UPGRADING ELECTRICAL INFRASTRUCTURE ASSOCIATED WITH UTILITY PRIVATIZATION AT ABERDEEN PROVING GROUND, MARYLAND

— DRAFT —

ENVIRONMENTAL ASSESSMENT

Prepared for:

ABERDEEN PROVING GROUND, MARYLAND

and

U.S. ARMY ENVIRONMENTAL COMMAND, TEXAS

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February 2015

FINDING OF NO SIGNIFICANT IMPACT

UPGRADING ELECTRICAL INFRASTRUCTURE ASSOCIATED WITH UTILITY PRIVATIZATION AT ABERDEEN PROVING GROUND, MARYLAND

Introduction

The U.S. Army Garrison Aberdeen Proving Ground (APG) is proposing to upgrade and construct new electrical utility infrastructure (e.g., wires, poles, switches, and transformers) within the Aberdeen and Edgewood areas of APG. An Environmental Assessment (EA) has been prepared to identify and evaluate potential adverse environmental effects associated with construction and operations of the proposed electrical utility infrastructure modernization.

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 provide necessary upgrades to maintain industry standards for APG's current (recently privatized) energy distribution system. The majority of the overhead electrical system has reached the end of its useful life and is highly inefficient, unreliable, and does not meet current safety standards. APG currently has approximately 2 million linear feet (approximately 380 miles) of power lines and switching stations that are outdated, antiquated, and do not meet current industry standards. Prolonged outages and component failures are common. The system has exceeded its design capacity with no room for future expansion. Construction of the Proposed Action would satisfy energy security goals and maintain compliance with environmental regulations. In addition, the system would provide cost savings and would reduce long-term damage to customer equipment. The Proposed Action would ensure reliability, safety, redundancy, visibility, and power quality per industry standards at APG.

2. Description of the Proposed Action and Alternatives

Chapter 2 of the EA presents a discussion of the alternatives evaluated. Total burial of power lines was initially considered during project design; however, this alternative is not feasible due to environmental, physical, and economic constraints and was dismissed from further analysis. Based on the screening criteria analysis presented in Section 2.2 of the EA, only one alternative was considered viable, and includes a hybrid approach of burial of new power lines, construction of new power lines, and upgrades to existing infrastructure. The No Action Alternative was also considered.

- **No Action Alternative –** Under this alternative, the current electrical infrastructure would be maintained.
- **Proposed Action Alternative –** The Proposed Action is to upgrade the existing electrical infrastructure (5 kilovolt [kV] and 35 kV) at both the Aberdeen and Edgewood areas of APG with a combination of both aboveground and underground power lines, new substations and switching stations, and other electrical support infrastructure.

3. Environmental Analysis

Environmental Consequences and Comparison of Alternatives: Chapter 3 of the EA discusses the affected environment and potential environmental consequences for the Proposed Action by valued environmental component (VEC). 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 VECs: land use, cultural resources, socioeconomics, airspace, traffic and transportation, and facilities, utilities, and energy. These VECs were not retained for further analysis within the EA.

A summary of potential effects on the VECs retained for further analysis is presented in Table 1. As shown in Table 1, 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 impact determinations presented.

Table 1. Summary of Potential Environmental Effects from Baseline Conditions

VEC	Activity	No Action	Proposed Action	Permits, Plans, and Measures Identified for Reduction of Adverse Impacts
Air Quality	Construction	No Impact	Minor	Vehicle emissions would be reduced with the implementation of industry standard best management practices (BMPs) including: • Control of vehicle speeds, reduction or elimination of equipment idling time, and use of properly maintained equipment Reduction of airborne particulate matter would be accomplished through: • Stabilizing exposed areas to reduce wind erosion and dust, and wetting of exposed areas and roads with water or appropriate surfactants. • Covering open equipment used for conveying or transporting material likely to create objectionable air pollution when airborne • Promptly removing spilled or tracked dirt or other materials from paved streets
	Operations	No Impact	Negligible	None identified
Noise	Construction	No Impact	Minor	Reduction of noise would be accomplished through: • Limiting construction to normal weekday business hours • Properly maintaining construction equipment mufflers • Personnel involved with project activities would adhere to hearing protection requirements defined in health and safety plans
	Operations	No Impact	Negligible	None identified

Table 1. Summary of Potential Environmental Effects from Baseline Conditions

VEC	Activity	No Action	Proposed Action	Permits, Plans, and Measures Identified for Reduction of Adverse Impacts
Biological Resources	Construction	No Impact	Minor	Reduction of impacts to biological resources would be accomplished through: • Revegetation of all temporary construction disturbances with appropriate native species The following conditions would be required by regulations: • An approved Forest Conservation Plan and Critical Area Management Plan would be required for the removal of up to 25.1 acres of forest within APG; a 1:1 ratio of reforestation will be required for forest removed • Tree removal would occur outside of the nesting period (i.e., February through August) in accordance with the Migratory Bird Treaty Act • Forest removal within the Chesapeake Bay Critical Area would be avoided during the colonial bird breeding season (i.e., April through mid-September) • Construction within the 500-meter protection zones (buffers) established by APG to minimize impacts to eagle nests and roosts would be avoided during nesting season (December 15 to June 15) and peak roosting hours (dusk to dawn) • Cutting of suitable forested areas would be avoided between April 1 and October 15 to avoid direct impacts to Indiana bat maternity colonies, otherwise tree removal during this period will require a habitat survey by a qualified biologist to verify no suitable Indiana bat habitat exists
	Operations	No Impact	Minor	Reduction of impacts to avian species would be accomplished through: • Installation or use of “flappers” or similar devices to discourage birds from colliding with overhead electrical lines

Table 1. Summary of Potential Environmental Effects from Baseline Conditions

VEC	Activity	No Action	Proposed Action	Permits, Plans, and Measures Identified for Reduction of Adverse Impacts
Wetlands	Construction	No Impact	Minor	Reduction of impacts to wetlands would be accomplished through: • Siting proposed construction activities (including placement of poles for new overhead lines) outside of identified wetlands and their associated 25-foot regulatory buffers • Use of horizontal directional drilling techniques in the vicinity of wetland features for underground line installation • Implementing soil and sedimentation control measures around construction sites (also refer to Water Resources) to reduce runoff rates to wetlands The following would be required by regulations: • Per Maryland State Programmatic General Permit-4 requirements, an application must be submitted to the Maryland Department of Environment for U.S. Army Corps of Engineers authorization prior to tree removal within forested wetlands for the potential 0.26 acres of forested wetland conversion to emergent wetland. Up to 0.26 acres of forested wetland mitigation will be required.
	Operations	No Impact	Negligible	None identified
Water Resources	Construction	No Impact	Minor	Reduction of impacts to water resources would be accomplished through: • Revegetation (stabilization) of all temporary construction-related footprint disturbances • Use of silt fencing, storm drain protection mechanisms, geotextile fabrics, dust control measures, etc. during construction • Minimizing vegetation disturbance during construction and restoring vegetation within temporarily disturbed areas post-construction to reduce the potential for erosion The following plans would be required by regulations: • Development and implementation of Erosion and Sediment Control and Stormwater Pollution Prevention plans • Preparation of a Critical Area Management Plan for construction activities within the Chesapeake Bay Critical Area; up to 5.5 acres of reforestation will be required within the Critical Area to mitigate for forest removal

