, wetlands, forests, and industrial land uses. The Henry (H) - Field Study Area is comprised of ranges, wetlands, and forests (Figure 4-1).

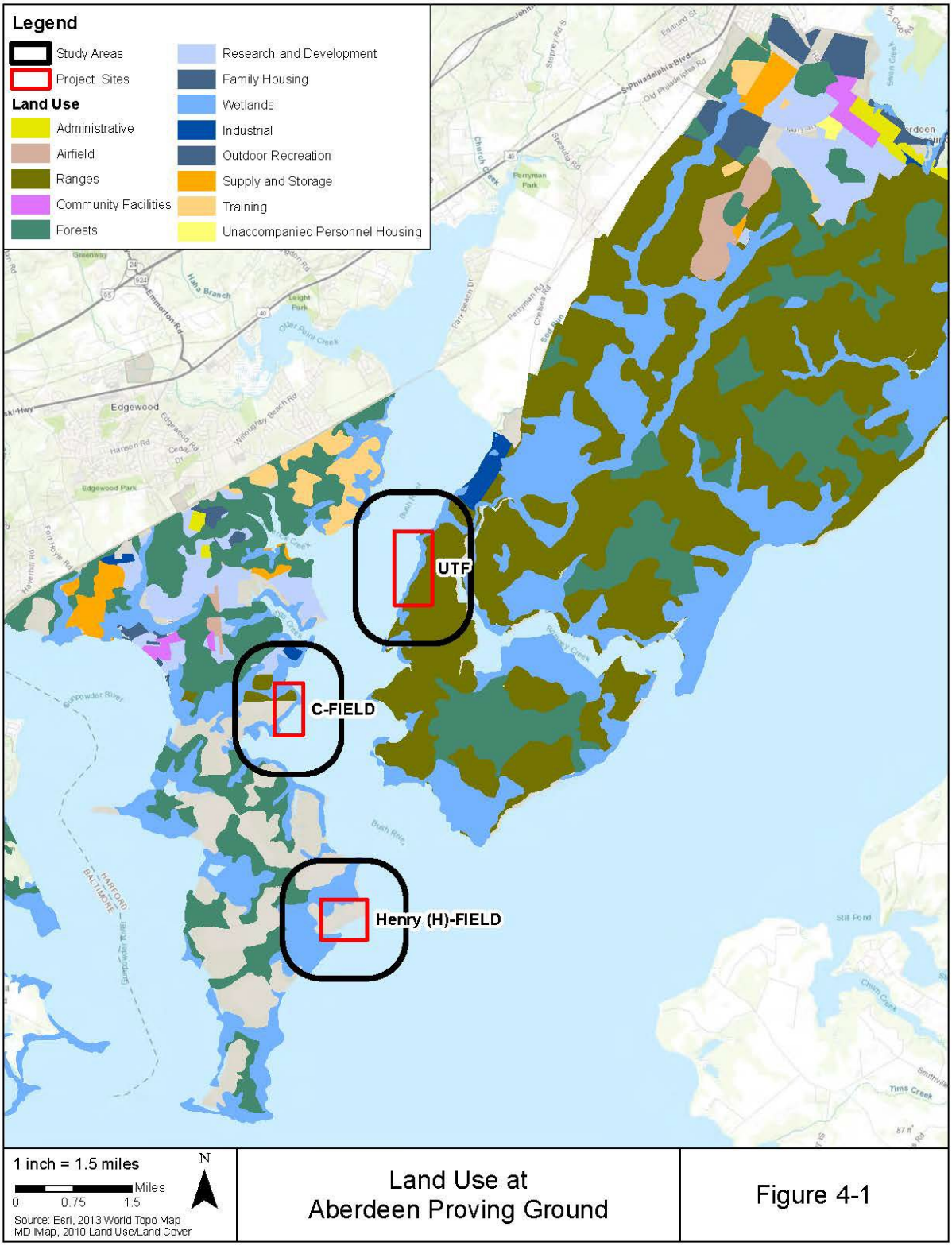

Figure 4-1: Land Use at Aberdeen Proving Ground

4.2 VISUAL AESTHETICS

Visual resources are the natural and human-made features on the installation landscape. They can include cultural and historic landmarks, landforms of particular beauty or significance, water surfaces, or vegetation. Together, these features, called the "viewshed," form the overall impression that a viewer receives of the area or its landscape.

As previously described, APG is located on the western shore of the upper Chesapeake Bay. About half of the Installation's 72,500 acres include undeveloped, intact forested areas, wetlands, marshes, and developed areas. The remaining acreage consists of open water associated with the Chesapeake Bay, and is surrounded by estuaries and approximately 103 miles of shoreline. The open shoreline and Chesapeake Bay waters provide valuable visual aesthetics to personnel, residents, and visitors to APG. Undeveloped areas along the shoreline also create a visual screen of APG for recreationists and other open water users in the adjacent waters of the bay.

The largely developed areas of APG include industrial and residential areas and the Cantonment area. Historic structures and historic districts are configured to meet specific visual themes within the Installation. Where feasible, buildings and associated landscaping are designed to meet theme criteria. Building heights within APG are typically lower than 40 feet, and tracts of trees are distributed throughout the post to offer a balance to elevated structures (APG, 2014a).

The viewsheds of the Bush River are generally unobstructed natural views within the three Study Areas. A generally unbuilt environment surrounds the three project areas within the Study Areas.

4.3 GEOLOGY, SOILS AND TOPOGRAPHY

4.3.1 Geology

Aberdeen Proving Ground is located in the Atlantic Coastal Plain Physiographic Province. This province consists of underlying unconsolidated sediments including clay, silt, sand, and gravel in a form that is thicker from east to southeast across the area. The sediment layer may reach a thickness of 700 feet. The sediment layer overlaps the crystalline rocks of the Paleozoic and Precambrian Piedmont Crystalline Complex. Sediments in the Atlantic Coastal Plain are marine and nonmarine sediments, which were deposited on the eastern continuation of the Piedmont Crystalline Complex. Transgressive and regressive seas and local streams deposited layers of clay, silt, sand, and gravel, from fluctuating water levels, forming a wedge that thickens and gently dips toward the southeast. These sediments were deposited on a surface of crystalline basement rocks that compose formations of Paleozoic and Precambrian age (USACE, 2014). Geology within the study areas for the three sites are similar in nature.

4.3.2 Soils

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) performed the most recent soil survey of APG in 1997 and 1998. According to this survey, the predominant soil types on APG include Mattapex, Romney, Udorthents, and Woodstown series. These soil types comprise approximately 60 percent (%) of the total soil types on the installation and are broken down into the following percentages: Romney silt loam (17.8%), Mattapex silt loam (16.0%), Woodstown sandy loam (9.5%), Udorthents loam (8.6%), and Puckum muck (8.1%). In all, there are 39 soil types that cover the installation (NRCS, 2013). There are 17 soil

series identified within the study areas for the three project sites as shown on Figures 4-2, 4-3, and 4-4. Both hydric and nonhydric soils exist at APG. Hydric soils are soils formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part (USDA, 2019). A brief description of these soil series, followed by the soil types at each project site, is presented below.

The Beltsville series consist of moderately well drained, nearly level to moderately sloping soils on uplands of the Coastal Plain. These soils are only moderately deep over a fragipan. They formed in loamy sediment deposited over very old loamy or gravel deposits. They are classified as fine-loamy, mixed, semiactive, mesic Typic Fragiudults. Beltsville is a nonhydric soil.

The Codorus series consists of very deep, moderately well drained, and somewhat poorly drained soils. These soils formed in recently deposited alluvial materials derived from upland soils materials weathered from mostly metamorphic and crystalline rocks. They are on floodplains with smooth, nearly level slopes of 0 to 3%. Saturated hydraulic conductivity is moderately high to high. They are classified as fine-loamy, mixed, active, mesic Fluvaquentic Dystrudepts. Cordorus is a nonhydric soil.

The Elkton series consists of very deep, poorly drained, smooth 0-2% sloping soils in woodlands of the Coastal Plain. They formed from silty eolian material underlain by loamy alluvial or marine sediments. They are classified as fine-silty, mixed, active, mesic Typic Endoaquults. Elkton is a hydric soil.

The Fallsington series consists of very deep, poorly drained, 0-5% sloping soils in flats, swales, drainageways, and depressions in the Coastal Plain. They formed from loamy fluviomarine sediments. They are classified as fine-loamy, mixed, active, mesic Typic Endoaquults. Fallsington is a hydric soil.

The Hambrook series consists of very deep, moderately well drained, nearly level to moderately sloping soils on uplands of the Coastal Plain. These soils are only moderately deep over a fragipan. They formed in loamy sediment deposited over very old loamy or gravel deposits and stratified alluvial and marine sediments. They are classified as fine-loamy, siliceous, semiactive, mesic Typic Hapludults. Hambrook is a nonhydric soil.

The Indiantown series consists of very deep, very poorly drained soils located on nearly level floodplains of the Mid-Atlantic Coastal Plain. They formed in loamy fluvial sediments overlying sandy alluvial and marine sediments. They are classified as coarse-loamy siliceous, active, acid, mesic Cumulic Humaquepts. Indiantown is a hydric soil.

The Lenape series consists of very deep, moderately well drained, nearly level to moderately sloping soils on uplands of the Coastal Plain. These soils are only very deep over a fragipan. They are classified as loamy, mixed, dysic, mesic Terric Haplosaprists. Lenape is a hydric soil.

The Longmarsh series consists of very deep, very poorly drained soils that formed in loamy alluvium over sandy and gravelly sediments. The Longmarsh soils are on floodplains on the Mid-Atlantic Coastal Plain. Permeability is moderate. Slopes range from 0 to 2 percent. The mean

annual temperature in 55 degrees F, and the mean annual precipitation is about 43 inches. They are classified is coarse-loamy, siliceous, active, acid, mesic Fluvaquentic Humaquepts. Longmarsh is a hydric soil.

The Mattapex series consist of deep, moderately well drained, nearly level and gently sloping soils on broad smooth uplands and in slight depressions within areas of the other soils of the Coastal Plain. These soils formed in old deposits of loamy material over older, coarser sediment. They are classified as fine-silty, mixed, active, mesic Aquic Hapludults. Mattapex is a nonhydric soil.

The Manahawkin series consists of very deep, very poorly drained soils. These soils formed from organic deposits underlain by sandy fluviomarine sediments. They are classified as sandy or sandy-skeletal, siliceous, dysic, mesic Terric Haplosaprists. Manahawkin is a hydric soil.

The Pone series consists of very deep, very poorly drained soils. They formed in woody organic deposits overlying unconsolidated, stratified alluvial and marine sediments. They are found on uplands, depressions, and floodplains of the Mid-Atlantic Coastal Plain. They are classified as coarse-loamy, siliceous, active, mesic Typic Umbraquults. Pone is a hydric soil.

The Puckum series consists of very deep, poorly drained soils. These soils formed from highly decomposed organic deposits derived from woody materials. They are on floodplains with smooth, nearly level slopes of 0 to 3 percent. Saturated hydraulic conductivity is moderately high to high. They are classified as Dysic, mesic Typic Haplosaprists. Pukum is a nonhydric soil.

The Romney series consists of very deep, very poorly drained soils that formed in loamy alluvium over sandy and gravelly sediments. The Romney soils are on floodplains on the Mid-Atlantic Coastal Plain. Permeability is moderate. Slopes range from 0 to 2 percent. The mean annual temperature in 55 degrees F, and the mean annual precipitation is about 43 inches. They are classified as: Fine-silty, mixed, active, mesic Aeric Endoaquults. Romney is a nonhydric soil.

The Udorthents series consist of very deep, well drained to excessively drained soils. Udorthents is a nonhydric soil.

The Woodstown series consists of very deep, moderately well drained and somewhat poorly drained soils. These soils formed in recently deposited alluvial materials derived from upland soils materials weathered from mostly metamorphic and crystalline rocks. They are found in depressions, fluviomarine terraces, flats, broad interstream divides. They are classified as fine-loamy, mixed, active, mesic Aquic Hapludults. Woodstown is a nonhydric soil.

The Zekiah series consist of very deep, poorly drained soils. These soils formed from loamy alluvium. They are found in floodplains in the Coastal Plain. They are classified as coarse-loamy, siliceous, active, acid, mesic Typic Fluvaquents. Zekiah is a hydric soil.

UTF Location

There are 5 different soil types identified along the shoreline at the UTF Location, as well as Water (Figure 4-2). These soil types include Hambrook sandy loam 0-10% slopes, Longmarsh sandy

loam, Mattapex silt loam 0-2% slopes, Udorthents loamy 0-10% slopes, and Woodstown sandy loam 0-2% slopes.

C-Field Location

There are 6 different soil types identified along the shoreline at the C-Field Location, as well as Water (Figure 4-3). These soil types include Beltsville silt loam 2-5% slopes, Codorus loam, Lenape mucky peat, Longmarsh sandy loam, Romney silt loam, and Woodstown sandy loam 2-5% slopes.

Henry (H) - Field Location

There are 3 different soil types identified along the shoreline at the Henry (H) - Field Location (Figure 4-4). These soil types include Codorus loam, Puckum muck, and Woodstown sandy loam 0-2% slopes.

Forty percent of APG's land area is within a range area. Because of range activities, soils in these areas have been physically altered, including changes in the topography, permeability, erosion potential, and chemical composition (from contamination). These contaminated areas are under an ongoing study, and the cleanup is outlined in the Installation Action Plan (Whitman, Requardt & Associates [WRA], 2013).

4.3.2.1 Prime and Unique Farmland

High quality farmland is of major importance in meeting the nation's short- and long-range needs for food and fiber. Prime farmland, as defined by USDA, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. Although NRCS identifies soil map units on APG that may be considered prime farmland due to the physical and chemical properties of the soil, it is located within the bounds of an active military installation and is excluded under the exceptions in the USDA definition; therefore, no prime farmland is found at APG (Department of the Army [DA], 2007).

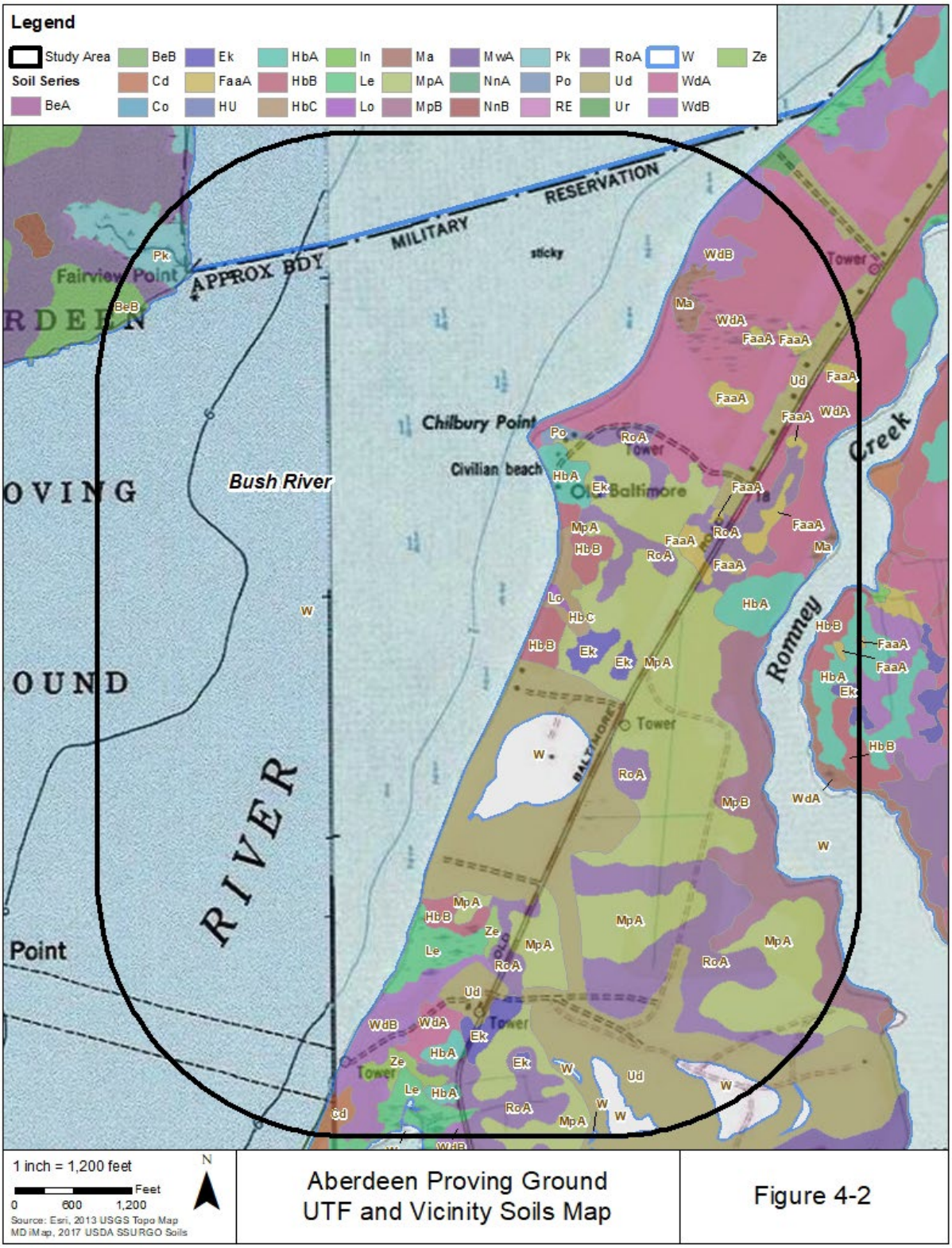

Figure 4-2: UTF and Vicinity Soils Map

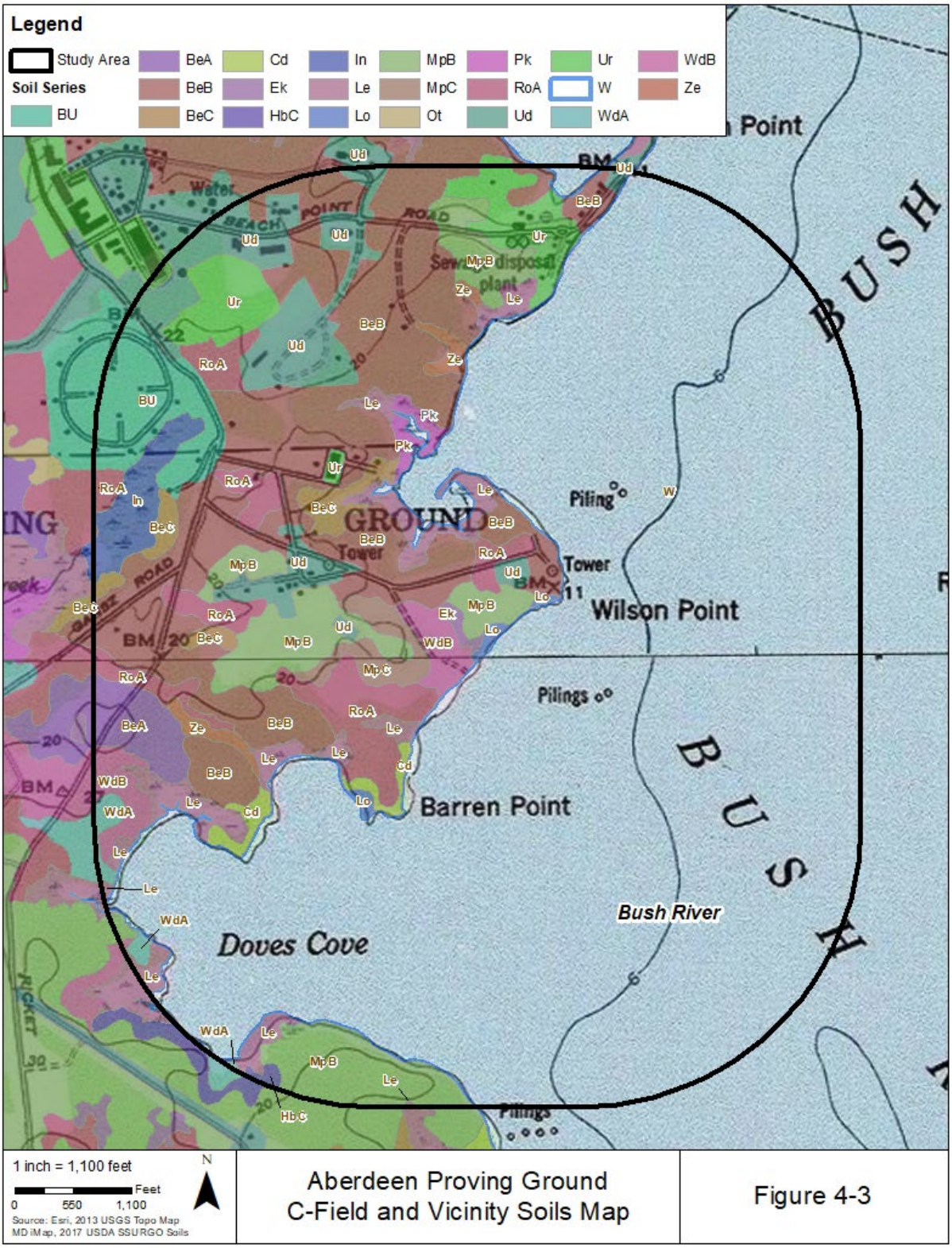

Figure 4-3: C-Field and Vicinity Soils Map

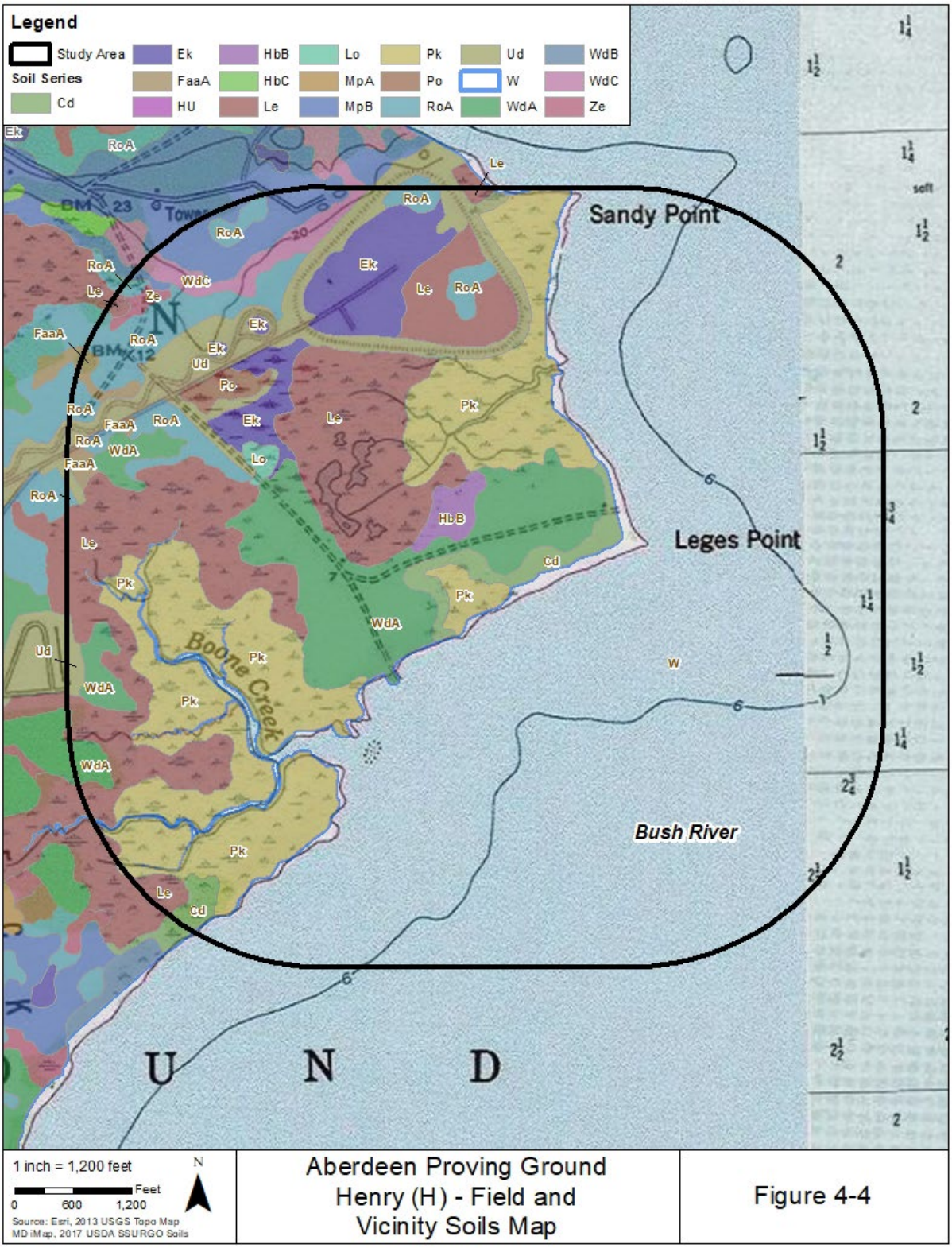

Figure 4-4: Henry (H) - Field and Vicinity Soils Map

4.3.3 Topography

The topography of the major portions of APG is gently rolling, and generally representative of the Coastal Plain Physiographic Province. Elevations in these areas range from 0 to 70 feet above mean sea level (AMSL). Highest elevations occur in the northern portions of APG-AA, near the 4700 Block (Rewa and Wolfin, 1989). Steep slopes, both naturally occurring and man-made, also exist across the installation along the banks of the Bush River and Swan Creek. These slopes range from zero to ten percent, but most are two percent or less (USACE, 2014). Significant portions of the installation are located below the 8-foot contour, falling within the one percent possible floodline established by the USACE. Large portions of the installation fall within the 100-year floodplain (Rewa and Wolfin, 1989). The low elevations of the project sites, as noted below, make them susceptible to flooding and even moderate wave action during storm events. Small bluffs occur in some areas along the shoreline, providing evidence of erosion.

UTF Location

According to the mapped source data (Figure 4-5), and communication with ATC personnel on June 6, 2018, topography at the UTF location ranges between 0 to 25 feet AMSL. While relatively flat, the site increases slightly from south to north near the southern end, but then decreases along the majority of the project's shoreline. Elevations also generally increase from west to east.

C-Field Location

According to the mapped source data (Figure 4-6), and communication with ATC personnel on June 6, 2018, topography at the C-Field location ranges between 0 to 20 feet AMSL. The land decreases in elevation from south to north and then begins to increase again as the point is rounded.

Elevations gradually increase from east to west and eventually reaches 20 feet approximately 750-1,500 feet west of the project site. The C Field shoreline displays the steepest slopes along the coastline, some slopes totaling 20 feet in height and at 90-degree angles.

Henry (H) - Field Location

Topography at the Henry (H) - Field location (Figure 4-7) range between 0 to 10 feet AMSL. Along the shoreline, the land relatively stays flat, with minor increases and decreases of 1-2 feet. Elevations also generally increase from east to west.

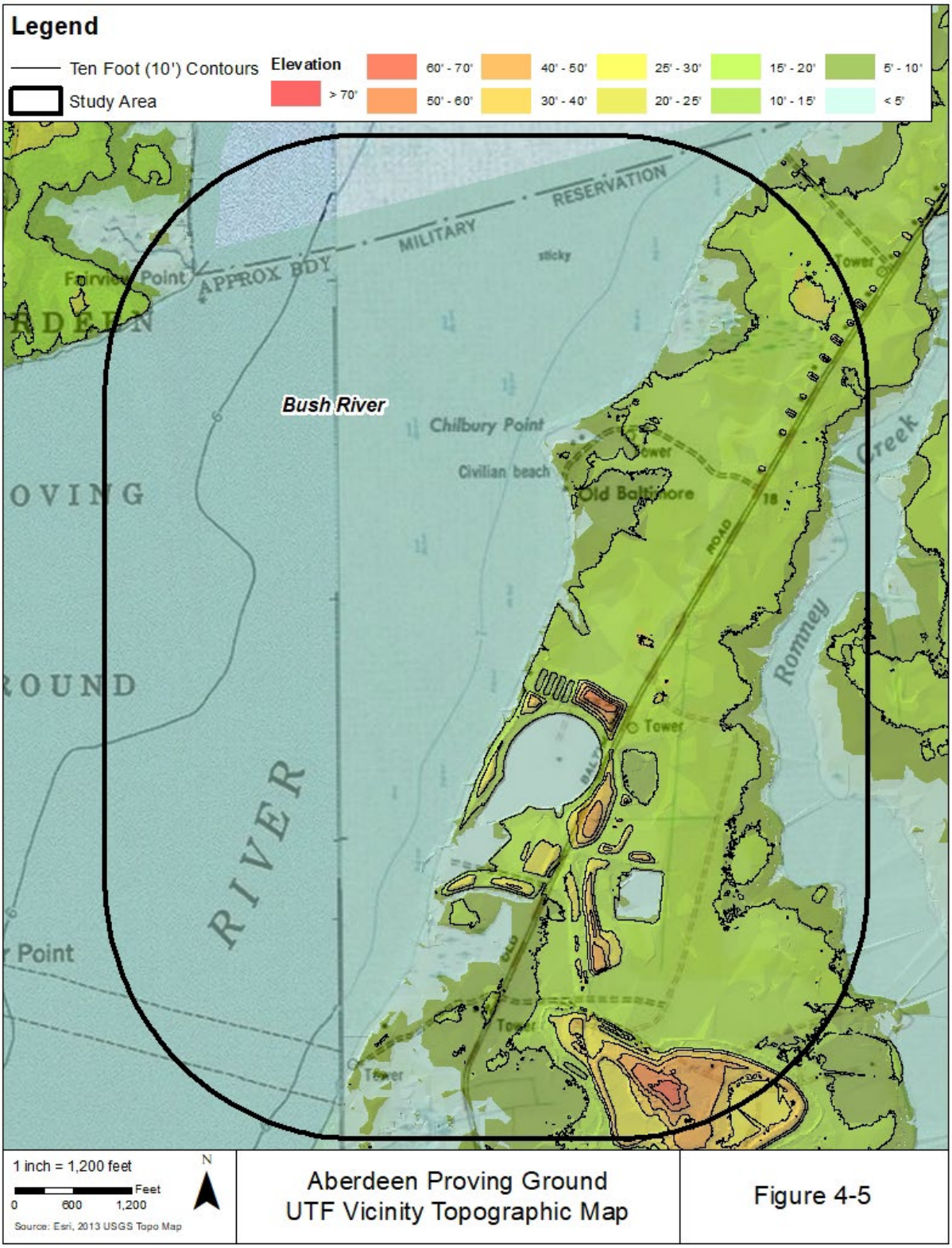

Figure 4-5: UTF Vicinity Topographic Map

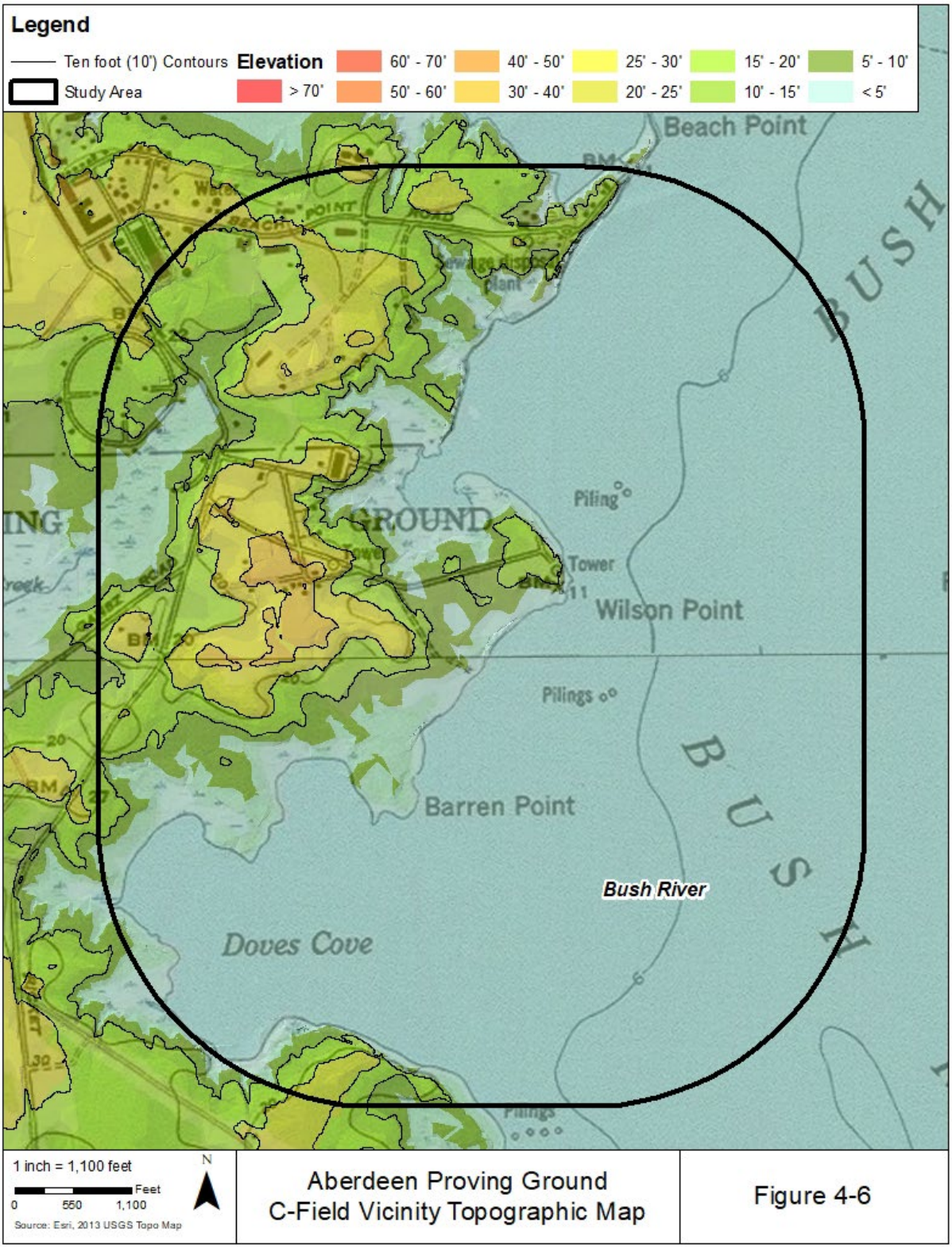

Figure 4-6: C-Field Vicinity Topographic Map

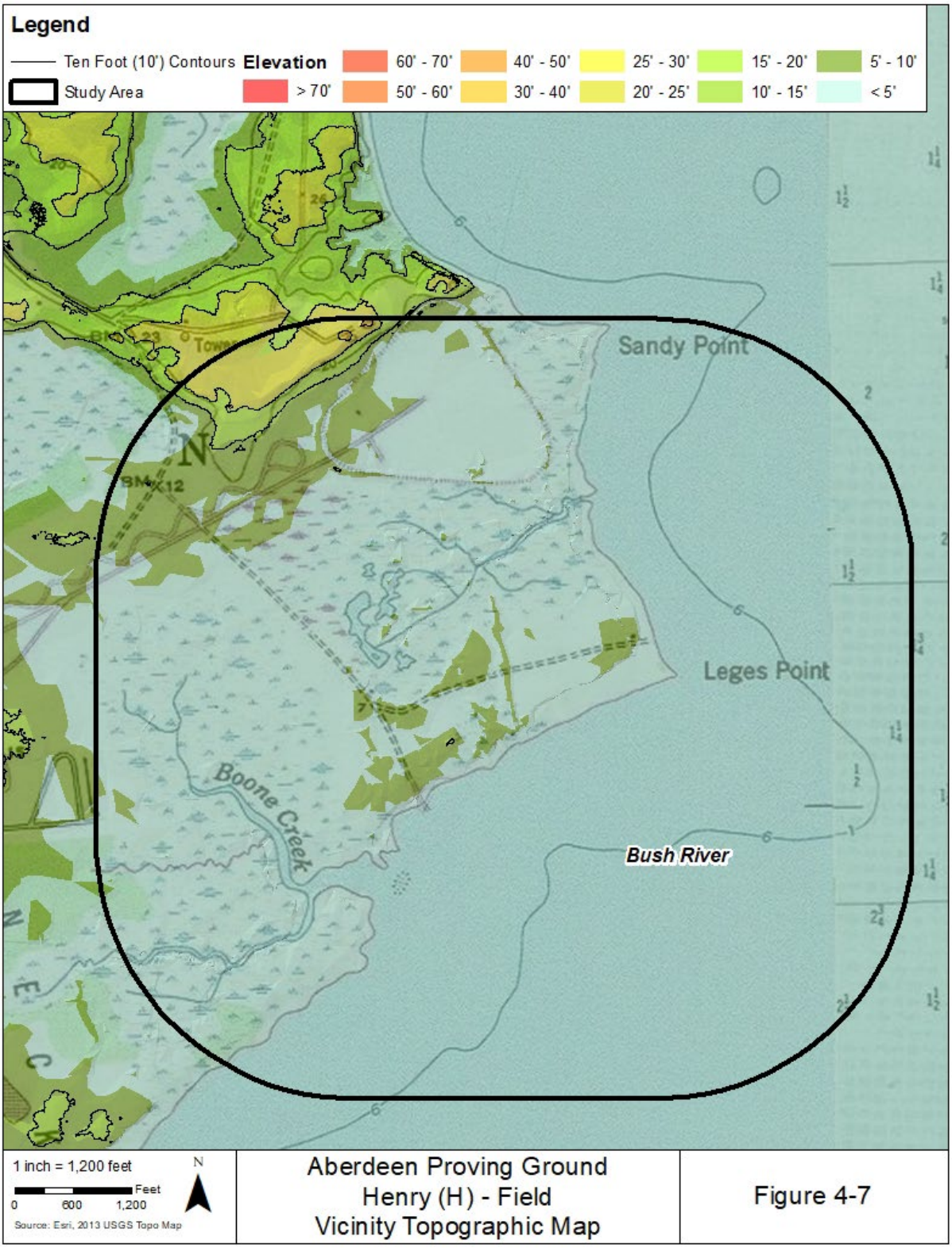

Figure 4-7: Aberdeen Proving Ground Henry (H) - Field Vicinity Topographic Map

4.4 AIR QUALITY AND GREENHOUSE GASES

4.4.1 National Ambient Air Quality Standards and Attainment Status

The United States Environmental Protection Agency (USEPA) Region 3 and the Maryland Department of the Environment (MDE) regulate air quality in Maryland. The CAA (42 4 U.S.C. 7401–7671q), as amended, gives USEPA the responsibility to establish the primary and secondary National Ambient Air Quality Standards (NAAQS) (40 CFR 50) acceptable concentration levels for seven criteria pollutants: particulate matter less than 10 microns (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen oxides (NO_X), ozone (O_3), and lead. Short-term standards (i.e., 1-, 8-, and 24-hour periods) have been established for pollutants that contribute to acute health effects, while long-term standards (i.e., annual averages) have been established for pollutants that contribute to chronic health effects. These standards identify the maximum allowable concentrations of criteria pollutants that regulatory agencies consider safe, with an additional adequate margin of safety to protect human health and welfare. Each state has the authority to adopt standards stricter than those established under the Federal program. MDE has adopted the NAAQS and is responsible for maintaining air quality standards for the State of Maryland.

Primary and secondary NAAQS for the aforementioned criteria are described in Table 4-1. Harford County was analyzed for that is where all project activities would take place. Areas that exceed the NAAQS ambient concentration are labeled as nonattainment areas and are designated by federal regulations. According to the severity of the pollution problem, areas exceeding the established NAAQS are categorized as marginal, moderate, serious, severe, or extreme nonattainment or maintenance areas. APG is within the Metropolitan Baltimore Intrastate Air Quality Control Region, also known as Area III of the State of Maryland Air Quality Control Area. The region is in compliance with all pollutants except for 8-hour O_3, which are in moderate nonattainment for 2008 8-hour O_3 standards and marginal nonattainment for 2015 O_3 standards (USEPA, 2022). Harford County was focused on in this EA, for all project activities are located within Harford County. The State of Maryland submitted an attainment demonstration for the 1-hour O_3 standard. Additionally, Harford County is within the O_3 transport region that includes 28 states and Washington, D.C.

Table 4-1: National Ambient Air Quality Standards

Pollutant	Standard	Averaging Time	Ambient Concentration	Harford County Attainment Status
CO	Primary	1-hour[a] (ppm)	35	Maintenance
		8-hour[a] (ppm)	9	
NO_2	Primary	1-hour[b] (ppm)	100	Attainment
	Primary and Secondary	Annual[c] (ppm)	53	
O_3	Primary and Secondary	8-hour[d] (ppm)	0.075	Nonattainment
SO_2	Primary	1-hour[e] (ppb)	75	Attainment
	Secondary	3-hour[a] (ppm)	0.5	
$PM_{2.5}$	Primary and Secondary	24-hour[f] ($\mu g/m^3$)	35	Attainment

Pollutant	Standard	Averaging Time	Ambient Concentration	Harford County Attainment Status
	Primary	Annual arithmetic mean[g] (µg/m^3)	12	
	Secondary	Annual arithmetic mean[g] (µg/m^3)	15	
PM_{10}	Primary and Secondary	24-Hour[h] (µg/m^3)	150	Attainment

Source: 40 CFR 50.1-50.12; U.S. Environmental Protection Agency [USEPA], 2015
CO = carbon monoxide; µg/m3 = micrograms per cubic meter; NAAQS = National Ambient Air Quality Standards; NO_2 = nitrogen dioxide; O_3 = ozone; ppb = parts per billion; ppm = parts per million; $PM_{2.5}$ = particulate matter less than 2.5 microns; PM_{10} = particulate matter less than 10 microns; SO_2 = sulfur dioxide
a Not to be exceeded more than once per year.
b 98th percentile, averaged over 3 years.
c Annual mean.
d The 3-year average of the fourth highest daily maximum 8-hour average O_3 concentrations over each year must not exceed 0.08 ppm.
e The 3-year average of the 99th percentile of 1-hour daily maximum concentrations.
f The 3-year average of the 98th percentile of 24-hour concentrations.
g The 3-year average of the weighted annual mean.
h Not to be exceeded more than once per year, on average over 3 years.

4.4.2 Regulatory Requirements for Hazardous Air Pollutants

In addition to criteria pollutant standards, the USEPA also regulates hazardous air pollutant (HAP) emissions for each state. HAPs differ from criteria pollutants for they are known or suspected to cause cancer and other diseases, or have adverse environmental impacts. The National Emission Standards regulate 188 HAPs based on available control technologies. The majority of HAPs are Volatile Organic Compounds (VOCs). A VOC is any organic compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate, which participates in atmospheric photochemical reactions, except those designated by USEPA as having negligible photochemical reactivity and having an initial boiling point less than or equal to 250° C measured at a standard atmospheric pressure of 101.3 kPa (USEPA, 2016a).