Table 1. Summary of Potential Environmental Effects from Baseline Conditions

VEC	Activity	No Action	Proposed Action	Permits, Plans, and Measures Identified for Reduction of Adverse Impacts
	Operations	No Impact	Negligible	None identified
Hazardous Materials and Hazardous Waste	Construction	No Impact	Minor	During construction, the following precautions would be taken when handling potentially contaminated soils: • Any soils excavated from an area of known or suspected contamination would be placed on plastic sheeting and covered at the end of the day to prevent wind and water erosion • Any soil proposed for off-site disposal should be characterized for waste disposal prior to transport • During windy or dry periods, dust control measures should be implemented through the use of a watering truck or other methods, as applicable; if dust control measures are not sufficient to control airborne soil transport, air monitoring would be conducted downwind adjacent to potential receptors to monitor exposure levels • Construction employees would wear gloves when handling soil and take other appropriate measures to limit exposure to soil • Close coordination would occur with the contractor, IRP, and facility safety personnel during all construction activities involving ground disturbance • Contractor would follow APG safety procedures and protocols as directed Other wastes generated during the Proposed Action would be handled according to the following: • Potentially hazardous wastes (e.g., PCB-containing transformers) and non-hazardous wastes (e.g., construction debris), would be handled and disposed of in accordance with Federal, state, and applicable Army and garrison-level regulations • Any UXO materials uncovered will be disposed of in accordance with all current Army regulations and standard operating procedures • Spills would be handled in accordance with the SPCCP and disposed of in accordance with Federal, state, and applicable Army and garrison-level regulations
	Operations	No Impact	Negligible	None identified

In addition, as stated in Section 2.1 of the EA, elements of impact reduction are being incorporated into the siting, design, and construction of the electrical infrastructure upgrades. This includes:

- The proposed design would utilize existing rights-of-way (ROWs) to the greatest extent practicable.
- Existing holes of demolished poles may be re-used to avoid contamination issues, if present.
- Staging areas would be located in the existing ROW or nearby parking areas, avoiding sensitive areas including wetlands, designated habitat areas for protected species, cultural sites, and critical areas and associated buffers.
- Drilling fluid and soil cuttings would be handled in accordance with Federal, state, and applicable Army and garrison-level regulations due to contamination potential.
- Pits used for the management of drilling fluids would be sited in previously disturbed areas and would avoid sensitive areas similar to staging areas.
- Prior to construction, a sampling plan would be prepared for ground-disturbing activities. The plan would be reviewed by appropriate environmental and Installation Restoration Program (IRP) personnel. Prior to excavation, contractors would obtain excavation permits, as well as utility and unexploded ordnance (UXO) clearance. Excavation activities would be conducted according to APG's *Guidance for Proper Management of Excavated Soil*. All soil disturbances would be stabilized in accordance with the requirements of MDE's "*Maryland Erosion and Sediment Control Guidelines for State and Federal Projects*." Under these guidelines, a detailed Erosion and Sediment Control Plan (ESCP) is required for ground disturbances or excavation activities greater than 5,000 square feet or any excavation activities that exceed 100 cubic yards.
- The Proposed Action will require a Stormwater Management Plan.
- Where feasible, underground lines would be directionally drilled underneath roadways to reduce impacts to road infrastructure and traffic. Proper notification would be provided in advance to APG personnel to reduce adverse impacts of temporary road closures and roadbeds would be restored following construction.
- Following construction, any old equipment (e.g., poles) would be recycled and disposed of off-site as necessary in accordance with Federal, state, and applicable Army and garrison-level regulations to permitted landfills.
- Any areas temporarily disturbed either through construction or staging would be stabilized (e.g., reseeded) following construction.

Table 3.1-1 within the EA also includes provisions for cultural resources; any new overhead lines (other than replacement lines) will be reviewed by the APG Cultural Resources Office prior to work to confirm views of and from historic buildings are not affected, and if cultural resources are encountered during construction, 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.

Cumulative Impacts: Cumulative effects are the combination of impacts of the Proposed Action, when added to other past, present, and reasonably foreseeable future actions, regardless of who undertakes those other actions (CEQ Regulation 1508.7). Cumulative effects can result from actions occurring over a period of time that are minor when each is considered individually, but that are significant when viewed collectively.

APG provides facilities to perform research, development, testing and evaluation of Army materiel. The installation also supports a wide variety of training, including mechanical maintenance, health promotion and preventive medicine, chemical and biological defense, and chemical casualty care and chemical demilitarization. The primary impacts associated with the Proposed Action would be minor, temporary, and a result of construction. Numerous other construction projects have been identified within APG, primarily associated with new facilities

and infrastructure improvements. Regionally, development with the surrounding Harford County is anticipated.

Construction and continued development within the region would cause the potential for significant cumulative adverse impacts to the VECs analyzed within the EA. As the Proposed Action would have the potential for adverse impacts to air quality, noise, biological resources, wetlands, water resources, and hazardous materials and hazardous waste, these VECs were reviewed in Chapter 3 of the EA to determine whether or not implementation of the Proposed Action would cause the potential for significant adverse cumulative effects to these VECs. The cumulative effects analysis of these VECs within the EA determined that the Proposed Action would not likely cause any appreciable significant cumulative impacts.

Proposed Impact Reduction Measures: As demonstrated in Table 1, 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 has been made available for a 30-day public review and comment period. Documents have also been made available at five local libraries (Baltimore County Public Library, Essex Branch; Baltimore Public Library, Perry Hall Branch; Harford County Public Library, Aberdeen Branch; Harford County Public Library, Edgewood Branch; Kent County Public Library). A Public Notice was published in three local newspapers (*Baltimore Sun,* the *Aegis*, and the *Cecil Whig*).

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, to update and construct new electrical utility infrastructure. Implementation of the Proposed Action, along with specified permits, plans, and measures 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 Parts 1500-1508), as well as the requirements of the Environmental Analysis of Army Actions (32 CFR Part 651). Therefore, issuance of a FNSI is warranted and an Environmental Impact Statement is not necessary.

_____ _____

Gregory R. McClinton Date
Colonel, LG
Commanding
U.S. Army Garrison
Aberdeen Proving Ground, Maryland

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1 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 Introduction

The National Environmental Policy Act (NEPA) of 1969 requires all Federal agencies to give appropriate consideration to the potential environmental effects of proposed major planning and decision-making actions. The Council on Environmental Quality (CEQ) is responsible for issuing regulations (40 Code of Federal Regulations [CFR] 1500-1508) that implement the provisions of NEPA. CEQ regulations are supplemented by agency-specific procedures. For the Department of the Army (DA), the pertinent regulation is 32 CFR Part 651 *Environmental Analysis of Army Actions*.

This Environmental Assessment (EA) for the U.S. Army Garrison Aberdeen Proving Ground (APG) assesses the environmental impacts of updating existing electrical utility infrastructure, and the construction of new electrical utility infrastructure (e.g., wires, poles, switches, and transformers), within the Aberdeen and Edgewood areas of APG.

1.2 Background

APG was established in 1917 on the northwestern shore of the upper Chesapeake Bay in Harford County, Maryland, as an Army material testing ground. Across the Bush River to the west of APG, Edgewood Arsenal was established as a chemical warfare equipment development, production, and testing site. The two installations, together more than 72,500 acres, were united as APG in 1971 (see Figure 1-1). Today, APG is home to 11 major commands, employs more than 21,000 civilian, military, and contractors, and supports more than 70 tenants, 20 satellites, and 17 private activities. Onsite facilities conduct research, development, testing, and evaluation of defense equipment. Researchers utilize laboratories with state-of-the-art technology for a variety of research topics, as well as ranges and engineering test courses for wheeled and tracked vehicles.

Electricity is distributed onto APG from power generation facilities through a series of high voltage (main lines) 35 kV transmission lines. Electrical substation and switching stations at APG transform voltage delivered from the main lines to lower voltage secondary lines (e.g. 5 kV and 13.2 kV) for distribution to facilities throughout the Aberdeen and Edgewood areas of APG.