The total HAP emissions for the State of Maryland and the three counties adjacent to APG are shown in Table 4-2. As shown, APG's contribution to area HAP emissions is negligible. Sources of HAP emission at APG include stationary, mobile, and fugitive emissions sources. Stationary sources include boilers, incinerators, fuel storage tanks, fuel-dispensing facilities, vehicle maintenance shops, laboratories, degreasing units, and similar testing units. Mobile sources of emissions include private and government-owned vehicles. Fugitive sources include dust generated from demolition activities, open burning, detonation of munitions, and roadway traffic.

Table 4-2: Regional Hazardous Air Pollutant Emissions for APG

Area	Total HAP Emissions tons per year (tpy)	Percent of Total Emissions in Maryland
State of Maryland	64,108	100.00
Baltimore County, Maryland	7,562	11.80
Harford County, Maryland	2,625	2.09
Cecil County, Maryland	1,327	2.07
Aberdeen Proving Ground	13	0.02

Source: APG, 2014a.

APG holds two Title V operating permits: permit number 24-025-00081 for the APG-AA, which expires on January 31, 2025, and permit number 24-025-00082 for APG-EA which expires on October 31, 2024 (MDE, 2019; MDE, 2020). The permits include processes regarding boilers, paint booths, storage tanks, generators, and other emission units. APG conducts comprehensive annual air emission inventories for the installation (APG, 2017a; APG, 2017b; APG, 2018a; APG, 2018b; APG, 2019a; APG, 2019b; APG, 2020a; APG, 2020b). Any new activity that would be conducted at the Installation requires an air permit review. Depending on the scope of the proposed activity, a demolition permit and/or a revision to the Title V air permit may be warranted. The cumulative criteria pollutant emissions calculated in both permits is denoted in Table 4-3.

Table 4-3: Criteria Pollutant Emissions for Aberdeen Proving Ground (2016 to 2019)

Year	NO_X	SO_X	PM_{10}	CO	VOC
	(tons per year)				
2019	75.64	4.45	8.99	74.11	7.96
2018	83.18	3.84	3.14	77.53	10.46
2017	67.60	3.11	2.50	66.57	10.52
2016	99.61	9.60	3.15	59.73	6.09

NOx = nitrogen oxides; SOx = sulfur oxides; PM_{10} = particulate matter less than 10 microns; CO = carbon monoxide; VOC = volatile organic compound

Source: APG, 2017a; APG, 2017b; APG, 2018a; APG, 2018b; APG, 2019a; APG, 2019b; APG, 2020a; APG, 2020b

MDE develops air quality plans, which are also referred to as State Implementation Plans (SIPs) that are designed to attain and maintain the NAAQS, and to prevent significant deterioration of air quality in areas which demonstrate air that exceeds NAAQS standards. Maryland has individual SIPs for various pollutants, including NO_2, $PM_{2.5}$, 8-hour O_3, regional 5 haze, lead, etc. Federal agencies must ensure that their actions conform to the SIP in a non-attainment area, and do not contribute to new violations of ambient air quality standards, or an increase in the frequency or severity of existing violations, or a delay in timely state and/or regional attainment standards. If a proposed project's emissions exceed ten percent of the total emissions inventory for a particular criteria pollutant in a nonattainment area, it is considered to be "regionally significant" and subject to the general conformity rule.

4.4.2.1 Clean Air Act Conformity

The 1990 amendments to the CAA require Federal agencies to ensure that their actions conform to the SIP in a nonattainment area. The purpose of the General Conformity Rule is to:

- Ensure that Federal activities do not interfere with the budgets in the SIPs

- Ensure the attainment and maintenance of NAAQS
- Ensure that actions do not cause or contribute to new violations of NAAQS

USEPA has developed two distinctive sets of conformity regulations: one for transportation projects and one for non-transportation projects. Non-transportation projects are governed by general conformity regulations (40 CFR 93). The Proposed Action is a non-transportation project within a nonattainment area. Therefore, a general conformity analysis is required with respect to the 8-hour O_3 NAAQS.

The General Conformity Rule specifies threshold emissions levels by pollutant to determine the applicability of conformity requirements for a project. Due to the proximity to the urbanized east coast of the United States, Harford County and Baltimore County are considered an Ozone Transport Region. The Ozone Transport Region has a moderate ozone nonattainment classification by definition. Because ozone formation is driven by other direct emissions, the air quality analyses focus on ozone precursors that include VOCs and NO_X. In accordance with USEPA policy, precursors that form $PM_{2.5}$ (NO_X and SO_2) have also been evaluated. For an area in moderate nonattainment for the 8-hour O_3 NAAQS within the O_3 transport region, the applicability criterion is 100 tpy for NO_X and 50 tpy for VOCs (40 CFR 21 93.153). For an area in nonattainment for the $PM_{2.5}$ NAAQS, the applicability criterion is 100 tpy for $PM_{2.5}$, NO_X, and SO_2 (71 CFR 40420).

Regulated under 40 CFR 93(b), the *General Conformity Rule* also prohibits any department, agency, or instrumentality of the Federal Government from engaging in, providing financial assistance for, approving, or supporting any activity that does not conform to applicable SIP designated for areas being in nonattainment of established NAAQS. A SIP is a compilation of a state's air quality control plans and rules, approved by the USEPA, in an effort to reduce or eliminate the severity and number of NAAQS violations and achieve expeditious attainment of these standards. A general conformity determination is also required if a proposed federal action exceeds ten percent of the total emissions inventory for a particular criteria pollutant in a nonattainment area. If the project's emissions exceed this ten-percent threshold, the federal action is considered to be "regionally significant" and the general conformity rules apply.

4.4.3 Greenhouse and Gas Emissions and Hazardous Air Pollutants

Greenhouse Gases (GHGs) are a particular group of gasses that have the ability to trap heat by absorbing infrared radiation in the atmosphere. Scientific evidence indicates a trend of increasing global temperature over the past century which may be due to an increase in GHG emissions from human based activities. The most common GHGs emitted from natural processes and human activities include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide. The main source of GHGs from human activities is the combustion of fossil fuels, including crude oil and coal. Other examples of GHGs created and emitted primarily through human based activities include fluorinated gases (hydro-fluorocarbons and perfluorocarbons) and sulfur hexafluoride.

Each GHG is assigned a global warming potential (GWP). The GWP is the ability of a gas or aerosol to trap heat in the atmosphere. The GWP rating system is standardized to CO_2, which has a value of one. For example, CH_4 has a GWP of 25, which means that it has a global warming effect 25 times greater than CO_2 on an equal-mass basis (International Panel on Climate Change [IPCC], 2007).

To simplify GHG analyses, total GHG emissions from a source are often expressed as a CO_2 equivalent (CO_2e). The CO_2e is calculated by multiplying the emissions of each GHG by its GWP and adding the results together to produce a single, combined emission rate representing all GHGs. While CH_4 and nitrous oxide have much higher GWPs than CO_2, CO_2 is emitted in higher quantities that it is the overwhelming contributor to CO_2e from both natural processes and human activities.

4.4.3.1 Regulatory Review and Permitting

Currently the USEPA has two regulations that 1) require annual GHG emissions reporting, and 2) add the requirement to address best available control technology for new or modified sources that occur after January 2, 2011. These rules apply to fossil fuel suppliers and industrial gas suppliers, direct GHG emitters, and manufacturers of heavy-duty and off-road vehicles and engines. The rule does not require control of GHGs, rather it requires only that sources above certain threshold levels monitor and report emissions. In addition, USEPA recently promulgated the Tailoring Rule that established a CO_2e threshold for permitting purposes (i.e., construction and operation) of 75,000 tpy for modifications and 100,000 tpy for new sources.

On 18 February 2010, the CEQ proposed, for the first time, guidance on how federal agencies should evaluate the effects of climate change and GHG emissions for NEPA documentation (CEQ, 2016). Specifically, if a proposed action emits 25,000 metric tons or more of CO_2e on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. The CEQ does not propose this reference point as an indicator of a level of GHG emissions that may significantly affect the quality of the human environment but notes that it serves as a minimum standard for reporting emissions under the CAA. In the analysis of the direct effects of a proposed action, the CEQ proposes that it would be appropriate to: (1) quantify cumulative emissions over the life of the project; (2) discuss measures to reduce GHG emissions, including consideration of reasonable alternatives; and (3) qualitatively discuss the link between such GHG emissions and climate change. In August of 2016 the CEQ revised the guidance to establish direction for:

- Advises agencies to quantify projected greenhouse gas emissions of proposed federal actions whenever the necessary tools, methodologies, and data inputs are available;
- Encourages agencies to draw on their experience and expertise to determine the appropriate level (broad, programmatic or project- or site-specific) and the extent of quantitative or qualitative analysis required to comply with NEPA;
- Counsels agencies to consider alternatives that would make the action and affected communities more resilient to the effects of a changing climate; and

Reminds agencies to use existing information and science when assessing proposed actions.

4.4.3.1.1 Executive Order (EO) 13693

In April 2007, the U.S. Supreme Court determined that the USEPA has the regulatory authority to list GHGs as pollutants under the federal CAA. Congress has considered numerous proposals and bills to regulate GHGs but has not adopted any legislation.

Currently, federal agencies address emissions of GHGs by reporting and meeting reductions mandated in laws, executive orders, and policies. The most recent of these are EO 13693, *Planning for Federal Sustainability in the Next Decade,* of March 19, 2015.

The Energy Policy Act of 2005, Energy Independence and Security Act of 2007, and EO 13693 require an installation to adhere to specific energy improvements, which address waste reduction and improvements in efficiency. Specifically, the DoD Strategic Sustainability Performance Plan contains strategies to reduce energy waste and improve efficiency (Department of Defense [DoD], 2015).

4.5 NOISE

Noise is often defined as unwanted sound that interferes with normal activities in a way that reduces the quality of the environment. The human ear experiences sound as a result of pressure variations in the air. The physical intensity or loudness level of noise is expressed quantitatively as the sound pressure level. Sound pressure levels are defined in terms of decibels (dB), which are measured on a logarithmic scale. Sound can be quantified in terms of its amplitude (loudness) and frequency (pitch). Frequency is measured in hertz, which is the number of cycles per second. The typical human ear can hear frequencies ranging from approximately 20 hertz to 20,000 hertz. Typically, the human ear is most sensitive to sounds in the middle frequencies where speech is found and is less sensitive to sounds in the low and high frequencies.

Since the human ear cannot perceive all pitches or frequencies equally, measured noise levels in dB will not reflect the actual human perception of the loudness of the noise. Thus, the sound measures can be adjusted or weighted to correspond to a scale appropriate for human hearing. A-weighting is used most often for high frequency sounds such as vehicle traffic ("hum" sounds). C-weighting is used for low-frequency events such as large arms and explosions ("boom" sounds). Sound levels and their associated dBA levels are listed in Table 4-4 below.

Table 4-4: Common Sound Levels

Noise Level (dBA)	Description	Typical Sources
140	Threshold of pain	---
125	Uncomfortably loud	Automobile assembly line
120	Uncomfortably loud	Jet aircraft
100	Very loud	Diesel truck
80	Moderately loud	Motor bus
60	Moderate	Low conversation
40	Quiet	Quiet room
20	Very quiet	Leaves rustling

Source: APG, 2017c

Noise levels decrease (attenuate) with distance from the source. A generally accepted rule is that the sound level from a stationary source would drop approximately 6 dB each time the distance from the sound source is doubled. The sound level from a moving "line" source (e.g., a train or a roadway) would drop 3 dB each time the distance from the source is doubled. Noise levels may be further reduced by natural factors, such as temperature and climate, and are reduced by barriers,

both manmade (e.g., sound walls) and natural (e.g., forested areas, hills) (Federal Transit Administration [FTA], 2006).

Physical mitigation of noise is generally feasible for higher frequency sounds, such as small arms fire and traffic, whereby the low frequency component of impulsive "boom" noise has wave characteristics that can typically travel through obstacles.

4.5.1 Regulatory Overview

The Noise Control Act of 1972 (P.L. 92-574) directs Federal agencies to comply with applicable Federal, state, interstate, and local noise control regulations to the fullest extent consistent with agency missions. The act requires compliance with state or local noise control regulations in off-post areas only; however, the Army often uses the time restrictions outlined in local ordinances as general guidelines for on-post activities. In 1974, the USEPA provided information suggesting that continuous and long-term noise levels in excess of 65 dBA are normally unacceptable for noise-sensitive land uses such as residences, schools, churches, and hospitals.

The Maryland Environmental Noise Act of 1974 established policy that states the "limitation of noise to that level which will protect the health, general welfare, and property of the people of the State." Effective October 1, 2012, MDE delegated noise enforcement authority to local governments. MDE continues to update noise control standards, but enforcement is handled by local jurisdictions. Harford County codes and regulation only regulate noise from loud music and the use of household tools.

Title 26 of the Code of Maryland Regulation (COMAR), Department of the Environment, Subtitle 02, Chapter 03 (26.02.03 Control of Noise Pollution) provides the regulatory structure for noise pollution, hazards, and control. The regulation set maximum allowable noise and vibration levels for zoning categories, as depicted in Table 4-5.

Table 4-5: Maximum Allowable Noise Levels (dBA)

Time	Industrial	Commercial	Residential
Day	75	67	65
Night	75	62	55

Source: COMAR 26.02.03.02 Environmental Noise Standards

In addition, COMAR states that noise levels that emanate from construction or demolition site activities cannot exceed 90 dBA during daytime hours. Also, noise levels that extend beyond the property line of the noise source must not cause vibrations strong enough to move objects.

4.5.2 Noise Management

Policies focused on the control of operational noise to protect the health and welfare of the people are outlined and defined in U.S. Army Regulation (AR) 200-1 *Environmental Protection and Enhancement.* In order to best prevent noise conflicts with areas surrounding military bases, the Army developed the Aberdeen Proving Ground Installation Compatible Use Zone Plan (ICUZ). The ICUZ program promotes land use that is compatible with the military noise environment through communication, cooperation, and collaboration between APG and the surrounding community. The ICUZ study quantifies the noise environment from military sources and

recommends the most appropriate uses of noise-impacted areas (Operational Noise Program, 2016).

In 2016, APG finalized and implemented the ICUZ. Through AR 200-1, noise exposure on communities is translated into Noise Zones. The guidelines established by this regulation state that for land use planning purposes, noise-sensitive land uses range from acceptable to not compatible within the Noise Zones. The guidelines are applied throughout the ICUZ as individual or combined military operations are analyzed. The program defines the following four Noise Zones:

- **Noise Zone III –** noise-sensitive land uses are not recommended or incompatible.
- **Noise Zone II –** Although local conditions such as availability of developable land or cost may require noise-sensitive land uses in Zone II, this type of land use is strongly discouraged on the installation and in surrounding communities. All viable alternatives should be considered to limit development in Zone II to non-sensitive activities such as industry, manufacturing, transportation and agriculture.
- **Noise Zone I** – Noise-sensitive land uses are generally acceptable but military operations may still be loud enough to be heard.
- **The Land Use Planning Zone (LUPZ)** – The LUPZ is a subdivision of Zone I and noise-sensitive land uses are generally acceptable. However, communities and individuals often have different views regarding what level of noise is acceptable or desirable. To address this, some local governments have implemented land use planning measures out beyond the Zone II limits. Additionally, implementing planning controls within the LUPZ can develop a buffer to avert future noise conflicts. (Operational Noise Program, 2016)

Table 4-6 presents the noise level categories associated with the above-mentioned Noise Zones (Operational Noise Program, 2016).

Table 4-6: Noise Limits for Military Noise Zones

		Noise Limits		
Noise Zone	**Noise Zone Description**	**Aviation ADNL (dB)**	**Impulsive CDNL (dB)**	**Small Arms dBP**
Noise Zone III	Not Compatible	>75	>70	>104
Noise Zone II	Generally Not Compatible	65-75	62-70	87-104
Noise Zone I	Generally Compatible	<65	<62	<87
LUPZ	Generally Compatible	60-65	57-62	n/a

Source: APG, 2006
ADNL = A-weighted day-night levels; CDNL = C-weighted day-night levels; dB = decibel; P = Peak; n/a = not applicable

Land use activities within Noise Zone I are acceptable for residential housing and medical and school facilities. Areas designated as Noise Zone I do not guarantee that training noise will not be heard in these areas, or that complaints about noise may be generated. Within Noise Zone II exposure to noise is considered significant and recommends limiting land use activities to

industrial, manufacturing, transportation, and resource production. If used for other purposes, noise level reduction features are recommended for incorporation into the design and demolition of buildings. Noise Zone III is considered severe and noise-sensitive land use activities are not recommended. Areas designated as Noise Zone III contain APG test ranges and may be designated natural open space (APG, 2016). There are often existing "noise-sensitive" land uses defined as non-conforming within a Noise Zone. In most cases, this is not a risk to community quality of life or mission sustainment. Average noise levels may be the best tool for long-term land use planning, but they may not adequately assess the probability of community noise complaints. As recommended in AR 200-1, the ICUZ assessment includes supplemental metrics to identify where noise from aviation overflights, demolition activity, and medium/large caliber weapons may periodically reach levels high enough to generate complaints (Operational Noise Program, 2016).

APG has noise receptors located both inside and outside the installation within the various noise contours. Noise receptors that are deemed sensitive are adjacent to communities that include single family residences, Edgewood High School, Edgewood Middle School, and Deerfield Elementary school. Within the boundaries of APG, sensitive noise receptors include installation facilities and service areas. Individuals on APG may be subjected to multiple sources of continuous, intermittent, or impulsive noise during the day. Noise at APG may originate from blast noise, aircraft noise, test vehicle noise, small arms firing, road construction and maintenance, construction projects, and regular vehicular traffic noise. Most of these noise sources are confined to the Installation with the exception of blast noise and aircraft noise during over-flights.

4.5.2.1 Stationary Noise Sources

Stationary sources of noise originate from weapons testing, explosives demolition, and limited small-unit training. Weather conditions can vary the level and directionality of noise levels, and APG employs Best Management Practices (BMPs) to avoid conducting high-noise-producing operations when weather conditions can amplify or send noise toward sensitive receptor areas (DA, 2007).

4.5.2.2 Construction Noise

Construction noise levels at APG are generated from site preparation, construction, demolition, renovation, infrastructure construction, and repair activities. Noise levels generated can fluctuate depending on the type, number, and duration of use of heavy equipment for construction activities and can differ in affect by the type of activity, distance to noise sensitive uses, existing site conditions (vegetation to buffer sound) and ambient noise levels at those uses (DA, 2007).

4.6 WATER RESOURCES

4.6.1 Surface Water

Surface drainage at APG is to the Chesapeake Bay, Gunpowder, and Bush Rivers, or to creeks that discharge to these water bodies, which are part of the Upper Maryland Western Shore watershed. The Bush and Gunpowder Rivers ultimately drain into the Chesapeake Bay. The Upper Maryland Western Shore watershed encompasses an area of 920 square miles, including all of Harford County and parts of Baltimore, Cecil, and Carroll Counties. The surface waters at APG consist of rivers, estuarine and freshwater creeks, estuarine and freshwater marshes, freshwater ponds, and

ephemeral ponds. Surface waters on APG tend to be shallow and sluggish, with tidal estuaries forming the mouths of the waterways, and marshes bordering their lengths (WRA, 2013).

The upper Chesapeake Bay, including APG, has a drainage basin comprising about 27,500 square miles. The average depth of the Chesapeake Bay in the vicinity of APG is 15 feet. The average depth of estuarine waters at APG is approximately 7 feet mean low tide and rarely exceeds 15 feet. Due to APG's proximity to the Chesapeake Bay, surface waters of APG are generally characterized by tidal estuaries at the mouths of the waterways and brackish marshes bordering the shorelines. Surface waters of APG range from fresh, where salinity is zero parts per thousand, to brackish, where salinity is up to 12 parts per thousand (USACE, 2014).

In order to address major issues facing the Chesapeake Bay, the Army has initiated the Army Chesapeake Bay Strategy. This strategy will address issues related to nutrient and sediment pollution, toxic chemical contaminants, and habitat. In addition, a bay-wide total maximum daily load has been established to reduce the amount of nitrogen, phosphorus, and suspended solids in the bay. The Army plans to reduce the levels of these pollutants to meet the total maximum daily load requirements through implementation of stormwater BMPs and pollution prevention activities, such as street sweeping (APG, 2017c).

In the developed portions of APG, storm sewers and catch basins manage the stormwater runoff. In less developed portions of the installation, stormwater runoff is managed by drainage swales. Contamination of surface waters at APG has resulted from historic discharges of sanitary, laboratory, and industrial wastewaters, historic disposal of solid and liquid wastes, and stormwater runoff, erosion, and sedimentation. Inorganic chemicals have been detected at concentrations exceeding water quality criteria in streams draining from APG (USACE, 2014).

UTF Location

The Bush River is located on the west side of the UTF location. Other surface water features located within the study area include Romney Creek to the east and 5 manmade water basins associated with the range. One basin is significantly larger than the other four. In addition, there are several tidal and non-tidal wetlands in and adjacent to the project site that are discussed further in Section 4.6.4.

C-Field Location

The Bush River is located to the east side of the C-Field location. In addition, there are several tidal and non-tidal wetlands located in and adjacent to the project site and within the study area that are discussed further in Section 4.6.4.

Henry (H) - Field Location

The Bush River is located to the east side of the Henry (H) - Field location and an unnamed tidal creek is located to the southwest of the project site. In addition, there are several tidal and non-tidal wetlands in and adjacent to the project site and within the study area that are discussed further in Section 4.6.4.

4.6.2 Groundwater

The predominant water-bearing formation in the APG region of the Atlantic Coastal Plain is the Patuxent Formation. A second formation, the Patapsco Formation, is also present and contains beds of sand and gravels that often yield a high volume of water. The groundwater flows primarily in the southeast direction, toward the Chesapeake Bay (APG, 2017c).

Groundwater on APG is monitored by 300 non-potable groundwater sampling wells at various environmental investigation/remediation sites across the installation. Preliminary results from the sampling of groundwater and surface water at APG indicate heavy metals, phosphorus, chemical agent breakdown by-products, and volatile organic compounds (VOCs). APG's Installation Action Plan outlines a multi-year cleanup program for the installation and identifies environmental cleanup requirements for the areas of concern (USACE, 2014).

UTF Location

According to the USDA NRCS soil survey of APG and the soil types present within the study area, depth to groundwater within the UTF study area and at the project site varies from approximately 0-72 inches.

C-Field Location

According to the USDA NRCS soil survey of APG and the soil types present within the study area, depth to groundwater within the C Field study area varies from approximately 0-60 inches. Depth to groundwater at the project site ranges from approximately 0-40 inches.

Henry (H) - Field Location

According to the USDA NRCS soil survey of APG and the soil types present within the study area, depth to groundwater within the H Field study area varies from approximately 0-72 inches. Depth to groundwater at the project site ranges from approximately 0-40 inches.

4.6.3 Floodplains

According to the Federal Emergency Management Administration (FEMA), floodplains are defined as those areas that will be inundated by a flood event having a 1% chance of exceedance in any given year. This is also referred to as the 100-year floodplain (Zone AE). Zone VE is defined as an area inundated by 1% annual chance flooding with velocity hazard (wave action). Based on FEMA's Flood Insurance Rate Maps for APG, several areas bordering the Chesapeake Bay, Bush River, and Gunpowder River on APG are within the 1-percent annual chance floodplain (WRA, 2013). Figures 4-8, 4-9 and 4-10 show both Zone AE and Zone VE for the UTF, C-Field and Henry (H) - Field locations, respectively.

UTF Location

The entire length of the UTF location is located within the floodplain. The southern two-thirds of the shoreline is located within Zone VE, in which the base flood elevation (BFE) transitions from 8 to 9 feet AMSL. The northern one-third of shoreline is located within Zone AE, in which the

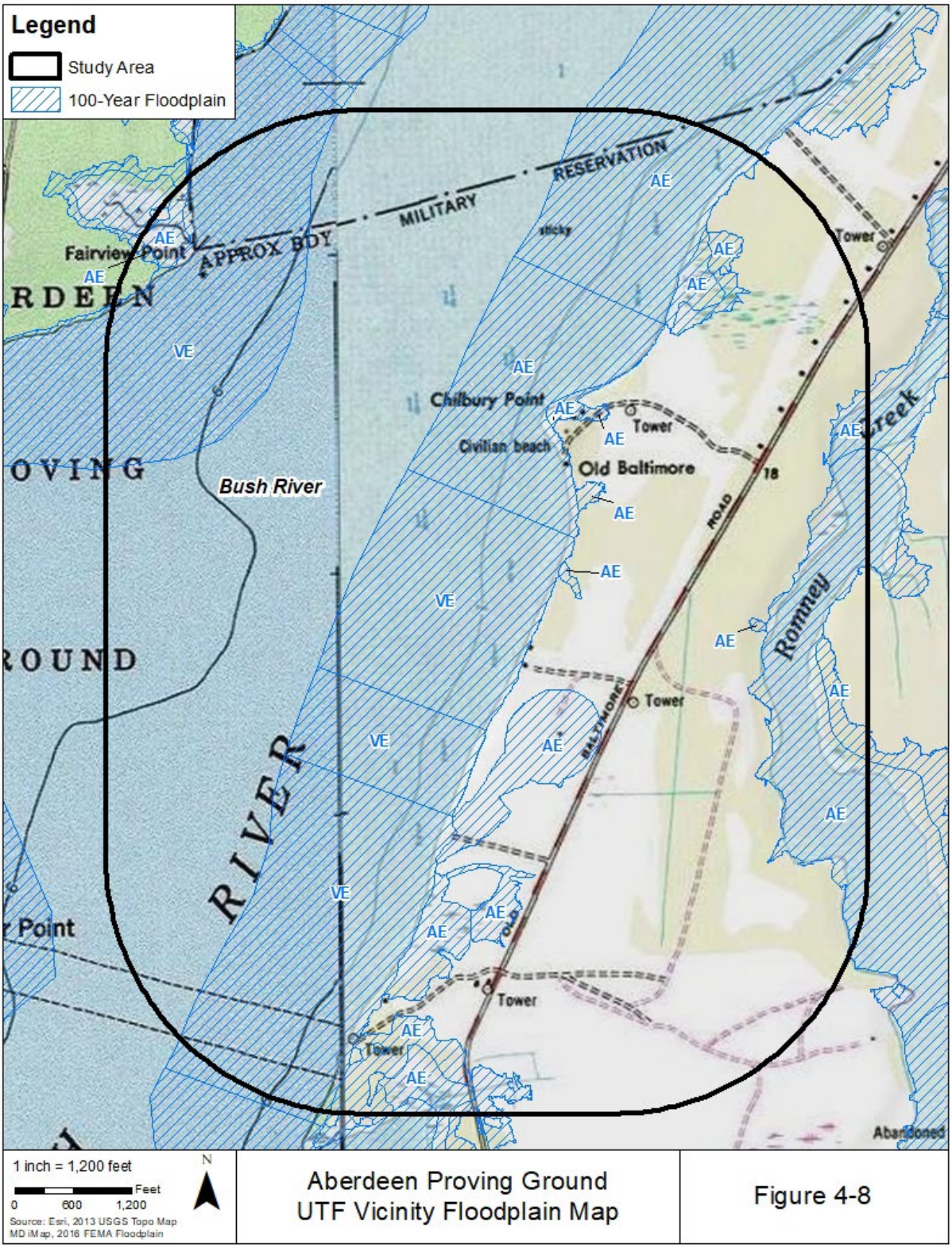

Figure 4-8: UTF Vicinity Floodplain Map

Figure 4-9: C-Field Vicinity Floodplain Map

Figure 4-10: Henry (H) - Field Vicinity Floodplain Map

BFE decreases to 7 feet AMSL. Within the study area there are other areas designated as VE and AE, including areas along the western shoreline of Bush River and along the shoreline of Romney Creek, as well as areas inland from the project location, associated with both waterbodies.

C-Field Location

The entire length of the C-Field location is located within the floodplain. The southern end is located within Zone AE, in which the BFE is at 7 feet AMSL. The remaining portion of the project site is completely contained within Zone VE. The BFE along the shoreline in Zone VE increases from south to north from 7 to 13 feet AMSL. Large portions of the study area in Bush River are designated Zone VE and areas adjacent to and landward of the shoreline in the project site and the study area are designated Zone AE.

Henry (H) - Field Location

The Henry (H) - Field location is completely contained within the floodplain and lies on the border between Zones VE and AE. The BFE within Zone AE transitions from 6 to 7 feet AMSL from the southern portion to the north. The BFE within Zone VE is 8 feet AMSL. More than two-thirds of the study area lies within Zones AE and VE both landward and waterward of the project site shoreline.

EO 11988 directs Federal agencies to avoid floodplains unless the agency determines there is no practical alternative to undertaking the action in a floodplain. If building in a floodplain is the only practical alternative, an eight-step process, detailed in the FEMA document *Further Advice on EO 11988 Floodplain Management*, should be followed.

4.6.4 Wetlands

Wetlands are jointly defined by the USEPA and the USACE as "those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include "swamp marshes, bogs and similar areas" (40 CFR 230.3(t) and 33 CFR 328.3(b)). USACE regulates the discharge of dredged or fill material in waters of the United States (WOUS), including jurisdictional wetlands pursuant to Section 404 of the CWA. Section 404 of the CWA requires Federal regulation for most activities that impact wetlands. The Section 404 requirements support the goal of no net loss of wetlands (APG, 2017c).

The goal of Maryland's Non-Tidal Wetlands Act is no overall net loss of non-tidal wetland acreage and function. A permit is required for any activity that alters a non-tidal wetland or its 25-foot buffer. The 25-foot buffer is expanded to 100 feet for wetlands of special state concern as defined and designated in COMAR 26.23.06. No wetlands of special state concern are located at APG (APG, 2017c).

EO 11990, *Protection of Wetlands,* requires Federal agencies take action to minimize the destruction, loss or degradation of wetlands. The order further requires Federal agencies to ensure that there are no practicable alternatives to such construction and that the Proposed Action includes all practical measures to minimize harm to wetlands which may result from such use. In making

this determination agencies may take into account economic, environmental and other pertinent factors (USACE, 2014).

According to APG's INRMP, updated October 2020, 18% (12,695 acres) of APG's land is identified as wetlands and 46% (33,210 acres) is identified as deepwater (open water) habitat (APG, 2020c). This was identified through the USFWS National Wetland Inventory (NWI). The NWI relies on trained image analysts to identify and classify wetlands and deepwater habitats from aerial imagery. This method is suitable for general planning purposes; however, detailed field delineation of wetlands would be necessary for future development.

UTF Location

The NWI identified a total of 66 different wetlands and other waterbodies at the UTF location and within the study area, including the Bush River and Romney Creek. There are 7 of these areas located along the shoreline at the UTF location, which include palustrine emergent and forested wetlands and estuarine emergent wetlands and deepwaters. A field delineation was conducted on the project site on March 9-12, 2015 and delineated four palustrine wetlands, summarized and classified according to the Cowardin classification system below. Wetlands identified by NWI and field delineated wetlands are shown on Figure 4-11.

Wetland A is a wetland swale located in the central portion of the UTF study area and adjacent to the project site. Wetland A connects a wetland to the east to Bush River and is characterized as a palustrine emergent wetland (PEM). Dominant vegetation found within Wetland A include common elderberry (*Sambucus canadensis*) and short-spike false nettle (*Boehmeria cylinderica*) (DA, 2017).

Wetland B is located north of Wetland A within the study area and adjacent to the project site. Wetland B begins as a narrow swale and becomes a broader open water wetland as it flows west to Bush River. Wetland B is classified as a palustrine emergent/scrub shrub wetland with non-persistent/broad-leaved deciduous vegetation and a seasonally flooded/saturated water regime (PEM/SS 2/1 E). Dominant vegetation found within Wetland B includes red maple (*Acer rubrum*), short-spike false nettle, Japanese stiltgrass (*Microstegium vimineum*), and stout wood-reed (*Cinna arundinacea*) (DA, 2017).

Wetland C is located north of Wetland B within the study area and adjacent to the project site. Wetland C flows from the east into Bush River and is classified as a palustrine forested wetland with broad-leaved deciduous vegetation and a seasonally flooded/saturated water regime (PFO1E). Dominant vegetation found within Wetland C includes sweetgum (*Liquidambar styraciflua*), tulip poplar (*Liriodendron tulipifera*), blackgum (*Nyssa sylvatica*), short-spike false nettle, Japanese stiltgrass, and stout wood-reed (DA, 2017).

Wetland D is located north of Wetland C in the study area and located on Chilbury Point, in close proximity to the northern end of the project site. Wetland D is isolated from Bush River, though storm surges and spring tides likely breach the sand berm which separates it from Bush River. It is classified as a palustrine emergent wetland with persistent vegetation and a permanently flooded water regime (PEM1H). Dominant vegetation found within Wetland D includes swamp loosestrife

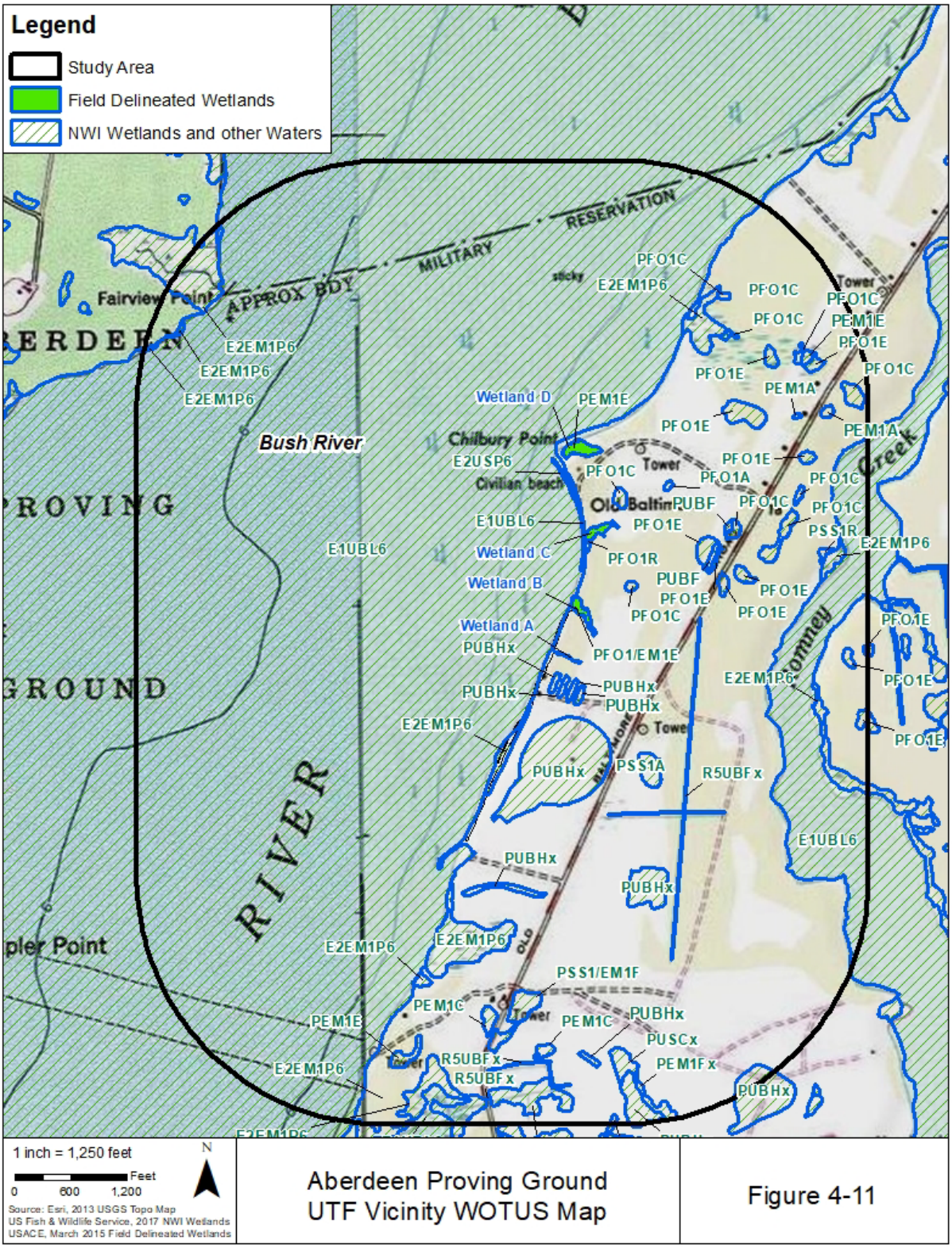

Figure 4-11: UTF Vicinity WOUS Map

(*Decodon verticillatus*), duckweed (*Lemna minor*), and New York fern (*Thelypteris noveboracensis*) (DA, 2017).

C-Field Location

The NWI identified a total of 34 different wetlands and other waterbodies at the C-Field Location and within the study area, including the Bush River. There are 6 of these located along the shoreline at the C-Field location, which include estuarine emergent wetlands and deepwaters. A field delineation was conducted on the project site on November 6 and 12, 2015 and delineated two estuarine/palustrine wetlands and three estuarine emergent wetlands, summarized and classified according to the Cowardin classification system below. Wetlands identified by NWI and field delineated wetlands are shown on Figure 4-12.

Wetland A is located in the central portion of the C-Field study area and landward of the southern end of the project site. Wetland A is characterized as estuarine emergent wetland (EEM) with a PEM. Dominant vegetation found within Wetland A within the estuarine portion includes fresh water cord grass (*Spartine pectinata*) and within the palustrine portion includes short-spike false nettle and common reed (*Phragmites australis*) (DA, 2017).

Wetland B is located north of Wetland A in the C-Field study area and landward of the shoreline and project site. Wetland B is classified as EEM and palustrine emergent/scrub shrub/forested wetland (PEM SS/FO). Dominant vegetation found within Wetland B within the estuarine portion includes common reed, within the palustrine emergent portion includes eastern marsh fern (*Thelyptris palustris*), deer tongue grass (*Dicanthelium clandestinum*), small carp grass (*Arthraxon hispidus*), and narrow leaved mountain mint (*Pycnanthemum tenuifolium*), and within the scrub/shrub and forested portions includes southern bayberry (*Morella cerifera*), sweetgum, and common greenbriar (*Smilax rotundifolia*) (DA, 2017).

Wetlands C and D are located north of Wetland B in the C-Field study area and adjacent to the northern portion of the project site. Wetlands C and D are classified as EEM. Dominant vegetation found within these wetlands includes common reed (DA, 2017).

Wetland E is located north of Wetland D in the C-Field study area and adjacent to the northern end of the project site. Wetland E is classified as an EEM. Dominant vegetation found within Wetland E includes narrow leaved cattail (*Typha angustifolia*) and stout wood-reed (DA, 2017).

Henry (H) - Field Location

The NWI identified a total of 39 different wetlands and other waterbodies at the Henry (H) - Field Location and within the study area, including the Bush River. There are 6 of these located along the shoreline at the Henry (H) - Field location, which include estuarine emergent wetlands and deepwaters. A field delineation was conducted on the project site on May 8-10 and June 11, 2015 and delineated one palustrine wetland and one estuarine wetland, summarized and classified according to the Cowardin classification system below. Wetlands identified by NWI and field delineated wetlands are shown on Figure 4-13.

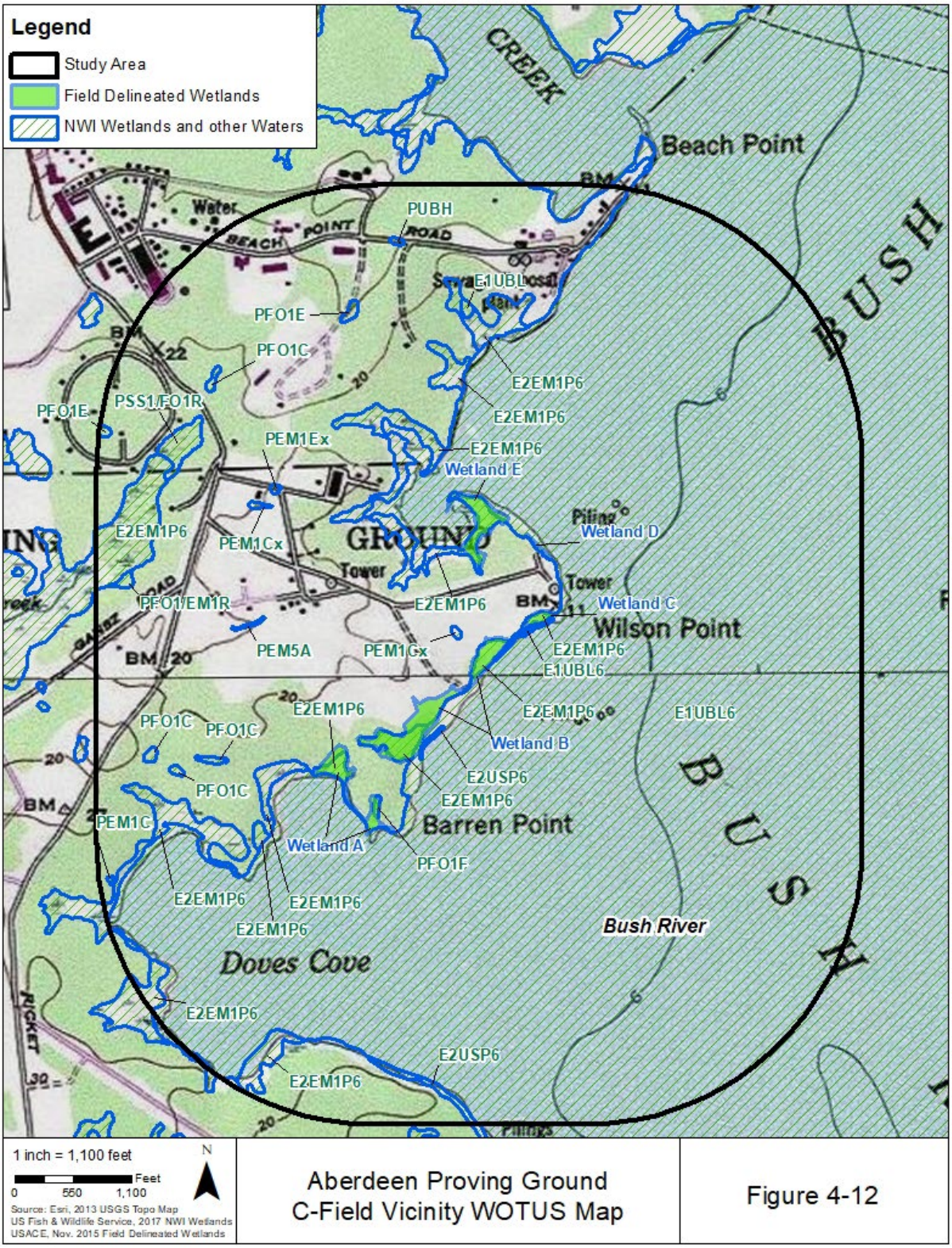

Figure 4-12: C-Field Vicinity WOUS Map

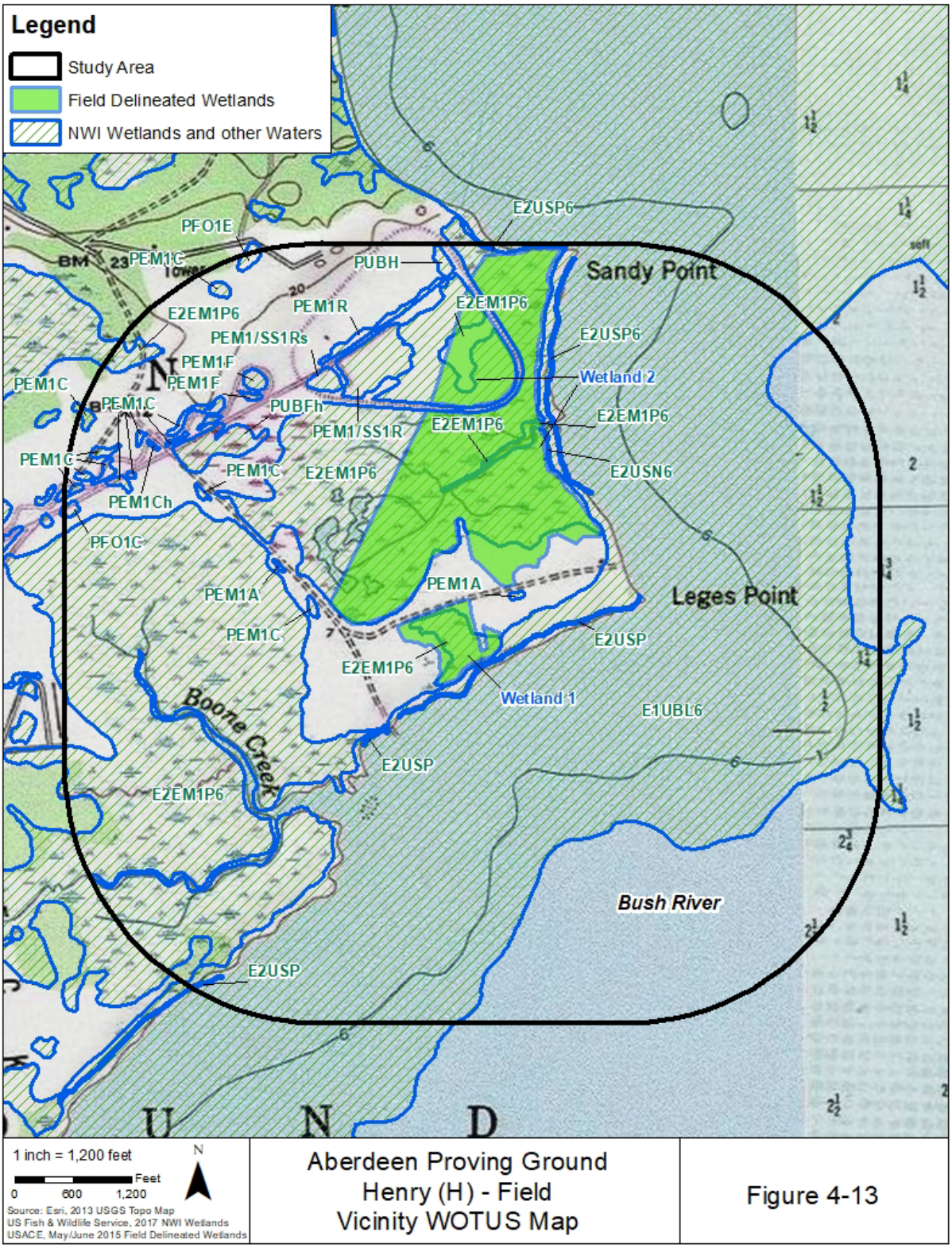

Figure 4-13: Henry (H) - Field Vicinity WOUS Map

Wetland 1 is located on the south side of Leges Point in the central portion of the Henry (H) - Field study area and adjacent to the project site. Wetland 1 is a non-tidal emergent area classified as a palustrine emergent wetland with non-persistent vegetation and a seasonally flooded/saturated water regime (PEM2E). Dominant vegetation found within Wetland 1 includes switch grass (*Panicum virgatum*), common reed, Japanese stilt grass, and eastern marsh fern (DA, 2017).

Wetland 2 is located north of Wetland 1 and Leges Point, and is adjacent to the northern half of the project site. Wetland 2 is classified as an EEM with a PEM. Dominant vegetation found within Wetland 2 within the estuarine portions includes common reed and within the palustrine portions includes eastern marsh fern, royal fern (*Osmunda regalis*), and American hog peanut (*Amphicarpaea bracteate*) (DA, 2017).

4.6.5 Water Quality Certification

CWA water quality certifications provide the opportunity to address aquatic resource impacts of federally issued permits and licenses, in order to help protect water quality within the state. Under §401, a Federal agency cannot issue a permit or license for an activity that may result in a discharge to WOUS until they state where the discharge would originate or the Federal agency has granted or waived §401 certification. The state has the ability to grant, with or without conditions; deny; or waive certification. Granting certification, with or without conditions, allows the Federal permit or license to be issued consistent with any conditions of the certification. Denying certification prohibits the Federal permit or license from being issued. Waiver allows the permit or license to be issued without state comment. States make their decisions to deny, certify, or condition permits or licenses based in part on the proposed project's compliance with USEPA-approved water quality standards.

4.7 COASTAL ZONE

Maryland's coastal zone extends from the inland boundaries of the 16 counties and the City of Baltimore that border the Atlantic Ocean, Chesapeake Bay, and Potomac River, to the District of Columbia. It extends seaward to a distance of 3 miles into the Atlantic Ocean. The entirety of the APG installation lies within Maryland's coastal zone (Figure 4-14).

As required by the Federal CZMA of 1972, Maryland established its Coastal Zone Management Program (CZMP), which was approved in 1978. Maryland's CZMP was established to protect the state's coastal zone through a network of state laws and policies. The CZMA requires that Federal actions likely to affect any land or water use or natural resource within the coastal zone must be enacted to the maximum extent practicable with the state's CZMP. These actions must also go through a federal consistency review (USACE, 2014).

4.7.1 Federal Consistency

Federal consistency refers to the review process mandated by Section 307 of the CZMA. This process includes submission of a consistency determination and supporting materials by the Federal proponent to the state. In Maryland, this process is carried out by the Coastal Zone Consistency Division of the Wetlands and Waterways Program of the Water Management Administration within MDE. Although the Water Management Administration is responsible for the official consistency decision, other agencies within the CZMP network will also often provide findings that are considered in the decision (EA Engineering, 2014).

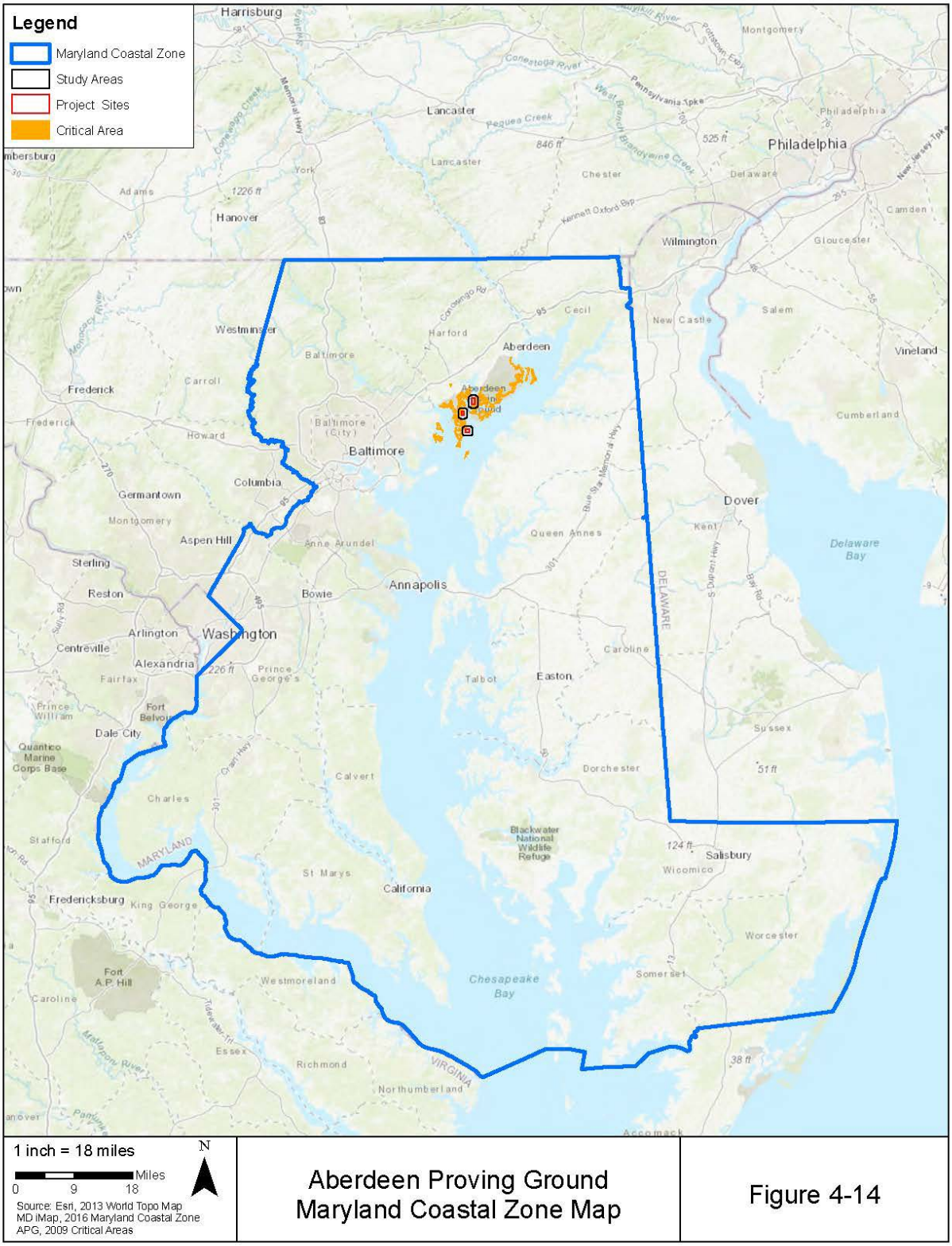

Figure 4-14: Maryland Coastal Zone Map

APG is entirely within Maryland's Coastal Zone Management CZMP area, which includes the Chesapeake Bay. Federal agencies are required to determine whether their activities are reasonably likely to affect any coastal use or resource and to conduct such activities in a manner consistent to the maximum extent practicable with the goals and objectives of Maryland's CZMP. The Proposed Action would be subject to these requirements as it is located within the Maryland defined Critical Area and per the Memorandum of Agreement between the State of Maryland and the DoD for the protection of Maryland's coastal resources.

A list and description of the specific enforceable policies for Federal Consistency determination for the State of Maryland can be seen in Article II of the signed Memorandum of Agreement between Maryland and the DoD, dated May 8, 2013. Please see Appendix B for a full list of these policies and a description of the actions that would be taken for ensuring consistency of the Proposed Action with the MD CZMA enforceable policies.

4.7.2 Chesapeake Bay Critical Area

Maryland's federally approved CZMP incorporates implementation of the Maryland Chesapeake Bay Critical Area Act (Critical Area Act). In 1984, the Maryland General Assembly conducted the Chesapeake Bay Critical Area Protection Act to help protect the Bay's environment. It also created a statewide Critical Area Commission to oversee development and implementation of local land use programs directed toward the Critical Area. The land immediately surrounding the Chesapeake Bay and its tributaries has the greatest potential to affect its water quality and wildlife habitat; therefore, all lands within 1,000 feet of the tidal waters' edge or from the landward edge of adjacent tidal wetlands and the lands under them are designated as the Chesapeake Bay "Critical Area". Harford County is included in the coastal zone management area, meaning that all Federal agencies proposing activities within the county are to comply with the CZMA. The State of Maryland, recognizing the Chesapeake Bay as an estuarine system of great importance to the state and the nation, enacted the Chesapeake Bay Critical Area Protection Act in 1984 to help reverse deterioration of the Bay environment. The Act designated all lands within 1,000 feet of the tidal waters' edge or from the landward edge of adjacent tidal wetlands and the lands under them as the "Critical Area." Local political entities administer and enforce locally adopted standards for protection of the Maryland defined Critical Area. Note that APG is a Federal property and is not covered by these local regulations (USACE, 2014).

Based on Critical Area mapping, proposed project activities within this critical area have the greatest potential for affecting water quality as well as fish, plant, and wildlife habitat' (Figure 4-15). Therefore, as shown on Figure 4-15 below, it is anticipated that all project-related activities will occur within the mapped Critical Area.

The Maryland Critical Area Commission does not permit new development activities within a 100-ft buffer of natural vegetation established landward from the mean high-water line of tidal waters, tributary streams, and tidal wetlands, except those necessarily associated with water-dependent facilities.

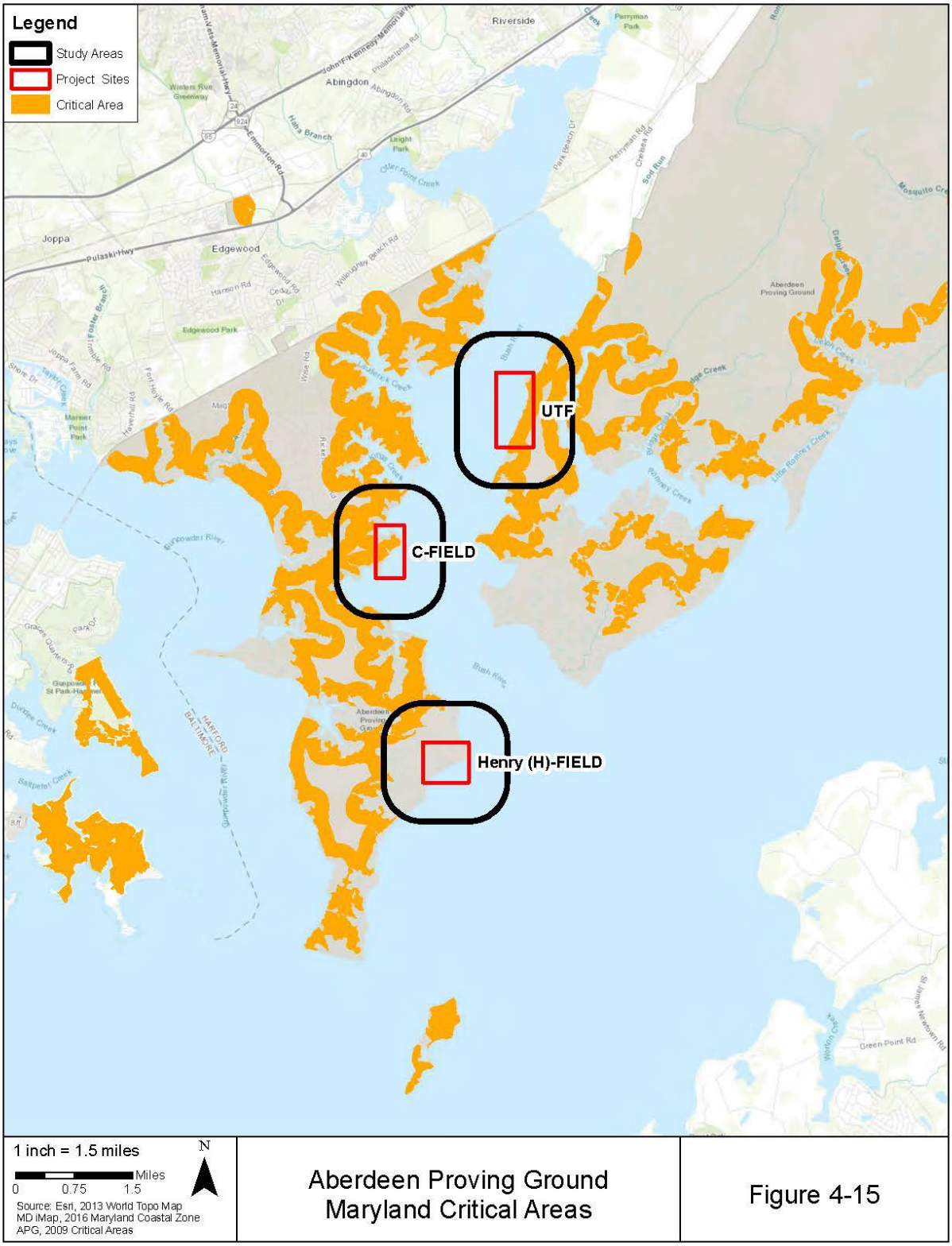

Figure 4-15: Maryland Critical Areas Map

4.8 BIOLOGICAL RESOURCES

Biological resources include native or naturalized plants and animals, as well as federally protected species and the habitats in which they live. Protected biological resources include plants and animal species listed by the State of Maryland as rare, threatened, or endangered, or by the USFWS as threatened or endangered. Special concern species are not afforded the same level of protection as the protected species, but their presence is taken into consideration by resource agency biologists involved in reviewing projects and permit applications (USACE, 2014).

4.8.1 Vegetation

Vegetative cover at APG consists of forest land, open land/meadow, and developed areas with maintained turf, and street trees. Approximately 35 percent of the total APG acreage is comprised of upland areas. Upland areas are dominated by forest vegetation, but also include maintained lawn/landscaped areas, fields, and developed areas (buildings and roads). The plants of APG are generally those typical of the Atlantic Plain physiographic province. A number of species are near the northern edge of their ranges. The variety of habitats on APG supports a variety of plants. Major plant community types on the land areas of APG include mixed deciduous forests, wetlands, meadows, and a variety of developed areas (APG, 2017c). Though most (as much as 90 percent) APG lands were farmland prior to military use, forests now cover over 18,000 acres of the land area at APG. However, forests on APG are largely discontinuous and fragmented by numerous watercourses, wetlands, open fields, development, and roads. Forest stands vary in size and natural forest regeneration is occurring, often with an initial population of pioneers of sweetgum (*L. styraciflua*) and red maple (*A. rubrum*) establishing early, then gradually oak (*Quercus* species), hickory (*Carya* species), and other hardwoods dominating as the forest matures. Proliferation of sweetgum and invasive plant species have contributed to declines in quantity and quality of forest habitat. A listing of vegetative species known to occur on APG is provided in Appendix B of the INRMP (APG, 2020c). Vegetative species found within wetlands delineated at each site were discussed in Section 4.6.4.

APG protects forested areas to the maximum extent practical in accordance with the Forest Conservation Act while continuing to sustain and support current and future missions. APG manages its forest conservation program in accordance with the MDNR. In keeping with the Forest Conservation Act standards, mitigation for forest disturbances is determined by the Forest Conservation Plan, and ratios in the Maryland defined Critical and non-Critical Area (USACE, 2014). Vegetation within the anticipated limits of disturbance associated with the Proposed Action is discussed in Section 4.6.4.

4.8.2 Submerged Aquatic Vegetation

SAV is a diverse group of rooted aquatic plants found in shallow water areas of the Chesapeake Bay. This group of plants performs a number of irreplaceable ecological functions, which range from chemical cycling and physical modification of the water column and sediments, to providing food and shelter for commercial, recreational, and ecologically important organisms (DA, 2007). The importance of SAV is well known as a primary indicator of local water quality, nursery areas for fish and crustaceans, filters nutrients and sediment, and provides natural stabilization for shorelines (APG, 2020c).

Since 1980, poor water quality, disturbance of SAV beds, and the alteration of shallow water habitats have contributed to the decline of SAV. The decline of SAV is commonly identified as one of the major ecological issues facing the Chesapeake Bay. Many shallow water areas around APG provide suitable habitat for SAV (APG, 2017c).

The Virginia Institute of Marine Sciences (VIMS) conducts annual aerial surveys to photograph and map SAV in the Chesapeake Bay. APG supports these efforts with ground surveys used in conjunction with the photography interpretation. These surveys indicate that SAV abundance has increased in recent years in the vicinity of APG (Virginia Institute of Marine Sciences [VIMS], 2015). The dominant species of SAV in the APG area include native species: wild celery (*Vallisneria Americana*), water stargrass (*Heteranthera dubia)*, coontail *(Ceratophyllum demersum),* and Redhead Grass *(Potamogeton perfoliatus)* (USACE, 2014).

UTF Location

SAV at the UTF location was documented primarily south of the proposed stone revetment area, along the shoreline of the Bush River. This patch of SAV was documented by the VIMS in 2005. East of the UTF location, SAV was also documented along the shorelines on Romney Creek in 2015. SAV identified by the VIMS from 2005 to 2015 in the vicinity of the UTF location is shown on Figure 4-16.

C-Field Location

Patches of SAV were documented by the VIMS along the shoreline of the Bush River at and within the vicinity of the C-Field location. North of the C-Field location SAV was documented by the VIMS in 2005, 2009, and 2015. In the locations of the proposed stone revetment, stone sill, and living shoreline, SAV was documented in 2005. SAV was documented where the breakwater is proposed along the Bush River from 2005 through 2012. South of the C-Field location, large patches of SAV along Doves Cove were documented from 2005 through 2015. SAV identified by the VIMS from 2005 to 2015 in the vicinity of the C-Field location is shown on Figure 4-17.

Henry (H) - Field Location

SAV at the Henry (H) - Field location was documented by the VIMS along the southern portion and at the northern tip of the proposed stone revetment from 2005 through 2008. North of the Henry (H) - Field location, patches of SAV were documented along the Bush River shoreline from 2005 through 2015. South of the Henry (H) - Field location, patches were documented along the Bush River shoreline from 2005 through 2007 and along Boone Creek from 2005 through 2015. SAV identified by the VIMS from 2005 to 2015 in the vicinity of the Henry (H) - Field location is shown on Figure 4-18.

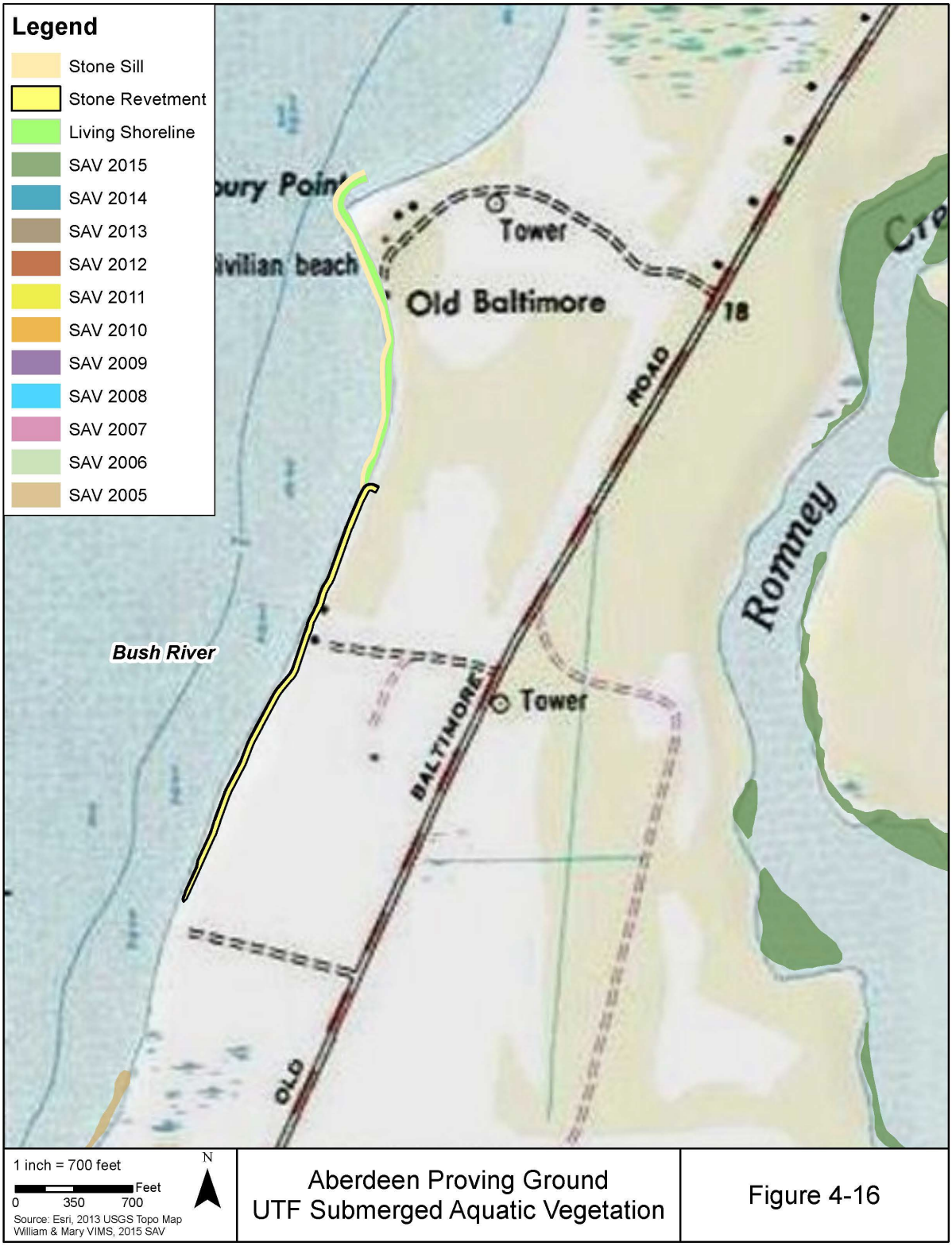

Figure 4-16: UTF Submerged Aquatic Vegetation

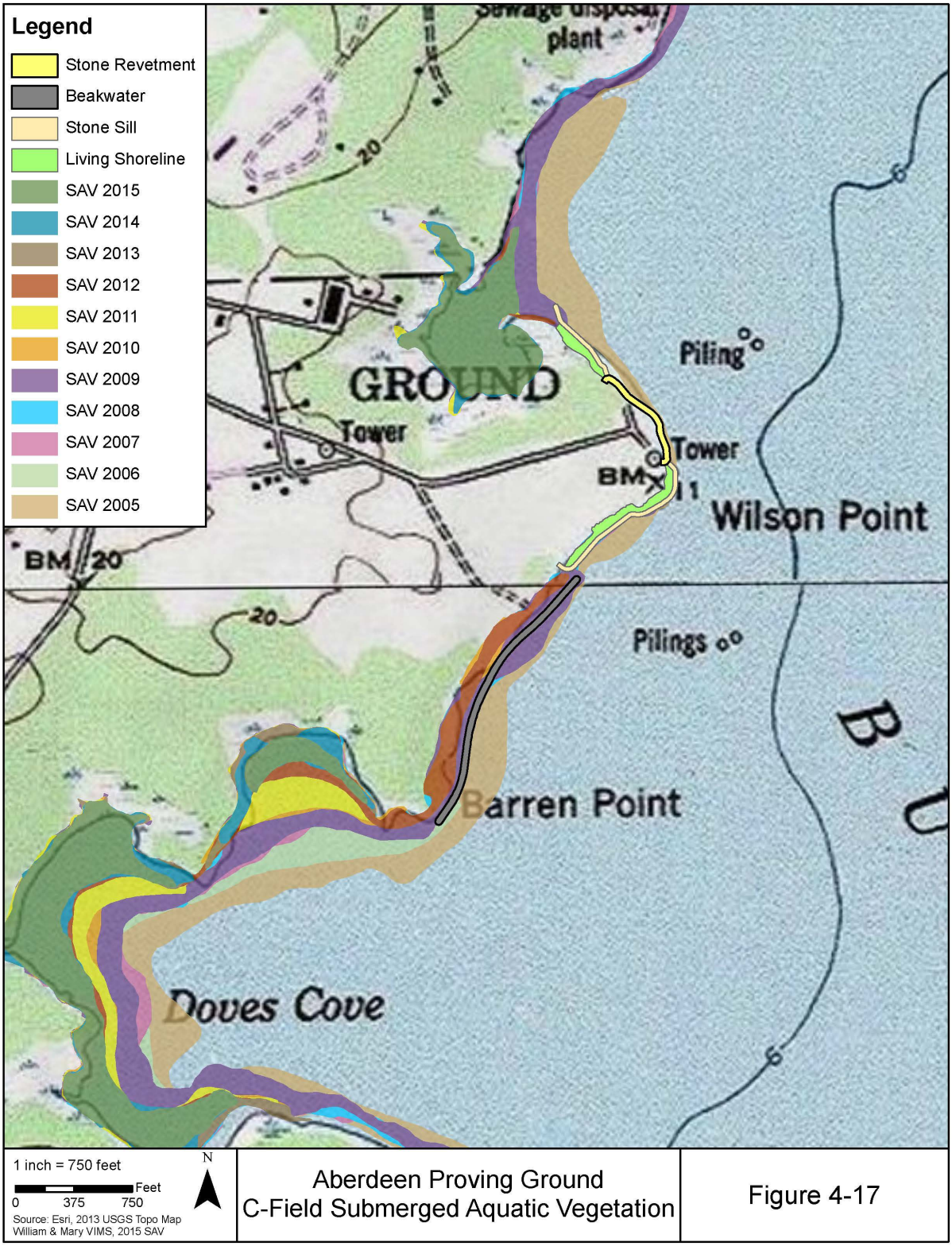

Figure 4-17: C-Field Submerged Aquatic Vegetation

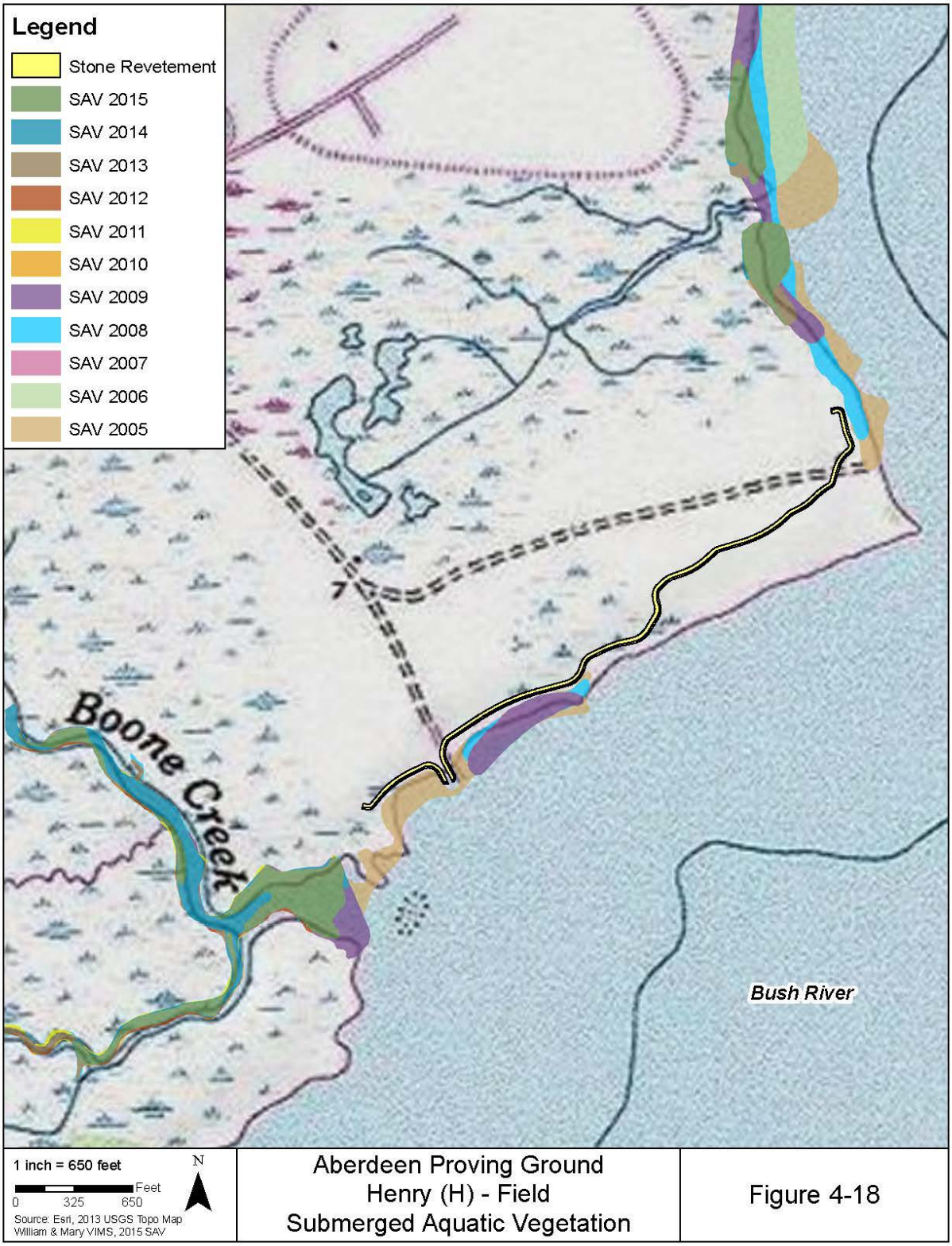

Figure 4-18: Henry (H) - Field Submerged Aquatic Vegetation

4.8.3 Wildlife Resources

Due to its diverse habitat, large expanses of undeveloped land, and location, APG is important to many bird groups, ranging from waterfowl, to raptors, to neotropical migrants. It is also home to a number of Forest Interior Dwelling Species (USACE, 2014). Forest Interior Dwelling Species require large forest areas to breed successfully and maintain viable populations. This diverse group includes songbirds such as tanagers and warblers, as well as residents and short-distance migrants such as woodpeckers, hawks, and owls (APG, 2017c).

Approximately 250 species of birds may occur at APG throughout the year, including 108 species of non-migratory or waterfowl bird species. The installation also provides breeding, foraging, and wintering habitat for many of the 29 species of waterfowl that use the Chesapeake Bay, including mallards (*Anas platyrhynchos)*, black ducks (*Anas rubripes)*, wood ducks (*Aix sponsa)*, blue-winged teals (*Anas discors*), hooded mergansers (*Lophodytes cucullatus*), and Canada geese (*Branta canadensis)*. Colonial waterbirds can be found seasonally at APG; they include: the great blue heron (*Ardea herodias)*, snowy egret (*Egretta thula)*, common egret (*Ardea alba)*, green heron (*Butorides virescens)*, and the black-crowned night heron (*Nycticorax nycticorax)*. There are several great blue heron rookeries, two of the largest occurring at the head of Romney Creek and on Poole's Island (APG, 2017c).

As a participant in the North American Waterfowl Management Plan, the Army has established the APG Waterfowl Sanctuary System, which includes approximately 600 acres of important nesting and feeding areas that are closed to waterfowl hunting. APG is located on the upper Chesapeake Bay and Atlantic Flyway, which is a major bird migratory route (USACE, 2014).

Suitable habitat for more than 40 mammal species occurs at APG. Among the more common species are the red fox (*Vulpes vulpes*), white-tailed deer (*Odocoileus virginianus*), eastern cottontail rabbit (*Sylvilagus floridanus*), muskrat (*Ondatra zibethicus*), gray squirrel (*Sciurus carolinensis*), striped skunk (*Mephitis mephitis*), groundhogs (*Marmota monax*), beaver (*Castor canadensis*), coyotes (*Canis latrans*), and river otters (*Lontra canadensis*). Several small mammals, such as the white-footed mouse (*Peromyscus leucopus*), short-tailed shrew (*Blarina brevicauda*) meadow vole (*Microtus pennsylvanicus*), pine vole (*Microtus pinetorum*), and chipmunk (*Tamias striatus*), are also present at the installation. While these species above may occur within the study areas and may occasionally be found within the project sites, none are particularly known for occurring in shoreline habitat adjacent to a large river system (APG, 1997).

More than 40 species of reptiles and amphibians may occur at APG. Most of the species inhabit streams, ponds, wetlands, and forests. Common reptile species include spotted turtle (*Clemmys guttata*), eastern mud turtle (*Kinosternon subrubrum subrubrum*), common snapping turtle (*Chelydra serpentina*), eastern box turtle (*Terrapene carolina*), black rat snake (*Pantherophis alleghaniensis*), northern water snake (*Nerodia sipedon*), and eastern garter snake (*Thamnophis sirtalis*). The most abundant amphibian species are American bullfrog (*Lithobates catesbeianus*), green frog (*Lithobates clamitans*), northern cricket frog (*Acris crepitans*), northern spring peeper (*Pseudacris crucifer crucifer*), southern leopard frog (*Lithobates sphenocephalus*), American toad (*Anaxyrus americanus*), and red-backed salamander (*Plethodon cinereus*) (APG, 1997).

Aquatic fauna is found in APG's high quality water habitats. Approximately 50 fish species have been recorded from or could reasonably be expected to occur in APG waters. The principal freshwater fish that occur in APG waters include the largemouth bass (*Micropterus salmoides*), pumpkinseed (*Lepomis gibbosus*), bluegill (*Lepomis macrochirus*), yellow perch (*Perca flavescens*), brown bullhead (*Ameiurus nebulosus*), channel catfish (*Ictalurus punctatus*), blue catfish (*Ictalurus furcatus*) and grass carp (*Ctenopharyngodon idella*) (DA, 2007). Additionally, the American shad (*Alosa sapidissima*), hickory shad (*Alosa mediocris*), alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), striped bass (*M. saxatilis*), white perch (*Morone americana*), live in the brackish portions of APG and may potentially utilize the aquatic habitat. Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and shortnose sturgeon (*Acipenser brevirostrum*) may potentially utilize the waters of APG (APG, 2017c). APG waters provide spawning and/or nursery areas for some of these species, including the striped bass. The American eel (*Anguilla rostrate*) is common in the area and is the only catadromous species (migrate from freshwater to saltwater to spawn) found in North America. Marine species such as bluefish (*Pomatomus saltatrix*) are occasionally reported from APG waters but would only be expected to be found during periods when low flows from tributaries reduce freshwater input, allowing higher salinities to occur (DA, 2007). Blue crabs (*Callinectes sapidus*) inhabit APG waters during their juvenile stages and parts of their adult stages. During their juvenile stages, blue crabs avoid predators and find food sources in the extensive beds of SAV in APG's waters. Blue crabs are critical to the economic health of the Chesapeake Bay and depend on its ecological health to mature and thrive (USACE, 2014).

A listing of wildlife species known to occur on APG is provided in Appendix C of the INRMP (APG, 2020c).

4.8.4 Bald Eagle

The bald eagle is protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The bald eagle is no longer listed on the Endangered Species Act, so no critical habitat is designated for the species.

APG is located in the Upper Chesapeake Bay bald eagle concentration area, and supports breeding, migratory, and wintering eagle populations. APG supports an estimated 10 percent of the Maryland breeding population of bald eagles, and it supports one of the highest density of bald eagles in the Chesapeake Bay region. The breeding population of bald eagles at APG has increased from one known pair in 1977 to approximately 70 territorial pairs in 2019, with approximately 300-350 eagles at any given time on APG (APG personnel consultation – Lynda Hartzell, April 3, 2019).

Bald eagles typically like to nest in large trees with a clear view of shoreline foraging areas, or if nesting inland, within one mile of suitable foraging areas. They also typically use the same nesting territories year after year. All tidal waters within APG provide potential foraging habitats for bald eagles. They are mostly isolated from human disturbance, have an abundant supply of prey – both fish and waterfowl, and contain suitable trees for perching along the shoreline (APG, 2017c).

In late spring and early summer, post-nesting and sub-adult eagles migrate north from Florida and other southeastern states to spend the summer months in the Chesapeake Bay area, while eagles from northeastern Canada and the U.S. migrate to the area during late fall and early winter. APG

is often a site with the highest summer and winter eagle populations in the upper Chesapeake Bay (USACE, 2014).

Non-breeding eagles are typically gregarious and establish communal roosts (areas where eagles gather and perch overnight). Communal roosts are typically positioned near major foraging areas (large bodies of water), isolated from human disturbance, contain sustainable substrate for roosting, positioned in areas protected from harsh weather, and have a clear movement corridor between the roost and primary foraging areas. Communal roosts at APG have been documented along several creeks including Woodrest Creek, Mosquito Creek, Romney Creek, and Cooper's Creek. Many areas on the installation contain suitable communal roosting habitat (APG, 2017c).

APG operates in accordance with its eagle management component of the INRMP, and in compliance with its USFWS-issued eagle incidental take permit. APG implements conservation measures to avoid or minimize impacts to bald eagles, while sustaining the military mission. These measures include exclusion zones (buffers) for habitat protection and adaptive management strategies to address allowable activities in proximity of eagle nests, roosts, and foraging areas, taking into consideration on-going and routine activities. Habitat modification (land clearing, timber harvesting, and vegetation removal) within the buffers is strictly limited. Additional conservation measures include burial of overhead electrical wires, and maintenance of avian protective devices (line markers, elevated perches, and insulating covers) on remaining overhead wires and poles, to reduce electrocution risks to eagles.

4.8.5 Rare, Threatened, and Endangered Species

Under the ESA, an "endangered species" is defined as any species in danger of extinction throughout all or a significant portion of its range. A "threatened species" is defined as any species likely to become an endangered species in the foreseeable future. The ESA also provides for recovery plans to be developed describing the steps needed to restore a species population. The ESA requires APG to protect any endangered or threatened species found on its property, and APG must consult with USFWS on any action that may affect endangered or threatened species or that may adversely impact critical habitat.

Critical habitats, as defined by the ESA, are areas with physical or biological features essential to the preservation of a species that may require special management or protection. Federal agencies are required to take precautions to not destroy or harm areas designated as critical habitat. The following considerations are made when determining critical habitat for a species: space for individual and population growth and normal behavior; cover or shelter; food, water, air, light, minerals, or other nutritional or physiological requirements; sites for breeding and rearing offspring; and habitats that are protected from disturbances or are representative of the historic geographical and ecological distributions of a species (USACE, 2014).

A review of the USFWS IPaC website identified northern long-eared bat (*Myotis septentrionalis*), which is listed as federally and state threatened, within the three study areas. However, the USFWS IPaC website indicated that this species only needs to be evaluated for projects that will clear 15 acres or more of trees. For the purposes of this document, it is assumed that less than 15 acres of trees would be cleared as a result of the Proposed Action and, therefore, northern long-eared bat has not been evaluated for potential impacts from the Proposed Action. The candidate species

monarch butterfly (*Danaus plexippus*) is also found within the study areas. As a candidate species, there are no Section 7 requirements for this species at this time. The IPaC report can be found in Appendix C.