APG has recently conveyed its electric utility to a private entity. Defense Reform Initiative Directive (DRID) #49, *Privatizing Utility Systems*, directs all Military Departments to privatize their utility systems except when under unique security conditions, or when privatization is uneconomical. Privatization (the transfer of ownership, responsibilities, investments, upgrades, and continued operation and maintenance to the non-Federal sector) allows installation commanders to commit energy and resources to defense missions and functions. Historically, military installations were unable to upgrade and maintain reliable utility systems due to inadequate funding and competing installation management priorities. Privatization shifts the upkeep and maintenance costs of utility systems to private entities, which can perform tasks more efficiently, effectively, and guarantee more dependable and efficient delivery of electricity.

Figure 1-1. APG Location and Setting

1.3 Purpose and Need of the Proposed Action

The purpose of the Proposed Action is to provide necessary upgrades to maintain industry standards for APG's energy distribution system. APG currently has approximately 2 million linear feet (approximately 380 miles) of outdated, substandard power lines and switching stations that do not meet current industry standards. Most of the overhead electrical system has reached the end of its useful life, and is highly inefficient and unreliable. Prolonged outages and component failures are common, with more than 100 annual unplanned power outages. The system has exceeded its design capacity with no room for future expansion. Improvements to overhead distribution (main) and secondary power lines would require the construction of new and upgraded buried lines, aboveground power lines, and associated electrical infrastructure in the cantonment area and within APG ranges.

One need for the Proposed Action stems from the existing 5 kilovolt (kV) system, which lacks capacity for larger (1500 kilovolt-amps [kVA] or higher) new service connections. This has forced the base to connect service transformers for these larger service connections directly to the 35 kV line, reducing the reliability and operability of the 35 kV system. The renewal and replacement plan proposes new hybrid solutions that can upsize substations, reduce the number of substations, and install or upgrade properly-sized main feeder conductors to connect the existing and future service connections when ready for replacement.

In addition, the existing 35 kV system is manually operated and lacks automation, metering, and monitoring capabilities, which results in slow restoration during outage. In the Aberdeen Area, the Army Research Laboratory and U.S. Army Command, Control, Communications, Computers Intelligence Surveillance and Reconnaissance feeders have excess capacity beyond their respective loads, whereas South and North feeders are overloaded and lack additional capacity for increased loads. The Edgewood Area has experienced significant load growth and is exceeding the design capacity of the existing 35 kV system. In order to ensure reliability, safety, redundancy, visibility, and power quality per industry standards, the system must be redesigned.

1.4 Scope of the Analysis and Decision to be Made

This EA addresses environmental impacts from construction and operation of the proposed electrical upgrades at APG. The EA has been developed in accordance with NEPA; the regulations issued by CEQ, 40 CFR Parts 1500–1508; and the Army's implementing procedures published in 32 CFR Part 651, *Environmental Analysis of Army Actions.*

The Army's decision concerns whether, and to what extent, electrical infrastructure upgrades at APG should occur (as presented in Section 2.1). Using the analysis presented in this EA, the Army can determine whether to publish a Finding of No Significant Impact (FNSI). If it is determined that the Proposed Action would have significant environmental impacts, the Army can publish a Notice of Intent (NOI) and subsequently order the preparation of an Environmental Impact Statement (EIS).

1.5 Relevant Environmental Documentation

This EA draws from the following documents, including:

- *The Integrated Natural Resource Management Plan (INRMP) 2009-2014*, which describes standard policies and procedures for managing natural resources to ensure the sustainability of APG lands
- *The Integrated Cultural Resource Management Plan (ICRMP)* (2008), which outlines the management of APG's cultural resources including Native American resources

- *Installation Operational Noise Management Plan* (2006), which establishes the Installation noise management program and a strategy for noise management at APG
- Project-related wetland delineation study and soil sampling (see Appendices A and B)

1.6 Public and Agency Involvement

As required by NEPA regulations, the Army invites public participation in the EA process. Comments from all interested persons promote open communication and enable better decision-making. All agencies, organizations, and members of the public with a potential interest in the Proposed Action, including minority, low-income, disadvantaged, and Native American groups, have the opportunity to participate in this process.

A 30-day public review period is being conducted on the Draft EA. Notices have been placed in the Baltimore Sun and the Aegis regarding the availability of the Draft EA, the duration of the public comment period, and how to obtain information about the Draft EA and provide comments. Copies of the Draft EA were also placed at two local libraries (Harford County Public Library, Aberdeen Branch and the Harford County Public Library, Edgewood Branch). During this period, coordination with the U.S. Environmental Protection Agency (USEPA) and the Maryland State Clearinghouse has been initiated for review of the Draft EA.

Appendix A contains relevant public and ageny involvement items.

2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

The Proposed Action is to upgrade the existing electrical infrastructure (5 kV, 13.2 kV, and 35 kV main and secondary power lines) at both the Aberdeen and Edgewood areas of APG. A combination of aboveground and underground power lines, and the replacement and construction of new substations and switching stations, are being proposed.

The new energy distribution system would include a combination of 13.2 kV and 35 kV power lines. The current energy distribution system is primarily located along the existing road network, and nearly all of the electrical right-of-ways (ROWs) are mowed to prevent vegetative overgrowth and maintain access. The proposed design would utilize these existing ROWs to the greatest extent practicable as an impact reduction measure. Figures 2-1 through 2-4 depict elements of the Proposed Action and the extent and general locations where utility upgrades will occur within the Aberdeen and Edgewood areas.

2.1.1 DESIGN OF UPGRADED SYSTEMS

2.1.1.1 35 kV Distribution System Upgrade

The new 35 kV distribution system would be comprised of new overhead main lines, upgraded existing overhead main lines, and new underground main lines. The following list includes design components of the new 35 kV overhead main line system:

- The system would primarily consist of a three-phase, three-wire system with three 795 thousands of circular mils (kcmil), aluminum conductor steel-reinforced (ACSR) units with (1) 1/0, and ACSR static wire. A portion of the overhead system in the Aberdeen Area would be designed with (3) 556 kcmil and ACSR; a different segment would be designed with no static wire.
- The system would utilize a vertical delta configuration with two conductors on one side of the pole and one conductor on the other side. The static wire would be mounted on top of the pole. Vertical configuration was chosen based on the following:
    - Maintains a narrower line profile, reducing the chances of contact with tree branches and other structures.
    - Allows for greater mechanical loading design with extra-large conductors and better balance of the pole.
    - Requires fewer components to maintain (i.e., no cross arms and branching support required) which reduces operation and maintenance costs.
    - Reduces line-to-line contacts during large bird landings on a power line. This in turn, reduces the potential for bird mortality from this type of contact, and reduces the potential for unplanned power outages from faulting (i.e., abnormal conditions to the power system that causes stress, damage, and safety hazard to the power system and surrounding area).
- No cross arms would be included, but rather the system would utilize bracket mount polymer insulators.
- The system would be designed with a 15 kV under build (see Section 2.1.2).
- The system would include one set of 48-strand fiber optic cable on the same pole system and would use 60-foot high poles and other new components (poles, insulators, etc.) for installation.