In addition, a total of 23 federal and/or state listed species are found, or have the potential to occur, at APG (including northern long-eared bat). These species are listed in Table 4-7 below. Of the species listed below, only two are considered to occur on APG: Atlantic sturgeon and Shortnose sturgeon. The remaining animal species have not yet been documented or were last documented over 14 years ago (EA Engineering, 2014).

Table 4-7: Federal and State Listed Rare, Threatened, and Endangered Species that Occur or have the Potential to Occur at APG

Scientific Name	Common Name	Status
Mammals		
*Myotis sodalis**	Indiana bat	FE
		SE
*Myotis septentrionalis**	Northern Long-Eared Bat	FT
		ST
Reptiles and Amphibians		
Ambystoma tigrinum	Eastern Tiger Salamander	---
		SE
*Glyptemys muhlenbergii**	Bog Turtle	FT
		ST
Birds		
*Laterallus jamaicensis**	Black Rail	---
		SE
Sternula antillarum	Least Tern	---
		ST
*Cistothorus platensis**	Sedge Wren	---
		SE
Ammodramus henslowii	Henslow's Sparrow	---
		ST
Fish		
Acipenser brevirostrum	Shortnose Sturgeon	FE
		SE
Acipenser oxyrinchus	Atlantic Sturgeon	FE
		---
*Etheostoma sellare**	Maryland Darter	FE
		SE
Insects		
*Cicindela dorsalis dorsalis**	Northeastern Beach Tiger Beetle	FT
		SE
*Cicindela puritan**	Puritan Tiger Beetle	FT
		SE
Shellfish		

Scientific Name	Common Name	Status
*Alasmidonta heterodon**	Dwarf Wedgemussel	FE
		SE
Plants		
Ceratophyllum echinatum	Prickly Hornwort	---
		SE
Hottonia inflata	Featherfoil	---
		SE
Iris prismatica	Slender Blue Flag	---
		SE
Juncus torreyi	Torrey's Rush	---
		SE
Lathyrus palustris	Vetchling Peavine	---
		SE
Lycopodiella caroliniana	Slender Clubmoss	---
		SE
Lysimachia hybrida	Lowland Loosestrife	---
		ST
Potamogeton foliosus	Leafy Pondweed	---
		SE
Rhynchospora globularis	Grass-like Beakrush	---
		SE

(EA Engineering, 2014)
*Species have not been documented at APG, but appropriate habitat exists.
Note: Federal Status – Determined by the U.S. Fish and Wildlife Service
FE − Endangered – Species in danger of extinction throughout all or a significant portion of their range.
FT − Threatened – Species likely to become endangered within the foreseeable future throughout all or a significant portion of their range.
SE − Endangered – A species whose continued existence as is determined to be in jeopardy.
ST − Threatened – A species which appears likely to become endangered in the State.

4.9 CULTURAL RESOURCES

APG is ideally located for the historic exploitation of estuarine, interior wetland, boreal, and agricultural environments by human populations. Therefore, the installation possesses potentially rich cultural significance due to its proximity to a variety of ecological habitats. Historic properties located on APG are those that have been formally determined eligible for listing in the National Register of Historic Places (NRHP) through written consensus agreements with the Maryland Historical Trust, or by written determination of the Keeper of the National Register, National Park Service (APG, 2019c).

Cultural resources are defined as prehistoric and historic sites, structures, districts, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for traditional, religious, scientific, or any other reason. Cultural resources include, but are not limited to buildings, structures, prehistoric and historic archaeological sites, native sacred sites, and cemeteries (EA Engineering, 2014).

APG manages historic properties through its Integrated Cultural Resources Management Plan (ICRMP). This plan identifies all previous and current cultural resource management activities and needs that have occurred and continue at the installation; along with addressing and documenting all Federal historic preservation legislation and U.S. Army regulations pertinent to protecting these historic properties. Guidance and SOPs within the ICRMP allow APG to efficiently manage all known and unknown historic properties within the military mission. (EA Engineering, 2014).

4.9.1 Archaeological Resources

Archaeological resources consist of locations where prehistoric or historic activity measurably altered the earth or produced deposits of physical remains. As a result of military research and testing operations at APG, many forested areas within the installation boundaries may have been contaminated with chemicals and radioactive materials and exposed to repeated burning. These wooded areas were selectively harvested during the 1970s and 1980s, and the environmental impacts resulting from operations over the last several decades have had a negative net effect on the archaeological potential of the installation land holdings (APG, 2019c). According to APG's 2008 ICRMP, APG has one archaeological site eligible for listing in the NRHP (USACE, 2014). The site was determined to have high research potential and areas of substantial integrity and was determined eligible for listing in the NRHP in 1994 (APG, 2019c).

Because only a small percentage of APG's land (less than 1%) has been subject to systematic field survey, there are likely many additional archaeological sites within the installation's boundaries (APG, 2017c). The locations and contents of these sites can be predicted based on regional prehistoric site distribution and historic data sources. However, natural processes and human activities have heavily disturbed many areas that have a high potential for prehistoric or historic remains resulting in the loss of integrity for the site (APG, 2009).

4.9.2 Architectural Resources

Architectural resources include standing buildings, districts, bridges, dams, and other structures of historic significance. According to the 2019 ICRMP for APG, there are 17 architectural resources that are eligible for listing in the NRHP on APG (USACE, 2014).

Buildings on APG are assessed as specific groups on a case-by-case basis, but many have been inventoried previously. A number of buildings with potential historic significance have been adversely altered due to repairs and renovations in the past, resulting in the loss of integrity.

4.9.3 Native American Resources

Due to its location adjacent to the Chesapeake Bay, and its historically ideal situation for human habitation, the land which APG now occupies has a long history of occupation, including pre-historic peoples and Native American tribes (APG, 2019c). Native American resources can include, but are not limited to, archaeological sites, burial sites, ceremonial areas, caves, mountains, water sources, trails, plant habitat or gathering areas, or any other natural area important to a culture for religious or heritage reasons. Native American sacred sites fall within the definition of traditional cultural properties (APG, 2019c). NRHP-eligible traditional sites are subject to the same regulations, and afforded the same protection, as other types of historic properties.

Many Native American groups either occupied or traveled through the area which is now APG. During the Contact Period (A.D. 1500-1764), the Susquehannocks dominated the area. Groups of Delaware, Mingoes, Massawomans (most likely Mohawks), Powhatans, Nanticoke, Piscataway, Senecas, Oneidas, and others mostly likely traveled through the area. In 1999, the USACE, Baltimore District, completed an ethnohistory of APG. Comments received from Native American groups during public meetings in 1999 were incorporated into the draft ethnohistory, and additional research, including oral interviews, were conducted. Native American resources identified included two Native American burials on a Late Woodland site and a traditional use area (hunting grounds) along Deer Creek, northwest of APG (USACE, 2014).

APG will initiate consultation with federally recognized Native American groups that may be affected by any Proposed Action, pursuant to 36 CFR 800.2. To ensure that any sites of traditional cultural value are identified and adequately considered under any future projects, APG will send correspondence to the tribes announcing the Proposed Action and requesting their concerns.

4.10 HAZARDOUS, TOXIC, RADIOACTIVE SUBSTANCES, AND SOLID WASTES

A hazardous substance is defined as any substance that is 1) listed in Section 101(14) of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); 2) designated as a biologic agent and other disease causing agent which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any person, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations in such persons or their offspring; 3) listed by the U.S. Department of Transportation as hazardous materials under 49 CFR 172.101 and appendices; or 4) defined as a hazardous waste per 40 CFR 261.3 or 49 CFR 171.

The Occupational Safety and Health Administration's (OSHA's) definition includes any substance or chemical which is a "health hazard" or "physical hazard," including: chemicals which are carcinogens, toxic agents, irritants, corrosives, sensitizers; agents which act on the hematopoietic system; agents which damage the lungs, skin, eyes, or mucous membranes; chemicals which are combustible, explosive, flammable, oxidizers, pyrophorics, unstable-reactive or water-reactive; and chemicals which in the course of normal handling, use, or storage may produce or release dusts, gases, fumes, vapors, mists or smoke which may have any of the previously mentioned characteristics. (Full definitions can be found at 29 CFR 1910.1200.)

USEPA incorporates the OSHA definition and adds any item or chemical which can cause harm to people, plants, or animals when released by spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing into the environment (40 CFR 355).

DOT defines a hazardous material as any item or chemical which, when being transported or moved in commerce, is a risk to public safety or the environment, and is regulated as such under its Pipeline and Hazardous Materials Safety Administration regulations (49 CFR 100-199), which includes the Hazardous Materials Regulations (49 CFR 171-180). In addition, hazardous materials in transport are regulated by the International Maritime Dangerous Goods Code; Dangerous Goods

Regulations of the International Air Transport Association; Technical Instructions of the International Civil Aviation Organization; and U.S. Air Force Joint Manual, Preparing Hazardous Materials for Military Air Shipments.

The NRC regulates materials that are considered hazardous because they produce ionizing radiation, which means those materials that produce alpha particles, beta particles, gamma rays, x-rays, neutrons, high-speed electrons, high-speed protons, and other particles capable of producing ions. This includes "special nuclear material," by-product material, and radioactive substances. (See 10 CFR 20).

Regulatory Background APG fulfills all requirements of the following federal, state, and Army regulations including:

- APG Pollution Prevention Plan
- APG Regulation 200-60 Hazardous Waste Management
- Comprehensive Environmental Response, Compensation, and Liability Act
- Superfund Amendments and Reauthorization Act (SARA)
- Toxic Substances Control Act
- Occupational Safety and Health Administration Hazard Communication Standard
- 29 CFR 1910.1200, Hazard Communication Standard, 2001
- APGR 385-4, APG Safety and Occupational Health Program
- Federal Acquisition Regulation
- AR 700-141, Hazardous Materials Information Resource System
- DoD Directive 4140.25M, Procedures for the Management of Petroleum Products
- DoD Directive 4150.7, Pest Management Program
- DoD Directive 5030.41, Oil and Hazardous Substances Pollution Prevention and Contingency Program
- EO 12580. Superfund Implementation
- Hazardous Waste Regulations (40 CFR 260-279)
- Superfund Amendments and Reauthorization Act (Public Law 99-499)
- Spill Prevention, Control, and Countermeasure Rule (40 CFR 112)
- OSHA Hazardous Waste Operations and Emergency Response standard (29 CFR 1910.120 and 1926.65)
- DoD Directive 4145.26M, DoD Contractors' Safety Manual for Ammunition and Explosives, 1997
- Explosives Safety Policy for Real Property Containing Conventional Ordnance
- Explosives "Army Specific" Headquarters Department of the Army Letter 385-00-2
- DoD Directive 6055.9, DoD Explosives Safety Board and Component Explosives Safety Responsibilities, July 29, 1996, Chapter 12, "Real Property Contaminated with Ammunition, Explosives or Chemical Agents"

Specific hazardous material guidance is also covered in AR 200-1 which establishes policies and procedures to protect the environment, including environmental responsibilities for the Department of the Army (DA), major commands, and installations. It directs Army staff to follow applicable environmental regulations of final governing standards and Army environmental

quality policies pertaining to the Emergency Planning and Community Right-to-Know Act, RCRA, and CERCLA, also known as the Federal Superfund Law. It also defines the Army's goal of continually managing and reducing the generation of hazardous waste, through waste identification and disposal, records management, and training programs.

4.10.1 Environmental Compliance Management Plans

APG follows the U.S. Army's Hazardous Materials Management Policy (HMMP) that fulfills the requirements of the Federal, State, and Army regulations as specified therein (DA, 2010). The manual includes procedures for maintaining inventory data and for procuring, receiving, and tracking hazardous materials. In addition, APG policies and regulations include:

- APG Regulation 200-1 Environmental Quality Control
- APGR-200-50 Solid Waste Management Regulation,
- Guidance for Proper Management of Excavated Soil,
- APG Lead Hazard Management Program − Lead and Waste Characterization and Disposal Plan,
- APGR-200-30 Air Quality Regulations,
- APG-Asbestos Management Program – Asbestos Notification Form MDE-259, and
- APG 200-60, Hazardous Waste Management.
- APG Regulation 200-41 Water Quality Management
- APG Regulation 200-7 Source Water Protection Area Management Strategies
- APG Regulation 200-30 Air Quality Management Aberdeen Proving Ground
- Directorate of Public Works (DPW) 01 Aberdeen Proving Ground guidance for Code of Maryland COMAR listing and Delisting for Chemical Agent Wastes
- DPW 03 Pollution Prevention Policy
- DPW 05 Paints and Coatings Policy
- DPW 07 APG Environmental Policy
- DPW 10 APG Policy on Coordinating Environmental Issues with Federal, State and Local Officials
- DPW 11 Special Medical and Related Toxicology/ and Biotechnology Wastes Management
- DPW 17 APG NEPA Policy
- DPW Plan Chapter 8, Environmental Release Prevention and Response Plan to the APG Emergency Response Plan

APG also maintains a Hazardous Waste Tracking System to track all generated hazardous wastes from their generation through off-site disposal.

The APGR 200-60 specifies policies, assigns responsibilities, and establishes procedures for the management and disposal of hazardous waste generated at APG.

The APG Spill Prevention, Contingencies and Countermeasures Plan (SPCCP) addresses requirements, response, organization, assessment, establishment of priorities, environmental considerations, recommended cleanup techniques, training, and preventative maintenance.

The Aberdeen Proving Ground Pollution Prevention Plan (P2 Plan) establishes the Installation's commitment to environmental leadership in pollution prevention and outlines the concepts and practices necessary to reduce the use of hazardous materials and the release of pollutants to as near zero as is feasible.

4.10.2 Hazardous Materials Use

Hazardous materials are utilized at APG during research, development, and testing activities. APG's primary goal is to reduce toxic and hazardous materials and waste generation through the identification of proven substitutes and established facility management practices (e.g., pollution prevention). APG's HMMP and Hazardous Materials Management Procedures Manual provide the baseline hazardous materials requirements for all Garrison, tenant activities, and contractors.

Reporting of hazardous chemical storage quantities and locations is required under and conducted in accordance with Emergency Planning and Community Right-to-Know Act. Physical and/or virtual hazardous materials serve as the primary point of entry for hazardous materials data, provide hazardous material inventory reporting, facilitate the sharing of excess materials among Installation activities, generate reports to guide P2 activities, and maintain Safety Data Sheets. Multiple automated systems track all Installation hazardous materials inventories for those hazardous materials used and stored on-site.

4.10.3 Hazardous Waste Treatment, Storage and Disposal

APG is regulated as a large quantity generator by the MDE. Typical hazardous waste generation for APG is 300,000 to 500,000 pounds annually, with special projects and restoration activities that typically contribute additional quantities. A wide variety of hazardous wastes are generated primarily from research, development, and testing activities performed by tenants (e.g., at the Edgewood Chemical Biological Center) and ongoing remediation activities. Other hazardous waste streams are generated from facility, motor vehicle, aircraft and electronic systems maintenance. The Installation also generates large quantities (i.e., typically greater than one million pounds per year) of industrial wastes that do not meet hazardous waste criteria; however, these wastes require special management and disposal to protect human health and the environment.

Hazardous waste generators at APG are required to properly collect, manage, and characterize their wastes at the point of generation. Waste-generating activities accumulate small quantities of hazardous waste at nearly 300 satellite accumulation sites located throughout the Installation. Most are found in research laboratories. The Installation also operates 12, 90-day storage sites designed for the accumulation and receipt of larger quantities of waste. From these sites, hazardous wastes are turned over to the DPW Hazardous Waste Branch for interim storage and off-site contract disposal at authorized commercial treatment, storage and disposal facilities located around the country. Due to its research, development, test and evaluation activities, APG operates 9 units, or facilities, for the on-site treatment and/or long-term (up to one year) storage of certain toxic and explosive wastes. The MDE and USEPA Region 3 have issued hazardous waste and organic air emissions control permits, respectively, to tightly control their activities. Inspection cadre from the DPW- Hazardous Waste Branch and larger tenant organizations conduct daily, weekly, quarterly, semi-annual and annual inspections of different aspects of APG hazardous waste management program to ensure compliance with state and federal regulations.

4.10.4 Existing Contamination

Historical testing, training, manufacturing, and disposal activities at APG have led to numerous sites with contaminated soil, sediments, groundwater, and/or surface water. Chemical research programs and manufactured chemical agents as well as testing, storage, and disposal of toxic materials have previously occurred on APG-EA. Primary contaminants of concern include asbestos, chemical weapon munitions, chemical agents, dioxins/dibenzofurans, explosives, herbicides, metals, munitions and explosives of concern, munitions constituents, perchlorate, pesticides, petroleum oil and lubricants, polychlorinated biphenyls, polycyclic aromatic hydrocarbons, radionuclides, semi-volatile organic compounds, VOCs, and white phosphorus. Soil contamination from historical activities includes VOCs, metals, and UXO. Surface water contamination from historical activities includes metals, pesticides, phosphorus, and VOCs (USEPA, 2011). Groundwater plumes are also located across both APG-AA and APG-EA, with some plumes highly contaminated with VOCs. As such, vapor intrusion into buildings is a concern throughout the Installation.

4.10.5 Installation Restoration Program

The DoD's Installation Restoration Program (IRP) was established to provide guidance and funding for the investigation and remediation of hazardous waste sites caused by historical disposal activities at military installations. The fundamental goal of the APG IRP is to protect human health, welfare, safety, and the environment, to include ecological receptors. APG has participated in the Army's IRP since 1976, when the key Army agency conducting IRP actions at APG was the U.S. Army Toxic and Hazardous Materials Agency [now known as the U.S. Army Environmental Command (USAEC)]. In 1983, APG assumed total management responsibility of its IRP projects. In 1984, the Defense Appropriation Act established a transfer account to fund the IRP for DoD installations. In 1989, Michaelsville Landfill in APG-AA was listed on the National Priorities List (NPL), while in 1990 all of APG-EA was listed on the NPL, whereby the NPL is a compilation of private and Federal hazardous waste sites determined by USEPA for prioritized action based on a release or potential for release of contaminants.

In March 1990, a Federal Facilities Agreement (FFA) between the U.S. Army, APG and the USEPA Region 3 for APG was signed. An FFA is a formal agreement between USEPA, the State, and the Army that establishes objectives, responsibilities, procedures, and schedules for remediation. Although not a formal partner in the FFA, the State of Maryland is actively involved in all aspects of the IRP via coordination between APG and the MDE. The FFA establishes a procedural framework and schedule for compliance with all applicable, relevant, and appropriate requirements regarding CERCLA studies and remediation of 13 identified study areas in APG-AA and APG-EA. The IRP is implemented subject to and in a manner consistent with CERCLA (1980) as amended by SARA (1986) and CERCLA's implementing regulation, the National Contingency Plan. APG's IRP includes over 252 sites in 13 study areas encompassing both APG-AA and APG-EA. Of these sites, 149 are considered "Response Complete" requiring no further action. Natural resources management is limited on IRP sites while remediation efforts at these sites are ongoing.

4.10.6 Pesticides

APG's Directorate of Public Works is responsible for the Pest Management Program at APG. The APG Pest Management Program details, identifies, and assigns priorities to the pests and their destructive effects so decisions can be made for any level of protection. Program priorities are: 1)

control disease vectors and reservoirs of medical importance; 2) control real property pests; 3) control of stored product pests; 4) control general household and nuisance pests; 5) control ornamental and turf pests; 5) control miscellaneous pests; 6) control quarantine pests; 7) control weeds; 8) carcass disposal; and 9) golf course pest control activities. The Secretary of Defense mandated that installations reduce pesticide usage 50 percent by the year 2000, and APG has met this target (APG, 2017c).

The current program to reduce pesticide usage is managed by the APG Directorate of Public Works who is responsible for implementing the APG Integrated Pest Management Plan (IPMP). The IPMP provides a framework through which pest problems can be effectively addressed at APG. Elements of the program, including health and environmental safety, pest identification, pest management, pesticide storage, transportation, use and disposal are defined within the plan. Used as a tool, the IPMP reduces reliance on pesticides, enhances environmental protection, and maximizes the use of integrated pest management techniques.

4.10.7 UXO

The DoD recognizes its responsibility to protect the public from the potential hazards associated with military operations, both past and present. This is particularly true regarding DoD's use of military munitions in training and testing. To minimize the risk of UXO detonation, all areas suspected of having UXO are subject to specific digging clearance procedures and physical security measures preventing access.

In accordance with APGR 385-7, Excavation Permit Program, all excavation/earth disturbance activities within the boundaries of APG require the preparation of an excavation permit. UXO clearance requirements are to be evaluated and documented in the excavation permit.

4.10.8 Contaminated Demolition Program

The purpose of the contaminated demolition program at APG is to reduce or eliminate excess potentially contaminated facilities, slabs and infrastructure associated with miss-based activities at APG, which would reduce fixed facility costs, reduce risk caused by structural deterioration, and clear areas within the already developed infrastructure of APG for redevelopment for future designated land uses. This program covers the demolition of facilities, slabs or infrastructure which may be contaminated with chemical agents (CA) / Chemical Warfare Materials (CWM), biological pathogens/biological warfare materials (BWM), radiological material and explosive residue/munitions and explosives of concern (MEC) and may not be readily removed using standard demolition methods or those that require decontamination prior to demolition (APG, 2017c).

4.11 UTILITIES

Utilities at APG consist of potable water supply and distribution, wastewater systems, stormwater systems, energy sources, communications, and solid waste. Harford County, Maryland and the communities of Aberdeen and Edgewood provide several services to the Installation. Many utility services for APG are privatized or in the process of being privatized.

The potable water delivery systems within APG-AA and APG-EA are two separate systems. The APG-AA water system is privatized by agreement with the City of Aberdeen, whereas APG-EA

is not; however, privatization of the system could occur within the next two years, and an Environmental Assessment is currently being prepared.

Baltimore Gas and Electric (BGE) supplies APG with electricity via a 110-kilovolt transmission line from BGE's Perryman Island Power Plant to APG-AA's Harford substation in the northwest corner of the APG-AA Cantonment and Edgewood's Magnolia substation in the northwest corner of the APG-EA Cantonment. APG-AA and APG-EA have a capacity of 30 megavolt-amperes. APG-AA is close to meeting full capacity, but APG-EA has adequate capacity with approximately 40 percent spare capacity.

DPW Operations and Maintenance Division is responsible for management of the Energy Conservation Program on the Installation, and APG has partnered with BGE to manage and perform energy efficient lighting retrofits for interior lighting systems. This program will help APG meet its commitment to the USEPA Green Lights Program (U.S. Army Garrison 2008). The electric system at APG is privatized; BGE owns the main substations entering the Installation. There is one main substation in APG-EA (Magnolia Substation) and two in APG-AA (Harford Substation and Aberdeen Substation). Once the transmission lines leave the substations, they are the property of City, Light and Power.

Some buildings on APG were serviced by a combination of sanitary sewers and chemical sewers/storm drains. Laboratories on APG could include chemical sewer systems, which represent potential sources of contamination from agent-related work on the site.

4.11.1 Regulatory Framework

Utilities include energy sources, potable water, wastewater systems, stormwater systems and solid waste management. Applicable federal, state, and DA regulations include (U.S. Army Garrison 2008):

- CWA Regulations (33 CFR 320-330, 335-338; 40 CFR104-140, 230-233, 401-471)
- RCRA I
- Safe Drinking Water Act Regulations (40 CFR 141-149)
- MDE Regulation of Water Supply, Sewage Disposal, and Solid Waste (COMAR
- Title 26, Subchapter 4)
- Oil Pollution and Tank Management (COMAR Title 26, Subchapter 10)
- DoD Directive 4165.60, Solid Waste Management – Collection, Disposal, Resource Recovery and Recycling Program

4.11.2 Stormwater

Stormwater is defined as rainwater that flows overland; accumulates in gutters, ditches, and culverts; and travels through storm drains to streams (APG, 2011a). The stormwater drainage systems within developed areas of APG are managed by a series of catch basins and storm sewers; in less developed areas the storm sewer systems are comprised of piped storm drainage networks, drainage ditches, and swales (APG, 2011). In the developed portions of APG, storm sewers and catch basins manage the stormwater runoff. In less developed portions of the installation, stormwater runoff is managed by drainage swales.

Provisions of COMAR 26.17.02.01 require that all jurisdictions in Maryland implement a stormwater management program to control the quality and quantity of stormwater runoff resulting from new development (MDE, 2010). The primary goals of the state and local stormwater management programs are to maintain after development, as nearly as possible, the predevelopment runoff characteristics, and to reduce stream channel erosion, pollution, siltation and sedimentation, and local flooding by implementing environmental site design to the maximum extent practicable and using appropriate structural best management practices only when necessary.

COMAR Title 26.17.02.05 (when stormwater management is required) exempts any developments that do not disturb more than 5,000 square feet of land area or 100 cubic yards of earth. Conversely, developments disturbing more than 5,000 square feet of land or 100 cubic yards of earth require stormwater management. The Stormwater Management Plan requirements are outlined in COMAR 26.17.02.09.

4.11.3 Solid Waste

DPW-Environmental Division is responsible for management of solid waste and recycling programs. All solid wastes are removed by a private contractor while APG records and manages disposal by fulfilling the Quality Reporting Requirement. APG Complies with the AR 200-1, *Environmental Quality*; AR 420-49, *Utility Services*; and the applicable elements of federal, state, and local regulations which set forth direction and general policy for solid waste management. APG maintains an Integrated Solid Waste Management Plan that reflects Army Policy regarding solid waste diversion goals for municipal solid waste and construction and demolition waste. Army requirements and previous APG Integrated Solid Waste Management Plans have established diversion goals of 40% for municipal solid waste and 50% for construction and demolition debris (APG, 2014b). To achieve these goals, an integrated approach to solid waste management is prescribed in which ha hierarchy of management approaches is followed. The integrated approach places reducing solid waste generation as the first priority, followed by reuse and recycling of solid waste. Disposal via incineration and landfilling is the least favored management option and should only be used after other hierarchical approaches have been determined to be technically or economically infeasible (APG, 2014b). According to the 2014 Integrated Solid Waste Management Plan, APG surpassed the Army 40% diversion goal and the DoD Sustainability Performance Goals in 2010-2012, and the projections for 2017 and 2022 indicated that it was anticipated that APG would fall below the Army and DoD diversion goals, based on 5-year projections (2018-2012), during which time the diversion rates were well below the goals in 2008 and 2009 (APG, 2014b).

Kirk U.S. Army Health Clinic obtains medical waste disposal services through a U.S. Army Medical Command contract. Edgewood Chemical Biological Center, US Army Public Health Center, 1st Area Medical Lab, and Army Research Lab receive services through the DPW-managed Hazardous and Industrial Waste Disposal contract. All medical waste is collected by private contractors and either incinerated or autoclaved (followed by landfill disposal) offsite at appropriately permitted and authorized solid waste disposal facilities.

4.12 TRANSPORTATION

APG is located in Baltimore and Harford Counties, Maryland. Vehicle travel on the roadway network is the primary mode of transportation at APG. All entrances to APG are accessible regionally from Interstate 95 (I-95), which is located three miles northwest of APG, as shown in Figure 4-19. Interstate 95 connects APG to Baltimore, Maryland, Washington, D.C., and other points south; and Philadelphia, Pennsylvania, Wilmington, Delaware, and other points north. U.S. 40 runs parallel to I-95 and is closer in proximity to APG.

Major state highways provide access to the main APG gates (the Magnolia Road Gate, the Wise Road Gate, the Hoadley Road Gate, the Maryland Boulevard Gate, and the Harford Boulevard Gate) from I-95 and U.S. 40, including MD 22 (Aberdeen Thruway/Harford Boulevard), MD 715 (Shore Lane/Maryland Boulevard), MD 755 (Edgewood Road), MD 24 (Emmorton Road), and MD 152 (Magnolia Road).

Within the installation, buildings are primarily located near the access gates in APG-AA and APG-EA, with networks of roads servicing these areas. Traveling south towards the coast of each peninsula, toward the UTF, C-Field, and Henry (H) – Field, buildings and roads become sparser. On APG-AA, Old Baltimore Road and Michaelsville Road provide connections between the main campus and the southwestern point of the peninsula (including UTF), shown in Figure 4-20. On APG-EA, Magnolia Road/Ricketts Point Road provides the only north-south connection beyond the main cantonment area towards the southernmost point of the peninsula (C-Field and Henry (H) – Field), shown in Figure 4-21.

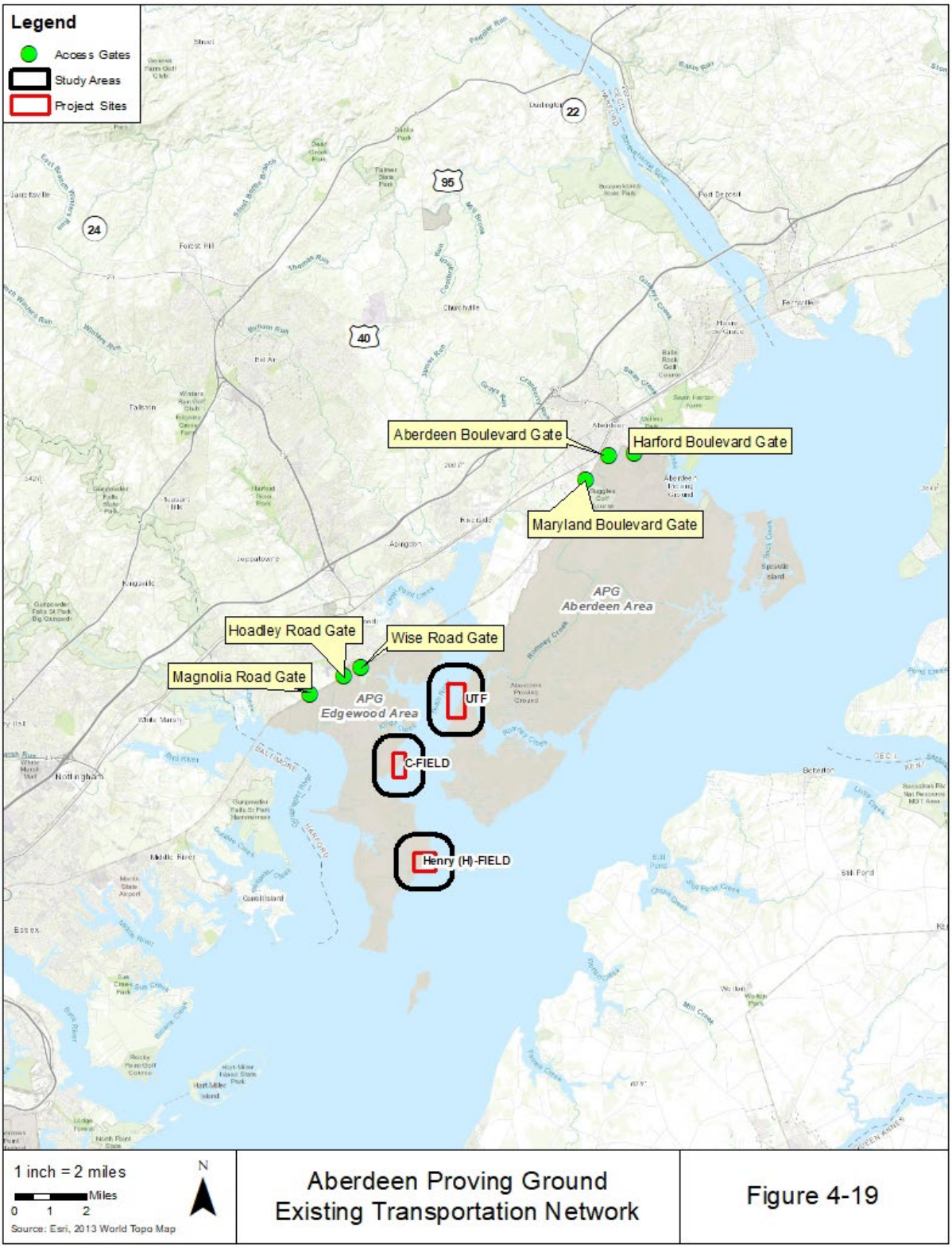

Figure 4-19: Existing Transportation Network

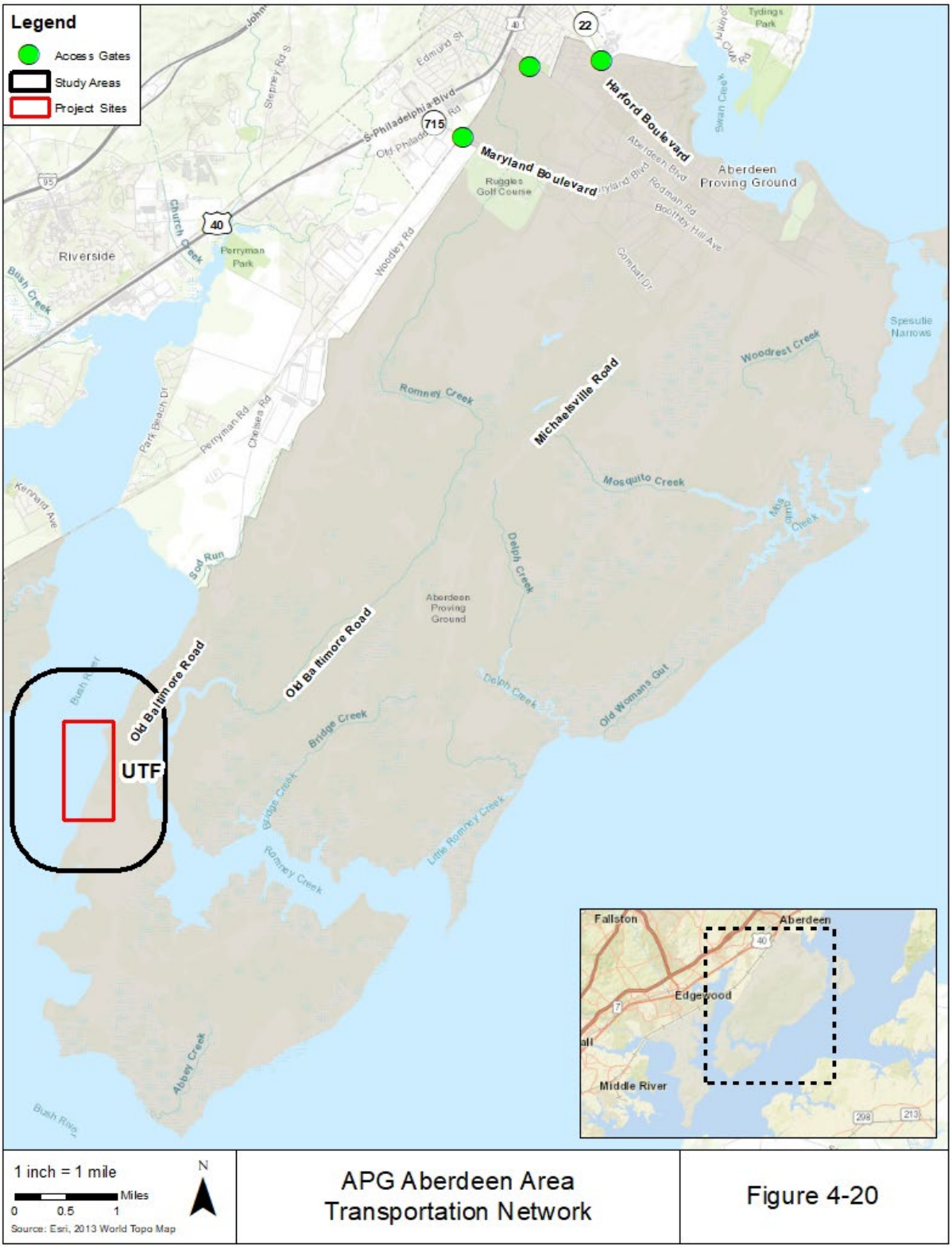

Figure 4-20: APG-AA Transportation Network

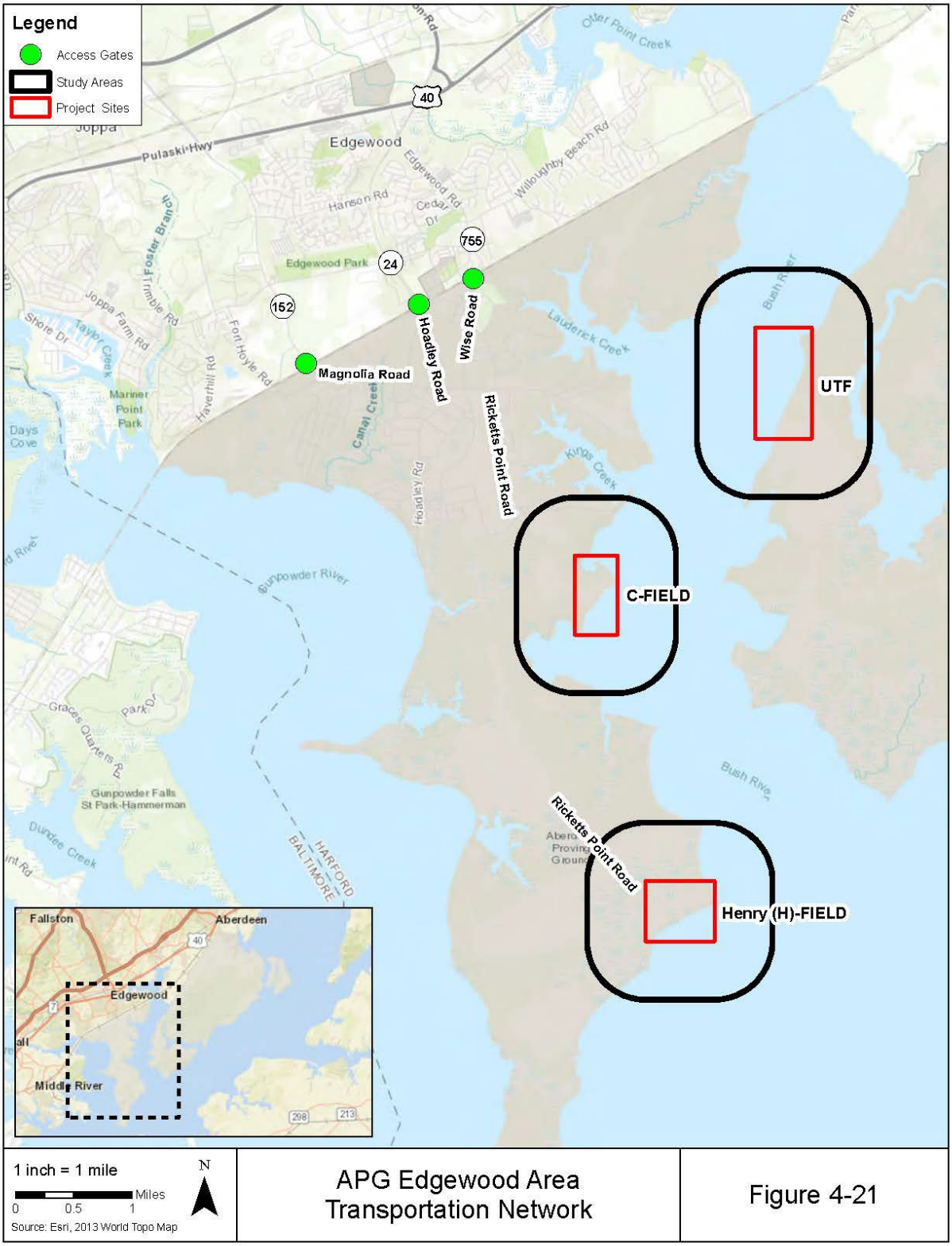

Figure 4-21: APG-EA Transportation Network

4.13 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, AND PROTECTION OF THE CHILDREN

Socioeconomics describes a community by examining its social and economic characteristics. Demographic variables such as population size, level of employment, and income range assist in analyzing the fiscal condition of a community and its government, school system, public services, healthcare facilities and other amenities. Socioeconomic information can be seen in Table 4-8.

4.13.1 Employment

During the day, the population at APG consists of military personnel, military family members residing on the Installation, DoD civilians, and civilian contractors. The total population at APG prior to the start of BRAC was 15,841 (ASIP COP Report, 2013), and the population increase resulting from BRAC resulted in a current total workforce of approximately 21,412 (APG 2017).

4.13.2 Economy

The regional economic activity for Anne Arundel, Baltimore City, Baltimore, Carroll, Cecil, Harford, Howard, and Queen Anne's Counties is influenced by APG. Harford and Cecil Counties realize the greatest social and economic effects from the installation's presence and serve as the primary region of influence for the social and economic environment. APG has long been a major economic source in northeastern Maryland and is the single-largest employer in Harford County, employing 4.5% of the Harford County's labor force of 244,826 people. Only 5,300 of the APG workforce live in Harford County, with the remainder commuting into the area (APG 2017).

4.13.3 Housing

Family housing on Aberdeen Proving Ground has been privatized under the Residential Communities Initiative and is managed by Corvias (APG, 2014a). Housing is located across from the Research Development and Engineering Command Buildings 3071, 3072, and 3073, as well as on Plumb Point Loop (APG, 2008a). On APG-EA, family housing is located along the northern edge of the Installation, along Everette Road, and in the southwestern corner of the Installation west of the 4400 Block (APG, 2014a).

4.13.4 Environmental Justice

Three Presidential Executive Orders: EO 12898, *Federal Actions to address Environmental Justice in Minority and Low-Income Populations*; EO 13084, *Consultation and Coordination with Indian Tribal Governments*; and EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* apply to required compliance at APG. The purpose of each of these Executive Orders is to avoid disproportionately high and adverse environmental, economic, social, or health impacts from federal actions and policies on these population groups.

On February 11, 1994, President Clinton issued Executive Order 12898, the purpose of which was to avoid the disproportionate placement of adverse environmental, economic, social, or health impacts from federal actions and policies on minority and low-income populations or communities. An element emanating from this Executive Order was the creation of an Interagency Federal Working Group on Environmental Justice composed of the heads of 17 Federal departments and agencies, including the Army. Each department or agency is to develop a strategy and implementation plan for addressing environmental justice.

It is the Army's policy to comply fully with Executive Order 12898, dated February 11, 1994 (Environmental Justice in Minority Populations), and requires that proponents of Federal projects assess potential impacts of proposed project on low income or minority populations. EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, requires Federal agencies to identify, assess, and address disproportionate environmental health and safety risks to children from federal actions. Information on minority and low-income populations in the project are as follows.