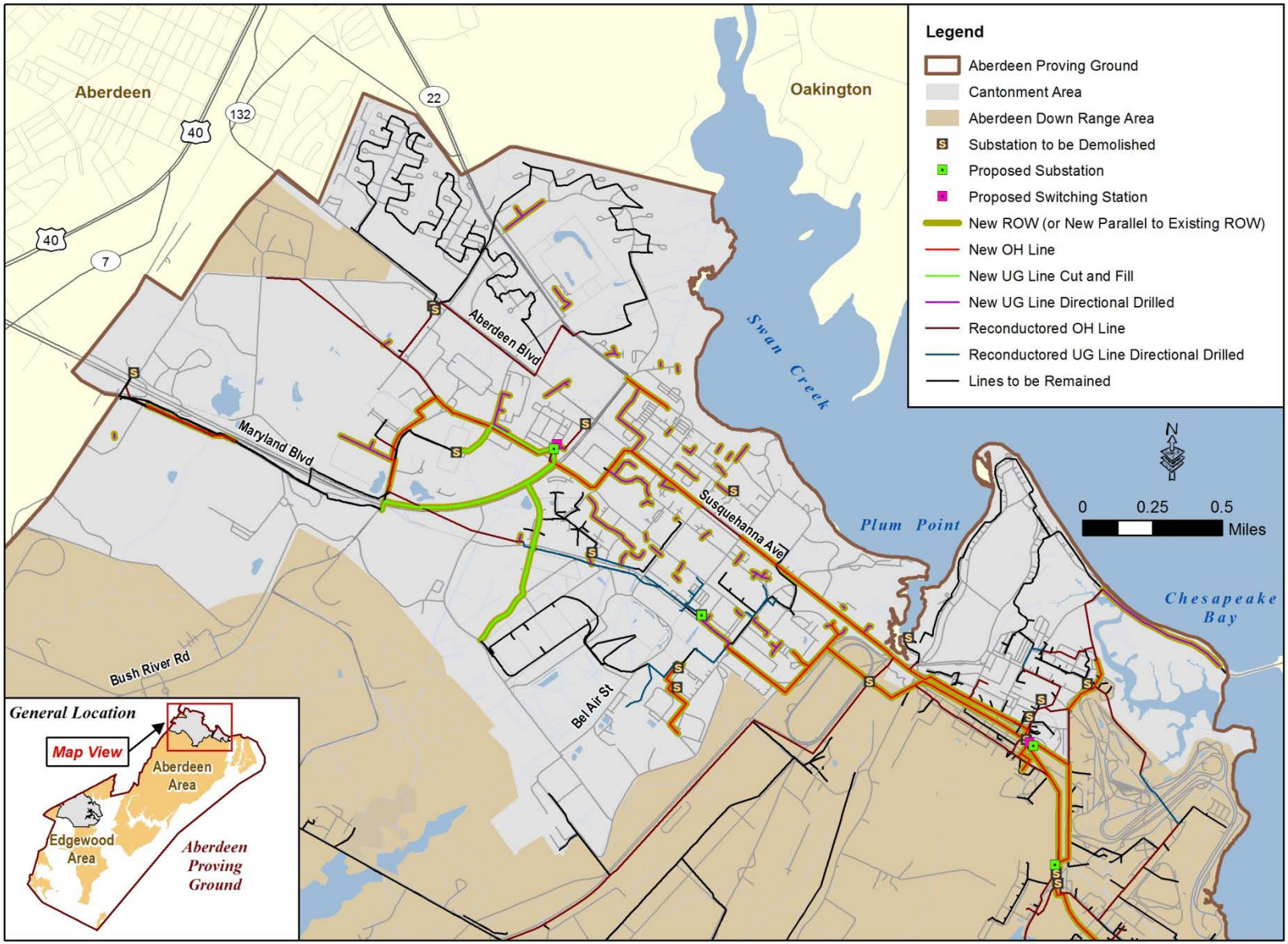

Figure 2-1. Overview of Aberdeen Cantonment Area Electrical Utility Upgrades

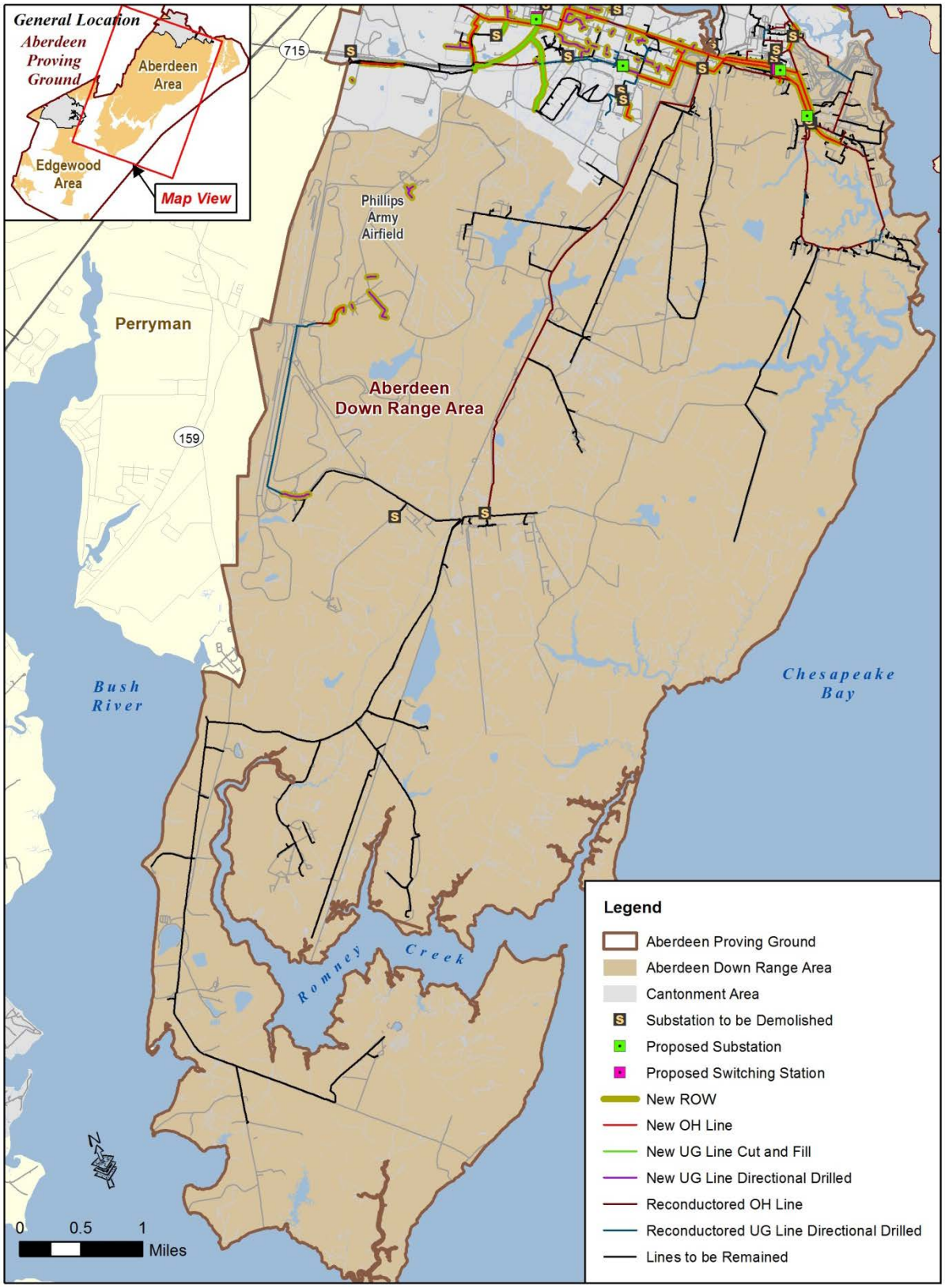

Figure 2-2. Overview of Aberdeen Down Range Area Electrical Utility Upgrades

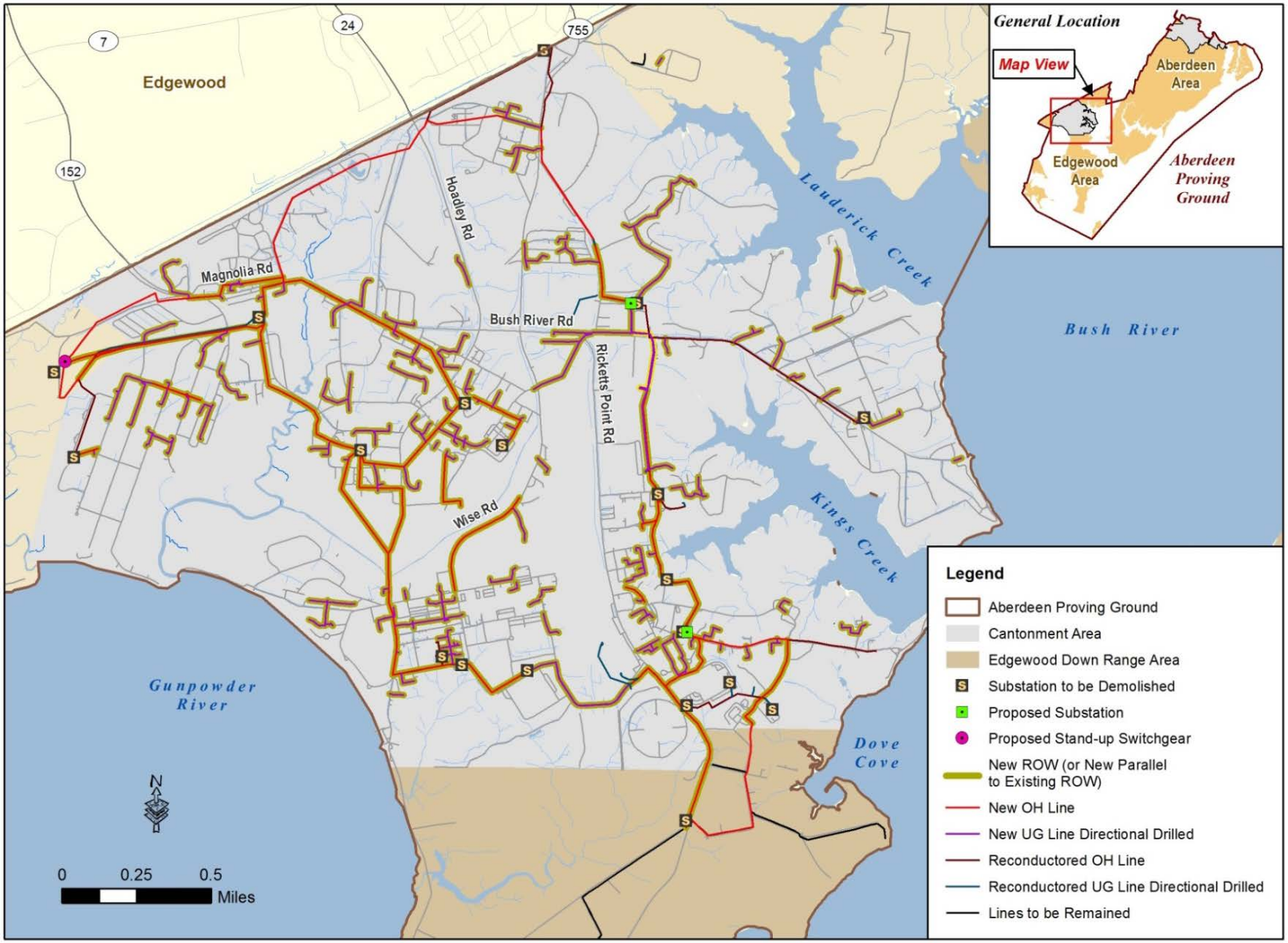