The Proposed Action project areas and their associated study areas are located entirely within Census Tract 3065. Census Tracts that border APG include Census Tract 3063, 3029.01, 3029.02, 3024, 3016.02, 3016.01, and 3014.02, (Figure 4-22). The term minority refers to people who classified themselves as African Americans, Asian or Pacific Islanders, American Indians, Hispanics of any race or origin, or other non-white races. Minority communities may be defined as areas where racial minorities comprise 50 percent or more of the total population or minority races comprise less than 50 percent of the total population. Low-income communities may be defined as those where 25 percent or more of the population is characterized as living in poverty (U.S. Census Bureau, 2021). Table 4-8 provides statistics that characterize the minority and low-income populations within the Region of Influence as captured in U.S. Census.

Table 4-8: Socioeconomic Figures

Socioeconomic Topic	Tract 3065 Value	Maryland State Value	Harford County Value
Median Household Income	$82,500	$87,063	$94,003
Total Population	2,680	6,177,224	262,977
Total Number of Housing Units	752	2,530,844	101,600
Total Child Population	762 (28%)	1,371,343 (22.2%)	58,380 (22.2%)
Poverty level	107 (4%)	555,950 (9%)	16,304 (6.2%)
Minority	1,052 (39%)	2,563,548 (41.5%)	55,751 (21.2%)

Source: Census Bureau 2016-2020 American Community Survey 5-Year Estimates

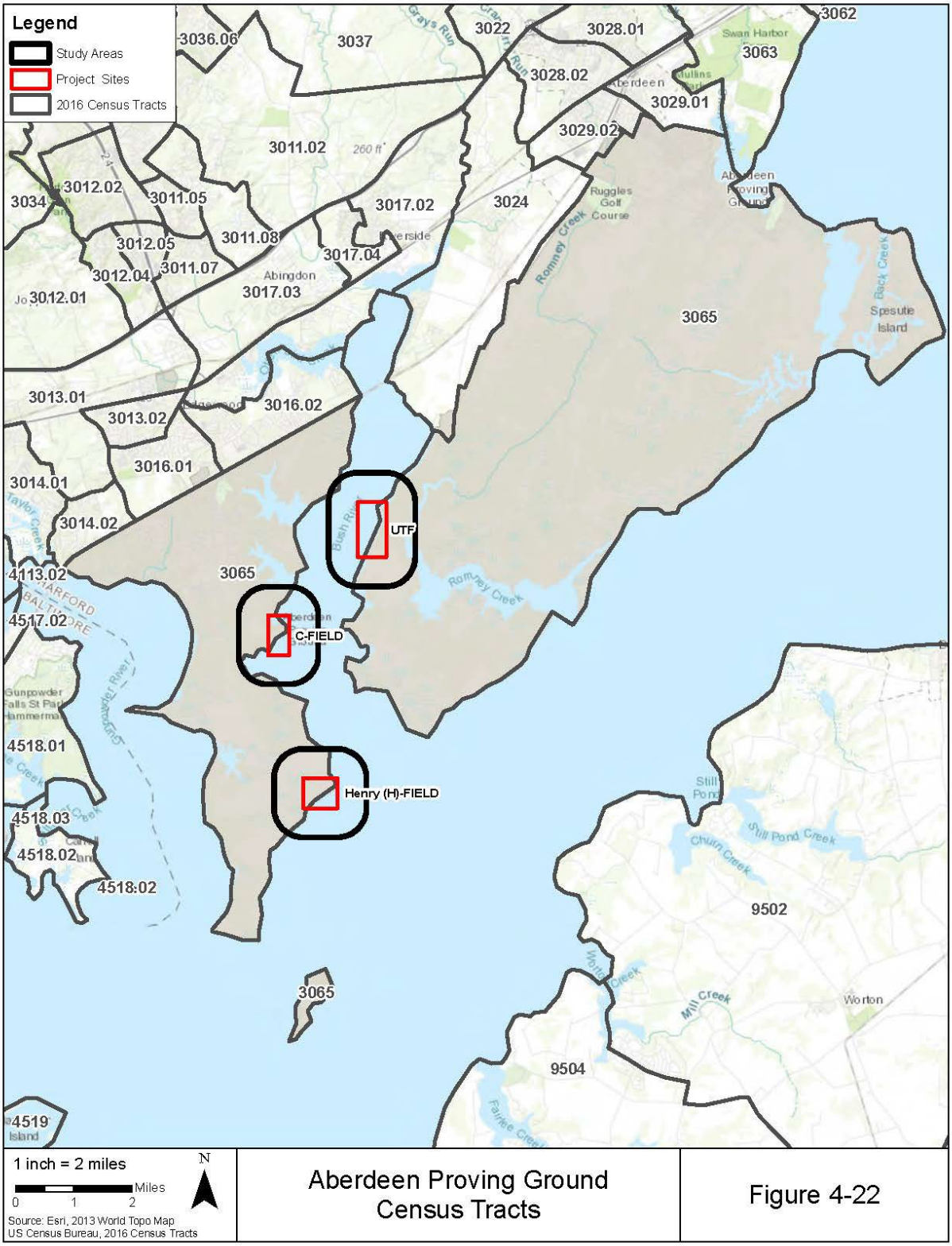

Figure 4-22: Census Tracts

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5.0 SUMMARY OF ENVIRONMENTAL IMPACTS

The following section describes the anticipated environmental impacts associated with implementing the Proposed Action and the No Action Alternative. The No Action alternative acts as a baseline condition, assuming the Proposed Action would not take place and the shorelines at the UTF, C-Field, and Henry (H) – Field sites, which are known to be eroding, would not be stabilized.

The method used to evaluate the overall importance of each impact was based on the following criteria:

1. **Nature** (beneficial or adverse, direct or indirect)

The nature of the impact can be described as positive (beneficial) or negative (adverse). Positive impacts enhance the quality or access to a resource, while negative impacts degrade the quality or limit access to the resource. Impacts are also described as direct or indirect. A direct impact is as an immediate result of an activity. An indirect impact arises from a project activity at the secondary level.

2. **Duration** (temporary or permanent)

The duration of an impact can be temporary or permanent.

3. **Areal extent** (regional, local, or isolated)

The areal extent of an impact refers to its area of influence and can be regional, local, or isolated to a particularly small and well-defined area. An impact of regional extent exerts an influence far beyond the surroundings of the project area. The local area of influence refers to the communities located near APG that could be affected by the project. An isolated impact is limited in extent to a small, readily defined area.

4. **Intensity** (low, moderate, or high)

The intensity of an impact concerns the scale or size of the impact on a resource. Intensity is evaluated as negligible, minor, moderate, or significant. A description of each measure of intensity is as follows:

- *Negligible:* This term indicates that the environmental impact is barely perceptible or measurable, remains confined to a single location, and would not result in a sustained recovery time for the resource impacted (days to months).
- *Minor:* This term indicates that the environmental impact is readily perceptible and measurable; however, the impact would be temporary, and the resource should recover in a relatively short period of time
- *Moderate:* This term indicates that the environmental impact is perceptible and measurable, and may not remain localized, impacting areas adjacent to the Proposed Action. Under the impact, recovery of the resource may require several years or decades.

- *Significant:* This term indicates significant impacts would occur. Under a significant impact, a resource may not recover and mitigation measures are considered to minimize the impact.

This section is organized by resource area following the same sequence as in the preceding Section 4.0. However, this section also includes a discussion of other environmental effects, including cumulative impacts and irretrievable commitment of resources that requires mitigation.

5.1 LAND USE

5.1.1 Environmental Criteria

The Proposed Action would be considered to have a significant effect on land use if:

- It is inconsistent with existing land use plans or policies;
- It prohibits the viability of existing land use;
- Surrounding land use would be expected to substantially change in the short or long term;
- It conflicts with adjacent land use to the extent that public health or safety is threatened; and
- It is incompatible with planning criteria that ensures the safety and protection of human life and property.

5.1.2 Impacts from the Proposed Action

The Proposed Action would not result in significant adverse impacts to land use. The shoreline erosion threatens testing infrastructure at three active test ranges, including moving target rails, roadways, test pads, ancillary structures, and a boat launch. Operational impacts due to shoreline erosion include loss of mission land, increased exposure to UXO, and overall degradation of the missionscape for Warfighter testing and training (APG, 2020c). Stabilization of the shoreline at the three project sites would allow for current and future mission use to continue by preventing additional loss of mission-critical land and infrastructure due to erosion, thereby maintaining the current land use at each of the sites. The Proposed Action would add approximately 4,000 to 5,000 linear feet of impervious surface at each site due to placement of armor stone breakwater, armor stone revetment, and stone sill along the shoreline. However, the Proposed Action would not create a land use incompatibility and is anticipated to comply with APG's overall land use plan.

The Proposed Action could have either negligible or long-term beneficial impacts on land use. There is no known additional land or alternative land location for ATC to utilize for testing purposes if the existing shoreline continues to erode. Future mission testing would be able to continue in its current locations with implementation of the Proposed Action, thus alleviating a future need to acquire alternative locations for purposes of this use. During the construction process, short-term, minor impacts could occur to land use through the use of construction vehicles, but would cease once shoreline stabilization construction activities are complete.

5.1.3 Impacts from the No Action Alternative

The No Action Alternative would not stabilize the eroding shorelines at UTF, C-Field, and Henry (H) – Field, and thus, it is anticipated that shoreline erosion would continue at the current rates, and the continued loss of land due to erosion along the shoreline would impact the ability for ATC mission-critical testing to continue. In addition, the No Action Alternative would not be compliant

with the installation's INRMP, which requires that APG, through shoreline protection and stabilization, reduce excess nutrient contamination and siltation of the Chesapeake Bay, and provide better habitat for living resources. The No Action Alternative would provide for moderate adverse, long-term impacts to land use.

5.2 VISUAL IMPACTS

5.2.1 Environmental Criteria

The Proposed Action would be considered to have a significant effect to visual impacts if:

- Long term alteration of the viewshed that would require mitigation would occur;
- Negative alterations to the viewshed of a historical resource would be expected; and
- Not compliant with the overall viewshed of adjacent areas.

5.2.2 Impacts from the Proposed Action

The Proposed Action would not result in significant adverse impacts to visual aesthetics, and instead, may provide beneficial, long-term impacts. Although it is anticipated that the breakwater and revetment may be visible from certain points on the shoreline, the overall Proposed Action would serve to maintain and enhance the natural viewshed that is currently being altered due to loss of eroded shoreline, including land, wetlands and other natural shoreline vegetation.

Short term minor impacts are expected under the Proposed Action during the construction process due to the presence of construction vehicles and materials. After construction however, the visual impacts will dissipate. Visual impacts would be mostly limited to areas in the near vicinity of the project areas.

The Proposed Action would result in either negligible or long-term beneficial impacts to the overall APG viewshed. It is expected that visual aesthetics would improve by replacing eroded shoreline areas and the wetlands and natural features associated with a non-structural and living stabilized shoreline.

5.2.3 Impacts from No Action Alternative

The No Action Alternative would result in long-term negative moderate impacts to aesthetic and visual resources. Under the No Action Alternative, the shorelines at UTF, C-Field, and Henry (H) – Field would continue to erode and degrade over time, causing a further dilapidation in the natural viewsheds in these areas.

5.3 GEOLOGY, SOILS AND TOPOGRAPHY

5.3.1 Environmental Criteria

The Proposed Action would be considered to have a significant effect to geology, soils and topography impacts if:

- It causes the substantial loss of soils, or compaction to the extent that makes it impossible to establish native vegetation within two growing seasons;
- It disturbs a land area larger than 1,000 acres;
- It causes a permanent loss of soil productivity that results from converting previous soils into impervious ground on more than 5% of installation land;

- It results in topography that does not comply with the overall topography of adjacent land; and
- It removes or alters soils and causes structural instability to surrounding buildings or infrastructure.

5.3.2 Impacts from the Proposed Action

The Proposed Action would not result in a significant adverse effect to soils. It is not expected that the Proposed Action would cause a substantial loss of soils or compaction. The Proposed Action would add approximately 4,000 to 5,000 linear feet of impervious surface at each site due to placement of armor stone breakwater, armor stone revetment, and stone sill along the shoreline. This additional impervious surface is not expected to cause a permanent loss of soil productivity on more than 5% of the installation land. As a result, no significant adverse impacts to soil are anticipated and an overall benefit to minimizing shoreline erosion at the project sites is expected to occur.

A short-term minor adverse effect on soils would be expected from implementing the Proposed Action at each site. Construction of the protection and stabilization measures at each site may take place by land or by water from a barge. Ground disturbance and soil compaction would be expected from using equipment on the land side to construct the stabilization and protection measures. The extent of the disturbance would be limited to the area within the immediate vicinity of each project site and any impacted areas would be restored upon completion of work and removal of equipment. Long term beneficial impacts are expected from the Proposed Action due to the placement of stabilization and protection measures at each site and placement of sand behind the stone sill to create a living shoreline of wetlands and SAV at the UTF Location and the C-Field Location. These measures would stabilize sand and soil along the shorelines and minimize future erosion at each project site.

APG would obtain all necessary state and local permits to construct the stabilization and protection measures at each site. It is anticipated that work at each site would disturb more than 5,000 square feet and would need to submit an Erosion Sediment Control Plan (ESCP). The ESCP would be designed in accordance with MDE regulations as published in the "2011 Standards and Specifications for Soil Erosion and Sediment Control" (MDE, 2011). Standard erosion and sediment control techniques include using vegetative and structural protective covers (e.g., permanent seeding, groundcover), sediment barriers (e.g., straw bales, silt fence, brush), constructing water conveyances (e.g., slope drains, check dam inlet, and outlet protection), and repairing and stabilizing bare and slightly eroded areas quickly. Maryland's "2010 Stormwater Management Guidelines for State and Federal Projects" would be followed to minimize adverse stormwater impacts from any work (MDE, 2010). APG would abide by state and local construction site permit requirements. Final site plans would include measures to minimize the total area of land disturbed, prevent soil erosion and sediment runoff on each site, and re-stabilize any temporarily disturbed areas during construction at each site.

No impacts to geology or topography are expected under the Proposed Action at each site. The Proposed Action would not penetrate the earth to the depth in which a disturbance to the local geology would be anticipated. Minor changes to topography are expected due to the placement of protection and stabilization measures at each site and placement of sand behind the stone sill at the UTF Location and C-Field Location to create a living shoreline. These changes would comply

with the overall topography of adjacent land along the shorelines and are not anticipated to cause a significant adverse effect to topography. The Proposed Action at each site would provide an overall benefit as erosional changes to topography along the shoreline would be minimized in the future.

5.3.3 Impacts from the No Action Alternative

Long term moderate adverse effects to soils and topography could occur as erosion would continue to scour away sands and soils from the shorelines. No impervious area would be created under the No Action Alternative. No effect on geology would be expected as a result of the No Action Alternative. Under the No Action Alternative, no protection and stabilization measures would be constructed at any site; therefore, geology would not be disturbed or changed.

5.4 AIR QUALITY AND GREENHOUSE GASES

5.4.1 Environmental Criteria

The Proposed Action would be considered to have a significant effect on air quality and greenhouse gas impacts if:

- The impact exceeds the *de minimis* levels for a pollutant; and
- It leads to a violation of an air operating permit.

5.4.2 Impacts from the Proposed Action

A General Conformity Applicability Analysis was performed for the Proposed Action, which estimated the level of potential air emissions (CO, NO_x, VOC, SO_2, and $PM_{2.5}$). It is not anticipated that the Proposed Action would result in a significant adverse impact to Air Quality. Table 5-1 below shows the estimated emissions for a 12-month period. Calculations were derived from estimated combustion equipment activities in one fiscal year.

Table 5-1: Estimated Annual Construction and Operational Emissions

Emission Source	Emissions (tons/year)					
	VOC[1]	CO[2]	NO_X[1]	SO_2[2]	PM_{10}[2]	$PM_{2.5}$[1]
Proposed Action Emissions	1.6	8.9	14.8	0.017	0.90	0.80
de minimis/New Source Review threshold	50	250	100	250	250	100
Exceeds *de minimis or NSR* threshold?	No	No	No	No	No	No

Notes:
[1] The Region of Influence (ROI) is a marginal nonattainment area for the 8-hour O_3 NAAQS (VOCs and NO_x are precursors to the formation of O_3), and is in attainment-maintenance of the $PM_{2.5}$ NAAQS. *De minimis* thresholds are defined in 40 CFR 93 Section 153. VOC *de minimis* established for nonattainment areas located in an O_3 transport area.
[2] D*e minimis* thresholds are not applicable to pollutants for which the area is in attainment for the NAAQS. New Source Review thresholds are 250 tons per year of any pollutant.
Sources: Arcadis, 2016.

The Proposed Action is not anticipated to result in any adverse effects to Air Quality. As demonstrated, the estimated emissions are well below the *de minimus* threshold.

The preferred alternative would create a short-term temporary impact on air quality from fugitive dust generated through the duration of onsite activities. All activities would be required to comply with federal, state, and current APG versions of regulations designed to support compliance with CAA, OSHA, and TSCA.

The Proposed Action is expected to comply with all air emission requirements and will follow the National Emissions Standards for Hazardous Air Pollutants. If regulated material is found within the work area such as lead and asbestos, best management practices outlined in the 2009 Building Demolition PEA will be followed.

CEQ guidance, based on many previous NEPA analyses, suggest that individual project scale GHG emissions typically have small potential environmental effects (CEQ, 2010). According to the USEPA an emission report must be filed if a Proposed Action generates CO2 emissions that are above 25,000 metric tons. As a military base, Aberdeen Proving Ground already reports their emissions to the USEPA, reporting a total of 33,282 tons CO2e in 2013 (USEPA, 2013). It is anticipated that the project would not cause a perceivable impact when compared to APG's overall CO2e emissions. Mitigation efforts could be implied by maintaining emission control technology on construction equipment.

5.4.3 Impacts from the No Action Alternative

Under the No Action Alternative, no activities would take place and general emissions would stay at their current rate.

5.5 NOISE

5.5.1 Environmental Criteria

The Proposed Action would be considered to have a significant effect to noise impacts if:

- It would raise the ambient noise level to such a state that it would be seriously incompatible with adjacent noise receptors; and
- It would substantially increase the number of people disturbed by the heightened noise levels on APG and off-post areas.

5.5.2 Impacts from the Proposed Action

Under the Proposed Action short-term negative effects are expected to occur throughout the construction process. The short-term negative effects would include temporary increases in noise levels resulting from heavy equipment and machinery that could affect personnel sensitive noise areas.

Noise due to construction activities will vary depending on the construction method, the types of construction equipment employed, the amount of each type of construction equipment, and the duration of construction equipment use. Heavy equipment produces the greatest amount of noise disturbances and should be of special concern. Noise levels under the Proposed Action are expected to be consistent with operations at a military post and are not expected to exceed the threshold limit values outlined in APG's ICUZ. If the proposed construction sites are within 800 feet of a noise sensitive receptor, mitigation efforts could include limiting the Proposed Action activities to weekday business hours to minimize off-post noise.

Appropriate safety procedures would be followed during excavation activities to minimize potential contact with UXO materials that may be present at the construction site. Any UXO materials uncovered will be disposed of in accordance with all current Army regulations and standard operating procedures.

5.5.3 Impacts from the No Action Alternative

No effect on the noise environment would be expected under the No Action Alternative. No construction activities would be undertaken, and thus no changes in operations or increases to overall noise levels would take place.

5.6 WATER RESOURCES

5.6.1 Surface Water and Ground Water

5.6.1.1 Environmental Criteria

The Proposed Action would be considered to have a significant impact on surface water or groundwater if:

- It could cause an exceedance of a Total Maximum Daily Load;
- It could cause a change in the impairment status of a surface water; or
- It could cause an unpermitted direct impact on a water of the United States.

5.6.1.2 Impacts of the Proposed Action

The Proposed Action at each site would not result in a significant adverse effect to surface waters or groundwater. It is not expected that the Proposed Action would cause an exceedance of a Total Maximum Daily Load, cause a change in the impairment of surface waters, or cause an unpermitted direct impact on WOUS. Stormwater runoff during construction of protection and stabilization measures at each site would be in compliance with regulatory requirements under a construction general permit for stormwater and would not cause an impairment of surface waters or groundwater.

Long term beneficial impacts are expected from the Proposed Action due to the placement of stabilization and protection measures at each site, and placement of sand behind the stone sill to create a living shoreline of wetlands and SAV at the UTF Location and the C-Field Location. The intent to provide several beneficial functions including trapping silts and other sediments during floods and biologically filtering contaminants from surface waters (APG, 2020c). These measures would help reduce sedimentation and runoff into Bush River.

APG would obtain all necessary state and local permits to construct the stabilization and protection measures at each site. It is anticipated that work at each site would disturb more than one acre of land and would need to apply to MDE for either a General or Individual Permit for Stormwater Associated with Construction Activity. As discussed in Section 5.3.2, an ESCP will be required, which would include standard erosion and sediment control techniques to protect surface water resources. Site-specific measures would reduce the impacts of sedimentation and stormwater runoff to surface waters at each Project Site during construction.

5.6.1.3 Impacts from the No Action Alternative

No effect on groundwater would be expected as a result of the No Action Alternative. Under the No Action Alternative, no protection and stabilization measures would be constructed at any site; therefore, groundwater would not be disturbed. Long term, moderate, adverse effects to surface waters could occur as sand and soils would continue to wash into Bush River due to erosion.

5.6.2 Floodplains

5.6.2.1 Environmental Criteria

The Proposed Action would be considered a significant adverse impact if it:

- Reduces water availability or supply to existing users;
- Overdrafts groundwater basins;
- Exceeds safe annual yield of water supply sources;
- Threatens or damages unique hydrologic characteristics;
- Endangers public health by creating or worsening health hazard conditions; or
- Violates established laws or regulations adopted to protect floodplains.

5.6.2.2 Impacts of the Proposed Action

EO 11988 directs that any new construction must avoid the floodplains as much as possible, and if construction in the floodplain cannot be avoided, flood protection measures must be undertaken to reduce the risk of flood-associated damages.

The Proposed Action would require construction within the floodplain of each site. The overall intent of the Proposed Action is to stabilize the shoreline and prevent future erosion, while establishing a living shoreline of SAV and wetlands to provide several beneficial functions including storage and attenuation of floodwaters, trapping silts and other sediments during floods, and naturally stabilizing shorelines (APG, 2020c). As such, long term beneficial impacts to floodplains at the project sites are expected from the Proposed Action.

Short-term minor adverse effects on floodplains may occur during construction of protection and stabilization measures at each site. The extent of the disturbance would be limited to the area within the immediate vicinity of each project site and any areas temporarily impacted by equipment and staging would be restored upon completion of work and removal of equipment. Minor changes in elevation would occur under the Proposed Action at each site, which by design would provide protection from floodwaters and minimize erosion along the shoreline. Therefore, negligible impacts on floodplains are expected under the Proposed Action and no significant impacts to this resource are anticipated. Impacts to floodplains would require authorization from MDE.

5.6.2.3 Impacts from the No Action Alternative

Long term negative effects to floodplains could be possible by the continued erosion of shorelines at each project site. If no protection and stabilization measures are constructed, sand and soils will continue to wear away from each site, reducing the overall size and benefit of floodplains along the Bush River. These floodplains provide benefits to the surrounding land and help to protect critical infrastructure at the adjacent test ranges.

5.6.3 Wetlands

5.6.3.1 Environmental Criteria

Significant adverse impacts to wetlands would occur as a result of the Proposed Alternative if it:

- Fills or alters a portion of wetland that would cause irreversible negative impacts to species or habitats of high concern;
- Irreversibly degrades the quality of a unique or pristine wetland; and
- Results in reductions of population size or distribution of species of high concern.

5.6.3.2 Impacts of the Proposed Action

Palustrine and estuarine wetlands are present within each study area and adjacent to each project site. Construction of proposed protection and stabilization measures is anticipated to impact a portion of wetlands at each project site. Impacts to regulated WOUS during construction of protection and stabilization measures at the Henry (H) – Field Location and creation of a living shoreline of SAV and wetlands at the UTF Location and C-Field Location would require a Section 404 permit from the USACE and MDE authorization. The permit would specify how the affected wetlands are to be protected and any required mitigation. Provided that the Proposed Action proponent meets the permit requirements, the action would be considered to have no net effect on wetlands.

All potential temporary impacts on wetlands during construction would be permitted and therefore, no significant adverse impacts on wetlands would be expected under the Proposed Action. The overall intent of the Proposed Action is to stabilize the shoreline, prevent future erosion, and establish wetlands along the shorelines to provide several beneficial functions including providing habitat for a variety of wildlife, attenuation of floodwaters, trapping silts and other sediments during floods, biologically filtering contaminants from surface waters, and naturally stabilizing shorelines (APG, 2020c). As such, long term beneficial impacts to wetlands at the project sites are expected from the Proposed Action.

5.6.3.3 Impacts from the No Action Alternative

There would be no direct impact on wetlands as a result of the No Action Alternative as no construction would occur along the shoreline. Long term negative effects could occur as erosion would continue to scour away sands and soils from the shorelines within adjacent wetlands.

5.6.4 Water Quality Certification

5.6.4.1 Environmental Criteria

Significant adverse impacts to water quality certifications would occur as a result of the Proposed Alternative if:

- Compliance with USEPA-approved water quality standards would not be met.

5.6.4.2 Impacts of the Proposed Action

As part of compliance with the CWA, consideration of water quality will be incorporated into the planning of the Proposed Action at each site, and measures will be taken to minimize impacts wherever possible. A Water Quality Certification would be requested through the Joint Federal/State

Application for the Alteration of Any Floodplain, Waterway, Tidal or Nontidal Wetland in Maryland and would be included in the wetland authorization issued by MDE.

Provided that the Proposed Action at each site is in compliance with USEPA-approved water quality standards, there are no expected adverse impacts to water quality certification from the Proposed Action.

5.6.4.3 Impacts of the No Action Alternative

Under the No Action Alternative, no protection and stabilization measures would be constructed at any site, so no permits would be needed, and in turn, no water quality certification would be needed. Therefore, there would be no impacts to water quality certification from the No Action Alternative.

5.7 COASTAL ZONE

5.7.1 Environmental Criteria

Significant adverse impacts to coastal zones would occur as a result of the Proposed Action if:

- Permits and mitigation required for construction within coastal zones were not obtained.

5.7.2 Impacts from the Proposed Action

Factors considered in evaluating coastal zone management impacts include the potential for the Proposed Action to be inconsistent with the Federal and State enforceable policies.

As part of compliance with the Federal CZMA, the State of Maryland's CZMP and Maryland's Chesapeake Bay Critical Area Protection Act, consideration of the location of coastal zone and critical areas will be incorporated into the planning of the shoreline stabilization actions, and measures will be taken to avoid these areas or minimize impacts wherever possible. Further analysis and a description of the Proposed Action's compliance with the Maryland CZMA is provided in Appendix B.

Because the Proposed Action's intension is to protect, stabilize, and enhance the natural shoreline areas at UTF, C-Field, and Henry (H) – Field, as part of the Proposed Action, wetlands and SAV beds would be created as part of a living shoreline stabilization solution to the erosion issue. Wetlands provide several beneficial functions including supplying habitat for a variety of wildlife, storage and attenuation of floodwaters, trapping silts and other sediments during floods, and biologically filtering contaminates from surface waters (APG, 2020c). The importance of SAV is well known as a primary indicator of local water quality, nursery areas for fish and crustaceans, filters of nutrients and sediment, and a natural stabilization for shorelines (APG, 2020c). The Proposed Action will serve to not only protect APG's mission-critical land and infrastructure but will also serve to protect the Chesapeake Bay's coastal resources. All design and construction aspects of the Proposed Action would be done in accordance with both APG's INRMP, the relevant Maryland CZM policies, and in consideration of APG's mapped Critical Areas. Therefore, it is expected that implementation of the Proposed Action would have a beneficial, long-term impact within the coastal zone.

5.7.3 Impacts from the No Action Alternative

Under the No Action Alternative, there would be no stabilization of the eroding shoreline. Erosion rates would continue to deteriorate the shoreline areas at UTF, C-Field and Henry (H) – Field. The continued loss of land due to erosion along the shoreline would impact the ability for ATC mission-critical testing to continue. In addition, the No Action Alternative would not be compliant with the installation's INRMP, which requires that APG, through shoreline protection and stabilization, reduce excess nutrient contamination and siltation of the Chesapeake Bay, and provide better habitat for living resources. The No Action Alternative would provide for long-term, moderate adverse, impacts to the coastal zone.

5.8 BIOLOGICAL RESOURCES

5.8.1 Environmental Criteria

The Proposed Action would be considered to have a significant impact on the biological environment if:

- It could result in a permanent net loss of habitat at a landscape scale;
- It could cause a long-term loss or impairment of a substantial portion of local habitat on which native species depend; or
- It could result in the unpermitted "take" of bald eagles or a threatened or endangered species.

5.8.2 Impacts from the Proposed Action

The Proposed Action would not result in a significant adverse effect to biological resources. It is not expected that the Proposed Action would result in permanent loss of habitat, cause a long-term loss or impairment of a substantial portion of local habitat on which native species depend, or result in the "taking" of bald eagles or a threatened or endangered species.

Short term minor adverse effects during construction of protection and stabilization measures would be expected under the Proposed Action at each site. Construction of protection and stabilization measures may take place by land or by water from a barge. Areas temporarily impacted from use of equipment on the land side would be limited to the area within the immediate vicinity of each project site and any impacted areas would be restored upon completion of work and removal of the equipment. It is anticipated that any wildlife that utilized the project sites could return upon completion of work.

Long term beneficial impacts are anticipated from the Proposed Action due to the creation of a living shoreline at the UTF Location and the C-Field Location, which includes creation of SAV and wetlands with the intent to provide several beneficial functions including habitat for a variety of wildlife and nursery areas for fish and crustaceans (APG, 2020c). The proposed protection and stabilization measures constructed along the shoreline at each site will also provide added benefit to protecting existing vegetation and habitats from future erosion.

The potential for bald eagle nest disturbance exists at the UTF and C-Field Locations, either directly (if the Proposed Action is conducted during nesting season, which could result in breeding pairs abandoning nests) or indirectly (if the Proposed Action is conducted outside nesting season, but results in habitat alteration where eagles do not return to these locations for nesting season).

Time of year restrictions would be implemented to the maximum extent possible, but the Proposed Action would likely overlap with a portion of the nesting season. If nests are abandoned, the original or another breeding pair may potentially return to the nest site the following season(s). Therefore, adverse impacts from the Proposed Action are considered to be minor. An incidental nest disturbance resulting from the Proposed Action would be covered under APG's eagle incidental take permit. Additionally, the Proposed Action is considered to have a net benefit to eagles as implementation of the Proposed Action would protect against further loss of shoreline nest trees.

An unpermitted "take" of a rare, threatened, or endangered species would not occur under the Proposed Action. As discussed in Section 4.8.5, the USFWS IPaC website identified northern long-eared bat, which is listed as federally and state threatened, in the three study areas, but only needs to be evaluated for projects that would clear 15 acres or more of trees. As it is assumed for the purposes of this document that less than 15 acres of trees would be cleared as a result of the Proposed Action, this species has not been evaluated in this document. Only two federal and/or state listed species are considered to occur on APG: Atlantic sturgeon (federally and state endangered) and shortnose sturgeon (federally endangered) (EA Engineering, 2014). Atlantic sturgeon live in offshore brackish waters and migrate to freshwater in the spring to spawn (USFWS 2011). Shortnose sturgeon also migrate to freshwater to spawn, though they are not known to migrate long distances offshore and primarily live in nearshore marine, estuarine, and riverine habitats of large river systems (USFWS 2016). While these species may be located within the study areas of each site, within Bush River, it is not anticipated that these species would be located in the immediate vicinity of each project site due to the extremely shallow nature of surface waters at each shoreline. Construction of protection and stabilization measures from the waterside would result in barges temporarily brought to each project site but would not require any further disturbances waterward. If any other federal or state protected species were found in the vicinity of the project sites, the installation would consult with the USFWS, the National Marine Fisheries Service, or the responsible state agency (as appropriate) and appropriate steps would be taken to ensure species were not harmed. Such steps should include scheduling construction work outside the breeding and nesting seasons or relocating the animal. No adverse impacts on protected species, therefore, would be expected under the Proposed Action at any site.

5.8.3 Impacts from the No Action Alternative

Under the No Action Alternative, there would be no protection and stabilization measures constructed and no disturbances that could impact vegetation, submerged aquatic vegetation, wildlife, bald eagles, or rare, threatened, or endangered species. Long term, moderate, adverse effects to vegetation, submerged aquatic vegetation, and protected species habitat could occur as erosion along the shoreline would continue. These areas would continue to decrease in size as future erosion occurred, with the potential to impact species that utilize these areas. Under the No Action Alternative, shoreline bald eagle nest trees would continue to be lost due to future erosion, which would result in bald eagle breeding pairs establishing nests further inland and closer to human activity. This would increase the risk of incidental take and disturbance to nests to a level that is not authorized by the current eagle incidental take permit.

5.9 CULTURAL RESOURCES

5.9.1 Environmental Criteria

Adverse effects on historic properties as a result of the Proposed Action include the following if:

- Physical destruction of or damage to all or part of the property;
- Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous substance remediation, and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines;
- Removal of the property from its historic location;
- Change of the character of the property's use or of physical features within its setting that contribute to its historic significance;
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features; and
- Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

5.9.2 Impacts from the Proposed Action

APG will coordinate with the State Historic Preservation Office for buildings eligible or potentially eligible for inclusion on the NRHP, and all required mitigation would be completed before construction activities would occur.

Excavation and earth moving has the potential to damage known and unknown archeological sites that may be near or underneath the ground surface. In the event that such a site was discovered during implementation of the Proposed Action, Standard Operating Procedures in the Installation's ICRMP would be followed to comply with the NHPA.

Additional evaluation under NEPA for cultural resources will be required if the project disturbs an archaeological resource (USACE, 2014). Because MHT and relevant Native American tribes would be consulted before any work is initiated, significant adverse impacts to cultural resources are not expected.

5.9.3 Impacts from the No Action Alternative

Under the No Action Alternative, there would be no ground disturbance that could impact archaeological, architectural, or Native American resources; therefore, there would be no adverse impacts.

5.10 HAZARDOUS, TOXIC, AND RADIOACTIVE SUBSTANCES

5.10.1 Environmental Criteria

The Proposed Action would result in significant adverse impacts to the environment if:

- Planned shoreline stabilization activities resulted in: a long-term (i.e., period of 5 years or more beyond completion of the project implementation) increase in the amount of hazardous materials or wastes to be handled, stored, used or disposed of;

- Non-compliance with applicable federal and state regulations; and/or
- Increased site contamination that could preclude future use of the proposed site.

5.10.2 Impacts from the Proposed Action

5.10.2.1 Hazardous Materials

Based on APG's potential for contaminated soils and groundwater due to historical testing, training, manufacturing, and disposal activities, it is possible that construction workers may encounter hazardous materials when working at the project sites. Contractual obligations in the construction documents would require contractors to adhere to all applicable local, state and Federal regulations pertaining to contaminated and hazardous materials, including, but not limited to, those regarding handling, transport, and proper disposal. It is anticipated that soils, sediments and encountered groundwater at the project sites would be sampled, tested and remediated, as necessary prior to implementation of the Proposed Action. Therefore, hazardous materials management at APG would not be impacted by the proposed activities. Because all materials would be handled in accordance with federal and state regulations, the Proposed Action is not anticipated to cause significant adverse impacts to hazardous materials.

5.10.2.2 Hazardous Wastes

Implementing the Proposed Action would not affect the management of hazardous material or hazardous waste. It is not anticipated that the Proposed Action will result in a substantial quantity of construction debris or wastes. Contractors, with government oversight and coordination, would be legally responsible for the proper disposal of these wastes in accordance with all federal, state and APG regulations. Therefore, it is not anticipated that the Proposed Action would cause significant adverse impacts to hazardous wastes.

5.10.2.3 Pesticides and Other Regulated Material

No impact to pesticides or other regulated material (ORM) is anticipated. Pesticide-contaminated soils and sediments would be handled in accordance with federal, state and APG regulations. Pesticides and ORM are normally well controlled and are subject to rigorous management controls thus the Proposed Action is not anticipated to result in significant adverse impacts from Pesticides and ORM.

5.10.2.4 Installation Restoration Program

No significant adverse impacts are anticipated to the Installation Restoration Program sites under the Proposed Action. All precautions and standards will be followed in order to severely limit the risk of any accidental release of hazardous wastes. Short term, minor adverse impacts are not expected, but are possible if hazardous materials or waste spills occur. Depending on the type and severity of a release, an action that resulted in a release, or a discovery of a previous contamination, would have to be added to the IRP and could be subject to the CERCLA process. APG has an IRP due to historical disposal activities. If a release does not occur, no impacts are expected from the Proposed Action. Any spills that have the potential to occur would be properly handled under state, federal and APG guidelines.

5.10.2.5 Unexploded Ordnance (UXO)

It is probable that when conducting excavation and earth-moving activities associated with implementation of the Proposed Action, UXO may be discovered, and mitigation would be required. Removal of UXO is necessary in any areas where the soil would be disturbed if the Proposed Action were to be implemented. To minimize the risk of UXO detonation, all areas suspected of having UXO are subject to specific digging clearance procedures and physical security measures preventing access. Long term, beneficial impacts are expected if UXO are discovered and removed from the sites.

Regulatory requirements and guidance applicable to management of potential chemical agent /chemical warfare materiel include the following:

- Interim Guidance for Chemical Warfare Material Responses, 1 April 2009;
- DODM 6055.09M,
- DA PAM 385-61, Toxic Chemical Agent Safety Standards, 20 July 2009
- DA PAM 385-65 Explosive and Chemical Site Plan Development and Submission

In the event potential UXO is encountered, appropriate protocols will be followed, as required by applicable guidance.

5.10.3 Impacts from the No Action Alternative

Under the No Action Alternative, it is expected that shoreline erosion would continue at its current rate, increasing potential exposure of UXO. Therefore, the No Action Alternative could have long term, moderate, adverse impacts regarding exposure and transport of hazardous materials and/or UXO.

5.11 UTILITIES

5.11.1 Environmental Criteria

The Proposed Action would result in significant adverse impacts to utilities if:

- It reduces water availability or supply to existing users;
- It results in noncompliance with the existing APG solid waste management plan;
- It overdrafts ground water basins; and
- It exceeds safe annual yield of water or energy supply sources.

5.11.2 Impacts from the Proposed Action

No significant adverse impacts to utilities are anticipated under the Proposed Action. Implementing the Proposed Action would not be expected to result in the need for any upgrades in utilities that service APG. The Proposed Action would not increase the long-term demand for public utility services and would not affect regional or local water or energy supplies. In the event that minimal amounts solid wastes result from project activities, contractors would comply with federal, state, and APG regulations to mitigate solid waste through recycling, reuse and management of the waste stream, where possible. No deviation from APG's normal stormwater and/or solid waste utility management is anticipated as a result of the Proposed Action. In the event that existing utilities are located within the proposed project areas, under the Proposed Action

Alternative, alleviation of existing erosion would serve to protect the utilities infrastructure, and prevent infrastructure damage or loss due to exposure of utility assets, resulting in a potential long-term beneficial impact.

Prior to project implementation, the locations of all existing underground utilities within the project areas would be determined. All utilities would be identified and clearly marked throughout the duration of project activities.

5.11.3 Impacts from the No Action Alternative

Under the No Action Alternative there would be no significant anticipated effect on utilities. No construction activities would be undertaken, and thus no changes in operations or impacts to existing utilities would take place.

In the event that existing utilities are located within the proposed project areas, under the No Action Alternative, continued erosion and degradation of the shorelines in these areas could cause exposure to utility assets, causing structural instability and a need for repair. Therefore, there is potential for the No Action Alternative to result in long term, minor, adverse impacts to utilities.

5.12 TRANSPORTATION

5.12.1 Environmental Criteria

The Proposed Action would result in significant adverse impacts to transportation if it:

- Contributes to a long-term increase in vehicle traffic that could not be accommodated by the existing roadway network; and,
- Results in long term traffic circulation problems within APG and off-post.

5.12.2 Impacts from the Proposed Action

Short-term, minor, adverse impacts on traffic and roadways leading up to the access gates would be expected due to the presence of construction vehicles if the Proposed Action was implemented. Temporary increases in traffic congestion would likely occur at access gates during peak construction periods. However, traffic disturbances related to construction activities would be minimal, as construction would take place along portions of the coast, where there are very low traffic volumes or conflicts with existing traffic.

Long-term, beneficial impacts would be expected on some roadways on the installation if the Proposed Action was implemented. Based on historical shoreline erosion rates (Figures 2-3, 2-5, and 2-7), the installation of preventative shoreline erosion measures would protect several roads on the installation west of Henry (H) – Field and several unnamed and unpaved roads servicing the C-Field and UTF, from further degradation.

5.12.3 Impacts from the No Action Alternative

If the No Action Alternative was implemented, continued shoreline erosion would threaten several unnamed and unpaved roads that provide access into and around the C-Field and UTF. Long-term, moderate, adverse effects on road infrastructure in these areas would result. No effects on traffic or roadways outside of these areas would occur from the No Action Alternative.

5.13 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, AND PROTECTION OF THE CHILDREN

5.13.1 Environmental Criteria

Significant environmental impacts to Socioeconomics, Environmental Justice and Protection of the Children would occur if:

- It results in a disproportionate share of adverse environmental or social impacts would be borne by minority or low-income populations;
- Health, safety, social stricture or economic viability of an environmental justice population are affected;
- Mitigation efforts could not eliminate disproportionate effects to minority or low-income populations; and
- Activities would disproportionately raise risks to children through environmental or health hazards.

5.13.2 Impacts from the Proposed Action

The Proposed Action is expected to result in both minor short term beneficial and negative impacts to socioeconomics. Minor short-term impacts are expected by the stimulation of the local economy caused by the increase of employment and income generated by the Proposed Action. Temporary adverse impacts to socioeconomics are expected due to the slight increase in noise and traffic. Noise and traffic impacts are expected to be minimal, but can cause minor negative impacts due to temporary increased ambient noise levels and traffic congestion. Minor long term positive impacts can also be expected from the Proposed Action. The stabilization of the shoreline, and the incorporation of the planned design features could improve the overall quality of life in the area by supplying habitat for a variety of wildlife, providing for storage and attenuation of floodwaters, trapping silts and other sediments during floods, biologically filtering contaminates from surface waters, and generally protecting the Chesapeake Bay's coastal resources, as well as improving the aesthetic appeal of the UTF, C-Field and Henry (H) – Field areas of APG.