Figure 2-3. Overview of Edgewood Cantonment Area Electrical Utility Upgrades

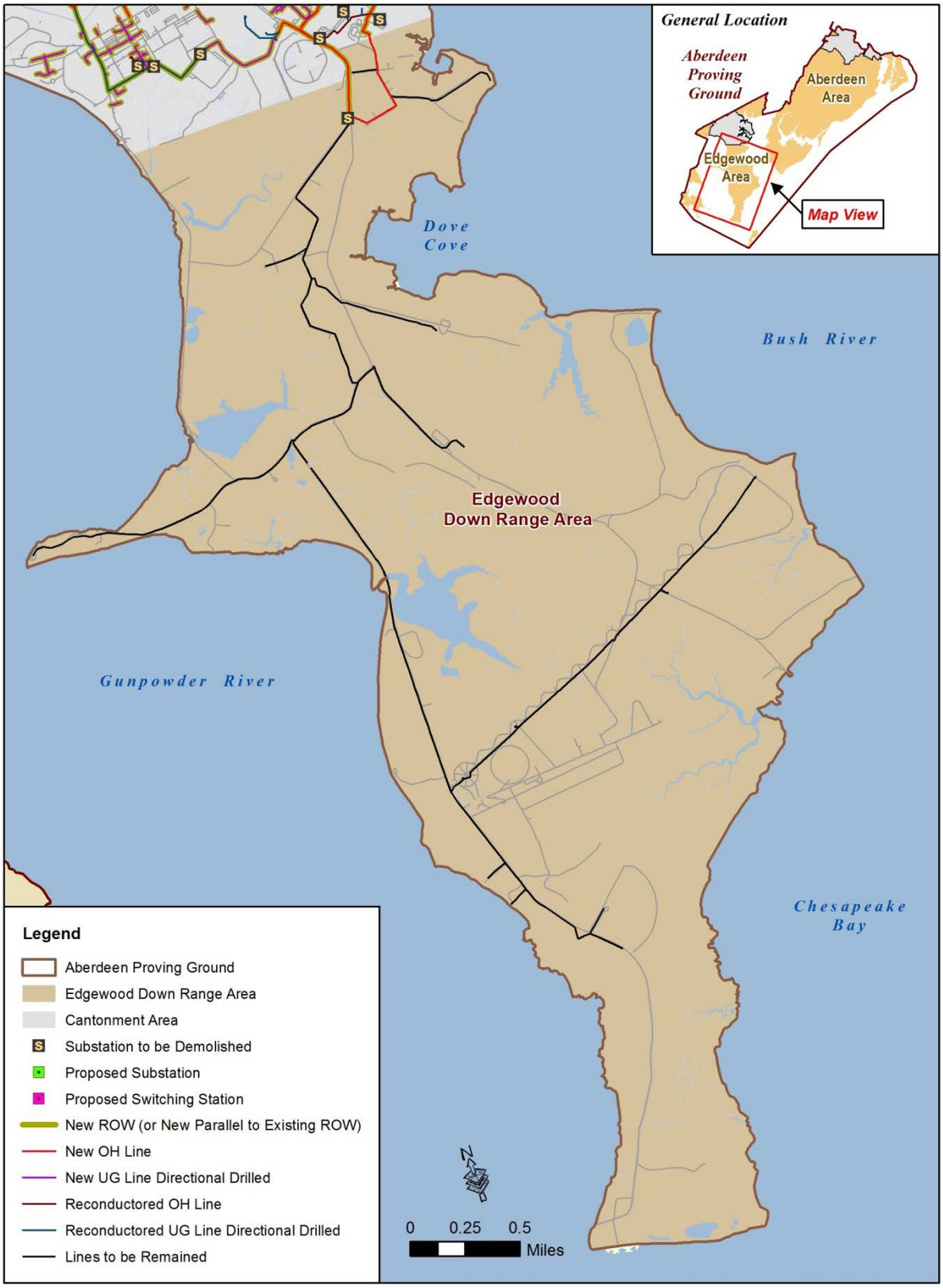

Figure 2-4. Overview of Edgewood Down Range Area Electrical Utility Upgrades

Figure 2-5 provides an example of the current horizontal configuration and Figure 2-6 shows an example of the proposed 35 kV vertical configuration.

Figure 2-5. Horizontal 35 kV Configuration.

Figure 2-6. Vertical 35 kV Configuration.

The new 35 kV overhead main lines would utilize existing 5 kV or 15 kV routes, with new adjacent 35 kV overhead lines. No new ROW would be needed for the construction of new 35 kV overhead main lines. The majority of the existing 35 kV overhead main line would remain in the same route and be reconductored and upsized (i.e., upgraded). The upgrade of existing overhead lines would utilize the same design considerations as the new overhead power lines, and would include replacing overhead street lights co-located on existing poles. Most of the existing 35 kV poles would need to be replaced because they are outdated and substandard. New lines would be located directly adjacent and parallel to existing lines. The existing 35 kV line would be extracted when the new lines become operational.

The system upgrade would include a new 35 kV underground main line with a concrete-encased duct bank, manholes, and fiber optic cables routed along the same conduit.

2.1.1.2 13.2 kV Distribution System Upgrade

The new 13.2 kV distribution system would include overhead and underground main 13.2 kV lines, as well as overhead and underground secondary 13.2 kV lines. The new system would require constructing new power lines and reusing existing lines and routes.

The following list includes design components of the new 13.2 kV main power line system:

- Three-phase, four-wire system with four 336 kcmil, ACSR conductors.
- Horizontal configuration with three phase conductors mounted on the cross arm using post insulators. The neutral wire shall be mounted on the pole.
- One circuit with one run/phase.
- 45-foot high poles for all 13.2 kV installations (i.e., when not co-located with 35 kV lines).
- One set of 48-strand single-mode fiber optic cable along the same pole system.
- Approximately four to six automatic reclosers per main distribution feeder loop.

The new 13.2 kV main overhead system would primarily occur within the existing ROW; however, portions would be sited in a new route without existing power lines (refer to Figures 2-

1 through 2-4). The new system would utilize the existing 5 kV route, with new 13.2 kV overhead lines located adjacent and parallel to the existing lines. Once the new system becomes operational, the existing 5 kV lines would be extracted. Out of use 35 kV lines would be trimmed to match the 13.2 kV design requirements. New and existing 35 kV lines would be upgraded to include 13.2 kV lines co-located on the same poles (see Section 2.1.1). Existing 13.2 kV overhead lines would also be reconductored and upsized in accordance with the same design considerations. Most existing poles and insulators would be reused. The 13.2 kV system would utilize existing route and duct banks, and would include new and upgraded underground main lines with a concrete-encased duct bank and manholes. Fiber optic cables and underground 35 kV lines would be routed along the same conduit and would utilize the same route and duct banks as the existing the 13.2 kV lines.

The new 13.2 kV secondary system would consist of primarily underground lines connected to the main feeders via a gang-operated pole-mount switch in a riser pole configuration. Secondary underground feeders would utilize a combination of junction box and loop-fed pad-mount transformers for the distribution configuration. Approximately one-third of the underground system would require new routes, while two-thirds of the system would operate via the existing 5 kV underground route.

The following list includes design components of the new 13.2 kV secondary overhead lines:

- Conductor size of 4/0, ACSR, 4-wire system.
- One circuit with one-run/phase.
- Horizontal configuration with three phase conductors mounted on the cross arm using post insulators. The neutral wire shall be mounted on the pole below the cross arm.
- Utilizes 45-foot high poles.

Existing 13.2 kV secondary feeders and service transformers would remain unchanged, as they are out of the scope of this Proposed Action.

All 5 kV pole-mounted and pad-mounted distribution transformers would be replaced with new 13.2 kV pad-mounted transformers, using existing pads to replace 5 kV pad-mounted transformers and new pads for the replaced 5 kV pole-mounted transformers. Three phase service transformers would measure 7 by 6 feet in dimension, and single phase service transformers would measure 3 by 3 feet. Existing transformers, poles, and wires not to be remained or reconductored would be demolished (removed). Conduit installation would integrate the secondary feeder distribution system. Low-voltage service connections would be upgraded for the new pad-mounted transformers, replacing the existing pole-mounted transformers.

2.1.1.3 Substations and Switching Stations

Two proposed switching stations constructed in the Aberdeen Area would combine all incoming feeders and the peak shaving plant, increasing the 35 kV system's capacity, redundancy, and reliability. Switching stations would provide advanced protection, metering, and monitoring capabilities for each of the incoming and outgoing feeders. Each switching station would be fenced in an approximately 120- by 90-foot space. In addition, substations would be redesigned to reduce the number of overall substations, increase capacity, enhance redundancy, and improve reliability and safety. The Proposed Action includes construction and operation of four substations at the Aberdeen Area and three substations at the Edgewood Area. In the Aberdeen area, three new substations would be constructed and existing Substation 4 would be reused. All of substations at Edgewood Area would be new. Twenty-five of the existing 26 substations across APG would be demolished, excluding the previously discussed Substation 4.

All new substations would have identical configurations, ratings, and footprints. Each substation's fenced-in footprint would be approximately 80 by 60 feet. Underground concrete-encased vaults would provide interconnections between the transformer and switchgear lineups.

2.1.2 CONSTRUCTION

The Proposed Action would require constructing and upgrading new and existing power lines, including the following actions:

- **Burying new electrical infrastructure:** The Proposed Action requires horizontal drilling or trenching in order to install the concrete-encased duct bank, manholes, and conduit and cables. The Proposed Action would require horizontal drilling to install underground power lines in the Edgewood Area in order to avoid surface contamination and to limit the overall area of surface disturbance. For the Aberdeen Area, open trench construction would be utilized for 35 kV underground power lines, and directional drilling would be utilized for the 13.2 kV underground system. Any required open trench construction would be up to three feet wide and five feet deep, and would be backfilled and stabilized following installation. Selection criteria for power line burial locations are discussed in Section 2.2. Construction would occur primarily along the sides of the roadways and paved parking lots. Transformers, switches, and other equipment would be housed aboveground to provide safety and maintenance access. Any planned ground disturbances would incorporate appropriate construction best management practices (BMPs) and would be reseeded or resurfaced when work is complete (i.e., construction and ground-disturbing activities are finished within a specific segment) and in accordance with the ESCP.
- **Constructing new overhead lines:** In undisturbed areas, the Proposed Action could require vegetation clearing, infrastructure removal, minor localized excavation for pole installation, and the installation of new electrical infrastructure. These actions would utilize standard construction vehicles and equipment.
- **Reconductoring and upsizing overhead power lines:** The Proposed Action also involves replacing conductors and other electrical infrastructure on existing poles, and possibly replacing existing poles. Minor localized excavation could be required to remove existing poles. New poles would be placed in new holes adjacent to existing poles. Existing holes may be re-used to avoid contamination issues, if present. Demolition (removal) of existing poles would occur as necessary. Trimming of trees along the periphery may be required to maintain ROW clearances. Reconductoring for underground power lines would include extracting and replacing existing cables with new, larger cables.

Construction activities would be phased over a five-year period based on the type of upgrade and geographical area. For upgraded and new lines, standard ROW clearances would be established. Permanent utility ROW for underground lines would be 35 feet wide with a 17.5-foot buffer on either side of the utility line. Permanent utility ROW for aboveground lines would be 30 feet wide with a 15-foot buffer on either side of the utility line. Existing ROW would be largely utilized. Up to 260.8 acres of new permanent ROW would be necessary under the Proposed Action. In addition, 0.7 acres of land would require clearing and grading to accommodate new switching stations, substations, concrete pads, and crushed gravel. A total of 25 existing substations would be demolished, an action that could remove up to 5.8 acres of impervious surface. Table 2-1 provides a summary of the construction elements and land requirements for the Proposed Action.