An environmental justice analysis determines whether a disproportionate share of adverse environmental or social impacts from implementing a federal action would be borne by minority or low-income populations. The census tract in which all three project areas are located has a minority level of less than 50 percent of the total population of that census tract. Implementation of the Proposed Action would not be expected to adversely impact any demographic group working or living in the economic region of influence. The Proposed Action would not cause changes in population, regional industrial or commercial growth. The project areas are located in areas that are not publicly accessible and are not located adjacent to areas located outside of (off-Post) the APG boundaries, and therefore, it is anticipated that the work conducted would not affect minority communities or Native American tribal communities.

The Proposed Action would not be expected to impact children's safety, and no adverse effects to children are predicted. All applicable local jurisdictional safety requirements would be implemented during construction of shoreline stabilization measures, to ensure the protection of the public, including children. All proposed construction and the operational exercise of the Proposed Action would be carried out in areas where children do not reside or visit. In all cases,

proper precautions including the placement of fencing, public broadcast, and other types of barriers would be used to prevent potential harm to all civilians, including children.

5.13.3 Impacts from the No Action Alternative

Under the No Action alternative, shoreline stabilization would not occur. Long-term moderate-to-significant adverse impacts to the on-Post community would be expected from the continued deterioration and erosion of the shoreline areas, further threatening testing infrastructure and continuing the loss of land, thus impacting mission-critical testing, increasing potential exposure to UXO, and degrading the missionscape for Warfighter testing and training. The No Action Alternative would not impact local and off-Post economic activity. In addition, the No Action Alternative would have long-term, moderate impacts to both the quality of life of the on-Post and the local/off-Post community by not reducing excess nutrient contamination and siltation of the Chesapeake Bay, thus not providing better habitat for living resources as a result of shoreline protection and stabilization measures. Under the No Action Alternative, wetlands and SAV beds would not be created, and therefore, additional storage and attenuation of floodwaters, trapping silts and other sediments during floods, biologically filtering contaminants from surface waters, and providing nursery areas for fish and crustaceans would not result.

5.14 CUMULATIVE EFFECTS

The CEQ NEPA-implementing regulations (40 CFR 1508.1), as amended in April 2022, require assessment of cumulative impacts in the decision-making process for federal projects.

For the purposes of this EA, cumulative impacts result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable actions, regardless of who undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. Given the localized nature of the Proposed Action a Study Area has been defined for evaluation of potential impacts to human and natural resources within one-half mile of each of the subject ATC facilities. This constitutes the Proposed Action's ROI for cumulative effects. This ROI includes areas where the Proposed Action's effects would most likely contribute to cumulative environmental effects.

The Army considered a wide range of past, present, and reasonably foreseeable future actions in the ROI that could contribute to cumulative environmental effects, regardless of the nature of the actions or the Army's jurisdiction.

Each resource section addresses cumulative effects for each alternative. This analytical approach provides a more complete understanding of resource conditions that the Proposed Action could magnify, amplify, exacerbate, or benefit.

Past, present, and reasonably foreseeable projects that may have a cumulative impact in combination with the Proposed Action are listed in Table 5-2. The information in this table represents a review of credible online sources, local planning documents, and communication with the local planning agencies responsible for lands or projects within the ROI. Only "reasonably foreseeable" projects (well-developed, in mature planning stages, and/or with secure funding) are considered in the cumulative impact analysis (See Table 5-2). "Reasonably foreseeable" is defined as those projects that are well-developed, in mature planning stages, and/or have funding secured.

Conceptual projects, broad goals, objectives, or ideas listed in planning documents that do not meet the above criteria are not considered reasonably foreseeable for the purposes of this analysis.

Table 5-2: Cumulative Actions at APG

Project	Description	Timeframe	
		2011-2015	2015-2019
Medical Research Institute of Chemical Defense New Facility Complex	US Army Medical Research Institute of Chemical Defense proposes to consolidate and centralize a portion of existing operations within APG-EA with the construction and operations of a new facility complex comprised of a new state-of-the-art laboratory and support facilities. FNSI Issued.		X
Installation Information Infrastructure Modernization Program Fiber Optic Cable Installation	APG recently installed approximately 25 miles of underground fiber optic line and constructed three surface communication utility structures over 29 acres in APG.	X	
Joint Receipts Facility, E3401 E3163 and E3844	The Edgewood Chemical Biological Center proposes to operate and construct a state-of-the-art facility known as the Sample Receipt Facility within APG-EA. The facility allows for the safe handling, evaluation, analysis, storage, and treatment of a variety of potentially lethal chemical, biological, radiological and/or explosive-containing samples. FNSI issued.	X	

Project	Description	Timeframe	
		2011-2015	2015-2019
Real Property Master Plan	The Army proposes to adopt and implement a Real Property Master Plan (RPMP), to respond to changing conditions at APG in compliance with Army Regulation (AR) 210-20, *Real Property Master Planning for Army Installations,* which mandates updating existing plans as circumstances require. The RPMP would guide long-term and short-term planning and development to accommodate the existing, currently planned, and future requirements for development and maintenance of real property assets at APG through 2031 including the construction and addition of new buildings, building complexes, building expansions and additions, utility upgrade stations, road improvements, and an increase in the overall workforce. The development of a PEA is required. If the project is determined to require a more detailed or broader review, it would be subject to the stand-alone EA or EIS process.	X	X
Wastewater Treatment Plant Enhanced Nutrient Removal Upgrade	APG proposed to upgrade the existing APG-EA wastewater treatment plant by altering, replacing, or constructing new facilities. Old, obsolete facilities were removed or repurposed when possible. FNSI issued.		X
Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System	APG constructed and operated two aerostats (tethered helium-filled aircraft) and support facilities on APG for a three-year homeland defense operational exercise. Two sites were constructed on APG, Graces Quarters in Baltimore County and G-Field at the APG Edgewood Area. Approximately 17 acres at each location were impacted by construction activities. FNSI Issued.	X	
Electrical Privatization PEA	APG proposed to upgrade and privatize the existing electrical infrastructure at both APG-AA and APG-EA. A combination of above ground and underground power lines, and the replacement and construction of new substations and switching stations were proposed.	X	X

Project	Description	Timeframe	
		2011-2015	2015-2019
99th Regional Support Command	U.S. Army proposes to construct and operate a 500-member U.S. Army Reserve Center on an approximate 15-acre land plot at APG-EA to support the training and mobilization of ten U.S. Army Reserve units to meet current requirements. FNSI issued.		X
US Army Public Health Command (USAPHC) Headquarters Campus	USAPHC proposes to consolidate and centralize existing operations at the APG-EA with the construction and operation of a new facility complex, required to locate USAPHC activities at the center of their customer base within flexible, modern facilities housing state-of-the-art equipment. FNSI issued.		X
Harford County Development	Ongoing residential, commercial, and industrial development in Harford County is projected to increase. The Harford County Department of Planning and Zoning and Harford County Office of Economic Development have issued updated reports providing an inventory of past, present, and future planned residential, commercial, and industrial development in Harford County. Approximately 450,000 square feet of real estate were developed in the county between 2011 and 2013, along with an additional 550,000 square feet of ongoing construction. Planned development includes office parks, warehouses, shopping centers and minor retail development, single family homes, and apartment complexes. Specifically, approximately 68 acres of warehouse, business parks and distribution centers are planned less than five miles north-west of APG's boundary south of Route 40 (Harford County, 2013a-d).	X	X

5.14.1 Land Use

The major foreseeable construction at APG is outlined in the RPMP. The Proposed Action contributes in a small, yet beneficial way, to APG's redevelopment by allowing the necessary mission testing and training to continue to operate in its current locations, thereby alleviating any need to seek out alternative land areas for mission activities and critical infrastructure. This serves to maintain existing associated land uses. The Proposed Action is in compliance with the RPMP.

No significant changes to land use are planned due to the Proposed Action; therefore, no cumulative impacts related to land use are anticipated.

5.14.2 Visual Aesthetics

Short term minor impacts are expected under the Proposed Action during the construction process due to the presence of construction vehicles and materials. After construction however, the visual impacts will dissipate. Visual impacts would be mostly limited to areas in the near vicinity of the project areas.

The aesthetic setting of the military installation has been altered over the course of APG history and would likely continue to change as new military initiatives are carried out within its boundaries. Views of the Installation are generally limited to personnel, contractors, resident and visiting families, and civilians working on or visiting the Installation, who are cognizant of the missions that occur at or near APG and have become accustomed to scenery characteristic of military installations. From outside the maritime portion of the restricted area, trees, water towers, and a few structures close to the shoreline are visible. There are a few locations west of the garrison where views inside the garrison are possible due to terrain; these vistas are in residential and light commerce areas surrounding APG. Therefore, no cumulative impacts related to visual aesthetics are anticipated.

5.14.3 Geology, Soils and Topography

Past, present, and reasonably foreseeable future projects on APG have and would likely continue to convert land within and around APG from open space to a variety of military uses. The Proposed Action would stabilize the shorelines and create a living shoreline of SAV and wetlands in order to allow necessary mission testing and training to continue to operate in its current locations, therefore it is anticipated that these resources would be protected, and no future projects would occur at the three project sites. Therefore, no cumulative adverse impacts to geology, soils or topography are anticipated. Beneficial cumulative impacts to geology, soils, and topography are likely to occur as the Proposed Action would minimize the loss of these resources and protect APG from further erosion.

5.14.4 Air Quality

Shoreline stabilization activities associated with the Proposed Action would result in minimal negative cumulative impacts related to air quality. Short term impacts are expected through increased traffic and heavy equipment use, but would be negligible and therefore, no long-term cumulative impacts are anticipated.

5.14.5 Noise

The noise resulting from construction equipment is an unavoidable condition. Although construction noise would occur under the Proposed Action, noise would be temporary and cease upon the completion of the shoreline stabilization project. Therefore, no cumulative impacts related to noise are anticipated.

5.14.6 Water Resources

Cumulative impacts to groundwater and stormwater are not anticipated as the Proposed Action would have no impacts to these resources. The Proposed Action may result in short-term minor

adverse impacts to surface waters and floodplains during construction of the protection and stabilization measures at each site, as these measures would be constructed within these resources, but impacts related to construction, equipment, and staging would be temporary. Any minor adverse impacts would be outweighed by the beneficial impacts anticipated. Long term beneficial impacts are expected to all water resources from the Proposed Action as stabilization of the shoreline would minimize future erosion and establishment of a living shoreline of SAV and wetlands would provide several beneficial functions including habitat for a variety of wildlife and nursery areas for fish and crustaceans, attenuation of floodwaters, trapping silts and other sediments during floods, biologically filtering contaminants from surface waters, and naturally stabilizing shorelines storage (APG, 2020c). Therefore, it is anticipated that the overall cumulative impacts to APG would be beneficial.

5.14.7 Wetlands

The Proposed Action would result in impacts to portions of regulated wetlands at each site. These impacts would be temporary in nature during construction of the protection and stabilization measures and all areas temporarily impacted by equipment and staging would be restored. These minor adverse impacts would be outweighed by the benefits of the Proposed Action through creation of wetlands, along with SAV, as part of the living shoreline. There are numerous wetlands located within APG and other projects will likely have some effects to these resources. However, the overall cumulative impact from the Proposed Action is considered beneficial to APG as it would stabilize an eroding shoreline to help protect existing wetlands and would create living shorelines of SAV and wetlands.

5.14.8 Coastal Zone

The Proposed Action takes place within the coastal zone and along the shoreline. The overall cumulative impact from the Proposed Action is considered beneficial to APG as it would stabilize an eroding shoreline to help protect mission-critical infrastructure and land, while also protecting existing wetlands and creating new living shorelines of SAV and wetlands. Shoreline protection and stabilization would reduce excess nutrient contamination and siltation of the Chesapeake Bay and provide better habitat for living resources in combination with anticipated effects of other area projects. A full list of Coastal Zone enforceable policies as well as a description of the compliance of the Proposed Action with the Maryland CZMA is provided in Appendix B.

5.14.9 Chesapeake Bay Critical Area

The land immediately surrounding the Chesapeake Bay and its tributaries has the greatest potential to affect its water quality and wildlife habitat; therefore, all lands within 1,000 feet of the tidal waters' edge or from the landward edge of adjacent tidal wetlands and the lands under them are designated as the Chesapeake Bay "Critical Area," except land owned by the federal government. APG has therefore created its own mapping of Critical Areas of the Chesapeake Bay shoreline located on APG property. The Proposed Action will take place within the Critical Area of the Chesapeake Bay as mapped by APG, and therefore, positive cumulative impacts to the Chesapeake Bay Critical Area are anticipated due to the stabilization of an eroding shoreline to help protect mission-critical infrastructure and land, while also protecting existing wetlands and creating new living shorelines of SAV and wetlands.

5.14.10 Biological Resources

The Proposed Action would cause impacts to areas of vegetation where protection and stabilization measures would be installed at each site. These impacts are overshadowed by the creation of living shorelines of SAV and wetlands, which would provide an overall benefit to vegetation along the shoreline and, therefore, create and enhance available habitat along the shoreline to wildlife on APG. The Proposed Action is not anticipated to result in any adverse impacts to protected species as construction is anticipated to be located outside of habitats of those protected species known to occur within APG (Atlantic sturgeon and Shortnose sturgeon).

The potential for bald eagle nest disturbance exists at the UTF and C-Field Locations, either directly (if the Proposed Action is conducted during nesting season, which could result in breeding pairs abandoning nests) or indirectly (if the Proposed Action is conducted outside nesting season but results in habitat alteration where eagles do not return to these locations for nesting season). Time of year restrictions would be implemented to the maximum extent possible, but the Proposed Action would likely overlap with a portion of the nesting season. If nests are abandoned, the original or another breeding pair may potentially return to the nest site the following season(s). Therefore, adverse impacts from the Proposed Action are considered to be minor. An incidental nest disturbance resulting from the Proposed Action would be covered under APG's eagle incidental take permit. Additionally, the Proposed Action is considered to have a net benefit to eagles as implementation of the Proposed Action would protect against further loss of shoreline nest trees.

Therefore, adverse cumulative impacts to biological resources are not anticipated. Additionally, protected species that utilize APG for various types of habitat may benefit overall from the Proposed Action's creation of SAV and wetland habitat.

5.14.11 Cultural Resources

No archaeological, architectural, or Native American resources are known to be located within the Study Areas.

Potential viewshed impacts will be coordinated with the MHT for short term, minor impacts to the viewshed from sites listed on the National Register of Historic Places, located within a five-mile radius of the project areas.

There are no anticipated direct impacts on Cultural Resources resulting from the Proposed Action, and consequentially, no foreseeable cumulative effects are expected.

5.14.12 Hazardous, Toxic and Radioactive Substances

The Proposed Action would not generate additional hazardous, industrial or possibly radioactive wastes. Potential exists for encountering UXO during the course of construction. Removal of UXO is necessary in any areas where the soil would be disturbed if the Proposed Action were to be implemented. Long-term, beneficial impacts are expected if UXO are discovered and removed from the sites. Because all materials would be handled in accordance with federal and state regulations, the Proposed Action is not anticipated to cause significant adverse impacts to hazardous materials. In the event potential UXO is encountered, appropriate excavation protocols will be followed, as required by applicable guidance. No foreseeable cumulative impacts to

hazardous, toxic, or radioactive substances and/or wastes are anticipated as a result of the Proposed Action.

5.14.13 Utilities

There are no direct or foreseeable cumulative effects on utilities as a result of the Proposed Action. No deviation from APG's normal stormwater and/or solid waste utility management is anticipated as a result of the Proposed Action.

5.14.14 Traffic and Transportation

The Proposed Action would occur within the Baltimore Metropolitan Council metropolitan planning organization region. The metropolitan planning organization has prepared a Transportation Improvement Plan for the region, *Maximize2040*, which outlines planned transportation projects through the year 2040. Within Harford County, a priority has been given to the *Aberdeen Proving Grounds, BRAC Intersection Improvements* program to improve traffic and roadway safety within the vicinity of the APG. There are also plans for minor capacity, safety/operational, transit, and bicycle and pedestrian improvements within the county. Other projects and activities which would affect traffic and transportation would be the construction and operations of the 99th Regional Support Command, the construction and operations of the USAPHC Headquarters Campus, US-40/MD-715 Interchange Improvements Project, I-95/MD-24 Interchange Improvement Project and continued local public and private development within Harford County. The temporary traffic increases and increased wear on roadways associated with the Proposed Project are minor and not readily quantifiable. The cumulative effect of the Proposed Project and other projects would be increased traffic on local roads during construction. Traffic congestion would be slightly reduced, compared to baseline traffic, within the transportation network upon completion of transportation improvements designed to increase capacity and improve traffic operations. The Proposed Action would contribute to cumulative effects in regard to the transportation system within APG during construction. However, there would be no overall cumulative impacts as a result of the shoreline stabilization efforts on the larger transportation network.

5.14.15 Socioeconomics, Environmental Justice, and Protection of the Children

No long-term direct impacts to the socioeconomic conditions are anticipated for the Proposed Action. Short term beneficial impacts are anticipated during construction as there would be a temporary increase in the construction workforce in the area. While this may result in a positive impact as the construction personnel patronize nearby businesses, this impact would be both minor and short term, and would not contribute to an overall cumulative effect of socioeconomic conditions in the area.

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6.0 CONCLUSION

This EA analyzes the potential environmental and social consequences associated with the activities required for shoreline stabilization for the U.S Army Aberdeen Proving Ground, ATC Facilities: UTF, C-Field, and Henry (H) - Field. The purpose of the Proposed Action is to protect the shoreline at APG for three areas with high erosion rates located within active testing ranges comprised of mission-critical infrastructure. The stabilization of the shoreline in these areas will benefit APG by preserving and protecting the land used for mission-critical testing. The Proposed Action will benefit the environment through restoration and protection of the eroded shoreline, which would reduce excess nutrient contamination and siltation of the Chesapeake Bay and provide better habitat for living resources. Shoreline stabilization will also allow APG to remain compliant with their INRMP.

The EA was prepared in accordance with the NEPA and implementing regulations issued by the CEQ and 32 CFR Part 651.

The Proposed Action would result in short term minor impacts to land use, visual aesthetics, geology, soils and topography, air quality, noise, wildlife, bald eagles, floodplains, transportation, and socioeconomics. The Proposed Action would result in negligible impacts to land use, wetlands, vegetation, rare, threatened or endangered species, and cultural resources. Long term beneficial impacts provided by the Proposed Action would be to land use, visual aesthetics, geology, soils and topography, surface waters, coastal zone, SAV, wildlife, bald eagles, hazardous, toxic and radioactive substances, transportation, and socioeconomics. The Proposed Action Alternative would have no effect on groundwater, and water quality certification.

Under the No Action Alternative, no shoreline stabilization activities would occur. The No Action Alternative would potentially result in long term moderate adverse impacts to land use, visual aesthetics, soils and topography, surface water, floodplains, wetlands, coastal zone, vegetation, SAV, wildlife, bald eagles rare, threatened or endangered species, hazardous, toxic, and radioactive substances, utilities, transportation, and socioeconomics. The No Action Alternative would have no effect on geology, air quality, noise, groundwater, water quality certification, cultural resources, utilities, and socioeconomics.

Based on the evaluation of environmental effects described in Chapter 5 and summarized in Table 6-1, the Proposed Action will not result in a significant impact to the environment. Therefore, an EIS will not be necessary for this Proposed Action. This conclusion is documented in the FNSI found at the beginning of this report.

Table 6-1: Summary of the Effects of the Proposed Action and No Action Alternative

Resource Area	No Action	Proposed Action	Permits, Plans, and Measures Identified for Reduction of Impacts
Land Use	Minor, Short-Term Moderate, Adverse Long-Term	Negligible or Beneficial Long-Term	Land use compatibility and compliance with APG's overall land use plan would be maintained.
Visual	Moderate, Negative, Long-Term	Minor, Short-Term Negligible or Beneficial Long-Term	Visual aesthetics would improve by replacing eroded shoreline areas and the wetlands and natural features associated with a non-structural and living stabilized shoreline.
Geology, Soils, and Topography	Moderate, Adverse, Long-Term	Minor, Adverse, Short-Term;	APG would obtain all necessary state and local permits to construct the stabilization and protection measures at each site, including: • ESCP Plan • State and Local construction site permits/requirements Final site plans would include measures to minimize the total area of land disturbed, prevent soil erosion and sediment runoff on each site, and re-stabilize any temporarily disturbed areas during construction at each site.
Air Quality and Greenhouse Gases	No Impact	Minor, Adverse, Short-Term	All activities would be required to comply with federal, state, and current APG versions of regulations designed to support compliance with CAA, OSHA, and TSCA. The Proposed Action is expected to comply with all air emission requirements and will follow the National Emissions Standards for Hazardous Air Pollutants. If regulated material is found within the work area, such as lead and asbestos, best management practices outlined in the

Resource Area	No Action	Proposed Action	Permits, Plans, and Measures Identified for Reduction of Impacts
			2009 Building Demolition PEA will be followed. Mitigation efforts could be implied by maintaining emission control technology on construction equipment.
Noise	No Impact	Negative, Short-Term	If the proposed construction sites are within 800 feet of a noise sensitive receptor, mitigation efforts could include limiting the Proposed Action activities to weekday business hours or using BMPs to minimize off-post noise. Appropriate safety procedures would be followed during excavation activities to minimize potential contact with UXO materials that may be present at the construction site. Any UXO materials uncovered will be disposed of in accordance with all current Army regulations and standard operating procedures.
Surface Water and Groundwater	Moderate, Adverse, Long-Term (surface water) No Impact (Groundwater)	Beneficial, Long-Term	Stormwater runoff during construction of protection and stabilization measures at each site would be in compliance with regulatory requirements under a construction general permit for stormwater. Reduction of sedimentation and runoff into the Bush River would result from placement of stabilization and protection measures at each site and placement of sand behind the stone sill to create a living shoreline of wetlands and SAV. APG would obtain all necessary state and local permits to construct the stabilization and protection measures at each site. It is anticipated that work at each site would disturb more than one acre of

Resource Area	No Action	Proposed Action	Permits, Plans, and Measures Identified for Reduction of Impacts
			land and the project proponent would need to apply to MDE for either a General or Individual Permit for Stormwater Associated with Construction Activity. An ESCP will be required, which would include standard erosion and sediment control techniques to protect surface water resources.
Floodplains	Negative, Long-Term	Minor, Adverse, Short-Term Beneficial, Long-Term	EO 11988 directs that any new construction must avoid the floodplains as much as possible, and if construction in the floodplain cannot be avoided, flood protection measures must be undertaken to reduce the risk of flood-associated damages. The overall intent of the Proposed Action is to stabilize the shoreline and prevent future erosion, while establishing a living shoreline of SAV and wetlands to provide several beneficial functions including storage and attenuation of floodwaters, trapping silts and other sediments during floods, and naturally stabilizing shorelines. The extent of the disturbance would be limited to the area within the immediate vicinity of each project site and any areas temporarily impacted by equipment and staging would be restored upon completion of work and removal of equipment. Minor changes in elevation would occur under the Proposed Action at each site, which by design would provide protection from floodwaters and minimize erosion along the shoreline. Impacts to floodplains would require authorization from MDE.

Resource Area	No Action	Proposed Action	Permits, Plans, and Measures Identified for Reduction of Impacts
Wetlands	Negative, Long-Term	Beneficial, Long-Term	Impacts to regulated WOUS during construction of protection and stabilization measures at the Henry (H) – Field Location, and creation of a living shoreline of SAV and wetlands at the UTF Location and C-Field Location would require a Section 404 permit from the USACE. The permit would specify how the affected wetlands are to be protected, and any required mitigation.
Water Quality Certification	No Impact	No Impact	A Water Quality Certification would be requested through the Joint Permit Application under Section 404 of the CWA. The Proposed Action at each site would be conducted in compliance with USEPA-approved water quality standards.
Coastal Zone	Moderate, Adverse, Long-Term	Beneficial, Long-Term	As part of compliance with the Federal CZMA, the State of Maryland's CZMP, Maryland's Chesapeake Bay Critical Area Protection Act, and APG's mapping of Critical Areas on federal property, consideration of the location of coastal zone and critical areas will be incorporated into the planning of the shoreline stabilization actions, and measures will be taken to avoid these areas or minimize impacts wherever possible. All design and construction aspects of the Proposed Action would be done in accordance with both APG's INRMP and the relevant Maryland CZM policies.
Biological Resources	Moderate, Adverse, Long-Term	Minor, Adverse, Short-Term Beneficial, Long-Term	Areas temporarily impacted from use of equipment on the land side would be limited to the area within the immediate vicinity of each project site and any impacted areas would be restored upon

Resource Area	No Action	Proposed Action	Permits, Plans, and Measures Identified for Reduction of Impacts
			completion of work and removal of the equipment. If any federal or state protected species were found in the vicinity of the project sites, the installation would consult with the USFWS, the National Marine Fisheries Service, or the responsible state agency (as appropriate) and appropriate steps would be taken to ensure species were not harmed. Such steps should include scheduling construction work outside the breeding and nesting seasons or relocating the animal. Time of year restrictions would be implemented to the maximum extent possible to minimize impacts to bald eagles, but the Proposed Action would likely overlap with a portion of the nesting season. If nests are abandoned, the original or another breeding pair may potentially return to the nest site the following season(s). Adverse impacts from the Proposed Action are considered to be minor and an incidental nest disturbance resulting from the Proposed Action would be covered under APG's eagle incidental take permit. The Proposed Action is considered to have a net benefit to eagles as implementation of the Proposed Action would protect against further loss of shoreline nest trees.
Cultural Resources	No Impact	Negligible	APG will coordinate with the State Historic Preservation Office for buildings eligible or potentially eligible for inclusion on the NRHP, and all required mitigation would be completed before construction activities would occur.

Resource Area	No Action	Proposed Action	Permits, Plans, and Measures Identified for Reduction of Impacts
			Excavation and earth moving has the potential to damage known and unknown archeological sites that may be near or underneath the ground surface. In the event that such a site was discovered during implementation of the Proposed Action, Standard Operating Procedures in the Installation's ICRMP would be followed to comply with the NHPA. Additional evaluation under NEPA for cultural resources will be required if the project disturbs an archaeological resource. All State and National Historic offices, and relevant Native American tribes would be consulted before any work is initiated.
Hazardous and Toxic Materials	Moderate, Adverse, Long-Term	Negligible or Beneficial, Long-Term	Contractual obligations in the construction documents would require contractors to adhere to all applicable local, state and Federal regulations pertaining to contaminated and hazardous materials and wastes, including, but not limited to, those regarding handling, transport, and proper disposal. It is anticipated that soils, sediments and encountered groundwater at the project sites would be sampled, tested and remediated, as necessary prior to implementation of the Proposed Action in order to account for personnel on-site safety and for offsite disposal requirements. Removal of UXO is necessary in any areas where the soil would be disturbed if the Proposed Action were to be implemented. To minimize the risk of UXO detonation, all areas suspected of

Resource Area	No Action	Proposed Action	Permits, Plans, and Measures Identified for Reduction of Impacts
			having UXO are subject to specific digging clearance procedures and physical security measures preventing access. Regulatory requirements and guidance applicable to management of potential chemical agent /chemical warfare materiel include the following: • Interim Guidance for Chemical Warfare Material Responses, 1 April 2009; • DODM 6055.09M, • DA PAM 385-61, Toxic Chemical Agent Safety Standards, 20 July 2009 • DA PAM 385-65 Explosive and Chemical Site Plan Development and Submission In the event potential UXO is encountered, appropriate excavation protocols will be followed, as required by applicable guidance.
Utilities	No Impact Minor, Adverse, Long-Term	No Impact Beneficial Long-Term	In the event that minimal amounts solid wastes result from project activities, contractors would comply with federal, state, and APG regulations to mitigate solid waste through recycling, reuse and management of the waste stream, where possible.
Transportation	Moderate, Adverse, Long-Term	Minor, Adverse, Short-Term Beneficial, Long-Term	No specific APG plans, permits, or measures regarding transportation.
Socioeconomics, Environmental Justice, and Protection of Children	Moderate-to-significant, Adverse, Long-Term	Minor, Beneficial Short-Term	All applicable local jurisdictional safety requirements would be implemented during construction of shoreline stabilization measures, to ensure the protection of the public, including children.

Resource Area	No Action	Proposed Action	Permits, Plans, and Measures Identified for Reduction of Impacts
		Minor, Negative, Short-Term	Proper precautions including the placement of fencing, public broadcast and other types of barriers would be used to prevent potential harm to all civilians, including children.

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8.0 ACRONYMS AND ABBREVIATIONS

%	percent
ADNL	A-weighted day-night levels
AMSL	Above Mean Sea Level
APG	Aberdeen Proving Ground
APG-AA	Aberdeen Area
APG-EA	Edgewood Area
APGR	Aberdeen Proving Ground Regulation
AR	Army Regulation
ARPA	Archaeological Resources Protection Act
ATC	U.S. Army Aberdeen Test Center
BFE	Base Flood Elevation
BGE	Baltimore Gas and Electric
BMP	Best Management Practices
BRAC	Base Realignment and Closure
BWM	Biological Warfare Materials
C5ISR	Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance and Reconnaissance
CA	Chemical Agent
CAA	Clean Air Act
CDNL	C-weighted day-night levels
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH_4	Methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_{2e}	CO_2 equivalent
COMAR	Code of Maryland Regulation
CWA	Clean Water Act
CWM	Chemical Warfare Materials
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Program
dB	decibel
DoD	Department of Defense
DPW	Directorate of Public Works
EA	Environmental Assessment
EEM	Estuarine Emergent Wetland
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
ESCP	Erosion and Sediment Control Plan

FE	Federal Endangered
FEMA	Federal Emergency Management Administration
FFA	Federal Facilities Agreement
FNSI	Finding of No Significant Impact
FT	Federal Threatened
GHG	Green House Gas
GWP	global warming potential
HAP	Hazardous Air Pollutant
HMMP	Hazardous Materials Management Policy
ICRMP	Integrated Cultural Resources Management Plan
ICUZ	Installation Compatible Use Zone
INRMP	Integrated Natural Resources Management Plan
IPaC	Information for Planning and Consultation
IPMP	Integrated Pest Management Plan
IRP	Installation Restoration Program
LF	linear feet
LUPZ	Land Use Planning Zone
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDE	Maryland Department of the Environment
MDNR	Maryland Department of Natural Resources
MEC	Munitions and Explosives of Concern
MHT	Maryland Historic Trust
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_x	nitrogen oxides
NPL	National Priorities List
NRCS	National Resource Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
O_3	ozone
ORM	other regulated material
OTC	Operational Test Command
PEA	Programmatic Environmental Assessment
PEM	Palustrine Emergent Wetland
PM_{10}	particulate matter less than 10 microns
$PM_{2.5}$	particulate matter less than 2.5 microns
ppm	Parts per million
RCRA	Resource Conservation and Recovery Act
ROI	Region of Influence
RPMP	Real Property Master Plan
SARA	Superfund Amendments and Reauthorization Act
SAV	Submerged Aquatic Vegetation
SE	State Endangered
SIP	Site Implementation Plan
SO_2	sulfur dioxide

SPCCP	Spill Prevention, Contingencies and Countermeasures Plan
ST	State Threatened
tpy	Tons per year
TSCA	Toxic Substance and Control Act
USACE	United States Army Corps of Engineers
USAEC	United States Army Environmental Center
USAPHC	United States Army Public Health Center
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UTF	Underwater Explosions Test Facility
UXO	Unexploded Ordnance
VEC	Valued Ecosystem Components
VOC	Volatile Organic Compound
WOUS	Waters of the United States
$\mu g/m^3$	Micrograms per cubic meter

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APPENDIX A:
Agency Coordination

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IMAP-PWE

Public Notice

Environmental Assessment
Underwater Test Facility (UTF), C-Field, and H-Field Shoreline Stabilization
Aberdeen Proving Ground, Maryland

All Interested Parties: Aberdeen Proving Ground (APG) is preparing an Environmental Assessment (EA) to evaluate potential environmental, cultural, and socioeconomic effects associated with the APG Shoreline Stabilization Project.

The Proposed Action will provide a long-term solution that stabilizes approximately 13,000 linear feet of Bush River shoreline, prevents loss of real estate and protects critical infrastructure at the adjacent ranges. The Proposed Action includes the placement of approximately 7,500 linear feet of armor stone revetment, the construction of approximately 1,800 linear feet of breakwaters and approximately 5 acres of living shoreline.

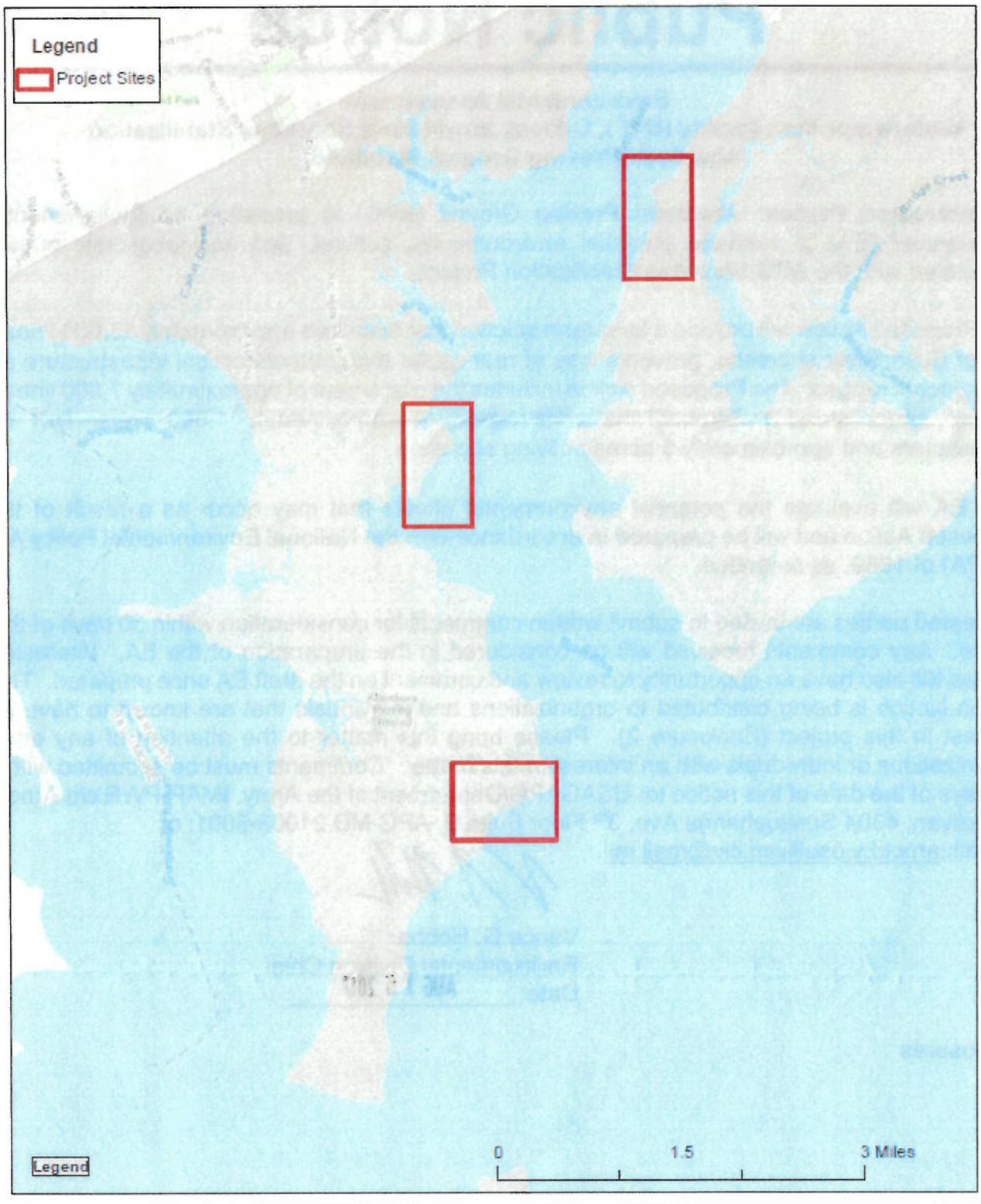
This EA will evaluate the potential environmental effects that may occur as a result of the Proposed Action and will be prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended.

Interested parties are invited to submit written comments for consideration within 30 days of this notice. Any comments received will be considered in the preparation of the EA. Interested parties will also have an opportunity to review and comment on the draft EA once prepared. This Public Notice is being distributed to organizations and individuals that are known to have an interest in this project (Enclosure 2). Please bring this matter to the attention of any other organizations or individuals with an interest in this matter. Comments must be submitted within 30 days of the date of this notice to: USAGAPG/Department of the Army, IMAP-PWE c/o Arnold O'Sullivan, 4304 Susquehanna Ave, 3rd Floor Suite B, APG MD 21005-5001; or E-mail: arnold.v.osullivan.civ@mail.mil.

Vance G. Hobbs
Environmental Division Chief
Date: AUG 15 2017

Enclosures

ENCLOSURE 1



N 0 0.5 1 Miles	Aberdeen Proving Ground Project Location Map	Enclosure 1

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1. Article Addressed to:

Maryland Department of Transportation
State Highway Administration
ATT: Lee Johnson
707 North Calvert Street
Mail Stop C303
Baltimore, MD 21202

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A. Signature
X [signature] ☐ Agent ☑ Addressee

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1. Article Addressed to:

Ms. Andrea Van Arsdale
Director Department of Planning
Jefferson Building, Suite 101
105W. Chesapeake Avenue
Townson, MD 21204

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X S. Stamos ☐ Agent ☐ Address

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1. Article Addressed to:

Ms. Lori Byrne
Maryland Dept. of Natural Resources
Tawes State Office Building
580 Taylor Avenue
Annapolis, MD 21401

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A. Signature
X received 8/21 ☐ Agent ☐ Addressee

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1. Article Addressed to:

Mr Ben Grumbles
Office of the Secretary
Maryland Department of Environment
1800 Washington Blvd.
Baltimore, MD 21230

9590 9402 2801 7069 7574 11

2. Article Number 7015 0920 0001 7602 9481

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X [signature] ☑ Agent ☐ Addres

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USAGAPG
Directorate of Public Works
Environmental Division
4304 Susquehanna Ave., 3rd Floor
APG, MD 21005-5001

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OFFICIAL BUSINESS

Maryland Department of Housing &
Community Development Maryland
Historical Trust
ATTN: Elizabeth J. Cole
100 Community Pl
Crownsville, MD 2

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1. Article Addressed to:

Maryland Department of Housing &
Community Development Maryland
Historical Trust
ATTN: Elizabeth J. Cole
100 Community Place
Crownsville, MD 21032-2023

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
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3. Service Type
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4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number
(Transfer from service label) 7016 1370 0000 1141 9634

PS Form 3811, July 2013 Domestic Return Receipt

DEPARTMENT OF THE ARMY
U.S.ARMY INSTALLATION MANAGEMENT COMMAND
U.S.ARMY GARRISON ABERDEEN PROVING GROUND
4510 BOOTHBY HILL AVENUE
ABERDEEN PROVING GROUND MARYLAND 21005-5001

REPLY TO
ATTENTION OF

Directorate of Public Works

Ms. Elizabeth J. Cole
State Historic Preservation Office
Office of Review and Compliance
Maryland Historical Trust
100 Community Place, 3rd Floor
Crownsville, MD 21032-2023

Dear Ms. Cole,

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act (NHPA) as amended for an undertaking by the U.S. Army Garrison (USAG) Aberdeen Proving Ground (APG), Aberdeen, Baltimore County Maryland. The USAG APG is preparing an Environmental Assessment (EA) to evaluate potential environmental, cultural, and socioeconomic effects associated with the Underwater Test Facility (UTF), C-Field, and H-Field Shoreline Stabilization Project.

The purpose of the Proposed Action will be to provide a long-term solution that stabilizes approximately 13,000 linear feet of Bush River shoreline at the UTC, C-Field, and H-Field (Figure 1), preventing loss of real estate and protecting critical infrastructure at the adjacent test ranges. The Proposed Action includes the placement of approximately 7,500 linear feet of armor stone revetment, the construction of approximately 1,800 linear feet of breakwaters and approximately 5 acres of living shoreline. Figures 2, 3, and 4 show the preliminary stabilization approaches at the UTF, C-Field and H-Field, respectively.

The Area of Potential Effect (APE) for this undertaking is defined as This EA will evaluate the potential environmental effects that may occur as a result of the Proposed Action and will be prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended.

To assist us in identifying issues that may affect the implementation of this project, please provide written comments within 30 days of receipt of this letter to our Point of Contact: USAGAPG/Department of the Army, IMAP-PWE c/o Arnold O'Sullivan, 4304 Susquehanna Ave, 3rd Floor Suite B, APG MD 21005-5001; or E-mail arnold.v.osullivan.civ@mail.mil. There will also be an opportunity to review and comment on the draft EA and Draft FONSI once prepared.

Sincerely,

Vance G. Hobbs
Chief, Environmental Division

Enclosures

MARYLAND DEPARTMENT OF
PLANNING

Larry Hogan, Governor
Boyd Rutherford, Lt. Governor

Wendi W. Peters, Secretary
Ewing McDowell, Deputy Secretary

August 28, 2017

Mr. Arnold O'Sullivan
Environmental Division
U.S. Army Garrison, Aberdeen Proving Ground
IMAP_PWE c/o Arnold O'Sullivan
4304 Susquehanna Ave, 3rd Floor, Suite B
Aberdeen Proving Ground, MD 21005-5001

STATE CLEARINGHOUSE REVIEW PROCESS

State Application Identifier: MD20170821-0722
Project Description: Public Notice - Environmental Assessment: Underwater Test Facility (UTF), C-Field, and H-Field Shoreline Stabilization Aberdeen Proving Ground, Maryland (Interested Parties are Invited to Submit Written Comments for Consideration within 30 days after August 15, 2017)
Project Location: County(ies) of Harford
Clearinghouse Contact: Rita Pritchett

Dear Mr. O'Sullivan:

Thank you for submitting your project for intergovernmental review. Participation in the Maryland Intergovernmental Review and Coordination (MIRC) process helps ensure project consistency with plans, programs, and objectives of State agencies and local governments.

Notice of your application is being provided to State and local public officials through the ***Intergovernmental Monitor***, which is a database of projects received by the State Clearinghouse for Intergovernmental Assistance. This information may be viewed at http://planning.maryland.gov/emircpublic/ . The project has been assigned a unique State Application Identifier that should be used on all documents and correspondence.

A "Project Status Form" has been enclosed and should be completed and returned after you receive notice that your project was approved or not approved.

All MIRC requirements have been met in accordance with Code of Maryland Regulations (COMAR 34.02.01.04-.06) and this concludes the review process for the above referenced project. If you need assistance or have questions, contact the State Clearinghouse staff noted above at 410-767-4490 or through e-mail at rita.pritchett@maryland.gov. Thank you for your cooperation with the MIRC process.