Table 2-1. Construction Summary of Proposed Action

	Aberdeen Area	Edgewood Area	Total
New OH Line (miles)	1.0	7.7	8.7
New UG Line, Cut & Fill (miles)	4.4	0	4.4
New UG Line, Directional Drilled (miles)	5.1	11.9	17.0
New OH Line parallel[a] to existing ROW (miles)	15.5	15.5	31.0
New UG Line parallel[a] to existing ROW, Cut & Fill (miles)	0	0	0
New UG Line parallel[a] to existing ROW, Directional Drilled (miles)	3	5.7	8.7
Reconductored OH Line (miles)	19.0	12.5	31.5
Reconductored UG Line (miles)	15.3	1.0	16.3
Reconductored UG Line, Cut & Fill (miles)	0	0	0
Lines to be Remained (miles)	74.0	11.5	85.5
New Right-of-Way (acres)	32.8	63.0	95.8
New Right-of-Way parallel to existing ROW (acres)	85.8	79.2	165
New Substations (acres)	1.0	0.7	1.7
New Switching Stations (acres)	0.5	0.2	0.7
Substations to be Demolished (acres)	2.2	3.6	5.8
Forest Removal (acres)	5.9	19.2	25.1
Stream Crossings[b]	112	182	294
Wetland Crossings	2	7	9

a. As discussed in Section 2.1.1.2, portions of the new hybrid system will be located parallel (i.e., 1 to 2 feet offset) to existing ROW.

b. Potential stream crossings were estimated using APG surface water GIS mapping which includes the centerlines of non-jurisdictional roadside ditches and swales. Only one perennial stream was identified within the Edgewood Area project footprint, Canal Creek.

An approximate 10,000 square-foot area would be required for non-operational laydown of each line segment to be directional drilled. Staging areas would be located in the existing ROW or nearby parking areas, avoiding sensitive areas including wetlands, designated habitat areas for protected species, cultural sites, and critical areas and associated buffers.

Drilling fluid is used during the drilling process to force drill cuttings to the surface where they would be allowed to settle out in a pit. Management pits (up to 0.5 acres) would be utilized for drying of drilling fluid used during directional drilling. Drilling fluid and cuttings have contamination potential and would be handled in accordance with Federal, state, and applicable Army and garrison-level regulations. Contractors would consider appropriate construction BMPs when establishing management pits, which would utilize appropriate design specifications to prevent migration of fluid or cuttings offsite. Management pits would be sited in previously disturbed areas and would avoid sensitive areas similar to staging areas. Section 3.7 provides additional detail regarding handling and disposal of hazardous waste.

Prior to construction, a sampling plan would be prepared for ground-disturbing activities. The plan would be reviewed by appropriate environmental and Installation Restoration Program (IRP) personnel. Prior to excavation, contractors would obtain excavation permits, as well as utility and unexploded ordnance (UXO) clearance. Excavation activities would be conducted according to APG's *Guidance for Proper Management of Excavated Soil* (APG, n.d.). All soil disturbances would be stabilized in accordance with the requirements of the Maryland

Department of the Environment's (MDE) "*Maryland Erosion and Sediment Control Guidelines for State and Federal Projects*." Under these guidelines, a detailed Erosion and Sediment Control Plan (ESCP) is required for ground disturbances or excavation activities greater than 5,000 square feet or any excavation activities that exceed 100 cubic yards. Additionally, the Proposed Action will require a Stormwater Management Plan. Contractors would adhere to Federal, state, and applicable Army and garrison-level regulations when conducting soil excavation and material disposal.

APG maintains an Installation-wide Spill Prevention, Control, and Countermeasures Plan (SPCCP) that details spill procedures at APG. The utility privatization contractor would use this plan that would detail preventative spill measures and spill response procedures for equipment to be utilized during construction. The SPCCP would also be used during operations to address the potential for spills associated with oil-filled operational equipment, such as electrical transformers and switches.

The Proposed Action may require temporary lane closures during installation of overhead lines or trenching of underground lines. All lines within the Edgewood area would be directionally drilled underneath roadways, however, installation of underground 35kV new construction within the Aberdeen area could involve cut and fill trenching through the roadways.

Following construction, any old equipment (e.g., poles) would be recycled and disposed of off-site as necessary, in accordance with Federal, state, and applicable Army and garrison-level regulations to permitted landfills. Any areas temporarily disturbed either through construction or staging would be stabilized (e.g., reseeded) following construction.

2.1.3 OPERATIONS

During operation, the upgraded electrical system would provide improved electrical distribution service throughout APG. The Proposed Action requires periodic aboveground maintenance in the ROW, which would be conducted by the utility company. Vegetation maintenance would be conducted in accordance with the INRMP.

2.1.4 ENVIRONMENTAL CONSIDERATIONS

APG requires the preparation of a record of environmental consideration (REC) and dig permit prior to any ground-disturbing activities. As the electrical upgrades would be phased over a period of approximately five years, RECs and dig permits would be obtained prior to each construction phase for any ground-disturbing activities. The RECs would be tiered off of this EA to further characterize potential environmental, cultural, and human health and safety impacts of electrical upgrades during the final planning and siting process.

The REC and dig permit process during the final planning and siting process would determine if additional surveys would be required for wetlands or contaminated soils, and whether cultural resource surveys would be required within a specific construction location. If additional surveys indicate that contamination[1] or other siting constraints are present at a specific electrical upgrade location (e.g., wetlands or cultural resources), results of the surveys would be used to

[1] Per Army Regulation 420–1, *Facilities Engineering/Army Facilities Management*, Non-Army tenants on Army installations are responsible for funding environmental surveys and associated documentation of proposed military construction (MILCON)/non appropriated funded (NAF) construction sites where they are the user. Installation Management Command (IMCOM) is responsible for certifying site categorization. Sites are classified into the three following categories. (1) Category I. There is no reason to suspect contamination will be encountered during construction. (2) Category II. There is no known contamination; there remains some potential that contamination may be encountered during construction. (3) Category III. The site is known to be contaminated or there is a strong suspicion contamination will be encountered during construction.

make a determination on whether the proposed electrical upgrades could be reconfigured to avoid such areas, or ensure appropriate measures are taken for handling and disposal of contaminated soils. Execution of each phase would be consistent with all applicable regulatory and permitting requirements.

The utility privatization contractor responsible for the construction and operation of the utility system under the Proposed Action would comply with all applicable Federal, state, and local regulations. In addition, the contractor would make an effort to comply with applicable Army and garrison-level regulations. In the event that the Proposed Action results in the need for the Army to support activities with environmental liabilities, such as waste management, the Army would comply with all applicable Federal, state, local, and Army regulations. Applicable Federal and state regulations are addressed in the appropriate sections of the EA.

2.2 Screening Criteria

This section presents the screening criteria used to consider alternatives analyzed in the EA. Alternatives were considered based on environmental and economic feasibility in order to maximize the availability and capability of the existing electrical distribution infrastructure.

Environmental Impacts. This includes avoidance of unmitigable environmental constraints and sensitive locations to the greatest extent practicable. This also includes harmful disturbance to contaminated sites, disturbance to sensitive sites such as cultural, wetland, and riparian areas, and impacts to migratory birds and bald eagle flight paths. Wooded forest areas were avoided to minimize potential for temporary outages and access issues. Existing lines within the electrical upgrade footprint would be buried in identified “bald eagle priority” areas.