Sincerely,

Myra L. Barnes

Myra Barnes, Lead Clearinghouse Coordinator

MB:RP
Enclosure(s)
17-0722_NM.NEW.docx

MARYLAND DEPARTMENT OF PLANNING

Larry Hogan, Governor
Boyd Rutherford, Lt. Governor

Wendi W. Peters, Secretary
Ewing McDowell, Deputy Secretary

PROJECT STATUS FORM

Please complete this form and return it to the State Clearinghouse upon receipt of notification that the project has been approved or not approved by the approving authority.

TO: **Maryland State Clearinghouse**
Maryland Department of Planning
301 West Preston Street
Room 1104
Baltimore, MD 21201-2305

DATE: _____
(Please fill in the date form completed)

FROM: _____
(Name of person completing this form.)

PHONE: ____-____-_____
(Area Code & Phone number)

RE: **State Application Identifier:** **MD20170821-0722**
Project Description: Public Notice - Environmental Assessment: Underwater Test Facility (UTF), C-Field, and H-Field Shoreline Stabilization Aberdeen Proving Ground, Maryland (Interested Parties are Invited to Submit Written Comments for Consideration within 30 days after August 15, 2017)

PROJECT APPROVAL

This project/plan was: ☐ **Approved** ☐ **Approved with Modification** ☐ **Disapproved**

Name of Approving Authority: _____ **Date Approved:** _____

FUNDING APPROVAL

The funding (if applicable) has been approved for the period of:

_____, 201____ **to** _____, 201____ **as follows:**

Federal $:	**Local $:**	**State $:**	**Other $:**
_____	_____	_____	_____

OTHER

☐ **Further comment or explanation is attached**

MARYLAND
DEPARTMENT OF
NATURAL RESOURCES

Larry Hogan, Governor
Boyd Rutherford, Lt. Governor
Mark Belton, Secretary
Joanne Throwe, Deputy Secretary

September 8, 2017

Mr. Arnold V. O'Sullivan
USAGAPG/Dept. of the Army IMAP-PWE
4304 Susquehanna Avenue
3rd Floor, Suite B
APG, MD 21005-5001

RE: Environmental Review for EA Underwater Test Facility (UTF), C-Field and H-Field Shoreline Stabilization, Aberdeen Proving Ground - 13000 LF of Bush River, Harford County, Maryland.

Dear Mr. O'Sullivan:

The Wildlife and Heritage Service has determined that there are no official State or Federal records for listed plant or animal species within the delineated area shown on the map provided. As a result, we have no specific concerns regarding potential impacts or recommendations for protection measures at this time. Please let us know however if the limits of proposed disturbance or overall site boundaries change and we will provide you with an updated evaluation.

Thank you for allowing us the opportunity to review this project. If you should have any further questions regarding this information, please contact me at (410) 260-8573.

Sincerely,

Lori A. Byrne

Lori A. Byrne,
Environmental Review Coordinator
Wildlife and Heritage Service
MD Dept. of Natural Resources

ER# 2017.1297.ha

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

September 14, 2017

Mr. Arnold V. O'Sullivan
U.S. Army Garrison Aberdeen Proving Ground
Directorate of Public Works Environmental Division
ATTN: IMAP-PWE (3rd Floor Suite B)
4303 Susquehanna Avenue
Aberdeen Proving Ground, MD 21005-5001

Re: Scoping of Environmental Assessment for a Shoreline Stabilization Project at Aberdeen Proving Ground—Aberdeen Area, Maryland

Dear Mr. O'Sullivan:

In accordance with the National Environmental Policy Act (NEPA) of 1969 and the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR 1500-1508), the U.S. Environmental Protection Agency (EPA) is providing scoping comments for the proposed Environmental Assessment (EA) for a Shoreline Stabilization Project at Aberdeen Proving Ground (APG), Aberdeen Area (AA) in Maryland.

The Proposed Action will provide a long-term solution that stabilizes approximately 13,000 linear feet of Bush River shoreline, prevents loss of real estate, and protects critical infrastructure at the adjacent ranges. The Proposed Action includes the placement of approximately 7,500 linear feet of armor stone revetment, the construction of approximately 1,800 linear feet of breakwaters, and approximately 5 acres of living shoreline.

We appreciate that APG is proposing to construct living shorelines. NOAA produced a *Guidance for Considering the Use of Living Shorelines* in 2015 which may be of use to APG in the shoreline stabilization planning process. Furthermore, EPA encourages APG to investigate the use of other natural bank stabilization techniques as an alternative to the proposed stone revetment, such as offshore movable manmade structures or beach prisms. Lastly, EPA suggests identification in the planning of the EA and consideration of the presence of natural oyster beds that may be present in the study area. If present, evaluation of potential impact from alteration of water velocity should be considered. EPA has enclosed additional general comments for your consideration.

EPA appreciates the opportunity to review this project and looks forward to receiving the EA. If you have questions regarding these comments, the staff contact for this project is Nora Theodore; she can be reached at 215-814-2728 or theodore.nora@epa.gov.

Sincerely,

Barbara Rudnick
NEPA Team Leader
Office of Environmental Programs

Enclosure (1)

Technical Comments
Shoreline Stabilization Project
Aberdeen Proving Ground—Aberdeen Area, MD
Environmental Assessment Scoping

Purpose and Need

Since the range of alternatives evaluated is defined by the purpose and need for the project, it is important that the purpose and need be clearly identified in the EA. The purpose or objective of the proposal should be defined in relationship to the need for the action. Therefore, the need for the action should identify and describe the underlying problem or deficiency; facts and analyses supporting the problem or deficiency in the particular location at the particular time should be specified; and the context or perspective of the agency mission in relation to the need for action should be stated.

Alternatives Analysis

As described in the regulations for the Council on Environmental Quality (CEQ) (40 CFR §1502.14), the examination and comparison of the alternatives under consideration is the heart of the environmental document. It is through this comparison that the lead agency is able to incorporate agency and public input to make informed decisions with regard to the merits of the project and the advantages and disadvantages of each of the alternatives being studied. Consequently, the CEQ regulations require that the details of each alternative, including the "no action" alternative be clearly presented in a comparative form for easy analysis by the reader. The rationale for the selection of the preferred alternative should be clearly stated in the analysis. For those alternatives that are eliminated from consideration, the reasons for their elimination should be given.

Land Use

The project area should be described in detail and quantified, specifying the type and acreage of land impacted as well as a description of the existing buildings on the site including their current and past use. Discuss any permits required before commencement of the project. In addition to NEPA, other laws, regulations, permits, licenses and Executive Orders may be applicable to the Proposed Action. A summary of applicable regulatory requirements and approvals with which the Proposed Action must demonstrate compliance should be discussed in the EA.

ENVIRONMENTAL IMPACTS

The EA should examine the potential direct and indirect impacts of the project on the environment. In addition, mitigation measures for any adverse environmental impacts should be described.

To assist in exploring resource impacts for sites, the NEPA reviewer is referred to EPA's NEPAssist tool at https://www.epa.gov/nepa/nepassist. (NEPAssist is a tool that facilitates the environmental review process and project planning in relation to environmental considerations. The web-based application draws environmental data dynamically from EPA Geographic Information System databases and web services and provides immediate screening of environmental assessment indicators for a user-defined area of interest. These features contribute to a streamlined review process that potentially raises important environmental issues at the earlier stages of project development.) The

NEPA reviewer can also refer to EPA's Environfacts tool at https://www3.epa.gov/enviro/. (Environfacts is a "one-stop source" for Environmental Information).

Air Resources

Attainment/Non-attainment: EPA, under the requirements of the 1970 Clean Air Act (CAA) as amended in 1977 and 1990, has established National Ambient Air Quality Standards (NAAQS) for six contaminants, referred to as criteria pollutants (40 CFR 50). These are: ozone (O3), carbon monoxide (CO), nitrogen dioxide (NO2), particulate matter (PM), lead (Pb), and sulfur dioxide (SO2). Particulate matter is divided into two classes, coarse particulate matter (PM10), i.e. particulates between 2.5 and 10 microns in diameter, and fine particulate matter (PM 2.5), i.e., particles less than 2.5 microns in diameter. The NAAQS include primary and secondary standards. The primary standards were established at levels sufficient to protect public health with an adequate margin of safety. The secondary standards were established to protect the public welfare from the adverse effects associated with pollutants in the ambient air. The Clean Air Act mandates that state agencies adopt State Implementation Plans (SIPs) that target the elimination or reduction of the severity and number of violations of the NAAQS. The EA should identify areas that meet the NAAQS standard for a criteria pollutant as well as those areas where a criteria pollutant level exceeds the NAAQS.

Conformity Analysis: A general conformity rule analysis should be conducted according to the guidance provided by the EPA in Determining Conformity of General Federal Actions to State or Federal Implementation Plans. Under the general conformity rule, reasonably foreseeable emissions associated with all operational and construction activities, both direct and indirect, must be quantified and compared to the annual de minimis levels for those pollutants in nonattainment for that area.

Noise (and Vibration): The results of noise studies in the project area should be summarized in the EA. Noise mitigation measures should be implemented during renovation, demolition and/or construction.

Water Resources

We recommend all water quality issues including surface water, groundwater, drinking water, stormwater management, wastewater management, wetlands and watersheds be addressed. Any existing and/or ongoing impact to water resources that have resulted from the current trail network or any additional crossings that may occur as a result of the new trail system should also be identified and explained. NEPAssist can also be used to identify if there are any impaired waters located near the site.

Groundwater: We recommend that the principal aquifers in the region be identified and described. All wells, both public and private, that could potentially be affected by the project should be identified. We suggest areas of groundwater recharge in the vicinity also be identified and any potential impacts from the proposed action examined.

Surface Water Resources: The EA should outline measures to protect surface waters. We recommend the aquatic ecosystem be evaluated carefully and include a detailed discussion of runoff, sediment and erosion control measures. Such mitigation measures should address both short term construction impacts and long term project impacts.

Chesapeake Bay Watershed: Chesapeake Bay Executive Order 13508, Protecting and Restoring a National Treasure, tasked a team of federal agencies to draft a way forward for protection and restoration of the Chesapeake watershed. This team, the Federal Leadership Committee for the Chesapeake Bay, developed the *Strategy for Protecting and Restoring the Chesapeake Bay Watershed.* This strategy sets out clear and aggressive goals, outcomes, and objectives to be accomplished through 2025 by the federal government, working closely with state, local, and nongovernmental partners, to protect and restore the health of the Chesapeake Bay watershed. The strategy deepens the federal commitment to the Chesapeake region, with agencies dedicating resources, targeting actions where they can have the most impact, ensuring that federal lands and facilities lead by example in environmental stewardship and taking a comprehensive, ecosystem-wide approach to restoration. We recommend NPS discuss in the EA the project's impact or relation to the goals of the EO.

Wetlands: Wetlands present on, or immediately surrounding the site should be delineated according to the 1987 Federal Manual for Identifying and Delineating Jurisdictional Wetlands. Impacts to wetlands should be avoided or minimized whenever possible. The total size of the wetlands should be provided, in addition to the size of the wetland in the study area and size of the direct impact. We recommend the EA analyze the size and functional values of all impacted wetlands and develop a mitigation plan for their replacement. Even if wetlands are not present on the site, please provide information for any adjoining resource.

Stormwater Management/Low Impact Development (LID): Stormwater runoff in urban and developing areas is one of the leading sources of water pollution in the United States. In recognition of this issue, Congress enacted Section 438 of the Energy Independence and Security Act of 2007 (EISA) to require federal agencies to reduce stormwater runoff from federal development projects to protect water resources. EPA published *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act.* It is recommended that trail design incorporate features to minimize runoff and consider potential retrofit for any areas that would benefit from LID.

Physiography

The physical and natural resources of the project area should be described including physiographic provinces, topography, climate and geologic setting. Soils at the project should be outlined. Distribution and classification of soils within the study area, and the major soil types found at the project site should be described.

Terrestrial Resources

The EA should provide a description of the terrestrial habitat resources in the study area. Complete species lists for mammals, birds, amphibians, reptiles, and plants present in the study area are recommended. The composition and characteristics of each community type should be summarized and the functions and total acreage indicated.

Socioeconomics

Discussion of the socioeconomic and cultural status of the area, including the number of people, employees and/or jobs impacted as a result of the proposed project, even if these impacts may be minor.

is useful to the EA analysis. The EA should address the decrease or increase of people/employees/jobs in relation to its effect on tax base, local housing, job markets, schools, utilities, businesses, etc.

Cumulative Impacts

Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. The Council on Environmental Quality in 40 CFR 1508.7 defines cumulative impacts as "impacts on the environment which result 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." Therefore, a cumulative impacts assessment should be an integral part of the EA for the proposed action.

Traffic and Transportation

The EA should address traffic and transportation as it relates to the Proposed Action. It may be necessary to provide an evaluation of existing roads specifying existing levels of service at major intersections near the project area as well as accident data. The EA should discuss existing and proposed public transportation to the area under consideration and provide estimates of expected usage.

Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs each federal agency to incorporate environmental justice into its mission and activities by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations…." The Executive Order also explicitly called for the application of equal consideration for Native American programs. The EA should identify Environmental Justice (EJ) communities in the study area and discuss potential impacts that the Proposed Action may have on these communities, if any.

To assist in this effort, EPA has developed a new environmental justice (EJ) mapping and screening tool called EJSCREEN. It is based on nationally consistent data and an approach that combines environmental and demographic indicators in maps and reports. It can be accessed at: https://www.epa.gov/ejscreen. Additionally, please consider referring to "Promising Practices for EJ Methodologies in NEPA Reviews": https://www.epa.gov/environmentaljustice/ej-iwg-promising-practices-ej-methodologies-nepa-reviews

Cultural Resources

The National Historic Preservation Act (NHPA) of 1966, as amended through 2006, directs federal agencies to integrate historic preservation into all activities which either directly or indirectly involve land use decisions. This is to ensure federal leadership in the preservation of prehistoric and historic resources of the United States. Before approving or carrying out a federal, federally assisted, or federally licensed undertaking, Section 106 of the NHPA requires federal agencies to take into consideration the impact that the action may have on historic properties which are included on, or are eligible for inclusion on, the National Register of Historic Places. Cooperation with the District of Columbia Office of Planning, DC SHPO, and the Advisory Council on Historic Preservation, throughout the process is encouraged.

Distribution List

An EA should include a Distribution List of agencies, organizations, and persons to whom copies of the document were sent as indicated in 40 CFR §1502.10 under "Recommended format" and §1502.19. A Distribution List identifies those parties who have been given the opportunity to comment and reveals that those not included on the list may need to be given the EA for review. This information is helpful to ensuring all necessary parties are given the opportunity to review and provide input to the impacts of the proposed action.

DEPARTMENT OF THE ARMY
U.S. ARMY INSTALLATION MANAGEMENT COMMAND
U.S. ARMY GARRISON ABERDEEN PROVING GROUND
BUILDING 4510, 6429 BOOTHBY HILL AVENUE
ABERDEEN PROVING GROUND MARYLAND 21005-5001

FEB 28 2022

Ms. Erin Paden
Director of Historic Preservation and Section 106
Delaware Nation of Oklahoma
P.O. Box 826
Anadarko, OK 73005-0826

Dear Ms. Paden,

Aberdeen Proving Ground would like to re-engage the Delaware Nation of Oklahoma regarding an Environmental Assessment and Section 106 consultation evaluating the potential environmental, cultural, and socioeconomic effects associated with the Underwater Explosions Test Facility, C-Field, and H-Field Shoreline Stabilization Project. The Delaware Nation of Oklahoma was previously contacted when this effort began in 2018. Aberdeen Proving Ground is now requesting additional or revised comments since the last communication about this project. The scope of the project and its existing conditions remain the same.

The Proposed Action will provide a long-term solution stabilizing approximately 13,000 linear feet of Bush River shoreline at the Underwater Explosions Test Facility, C-Field, and H-Field (enclosure 1), prevents loss of real estate and protects critical infrastructure at the adjacent test ranges. The Proposed Action includes the placement of approximately 7,500 linear feet of armor stone revetment, the construction of approximately 1,800 linear feet of breakwaters and approximately 5 acres of living shoreline. Enclosures 2, 3, and 4 show the preliminary stabilization approaches at the Underwater Explosions Test Facility, C-Field, and H-Field, respectively.

This Environmental Assessment will evaluate the potential environmental effects that may occur resulting from the Proposed Action and will be prepared in accordance with the National Environmental Policy Act of 1969, as amended.

To assist in identifying issues that may affect the implementation of this project, please provide written comments within 30 days of receipt of this letter to: USAGAPG/Department of the Army, c/o Mr. Arnold O'Sullivan, Building 4304,

DEPARTMENT OF THE ARMY
U.S. ARMY INSTALLATION MANAGEMENT COMMAND
U.S. ARMY GARRISON ABERDEEN PROVING GROUND
BUILDING 4510, 6429 BOOTHBY HILL AVENUE
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FEB 28 2022

Mr. Tony Gonyea
Faithkeeper for the Onondaga Nation
P.O. Box 245
Nedrow, NY 13120-0245

Dear Mr. Gonyea,

Aberdeen Proving Ground would like to re-engage the Delaware Nation of Oklahoma regarding an Environmental Assessment and Section 106 consultation evaluating the potential environmental, cultural, and socioeconomic effects associated with the Underwater Explosions Test Facility, C-Field, and H-Field Shoreline Stabilization Project. The Onondaga Nation was previously contacted when this effort began in 2018. Aberdeen Proving Ground is now requesting additional or revised comments since the last communication about this project. The scope of the project and its existing conditions remain the same.

The Proposed Action will provide a long-term solution stabilizing approximately 13,000 linear feet of Bush River shoreline at the Underwater Explosions Test Facility, C-Field, and H-Field (enclosure 1), prevents loss of real estate and protects critical infrastructure at the adjacent test ranges. The Proposed Action includes the placement of approximately 7,500 linear feet of armor stone revetment, the construction of approximately 1,800 linear feet of breakwaters and approximately 5 acres of living shoreline. Enclosures 2, 3, and 4 show the preliminary stabilization approaches at the Underwater Explosions Test Facility, C-Field, and H-Field, respectively.

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FEB 28 2022

Ms. Susan Bachor
Deputy THPO & Archaeologist
Delaware Tribe Historic Preservation
126 University Circle
Stroud Hall, Rm. 437
East Stroudsburg PA 18301

Dear Ms. Bachor,

Aberdeen Proving Ground would like to re-engage the Delaware Nation of Oklahoma regarding an Environmental Assessment and Section 106 consultation evaluating the potential environmental, cultural, and socioeconomic effects associated with the Underwater Explosions Test Facility, C-Field, and H-Field Shoreline Stabilization Project. The Delaware Tribe Historic Preservation Office was previously contacted when this effort began in 2018. Aberdeen Proving Ground is now requesting additional or revised comments since the last communication about this project. The scope of the project and its existing conditions remain the same.

The Proposed Action will provide a long-term solution stabilizing approximately 13,000 linear feet of Bush River shoreline at the Underwater Explosions Test Facility, C-Field, and H-Field (enclosure 1), prevents loss of real estate and protects critical infrastructure at the adjacent test ranges. The Proposed Action includes the placement of approximately 7,500 linear feet of armor stone revetment, the construction of approximately 1,800 linear feet of breakwaters and approximately 5 acres of living shoreline. Enclosures 2, 3, and 4 show the preliminary stabilization approaches at the Underwater Explosions Test Facility, C-Field, and H-Field, respectively.

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BUILDING 4510, 6429 BOOTHBY HILL AVENUE
ABERDEEN PROVING GROUND MARYLAND 21005-5001

FEB 28 2022

Mr. Jesse Bergevin
Historical Resources Specialist
Oneida Indian Nation
2037 Dream Catcher Plaza
Oneida, NY 13421

Dear Mr. Bergevin,

Aberdeen Proving Ground would like to re-engage the Delaware Nation of Oklahoma regarding an Environmental Assessment and Section 106 consultation evaluating the potential environmental, cultural, and socioeconomic effects associated with the Underwater Explosions Test Facility, C-Field, and H-Field Shoreline Stabilization Project. The Oneida Indian Nation was previously contacted when this effort began in 2018. Aberdeen Proving Ground is now requesting additional or revised comments since the last communication about this project. The scope of the project and its existing conditions remain the same.

The Proposed Action will provide a long-term solution stabilizing approximately 13,000 linear feet of Bush River shoreline at the Underwater Explosions Test Facility, C-Field, and H-Field (enclosure 1), prevents loss of real estate and protects critical infrastructure at the adjacent test ranges. The Proposed Action includes the placement of approximately 7,500 linear feet of armor stone revetment, the construction of approximately 1,800 linear feet of breakwaters and approximately 5 acres of living shoreline. Enclosures 2, 3, and 4 show the preliminary stabilization approaches at the Underwater Explosions Test Facility, C-Field, and H-Field, respectively.

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DEPARTMENT OF THE ARMY
U.S. ARMY INSTALLATION MANAGEMENT COMMAND
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BUILDING 4510, 6429 BOOTHBY HILL AVENUE
ABERDEEN PROVING GROUND MARYLAND 21005-5001

FEB 28 2022

Mr. Darren Bonaparte
Tribal Historic Preservation Officer
Saint Regis Mohawk Tribe
412 State Route 37
Akwesasne, NY 13655

Dear Mr. Bonaparte,

Aberdeen Proving Ground would like to re-engage the Delaware Nation of Oklahoma regarding an Environmental Assessment and Section 106 consultation evaluating the potential environmental, cultural, and socioeconomic effects associated with the Underwater Explosions Test Facility, C-Field, and H-Field Shoreline Stabilization Project. The Saint Regis Mohawk Tribe was previously contacted when this effort began in 2018. Aberdeen Proving Ground is now requesting additional or revised comments since the last communication about this project. The scope of the project and its existing conditions remain the same.

The Proposed Action will provide a long-term solution stabilizing approximately 13,000 linear feet of Bush River shoreline at the Underwater Explosions Test Facility, C-Field, and H-Field (enclosure 1), prevents loss of real estate and protects critical infrastructure at the adjacent test ranges. The Proposed Action includes the placement of approximately 7,500 linear feet of armor stone revetment, the construction of approximately 1,800 linear feet of breakwaters and approximately 5 acres of living shoreline. Enclosures 2, 3, and 4 show the preliminary stabilization approaches at the Underwater Explosions Test Facility, C-Field, and H-Field, respectively.

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DEPARTMENT OF THE ARMY
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FEB 28 2022

Mr. William Tarrant
Tribal Historic Preservation Officer
Seneca-Cayuga Nation of Oklahoma
P.O. Box 45322
Grove, OK 74345

Dear Mr. Tarrant,

Aberdeen Proving Ground would like to re-engage the Delaware Nation of Oklahoma regarding an Environmental Assessment and Section 106 consultation evaluating the potential environmental, cultural, and socioeconomic effects associated with the Underwater Explosions Test Facility, C-Field, and H-Field Shoreline Stabilization Project. The Seneca-Cayuga Nation of Oklahoma was previously contacted when this effort began in 2018. Aberdeen Proving Ground is now requesting additional or revised comments since the last communication about this project. The scope of the project and its existing conditions remain the same.

The Proposed Action will provide a long-term solution stabilizing approximately 13,000 linear feet of Bush River shoreline at the Underwater Explosions Test Facility, C-Field, and H-Field (enclosure 1), prevents loss of real estate and protects critical infrastructure at the adjacent test ranges. The Proposed Action includes the placement of approximately 7,500 linear feet of armor stone revetment, the construction of approximately 1,800 linear feet of breakwaters and approximately 5 acres of living shoreline. Enclosures 2, 3, and 4 show the preliminary stabilization approaches at the Underwater Explosions Test Facility, C-Field, and H-Field, respectively.

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BUILDING 4510, 6429 BOOTHBY HILL AVENUE
ABERDEEN PROVING GROUND MARYLAND 21005-5001

FEB 28 2022

Mr. Bryan Printup
Representative
Tuscarora Nation
5226 Walmore Road
Lewiston, NY 14092

Dear Mr. Printup,

Aberdeen Proving Ground would like to re-engage the Delaware Nation of Oklahoma regarding an Environmental Assessment and Section 106 consultation evaluating the potential environmental, cultural, and socioeconomic effects associated with the Underwater Explosions Test Facility, C-Field, and H-Field Shoreline Stabilization Project. The Tuscarora Nation was previously contacted when this effort began in 2018. Aberdeen Proving Ground is now requesting additional or revised comments since the last communication about this project. The scope of the project and its existing conditions remain the same.

The Proposed Action will provide a long-term solution stabilizing approximately 13,000 linear feet of Bush River shoreline at the Underwater Explosions Test Facility, C-Field, and H-Field (enclosure 1), prevents loss of real estate and protects critical infrastructure at the adjacent test ranges. The Proposed Action includes the placement of approximately 7,500 linear feet of armor stone revetment, the construction of approximately 1,800 linear feet of breakwaters and approximately 5 acres of living shoreline. Enclosures 2, 3, and 4 show the preliminary stabilization approaches at the Underwater Explosions Test Facility, C-Field, and H-Field, respectively.

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DEPARTMENT OF THE ARMY
U.S. ARMY INSTALLATION MANAGEMENT COMMAND
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BUILDING 4510, 6429 BOOTHBY HILL AVENUE
ABERDEEN PROVING GROUND MARYLAND 21005-5001

FEB 28 2022

Mr. Bob Rosenbush, Planner
Maryland Department of Planning
301 West Preston Street, Suite 1101
Baltimore, MD 21201-2392

Dear Mr Rosenbush,

Aberdeen Proving Ground would like to re-engage regarding an Environmental Assessment and Section 106 consultation evaluating the potential environmental, cultural, and socioeconomic effects associated with the Underwater Explosions Test Facility, C-Field, and H-Field Shoreline Stabilization Project. Aberdeen Proving Ground previously contacted your agency when this effort began in 2018 and followed up on this initial correspondence in January 2020. Aberdeen Proving Ground is now requesting additional or revised comments since the last communication about this project, particularly with regard to archaeological sites within the project area. The scope of the project and its existing conditions remain the same.

The Proposed Action will provide a long-term solution stabilizing approximately 13,000 linear feet of Bush River shoreline at the Underwater Explosions Test Facility, C-Field, and H-Field (Encl 1), prevents loss of real estate and protects critical infrastructure at the adjacent test ranges. The Proposed Action includes the placement of approximately 7,500 linear feet of armor stone revetment, the construction of approximately 1,800 linear feet of breakwaters and approximately 5 acres of living shoreline. Enclosures 2, 3, and 4 show the preliminary stabilization approaches at the Underwater Explosions Test Facility, C-Field, and H-Field, respectively.

This Environmental Assessment will evaluate the potential environmental effects that may occur as a result of the Proposed Action and will be prepared in accordance with the National Environmental Policy Act of 1969, as amended.

To assist in identifying issues that may affect the implementation of this project, particularly any issues concerning archaeological sites, please provide written comments within 30 days of receipt of this letter to: USAGAPG/Department of the Army, c/o Mr. Arnold O'Sullivan, Building 4304, 6504 Rodman Road, 3rd Floor Suite B,

DEPARTMENT OF THE ARMY
U.S. ARMY INSTALLATION MANAGEMENT COMMAND
U.S. ARMY GARRISON ABERDEEN PROVING GROUND
BUILDING 4510, 6429 BOOTHBY HILL AVENUE
ABERDEEN PROVING GROUND MARYLAND 21005-5001

FEB 28 2022

Mr. W. Lee Johnston
Maryland Department of Transportation
State Highway Administration
707 North Calvert Street,
Mail Stop C303
Baltimore, MD 21202-3601

Dear Mr Johnson,

Aberdeen Proving Ground would like to re-engage regarding an Environmental Assessment and Section 106 consultation evaluating the potential environmental, cultural, and socioeconomic effects associated with the Underwater Explosions Test Facility, C-Field, and H-Field Shoreline Stabilization Project. Aberdeen Proving Ground previously contacted your agency when this effort began in 2018 and followed up on this initial correspondence in January 2020. Aberdeen Proving Ground is now requesting additional or revised comments since the last communication about this project, particularly with regard to archaeological sites within the project area. The scope of the project and its existing conditions remain the same.

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FEB 28 2022

Ms. Denise Burrell
State of Maryland Dept. of Agriculture
Executive Associate to Secretary
50 Harry South Truman Parkway
Annapolis, MD 21401-8960

Dear Ms Burnell,

Aberdeen Proving Ground would like to re-engage regarding an Environmental Assessment and Section 106 consultation evaluating the potential environmental, cultural, and socioeconomic effects associated with the Underwater Explosions Test Facility, C-Field, and H-Field Shoreline Stabilization Project. Aberdeen Proving Ground previously contacted your agency when this effort began in 2018 and followed up on this initial correspondence in January 2020. Aberdeen Proving Ground is now requesting additional or revised comments since the last communication about this project, particularly with regard to archaeological sites within the project area. The scope of the project and its existing conditions remain the same.

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FEB 28 2022

Ms. Amanda Redmiles
Office of the Secretary
Maryland Department of Environment
1800 Washington Boulevard
Baltimore, MD 21230

Dear Ms Redmiles,

Aberdeen Proving Ground would like to re-engage regarding an Environmental Assessment and Section 106 consultation evaluating the potential environmental, cultural, and socioeconomic effects associated with the Underwater Explosions Test Facility, C-Field, and H-Field Shoreline Stabilization Project. Aberdeen Proving Ground previously contacted your agency when this effort began in 2018 and followed up on this initial correspondence in January 2020. Aberdeen Proving Ground is now requesting additional or revised comments since the last communication about this project, particularly with regard to archaeological sites within the project area. The scope of the project and its existing conditions remain the same.

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FEB 28 2022

Mr. Jason Dubow
Maryland State Clearinghouse
Maryland Office of Planning
301 West Preston Street, Suite 1101
Baltimore, MD 21201-2392

Dear Mr. Dubow,

Aberdeen Proving Ground would like to re-engage regarding an Environmental Assessment and Section 106 consultation evaluating the potential environmental, cultural, and socioeconomic effects associated with the Underwater Explosions Test Facility, C-Field, and H-Field Shoreline Stabilization Project. Aberdeen Proving Ground previously contacted your agency when this effort began in 2018 and followed up on this initial correspondence in January 2020. Aberdeen Proving Ground is now requesting additional or revised comments since the last communication about this project, particularly with regard to archaeological sites within the project area. The scope of the project and its existing conditions remain the same.

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FEB 28 2022

Ms. Lori Byrne
Maryland Dept. of Natural Resources
Tawes State Office Building
580 Taylor Avenue
Annapolis, MD 21401-2352

Dear Ms Byrne,

Aberdeen Proving Ground would like to re-engage regarding an Environmental Assessment and Section 106 consultation evaluating the potential environmental, cultural, and socioeconomic effects associated with the Underwater Explosions Test Facility, C-Field, and H-Field Shoreline Stabilization Project. Aberdeen Proving Ground previously contacted your agency when this effort began in 2018 and followed up on this initial correspondence in January 2020. Aberdeen Proving Ground is now requesting additional or revised comments since the last communication about this project, particularly with regard to archaeological sites within the project area. The scope of the project and its existing conditions remain the same.

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FEB 28 2022

Mr. Quintin Cornwell
District Manager
Harford County Soil
Conservation District
3525 Conowingo Road, Suite 500
Street, MD 21050-1900

Dear Mr Cornwell,

Aberdeen Proving Ground would like to re-engage regarding an Environmental Assessment and Section 106 consultation evaluating the potential environmental, cultural, and socioeconomic effects associated with the Underwater Explosions Test Facility, C-Field, and H-Field Shoreline Stabilization Project. Aberdeen Proving Ground previously contacted your agency when this effort began in 2018 and followed up on this initial correspondence in January 2020. Aberdeen Proving Ground is now requesting additional or revised comments since the last communication about this project, particularly with regard to archaeological sites within the project area. The scope of the project and its existing conditions remain the same.

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FEB 28 2022

Ms. Genevieve LaRouche
U.S. Dept. of the Interior
Fish & Wildlife Services
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401-7307

Dear Ms LaRouche,

Aberdeen Proving Ground would like to re-engage regarding an Environmental Assessment and Section 106 consultation evaluating the potential environmental, cultural, and socioeconomic effects associated with the Underwater Explosions Test Facility, C-Field, and H-Field Shoreline Stabilization Project. Aberdeen Proving Ground previously contacted your agency when this effort began in 2018 and followed up on this initial correspondence in January 2020. Aberdeen Proving Ground is now requesting additional or revised comments since the last communication about this project, particularly with regard to archaeological sites within the project area. The scope of the project and its existing conditions remain the same.

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FEB 28 2022

Ms. Carrie Traver
USEPA Region III
1650 Arch Street, 3RA10
Philadelphia, PA 19103-2029

Dear Ms Traver,

Aberdeen Proving Ground would like to re-engage regarding an Environmental Assessment and Section 106 consultation evaluating the potential environmental, cultural, and socioeconomic effects associated with the Underwater Explosions Test Facility, C-Field, and H-Field Shoreline Stabilization Project. Aberdeen Proving Ground previously contacted your agency when this effort began in 2018 and followed up on this initial correspondence in January 2020. Aberdeen Proving Ground is now requesting additional or revised comments since the last communication about this project, particularly with regard to archaeological sites within the project area. The scope of the project and its existing conditions remain the same.

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FEB 18 2022

Ms. Beth Cole
Maryland Dept. of Housing and Community Development,
Maryland Historical Trust
100 Community Place
Crownsville, MD 21032-2023

Dear Ms. Cole,

Aberdeen Proving Ground would like to re-engage the Delaware Nation of Oklahoma regarding an Environmental Assessment and Section 106 consultation evaluating the potential environmental, cultural, and socioeconomic effects associated with the Underwater Explosions Test Facility, C-Field, and H-Field Shoreline Stabilization Project. We previously contacted your agency when this effort began in 2018 and followed up on this initial correspondence in January 2020. We are now requesting additional or revised comments since our last communication about this project, particularly with regard to archaeological sites within the project area. The scope of the project and its existing conditions remain the same. The scope of the project and its existing conditions remain the same.

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FEB 28 2022

Mr. Joel Gallihue
Department of Planning and
Zoning County
220 South Main Street
Bel Air, MD 21014-3820

Dear Mr Gallihue,

Aberdeen Proving Ground would like to re-engage regarding an Environmental Assessment and Section 106 consultation evaluating the potential environmental, cultural, and socioeconomic effects associated with the Underwater Explosions Test Facility, C-Field, and H-Field Shoreline Stabilization Project. Aberdeen Proving Ground previously contacted your agency when this effort began in 2018 and followed up on this initial correspondence in January 2020. Aberdeen Proving Ground is now requesting additional or revised comments since the last communication about this project, particularly with regard to archaeological sites within the project area. The scope of the project and its existing conditions remain the same.

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FEB 2 8 2022

Mr. William D. Amoss,
Chief, Agricultural and Historic Preservation Section
Department of Planning and Zoning
220 South Main Street
Bel Air, MD 21014-3820

Dear Mr Amoss,

Aberdeen Proving Ground would like to re-engage regarding an Environmental Assessment and Section 106 consultation evaluating the potential environmental, cultural, and socioeconomic effects associated with the Underwater Explosions Test Facility, C-Field, and H-Field Shoreline Stabilization Project. Aberdeen Proving Ground previously contacted your agency when this effort began in 2018 and followed up on this initial correspondence in January 2020. Aberdeen Proving Ground is now requesting additional or revised comments since the last communication about this project, particularly with regard to archaeological sites within the project area. The scope of the project and its existing conditions remain the same.

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From: O"Sullivan, Arnold Victor JR CIV USARMY ID-SUSTAINMENT (USA)
To: Wetmore, Marisa L CIV USARMY CENAB (USA); Joyal, Lauren E CIV USARMY CENAB (USA)
Subject: FW: Underwater Expositions Test Facility C-Field and H-Field
Date: Monday, March 7, 2022 1:04:19 PM

HARCO opines

Safety is a journey, not a destination.

ARNOLD O'SULLIVAN
Directorate of Public Works
Environmental Division
Aberdeen Proving Ground
Office: 410-306-2731
Cell Phone (410) 322-6630
FAX: 410-306-2252

From: Gallihue, Joel <jagallihue@harfordcountymd.gov>
Sent: Monday, March 7, 2022 1:01 PM
To: O'Sullivan, Arnold Victor JR CIV USARMY ID-SUSTAINMENT (USA) <arnold.v.osullivan.civ@mail.mil>
Cc: kropp, matt <mtkropp@harfordcountymd.gov>
Subject: [Non-DoD Source] Underwater Expositions Test Facility C-Field and H-Field

Dear Mr. O'Sullivan,

Harford County has reviewed the letter stamped February 28, 2022 regarding the above. We understand the effort will require extensive breakwaters and living shoreline. Harford County has no issues associated with the project. You are probably well aware the state tracks bulkheads, revetments, and living shorelines through the Critical Area Commission.

Joel Gallihue, AICP, ALEP
Chief of Long Range Planning
Harford County Planning and Zoning
220 South Main Street
Bel Air, MD 21014
410-638-3103 x3136

MARYLAND
DEPARTMENT OF
NATURAL RESOURCES

Larry Hogan, Governor
Boyd Rutherford, Lt. Governor
Jeannie Haddaway-Riccio, Secretary
Allan Fisher, Deputy Secretary

April 4, 2022

Mr. Arnold V. O'Sullivan
USAGAPG/Dept. of the Army IMAP-PWE
4304 Rodman Road
3rd Floor, Suite B
APG, MD 21005-5001

RE: Environmental Review for APG Underwater Explosions Test Facility, C-Field and H-Field Shoreline Stabilization Project, Harford County, Maryland.

Dear Mr. O' Sullivan:

For all three sites, the Wildlife and Heritage Service has no official records for State or Federal listed, candidate, proposed, or rare plant or animal species within the project area shown on the map provided. As a result, we have no specific concerns regarding potential impacts to such species or recommendations for protection measures at this time. If the project changes in the future such that the limits of proposed disturbance or overall site boundaries are modified, please provide us with revised project maps and we will provide you with an updated evaluation.

Thank you for allowing us the opportunity to review this project. If you should have any further questions regarding this information, please contact me at lori.byrne@maryland.gov or at (410) 260-8573.

Sincerely,

Lori A. Byrne

Lori A. Byrne,
Environmental Review Coordinator
Wildlife and Heritage Service
MD Dept. of Natural Resources

ER# 2022.0371.ha
Cc: C. Jones, CAC
.

From:	O"Sullivan, Arnold Victor JR CIV USARMY ID-SUSTAINMENT (USA)
To:	Dixie Henry -MDP-; O"Sullivan, Arnold Victor JR CIV USARMY ID-SUSTAINMENT (USA) (arnold.v.osullivan.civ@mail.mil); Falls, Eva E CIV USARMY CENAB (USA); Bean, Ethan A CIV USARMY CENAB (USA); Wetmore, Marisa L CIV USARMY CENAB (USA)
Subject:	RE: [URL Verdict: Neutral][Non-DoD Source] MHT review of APG Underwater Explosions Test Facility, C-Field and H-Field Shoreline Stabilization Project
Date:	Thursday, April 7, 2022 1:04:24 PM

Thank you for taking time to review
V/r
Arnold

Safety is a journey, not a destination.

ARNOLD O'SULLIVAN
Directorate of Public Works
Environmental Division
Aberdeen Proving Ground
Office: 410-306-2731
Cell Phone (410) 322-6630
FAX: 410-306-2252

From: Dixie Henry -MDP- <dixie.henry@maryland.gov>
Sent: Thursday, April 7, 2022 10:41 AM
To: O'Sullivan, Arnold Victor JR CIV USARMY ID-SUSTAINMENT (USA) (arnold.v.osullivan.civ@mail.mil) <arnold.v.osullivan.civ@mail.mil>; Falls, Eva E CIV USARMY CENAB (USA) <Eva.E.Falls@usace.army.mil>; Bean, Ethan A CIV USARMY CENAB (USA) <ETHAN.A.BEAN@usace.army.mil>
Subject: [URL Verdict: Neutral][Non-DoD Source] MHT review of APG Underwater Explosions Test Facility, C-Field and H-Field Shoreline Stabilization Project

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Thankyou for providing theMaryland Historical Trust (MHT) with information regarding the above-referencedproject. In response to your request, weare reviewing the proposed work to assess potential effects on historicproperties in accordance with Section 106 of the National Historic PreservationAct and would like to offer the following comments andrecommendations regarding the project's potential effects on culturalresources.

Two archeological sites (18HA2 and 18HA11) are located in the vicinity of the proposed C-Field breakwaters. These 2 sites, however, have been largely destroyed by erosion, and it is our opinion that the proposed off-shore breakwaters have a low potential for impacting intact archeological deposits.

A third prehistoric archeological site - 18HA90 - is located along the northern portion of the proposed H-Field stone revetment project area. Given the presence of this prehistoric resource, archeological investigations *may* be needed prior to construction,depending upon the extent of the proposed work. We are thereforerequesting that we beprovided with detailed site plans illustrating the location andboundaries of all proposed ground disturbing activities and impact areas (includingaccess roads and staging areas) sothat we may assess the project's *potential*impacts on archeologically sensitive areas. The plans should clearly indicate where grading and otherground-disturbing activities will be taking place and to what depth

these areaswill be graded. Itwould also be helpful if we could be provided with information regarding the level of erosion/bank disturbance thathas taken place within the H-Field project area. Upon our review of this information, we will be able to provideinformed recommendations regarding what*, if any*, archeological investigations or minimization measures may be necessary prior toconstruction.

Welook forward to receiving the information requested above and to furthercoordination as project planning proceeds. Thank you forproviding us with this opportunity to comment --

- Dixie Henry

Dixie L. Henry, Ph.D.

Preservation Officer, Project Review and Compliance

Maryland Historical Trust

Maryland Department of Planning

100 Community Place

Crownsville, MD 21032

dixie.henry@maryland.gov/ < Caution-http://dixie.henry@maryland.gov/ > 410-697-9553 < tel:(410)%20697-9553 >

mht.maryland.gov < Caution-http://mht.maryland.gov/ >

Please take our customer service survey. < Caution-http://www.doit.state.md.us/selectsurvey/TakeSurvey.aspx?agencycode=MDP&SurveyID=86M2956 >

To check on the status of a project submittal, please use our online search: Caution-https://mht.maryland.gov/compliancelog/ComplianceLogSearch.aspx < Caution-https://mht.maryland.gov/compliancelog/ComplianceLogSearch.aspx > .

April 8, 2022

Mr. Arnold O'Sullivan, Directorate of Public Works, Environmental Division
U.S. Army Garrison, Aberdeen Proving Ground
IMAP-PWE
6504 Rodman Road, Building 4304
3rd Floor, Suite B
Aberdeen Proving Ground, MD 21005-5001

STATE CLEARINGHOUSE RECOMMENDATION

State Application Identifier: MD20220307-0151
Applicant: U.S. Army Garrison, Aberdeen Proving Ground
Project Description: Pre-Environmental Assessment Consult: Identify Issues that May Affect Implementation of Proposed Action, i.e., Stabilizing ~13,000 Linear Feet of Bush River Shoreline at the Underwater Explosions Test Facility, C-Field, and H-Field to Prevent Loss of Real Estate and Protect Critical Infrastructure
Project Address: Underwater Explosions Test Facility, C-Field and H-Field, Aberdeen Proving Ground, MD 21005
Project Location: Harford County
Recommendation: **Consistent with Qualifying Comments and Contingent Upon Certain Actions**

Dear Mr. O'Sullivan:

In accordance with Presidential Executive Order 12372 and Code of Maryland Regulation 34.02.02.04-.07, the State Clearinghouse has coordinated the intergovernmental review of the referenced project. This letter constitutes the State process review and recommendation.

Review comments were requested from the Maryland Departments of General Services, Natural Resources, Transportation, and the Environment; the Maryland Military Department; Harford County; and the Maryland Department of Planning, including the Maryland Historical Trust. The Maryland Department of General Services did not have comments; and the Maryland Department of Natural Resources (DNR), and the Maryland Military Department did not provide comments.

The Maryland Department of Transportation, and the Maryland Department of Planning found this project to be consistent with their plans, programs, and objectives.

The Maryland Department of Planning (MDP) provided the following comment: "The parcel is not located within a state designated PFA [Priority Funding Area]. MDP has no further comment."

The Maryland Historical Trust (MHT) stated that their finding of consistency is contingent upon the applicant's completion of the review process required under Section 106 of the National Historic Preservation Act, as follows: "Section 106 consultation with MHT has been initiated by the Department of the Army. Prehistoric archeological site 18HA90 is located in the vicinity of the proposed H-Field stone revetment project area. MHT is requesting a copy of

detailed site plans for the H-Field shoreline work so that we can assess the potential impacts on site 18HA90 and provide informed comments/recommendations regarding any cultural resources investigations that may be needed prior to construction. All historic preservation review requirements will be fulfilled through direct consultation with the Army (DLH - 202201140)."

The Maryland Department of the Environment (MDE) found this project to be generally consistent with their plans, programs, and objectives, but included certain qualifying comments summarized below.

1. "Any solid waste including construction, demolition and land clearing debris, generated from the subject project, must be properly disposed of at a permitted solid waste acceptance facility, or recycled if possible. Contact the Solid Waste Program at (410) 537-3315 for additional information regarding solid waste activities and contact the Resource Management Program at (410) 537-3314 for additional information regarding recycling activities.
2. The Solid Waste Program should be contacted directly at (410) 537-3315 by those facilities which generate or propose to generate or handle hazardous wastes to ensure these activities are being conducted in compliance with applicable State and federal laws and regulations. The Program should also be contacted prior to construction activities to ensure that the treatment, storage or disposal of hazardous wastes and low-level radioactive wastes at the facility will be conducted in compliance with applicable State and federal laws and regulations.
3. The proposed project may involve rehabilitation, redevelopment, revitalization, or property acquisition of commercial, industrial property. Accordingly, MDE's Brownfields Site Assessment and Voluntary Cleanup Programs (VCP) may provide valuable assistance to you in this project. These programs involve environmental site assessment in accordance with accepted industry and financial institution standards for property transfer. For specific information about these programs and eligibility, please contact the Land Restoration Program at (410) 537-3437.
4. Borrow areas used to provide clean earth back fill material may require a surface mine permit. Disposal of excess cut material at a surface mine may require site approval. Contact the Mining Program at (410) 537-3557 for further details.
5. If a project receives federal funding, approvals and/or permits, and will be located in a nonattainment area or maintenance area for ozone or carbon monoxide, the applicant needs to determine whether emissions from the project will exceed the thresholds identified in the federal rule on general conformity. If the project emissions will be greater than 25 tons per year, contact the Air Quality Planning Program of the Air and Radiation Administration, at (410) 537-4125 for further information regarding threshold limits."

Harford County found this project to be generally consistent with their plans, programs, and objectives, but included certain qualifying comments, as follows: "Consult with MDE and/or DNR as needed to obtain any permits and/or approvals required as part of this proposal."

The State Application Identifier Number must be placed on any correspondence pertaining to this project.

Please remember, you must comply with all applicable state and local laws and regulations. If you need assistance or have questions, contact the State Clearinghouse staff person noted above at 410-767-4490 or through e-mail at sylvia.mosser@maryland.gov.

Thank you for your cooperation with the MIRC process.

Sincerely,

Myra Barnes, Lead Clearinghouse Coordinator

MB:SM
cc:

Tony Redman - DNR	Tyson Byrne - MDOT	Kirk Yaukey - MILT	Joseph Griffiths - MDPL
Amanda Redmiles - MDE	Tanja Rucci - DGS	Jennifer Freeman - HRFD	Beth Cole - MHT

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APPENDIX B:
Coastal Zone Federal Consistency Determination

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Determination of Consistency with Maryland's Coastal Zone Management Program

In accordance with Section 307 of the Coastal Zone Management Act of 1972 (CZMA) as amended, this document serves as a Federal Consistency Determination for the stabilization of the shoreline in three areas located within the U.S. Army Aberdeen Test Center (ATC) on Aberdeen Proving Ground (APG).

In its entirety, APG occupies approximately 72,500 acres of land and water. The Bush River divides the installation into two non-contiguous areas, commonly referred to as the Aberdeen Area (APG-AA), which encompasses 27,600 acres, and the Edgewood Area (APG-EA), which encompasses 9,850 acres. Contiguous waters of APG account for an additional 33,000 acres. Other areas of APG not attached to the main installation account for the remaining acreage, which includes the Churchville Test Area, Van Bibber Water Treatment Plant, Atkisson Reservoir and Dam, and Poole's Island in Harford County, and Graces Quarters and Carroll Island in Baltimore County, Maryland (APG, 2014a).

This EA has been prepared to analyze the potential environmental and social consequences associated with the activities required for shoreline stabilization for the U.S. Army ATC Facilities: UTF, C-Field, and Henry (H) - Field, in accordance with NEPA, the CEQ regulations (40 CFR Parts 1500-1508), and 32 CFR Part 651. For purposes of this EA, a Study Area has been defined for evaluation of potential impacts to human and natural resources within one-half mile of each of the subject ATC facilities. An evaluation of potential beneficial and negative impacts on the human and natural environment resulting from the proposed development and alternatives is included herein.

Maryland's CZMP was established by executive order and approved in 1978 as required by the Federal CZMA of 1972, as amended. Maryland's Coastal Zone consists of land, water, and sub-aqueous land between the territorial limits of Maryland (including the towns, cities, and counties that contain coastal shoreline) in the Chesapeake Bay, Atlantic coastal bays, and the Atlantic Ocean. All of APG lies within the Maryland Coastal Zone.

The CZMA requires that Federal actions likely to affect land, water, or natural resources in the Coastal Zone be conducted in a manner consistent to the maximum extent practicable with the enforceable policies of a state's federally-approved CZMP. The Coastal Zone Act Reauthorization Amendments of 1990 also clarified that coastal effects include cumulative, secondary, or indirect effects of the activity in the immediate or reasonably foreseeable future.

The Army is required to determine the consistency for its proposed shoreline stabilization affecting Maryland's coastal resources or coastal uses with the CZMP. The Army determined that implementation of the Proposed Action would ultimately have a beneficial effect on the land, water, or natural resources of the Maryland's Coastal Zone. This document represents an analysis of Maryland's CZMP Enforceable Coastal Policies (MDNR, 2011), and reflects the commitment of the Army to be consistent with the Maryland CZMP.

Description of the Proposed Action

The purpose of the Proposed Action is to protect the shoreline at APG for three areas with high erosion rates located within active testing ranges comprised of mission-critical infrastructure.

The Proposed Action is needed because APG is a Major Range and Test Facility Base (MRTFB) and is the leading agency for land-combat, direct-fire, and live-fire vulnerability testing for the U.S. Army. The shorelines within APG have been known to be experiencing significant levels of wave-induced erosion since 1841 (U.S. Army and USACE Joint Evaluation Meeting, April 2016). The shoreline erosion threatens testing infrastructure at three active testing ranges, including moving target rails, roadways, test pads, ancillary structures, and a boat launch. Operational impacts due to shoreline erosion include loss of mission land, increased exposure to UXO, and overall degradation of the missionscape for Warfighter testing and training (APG, 2020c). The continued loss of land due to erosion along the shoreline would impact the ability for ATC mission-critical testing to continue; and there is no known additional land or alternative land location for ATC to utilize for testing purposes if the existing shoreline continues to erode. In addition, restoration and protection of the eroded shoreline allows APG to remain compliant with their Integrated Natural Resources Management Plan (INRMP), which influences the management of all-natural resources and habitats at APG, including wetlands, shorelines, uplands, tidal marshes, forests, Chesapeake Bay waters, and grasslands. The INRMP states that shoreline protection and stabilization would reduce excess nutrient contamination and siltation of the Chesapeake Bay and provide better habitat for living resources (APG, 2020c), and specifically requires the implementation, maintenance, and/or monitoring of shoreline erosion control measures at the Underwater Explosions Test Facility (UTF), C-Field, and wetlands and deep-water habitat management at Henry (H) - Field (APG, 2020c).

Required permits could include, but are not limited to: Department of the Army Permit pursuant to Section 404 of the Clean Water Act, Maryland Department of Environment (MDE) Wetlands and Waterways Permit and Water Quality Certification, National Pollutant Discharge Elimination System permit, MDE Stormwater Permit, and approved Erosion and Sediment Control (ESC) Plans by MDE. Prior to the start of construction, any required demolition-related permits or approvals would be obtained by APG as needed.

Public Participation

Public participation is currently taking place as a part of the Environmental Assessment (EA) that is currently being prepared for the Proposed Action. The EA serves as the primary document to facilitate environmental review of the Proposed Action by Federal, state and local agencies and the public. Agency consultation is currently being performed as the EA and a draft Finding of No Significant Impact (FNSI) were submitted for review by state and county agencies through the Maryland State Clearinghouse. Public participation opportunities with respect to the EA and decision making on the Proposed Action are guided by 32 CFR Part 651. The EA will be made available to the public for 30 days, along with a draft FNSI. Any comments or responses will be addressed prior to the final EA. APG will sign a FNSI if there are no significant impacts, and will proceed with implementation of the Proposed Action. If there are significant impacts, the Army will publish a Notice of Intent to prepare an Environmental Impact Statement.

A. GENERAL POLICIES

1. Core Policies (Relevant policies are detailed below; Not Relevant Polices:4-5, 7-9, 13, 14)

    1. Air Quality: The preferred alternative would create a short-term temporary impact on air quality from fugitive dust generated through the duration of the construction of shoreline stabilization measures. All construction activities would be required to comply with federal, state, and current APG versions of regulations designed to support compliance with the Clean Air Act (CAA), Occupational Safety and Health Administration, and Toxic Substance and Control Act.

        All construction activities will use best management practices in order to reduce emissions and if necessary will utilize emission control technologies and other required mitigation technologies. See the EA, Sections 4.4 and 5.4 for further information.

    2. Noise: Under the Proposed Action short-term negative effects are expected to occur throughout the construction. The short-term negative effects would include temporary increases in noise levels resulting from heavy equipment and machinery that could affect personnel sensitive noise areas during the course of construction of shoreline stabilization measures. Noise due to construction activities will vary depending on the types of construction equipment employed, the amount of each type of construction equipment, and the duration of construction equipment use. Heavy equipment produces the greatest amount of noise disturbances and should be of special concern. Noise levels under the Proposed Action are expected to be consistent with operations at a military post and are not expected to exceed the threshold limit values outlined in APG's ICUZ. If the proposed site is within 800 feet of a noise sensitive receptor, mitigation efforts could include limiting the Proposed Action activities to weekday business hours or using BMPs to minimize off-post noise. See the EA, Sections 4.5 and 5.5 for further information.

    3. Wild Lands: Shoreline protection and stabilization would reduce excess nutrient contamination and siltation of the Chesapeake Bay and provide better habitat for living resources. As part of the Proposed Action, wetlands and SAV beds would be created as part of a living shoreline stabilization solution to the erosion issue. Wetlands provide several beneficial functions including supplying habitat for a variety of wildlife, storage and attenuation of floodwaters, trapping silts and other sediments during floods, and biologically filtering contaminates from surface waters (APG, 2020c). The importance of SAV is well known as a primary indicator of local water quality, nursery areas for fish and crustaceans, filters of nutrients and sediment, and a natural stabilization for shorelines (APG, 2020c). The Proposed Action will serve to not only protect APG's mission-critical land and infrastructure but will also serve to protect the Chesapeake Bay's coastal resources. See the EA Sections 4.6, 4.8, 5.6, and 5.8 for further information.

6. Viewsheds: The proposed shoreline stabilization will serve to ultimately restore previously-eroded shoreline areas and vegetation, thereby protecting and improving the natural character and scenic value of the project areas in compliance with this policy. Long term positive impacts are anticipated through the shoreline stabilization and restoration of previously-eroded shoreline areas. See the EA, Sections 4.2 and 5.2 for further information.

10. Public Hearing for Non-Tidal Waters: Wetland delineations were conducted on March 9-12, 2015 at the UTF Location and November 6 and 12, 2015 at the C-Field Location and did not identify any non-tidal wetlands adjacent to either project site. A wetland delineation was conducted May 8-10 and June 11, 2015 at the Henry (H) - Field Location, which identified one non-tidal wetland, Wetland 1, adjacent to the southern portion of the project site. It is not anticipated that proposed shoreline stabilization measures at the Henry (H) - Field Location would impact this wetland; however, if the project necessitates impacts to non-tidal wetlands, public notice may be required, but would be dependent on quantification of impacts to non-tidal wetlands and the type of permits to be issued. See the EA, Sections 4.6 and 5.6 for further information.

11. Soil Erosion: The purpose of the Proposed Action is to protect the shoreline at APG for three areas with high erosion rates located within active testing ranges comprised of mission-critical infrastructure. The shorelines within APG have been known to be experiencing significant levels of wave-induced erosion since 1841 (U.S. Army and USACE Joint Evaluation Meeting, April 2016). Restoration and protection of the eroded shoreline allows APG to remain compliant with their Integrated Natural Resources Management Plan (INRMP), which influences the management of all natural resources and habitats at APG, including wetlands, shorelines, uplands, tidal marshes, forests, Chesapeake Bay waters, and grasslands. The INRMP states that shoreline protection and stabilization would reduce excess nutrient contamination and siltation of the Chesapeake Bay and provide better habitat for living resources (APG, 2020c), and specifically requires the implementation, maintenance, and/or monitoring of shoreline erosion control measures at the Underwater Explosions Test Facility (UTF), C-Field, and wetlands and deep-water habitat management at Henry (H) - Field (APG, 2020c).

    The Proposed Action will provide a long-term solution that curtails the wave-induced erosion along approximately 13,000 linear feet of Bush River shoreline; thereby protecting mission-critical testing infrastructure at the UTF, C-Field, and Henry (H) - Field.

    It is anticipated that work at each site would disturb more than one acre of land and would need to submit an Erosion Sediment Control Plan (ESCP) and would need to apply to MDE for either a General or Individual Permit for Stormwater Associated with Construction Activity. As the ESCP would be designed in accordance with MDE regulations as published in the "2011 Standards and Specifications for Soil Erosion and Sediment Control" (MDE, 2011). Standard erosion and sediment control techniques include using vegetative and structural protective covers (e.g., permanent seeding,

groundcover), sediment barriers (e.g., straw bales, silt fence, brush), constructing water conveyances (e.g., slope drains, check dam inlet, and outlet protection), and repairing and stabilizing bare and slightly eroded areas quickly. Maryland's "2010 Stormwater Management Guidelines for State and Federal Projects" would be followed to minimize adverse stormwater impacts from any work (MDE, 2010). APG would abide by state and local construction site permit requirements. Final site plans would include measures to minimize the total area of land disturbed, prevent soil erosion and sediment runoff on each site, and re-stabilize any temporarily disturbed areas during construction at each site.

12. Controlled Hazardous Substances: APG operates Hazardous Materials and Hazardous Waste Management Programs that set forth procedures for handling and tracking hazardous materials from receipt through use, waste generation and disposal. The Hazardous Materials Management Program includes procedures for maintaining inventory data and for procuring, receiving, and tracking hazardous materials. All hazardous materials needed during construction activities (i.e., diesel fuel) would be properly stored with secondary containment, as required. All generated hazardous wastes will be disposed of via authorized contractors at appropriately permitted hazardous waste treatment, storage and disposal facilities. Any spills would be cleaned up appropriately, in accordance with the Spill Prevention, Contingencies, and Countermeasures Plan (SPCCP). It is probable that when conducting excavation and earth-moving activities associated with implementation of the Proposed Action, UXO may be discovered and mitigation would be required. Removal of UXO is necessary in any areas where the soil would be disturbed if the Proposed Action were to be implemented. To minimize the risk of UXO detonation, all areas suspected of having UXO are subject to specific digging clearance procedures and physical security measures preventing access. Long term, beneficial impacts are expected if UXO are discovered and removed from the sites. The Proposed Action would not present a significant impact to the public or the environment resulting from the transport, use, or disposal of hazardous materials wastes. See the EA, Sections 4.10 and 5.10 for further information.

2. **Water Quality** (Relevant policies are detailed below; Not Relevant Polices: 3, 5-8, 10, 11)

1. Pollution of waters of the State: Any hazardous substances needed on site (e.g., diesel fuel) would be stored and contained appropriately and disposed of appropriately, with all necessary permits. Any spills would be cleaned up appropriately, in accordance with the SPCCP. All activities will comply and demonstrate consistency with the relevant laws, policies and regulations. See the EA, Section 4.10, 4.11.2, 5.6, and 5.14.6.

2. Protection of waters of the State: Shoreline protection and stabilization would reduce excess nutrient contamination and siltation of the Chesapeake Bay and provide better habitat for living resources. The wetlands and submerged aquatic vegetation (SAV) beds created as part of a living shoreline stabilization solution to the erosion issue will provide several beneficial functions including supplying habitat for a variety of wildlife, storage and attenuation of floodwaters, trapping silts and other sediments

during floods, and biologically filtering contaminates from surface waters (APG, 2020c). The importance of SAV is well known as a primary indicator of local water quality, nursery areas for fish and crustaceans, filters of nutrients and sediment, and a natural stabilization for shorelines (APG, 2020c). The Proposed Action will serve to not only protect APG's mission-critical land and infrastructure but will also serve to protect the Chesapeake Bay's coastal resources, and the waters of the State will be protected for water contact recreation, fish, and other aquatic life and wildlife, in compliance with this policy. MDE authorization would be required prior to disturbance of wetlands. See the EA Sections 4.6, 4.8, 5.6, and 5.8 for further information.

4. Stormwater Discharge Permit: Proposed construction activities are anticipated to exceed one acre of land disturbance at each site, and a Stormwater Management Plan and ESCP would be prepared in accordance with Maryland Stormwater Management Act permit regulations and implemented to prevent impacts to nearby surface water bodies. The Stormwater Management Plan and ESCP would be submitted to MDE for approval and for a permit to construct. Methods to minimize erosion and control stormwater runoff both during and after construction activities would be employed, such as installing silt fencing and sediment traps, revegetating disturbed areas after disturbance, employing BMPs, and meeting performance standards established by the MDE. See the EA, Section 4.10, 4.11.2, 5.6, and 5.14.13.

9. Used Oil Disposal: The potential exists for storage of minor amounts of fuel to maintain and fuel equipment and vehicles; these areas would have primary and secondary containment measures. Hazardous materials and waste generated would be disposed of in accordance with the Hazardous Waste Management Plan (HWMP) and in accordance with Federal regulations. See the EA, Section 4.10 and 5.10 for more information.

3. **Flood Hazards:** (Relevant policies are detailed below; Not Relevant Polices: 2, 3)

1. Additional Flooding: The entirety of the work associated with implementation of the Proposed Action would take place within the FEMA 100-year floodplain. As part of the Proposed Action, wetlands and SAV beds would be created as part of a living shoreline stabilization solution to the erosion issue. Wetlands provide several beneficial functions including supplying habitat for a variety of wildlife, storage and attenuation of floodwaters, trapping silts and other sediments during floods, and biologically filtering contaminates from surface waters (APG, 2020c). As such, long term beneficial impacts to floodplains at the project sites are expected from the Proposed Action.

   The Proposed Action would require construction within the floodplain of each site. Short-term minor adverse effects on floodplains may occur during construction of protection and stabilization measures at each site. The extent of the disturbance would be limited to the area within the immediate vicinity of each project site and any areas temporarily impacted by equipment and staging would be restored upon completion of work and removal of equipment. Minor changes in elevation would occur under the Proposed Action at each site, which by design would provide protection from

floodwaters and minimize erosion along the shoreline. Therefore, negligible impacts on floodplains are expected under the Proposed Action and no significant impacts to this resource are anticipated.

B. COASTAL RESOURCES

1. The Chesapeake and Atlantic Coastal Bays Critical Area (Relevant policies are detailed below; Not Relevant Polices: 2, 7, 8, 11-25, 27-31)

1. Colonial Water Bird Nesting Sites in the Critical Area: Shoreline stabilization activities near known and/or found colonial water bird nesting sites (i.e., tidal marshes and wetlands, isolated riparian forest) would be prohibited in the Critical Area areas during the breeding season (i.e., April 1 through September 15), limiting the potential for disturbance to colonial water bird nesting sites. In addition, the creation of additional wetlands as part of the Proposed Action may serve to increase the availability of water bird nesting sites as a result.

3. Physical Alterations of Streams in Critical Area: Stream crossings resulting from the movement of construction vehicles and materials to and from the project sites would be in previously disturbed areas with existing stream crossing infrastructure (i.e. bridges) and would not require in-water construction, or physical alteration to streams.

4. Installation or Introduction of Artificial Surfaces onto the Bottom of Natural Streams in the Critical Area Prohibited Unless Water Quality and Fisheries Habitat Improve: Short term minor adverse effects during construction of protection and stabilization measures would be expected under the Proposed Action at each site. Construction of protection and stabilization measures may take place by land or by water from a barge. Areas temporarily impacted from use of equipment on the land side would be limited to the area within the immediate vicinity of each project site and any impacted areas would be restored upon completion of work and removal of the equipment. It is anticipated that any wildlife that utilized the project sites could return upon completion of work.

   Long term beneficial impacts are anticipated from the Proposed Action due to the creation of a living shoreline at the UTF Location and the C-Field Location, which includes creation of SAV and wetlands with the intent to provide several beneficial functions including habitat for a variety of wildlife and nursery areas for fish and crustaceans (APG, 2020c). The proposed protection and stabilization measures constructed along the shoreline the UTF location, the C-Field location, and the Henry (H) - Field location will also provide added benefit to protecting existing vegetation and habitats from future erosion.

5. Prohibition of Construction or Placement of Dams or Other Structures in Critical Area That Prevents Movement of Spawning Fish or Larval Forms in Streams: No structures are proposed for construction within streams as a result of the Proposed Project. Long term beneficial impacts are anticipated from the Proposed Action due to the creation of a living shoreline at the UTF Location and the C-Field Location, which includes creation

of SAV and wetlands with the intent to provide several beneficial functions including habitat for a variety of wildlife and nursery areas for fish and crustaceans (APG, 2020c). Atlantic sturgeon live in offshore brackish waters and migrate to freshwater in the spring to spawn (USFWS 2011). Shortnose sturgeon also migrate to freshwater to spawn, though they are not known to migrate long distances offshore and primarily live in nearshore marine, estuarine, and riverine habitats of large river systems (USFWS 2016). While these species may be located within the study areas of each site, within Bush River, it is not anticipated that these species would be located in the immediate vicinity of each project site due to the extremely shallow nature of surface waters at each shoreline. Construction of protection and stabilization measures from the waterside would result in barges temporarily brought to each project site but would not require any further disturbances waterward. If any other federal or state protected species were found in the vicinity of the project sites, the installation would consult with the USFWS, the National Marine Fisheries Service, or the responsible state agency (as appropriate) and appropriate steps would be taken to ensure species were not harmed. Such steps should include scheduling construction work outside the breeding and nesting seasons or relocating the animal. No adverse impacts on protected species, therefore, would be expected under the Proposed Action at any site. The proposed protection and stabilization measures constructed along the shoreline at each site, including the stone revetment and breakwaters, will also provide added benefit to protecting existing vegetation and habitats from future erosion. No obstruction to fish or larvae passage/movement is anticipated as a result of the construction of the proposed structures.

6. Development May Not Cross or Affect a Stream in the Critical Area: Project activities will be located within the Critical Area as mapped by APG, however, no development other than the improvements necessary to stabilize the shoreline as part of the Proposed Action will occur within the Critical Area.

9. A Minimum 100-foot Vegetated Buffer Landward from Mean High Water Line of Tidal Waters in Critical Area: All work associated with the Proposed Action, is anticipated to occur within the APG-mapped Critical Area and therefore, a buffer management plan would be developed in accordance with standards adopted by the Critical Area Commission.

10. Buffer Management Plan: All work associated with the Proposed Action, is anticipated to occur within the APG-mapped Critical Area and therefore, a buffer management plan would be developed in accordance with standards adopted by the Critical Area Commission.

26. Soil Erosion and Sediment Control Plan in Critical Area: Although no work associated with the Proposed Action, or within one-half mile of the project sites is anticipated to occur within the mapped Critical Area, if work was necessary within the Critical Area, the Proposed Action would incorporate erosion and sediment controls and stormwater BMPs to reduce adverse water quality impacts. If necessary, an Erosion sediment control and Stormwater Management Plan would be prepared, and appropriate permits

would be obtained from MDE prior to demolition. (See the EA sections 4.6, 4.11, 5.3.2, 5.6, 5.11)

2. Tidal Wetlands:

1. Wetland delineations conducted on March 9-12, 2015 at the UTF Location, November 6 and 12, 2015 at the C-Field Location, and May 8-10 and June 11, 2015 at the Henry (H) - Field Location identified palustrine and estuarine wetlands adjacent to each project site (see EA section 4.6 for additional details on delineated wetlands). Construction of proposed protection and stabilization measures is anticipated to impact a portion of delineated wetlands at each project site. Impacts to regulated WOUS during construction of protection and stabilization measures and creation of a living shoreline of SAV and wetlands at the UTF Location and C-Field Location would require a Section 404 permit from the USACE and MDE authorization. The permit would specify how the affected wetlands are to be protected and any required mitigation. Provided that the Proposed Action proponent meets the permit requirements, the action would be considered to have no net effect on wetlands.

   All potential temporary impacts on wetlands during construction would be permitted and therefore, no significant adverse impacts on tidal wetlands would be expected under the Proposed Action. The overall intent of the Proposed Action is to stabilize the shoreline, prevent future erosion, and establish wetlands along the shorelines to provide several beneficial functions including providing habitat for a variety of wildlife, attenuation of floodwaters, trapping silts and other sediments during floods, biologically filtering contaminants from surface waters, and naturally stabilizing shorelines (APG, 2020c). As such, long term beneficial impacts to wetlands at the project sites are expected from the Proposed Action.

3. Non-Tidal Wetlands:

1. There were no non-tidal wetlands delineated at the UTF Location and the C-Field Location. Wetland delineations conducted on May 8-10 and June 11, 2015 at the Henry (H) - Field Location identified one non-tidal wetland, Wetland 1, adjacent to the southern portion of the project site. It is not anticipated that proposed shoreline stabilization measures would impact this wetland, though staging areas may affect the non-tidal wetland temporarily. In the event proposed construction at the Henry (H) - Field Location requires temporary impacts to this non-tidal wetland, appropriate permits will be obtained prior to starting work. Therefore, no significant adverse impacts on non-tidal wetlands would be expected under the Proposed Action.

4. Forests: (Not Relevant Polices: 1-6)

No work involving forested areas is anticipated associated with the proposed shoreline stabilization project activities.

5. Historical and Archaeological Sites: (Relevant policies are detailed below; Not Relevant Polices: 2, 3)

1. Based on predictive modeling for both prehistoric and historic (pre-military) resources, APG has a high probability of containing prehistoric sites; however, no known archaeological or Native American resources are located within or adjacent to the previously disturbed project areas. However, as a result of military research and testing operations at APG, many forested areas within the installation boundaries may have been contaminated with chemicals and radioactive materials, and exposed to repeated burning. These wooded areas were selectively harvested during the 1970s and 1980s, and the environmental impacts resulting from operations over the last several decades have had a negative net effect on the archaeological potential of the installation land holdings (APG, 2008b). If cultural resources are encountered during excavation and earth work activities, all work in the area of the discovery would cease immediately and the APG Cultural Resources Manager and the State Historic Preservation Officer (SHPO) would be notified.

6. Living Aquatic Resources: (Relevant policies are detailed below; Not Relevant Polices: 2-3, 5-6, 8-14)

1. Threatened and Endangered Species: No significant adverse effects on bald eagles or on rare, threatened, or endangered species would be expected if the Proposed Action was implemented. It is not anticipated that the Proposed Action at any project site would impact bald eagle nesting habitat as there is no tree removal anticipated at any site to construct the protection and stabilization measures. A bald eagle nesting site is located at the UTF location. Proposed work that falls within the buffer of this nesting site would require coordination in advance with the Garrison Bald Eagle Biologist for any required measures to avoid or minimize "take" or disturbance to eagles. Habitat modification (land clearing, timber harvesting, and vegetation removal) is strictly limited within this buffer. An adaptive management strategy is developed in coordination with the Garrison Bald Eagle Biologist and employed to address allowable activities within the buffer.

   An unpermitted "take" of a rare, threatened, or endangered species would not occur under the Proposed Action. The USFWS IPaC website identified northern long-eared bat, which is listed as federally and state threatened, in the three study areas, but only needs to be evaluated for projects that would clear 15 acres or more of trees. As it is assumed for the purposes of this document that less than 15 acres of trees would be cleared as a result of the Proposed Action, this species has not been evaluated in this document. Only two federal and/or state listed species are considered to occur on APG: Atlantic sturgeon (federally and state endangered) and shortnose sturgeon (federally endangered) (EA Engineering, 2014). Atlantic sturgeon live in offshore brackish waters and migrate to freshwater in the spring to spawn (USFWS 2011). Shortnose sturgeon also migrate to freshwater to spawn, though they are not known to migrate long distances offshore and primarily live in nearshore marine, estuarine, and riverine habitats of large river systems (USFWS 2016). While these species may be located within the study areas of each site, within Bush River, it is not anticipated that these species would be located in the immediate vicinity of each project site due to the extremely shallow nature of surface waters at each shoreline. Construction of protection and stabilization measures from the waterside would result in barges temporarily brought to each project site, but would not require any further disturbances waterward. If any other federal or state protected species

were found in the vicinity of the project sites, the installation would consult with the USFWS, the National Marine Fisheries Service, or the responsible state agency (as appropriate) and appropriate steps would be taken to ensure species were not harmed. Such steps should include scheduling construction work outside the breeding and nesting seasons or relocating the animal. No adverse impacts on protected species, therefore, would be expected under the Proposed Action at any site.

4. Finfish Passage: It is not anticipated that the Proposed Action would impede or prevent the free passage of any finfish, migratory or resident, up or down stream. Construction of protection and stabilization measures at each site would include minimal work below the mean low water line and may take place by land or by water from a barge. Any fish that use areas near the project sites would be expected to temporarily utilize the available habitat upstream and downstream of each project site, and could return upon completion of work. Construction by water from a barge would not impede waters or impact the free passage of finfish.

7. Non-Tidal Waters: Impacts to non-tidal wetlands are discussed in B.3 above.

C. COASTAL USES

1. Mineral Extraction: Not Relevant
2. Electrical Generation and Transmission: Not Relevant
3. Tidal Shore Erosion Control: (Relevant policies are detailed below; Not relevant policies: 3, 5)

1. Design requirements for structural erosion control measures will ensure stability coefficients for layers of rough angular quarry stone subject to breaking waves due to tidal action. Design specifications will be in accordance with MDE (C1) COMAR 26.24.04.01.

2. For purposes of this shoreline stabilization project, living shorelines will be created by filling behind the stone sill with sand obtained from an offshore barrow area. Native low- and high-marsh vegetation will be planted. The stone sills and armor stone revetment will be constructed of layers of armor stone, based on standard and accepted design practices. No junk, metal, tree stumps, logs, or other unsuitable materials will be used for backfill in accordance with MDE (C1) COMAR 26.24.04.01.

4. As part of the Proposed Action, wetlands and SAV beds would be created as part of a living shoreline stabilization solution to the erosion issue. Wetlands provide several beneficial functions including supplying habitat for a variety of wildlife, storage and attenuation of floodwaters, trapping silts and other sediments during floods, and biologically filtering contaminates from surface waters (APG, 2020c). The importance of SAV is well known as a primary indicator of local water quality, nursery areas for fish and crustaceans, filters of nutrients and sediment, and a natural stabilization for shorelines (APG, 2020c). The Proposed Action will serve to not only protect APG's mission-critical land and infrastructure, but will also serve to protect the Chesapeake Bay's coastal resources.

6. Non-structural shoreline stabilization will encourage the preservation of the natural environment through the creation of wetlands and marshes, and SAV beds. Shoreline revetments, and breakwaters will be designed to ensure the establishment and long-term viability of this non-structural shoreline stabilization project.

7. Since 1841, the shorelines have been experiencing varying levels of erosion rates, which may jeopardize mission-critical testing (U.S. Army and USACE Joint Evaluation Meeting, April 2016). The unprotected shorelines of APG are known to be degrading annually, with loss estimated to be approximately 36 acres per year (APG, 2020c). No known archaeological, historic architectural, or Native American resources are known to exist within the study areas evaluated in this EA. No significant adverse effects on bald eagles or on rare, threatened, or endangered species would be expected under the Proposed Action (see section 4.8 of the EA for additional details on protected species). If any other federal or state protected species were found in the vicinity of the project sites, the installation would consult with the USFWS, the National Marine Fisheries Service, or the responsible state agency (as appropriate) and appropriate steps would be taken to ensure species were not harmed. Such steps should include scheduling construction work outside the breeding and nesting seasons or relocating the animal.

4. **Oil and Natural Gas Facilities**: Not Relevant
5. **Dredging and Disposal of Dredged Material**: Not Relevant
6. **Navigation**: Not Relevant
7. **Transportation**: Not Relevant
8. **Agriculture**: Not Relevant
9. **Development**: Not Relevant
10. **Sewage Treatment**: Not Relevant

D. SUMMARY OF FINDINGS

Based on the above analysis as well as the extended analysis within the EA, APG personnel would 1) ensure that contractor personnel use and maintain appropriate BMPs, 2) obtain the requisite permits and approvals for demolition and operational work, and 3) implement measures to mitigate potential environmental impacts. APG has conducted a Coastal Zone Management Federal Consistency review of the Proposed Action and has determined that the Proposed Action is consistent, to the maximum extent practicable, with the policies of Maryland's approved federal Coastal Zone Management Program.

APPENDIX C
Information for Planning and Consultation (IPaC) Report

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IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Harford County, Maryland

Local office

Chesapeake Bay Ecological Services Field Office

(410) 573-4599
(410) 266-9127

177 Admiral Cochrane Drive
Annapolis, MD 21401-7307

http://www.fws.gov/chesapeakebay/
http://www.fws.gov/chesapeakebay/endsppweb/ProjectReview/Index.html

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found	Threatened

This species only needs to be considered if the following condition applies:

- Projects with a federal nexus that have tree clearing = to or > 15 acres: 1. REQUEST A SPECIES LIST 2. NEXT STEP: EVALUATE DETERMINATION KEYS 3. SELECT EVALUATE under the Northern Long-Eared Bat (NLEB) Consultation and 4(d) Rule Consistency key

No critical habitat has been designated for this species.
http://ecos.fws.gov/ecp/species/9045

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found	Candidate

This species only needs to be considered if the following condition applies:

- The monarch is a candidate species and not yet listed or proposed for listing. There are generally no section 7 requirements for candidate species (FAQ found here: https://www.fws.gov/savethemonarch/FAQ-Section7.html).

No critical habitat has been designated for this species.
http://ecos.fws.gov/ecp/species/9743

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. http://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31

Black-billed Cuckoo Coccyzus erythropthalmus — Breeds May 15 to Oct 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
http://ecos.fws.gov/ecp/species/9399

Blue-winged Warbler Vermivora pinus — Breeds May 1 to Jun 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Canada Warbler Cardellina canadensis — Breeds May 20 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Cerulean Warbler Dendroica cerulea — Breeds Apr 29 to Jul 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
http://ecos.fws.gov/ecp/species/2974

Common Loon gavia immer — Breeds Apr 15 to Oct 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
http://ecos.fws.gov/ecp/species/4464

Double-crested Cormorant phalacrocorax auritus — Breeds Apr 20 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
http://ecos.fws.gov/ecp/species/3478

Eastern Whip-poor-will Antrostomus vociferus — Breeds May 1 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Golden Eagle Aquila chrysaetos — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
http://ecos.fws.gov/ecp/species/1680

Kentucky Warbler Oporornis formosus — Breeds Apr 20 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

King Rail Rallus elegans — Breeds May 1 to Sep 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
http://ecos.fws.gov/ecp/species/8936

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
http://ecos.fws.gov/ecp/species/9679

Pomarine Jaeger Stercorarius pomarinus — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prothonotary Warbler Protonotaria citrea — Breeds Apr 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-breasted Merganser Mergus serrator — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-necked Phalarope Phalaropus lobatus — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Red-throated Loon Gavia stellata This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Ring-billed Gull Larus delawarensis This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Royal Tern Thalasseus maximus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Apr 15 to Aug 31
Rusty Blackbird Euphagus carolinus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Short-billed Dowitcher Limnodromus griseus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. http://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
White-winged Scoter Melanitta fusca This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

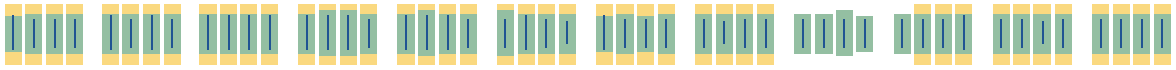
No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

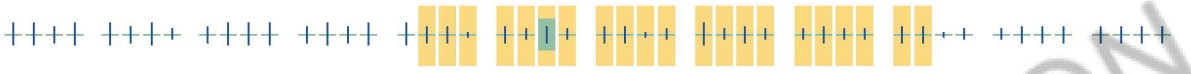
▪ probability of presence ▪ breeding season | survey effort – no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

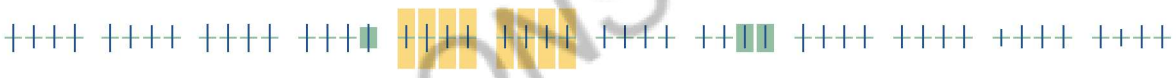
Bald Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)



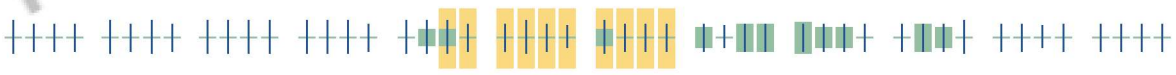
Black-billed Cuckoo
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



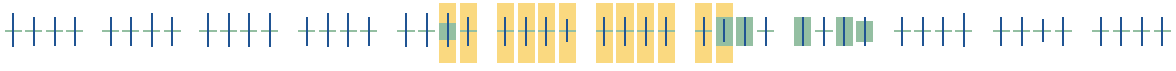
Blue-winged Warbler
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



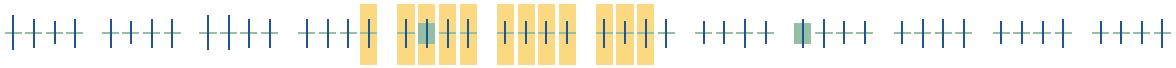
Bobolink
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



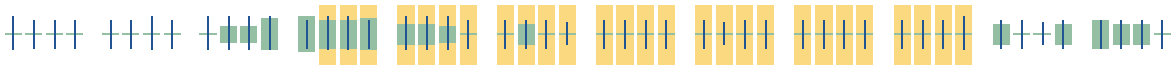
Canada Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Cerulean Warbler BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

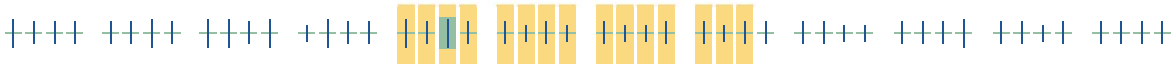


Common Loon Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)



Double-crested Cormorant Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

Eastern Whip-poor-will BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Golden Eagle Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

Kentucky Warbler BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

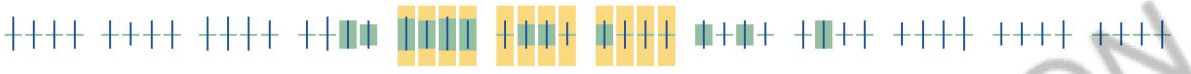
King Rail BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

SPECIES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

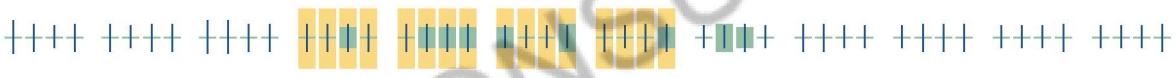
Lesser Yellowlegs BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Pomarine Jaeger Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

Prairie Warbler BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

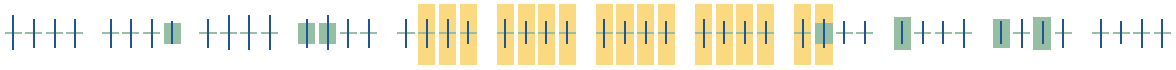


Prothonotary Warbler BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

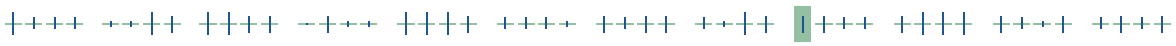


Red-breasted Merganser Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

Red-headed Woodpecker BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



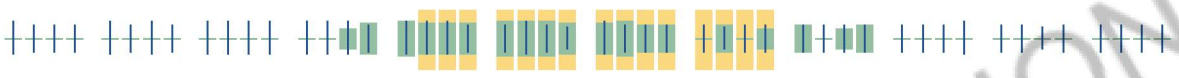
Red-necked Phalarope Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)



Red-throated Loon Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

White-winged Scoter Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

Wood Thrush BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.