Economic Feasibility. Environmental conditions (e.g., site terrain/grading, UXO clean-up, infrastructure accessibility, and mitigation requirement costs) were taken into consideration from a cost perspective in siting proposed electrical upgrades.

Design and Operations. Design should maximize existing infrastructure/utility ROW and electrical distribution needs. Power line siting should utilize existing infrastructure and available ROW to the extent practicable to minimize waste and costs, and maximize compatible land use. The proposed distribution system should incorporate the following design elements to ensure reliability of the electrical distribution system:

- To minimize demolition efforts and maximize use of existing ROW, utilize the existing 35 kV lines as a path for the new 13.2 kV system where possible (co-locate lines). This includes utilizing 35 kV pole structures to under build 13.2 kV lines wherever possible and following existing 5 kV routes as much as possible for the new distribution lines.
- Specify underground installation of main distribution (35 kV) lines only if required, or if the existing system is already underground, to allow for overall easier access and line maintenance.
- Minimize underground overlap with existing utilities.
- Reduce the 35 kV line length and reuse existing routes as much as possible.
- Maintain the majority of 13.2 kV secondary distribution feeders and service drop feeders underground.
- Replace all overhead 5 kV distribution transformers with new pad-mounted service transformers.
- Utilize loop-fed circuit configuration for smaller distribution transformers to minimize junction box and pad-mounted switches.
- Provide redundant feed capabilities for secondary distribution system where available.
- Maintain loop configuration of 13.2 kV main distribution lines with at least two sources with normally opened tie points.

- Provide at least one main 13.2 kV interconnection line between each substation as back feed sources.
- Keep the main 13.2 kV lines behind the facilities whenever possible to minimize their exposure.
- Keep and utilize existing 35 kV underground lines.

Similar criteria for substation siting include:

- Minimize 35 kV line lengths and keep load to substation length minimal.
- Maintain substation proximity to minimize cutover efforts to the new feeders.
- Avoid major utility junctions and interconnection points.
- Maintain adequate accessibility to the substation yard.
- Avoid proximity to major facilities and residential areas.
- Avoid environmentally-sensitive locations.

2.3 No Action Alternative

Under this alternative, the current electrical infrastructure would be maintained. The approximate 2 million linear feet (approximately 380 miles) of outdated, substandard power lines and switching stations that do not meet current industry standards would remain. The electrical system would continue to be highly inefficient and unreliable and APG would continue to experience prolonged outages and component failures which could increase over time as the system continues to age. Improvements to overhead distribution (main) and secondary power lines would require incremental replacement of lines as they reach the end of their lifecycle.

This alternative is unacceptable because the existing electrical infrastructure and switching stations do not meet current industry standards, and will continue to cause power outages and insufficient energy distribution at APG.

2.4 Alternatives Considered but Dismissed

Two Proposed Action alternatives were initially considered for implementing the electrical system upgrade. The first alternative was an entire underground system with all the electrical components replaced and reconfigured. The second alternative (being carried forward within this EA) was a hybrid system that would keep the majority of the main power lines above ground and provide underground service drops and pad mounted service transformers when upgrading from 5 kV to 15 kV. Table 2-2 outlines the system component comparisons among the alternatives and Table 2-3 provides an initial assessment of factors considered in determining the feasibility of the alternatives based on screening criteria outlined in Section 2.2.

Table 2-2. Differences Between Underground and Hybrid Upgrade Components

System Components	Underground (UG) System	Hybrid System
35 kV Feeders	All UG	Approximately 23 percent UG
Substations	Fewer, double-ended, larger substations with adequate interties	Same as UG system
15 kV Main Feeders	All UG	Approximately 16 percent UG
15 kV Secondary Feeders	All UG	Approximately 70 percent UG
Service Transformers	Pad-mounted	Same as UG system
Protection, Automation, and Metering	Modern digital technology	Same as UG system

Table 2-3. Construction and Operational Comparisons

Screening Criteria		Underground System	Hybrid System
Environmental Impacts	---	High	Low
Economic Feasibility	Installation Cost	High	Medium
	Operation & Maintenance Cost	High	Low
	Future Upgrades/Expansion	Not flexible, expensive	Flexible, economical
Design and Operations	Life-cycle	Shorter	Longer
	Reusing existing 13.2 kV ROW	None	Will use majority of existing ROW
	Electrical Stress Capability	Limited	More resilient
	Frequency of Outages	Low	Medium
	Outage Restoration	Very slow, manual	Fast, automatic for temporary faults

After reviewing the alternatives against the factors considered in Table 2-3, the Army decided to carry the hybrid alternative forward for detailed analysis within the EA because it was more economical, it would address the deficiencies in Section 1.3, and would have minimal environmental impacts. The following discussion describes and justifies dismissal of entire electrical system burial from further consideration.

2.4.1 BURIAL OF ALL ELECTRIC INFRASTRUCTURE

This alternative would relocate the existing aboveground electrical transmission and distribution system on APG (approximately 380 miles) to an entirely underground system. All existing aboveground lines would be upgraded to a 13.2 kV reconfigured underground system. Main feeders would be equipped with automatic fault isolation and restoration system. Implementation of this alternative was determined not to meet all of the selected screening criteria. The following screening criteria would not be achieved:

- Environmental Impacts. Directionally drilling of the entire system would be unlikely due to economic constraints. Maintenance activities for an entire underground system would also require ground-disturbance to expose buried portions of the system requiring repair. Increased potential, would therefore, exist for open trench construction and maintenance of lines in sensitive areas such as wetlands and potential disturbance to areas with surface contamination.
- Economic Feasibility. The costs associated with directional drilling the entire system would be unrealistic. Complete burial would result in 25 percent higher construction costs and would not accommodate the accessibility criteria described below. Furthermore, general maintenance costs and future upgrade costs would be higher.
- Design and Operations. Burial of the entire system, including the main distribution (35 kV) lines, would not allow for readily-accessible maintenance activities to be performed on the main distribution lines. Maintenance activities would likely require open-trenching and disturbance to expose areas of the buried system requiring repair. This would require longer periods for outage restoration.

Due to the factors discussed above, this alternative is not considered feasible and has been eliminated from further consideration.

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3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the impact assessment methodology, the affected environment (existing conditions), and the environmental consequences of the No Action and Proposed Action. The description of baseline data sources and approach for analyzing impacts are discussed in Sections 3.1.1 and 3.1.2, respectively.

Several resources were determined not to be affected by the Proposed Action; therefore, a detailed analysis of these topics is not presented in this chapter. A discussion of valued environmental components (VECs) carried through for further analysis within the EA, and justification for those VECs dismissed from further analysis, is presented in Section 3.1.3.

3.1 Impact Assessment Methodology

3.1.1 DESCRIPTION OF BASELINE DATA AND SOURCES

The following types of data were used to characterize the affected environment of the project area:

- Geographical Information System (GIS), including utilities, infrastructure, and hydrology
- Aerial photography: 2012, U.S. Department of Agriculture (USDA), National Agriculture Imagery Program
- Landcover: 2012, U.S. Geologic Survey (USGS), National Gap Analysis Program Land Cover Data
- Regional and local reports: including Natural Resources Conservation Service Soil Surveys
- Previous NEPA documentation
- Field survey results from the wetlands delineation and soil sampling survey
- APG management plans including the INRMP and ICRMP
- Interviews with subject matter experts (SMEs), including utility contractor personnel
- Agency consultation

3.1.2 APPROACH FOR ANALYZING IMPACTS

Under 40 CFR Part 1508.27, the Army must consider the context and intensity of the Proposed Action's potential environmental impacts. These considerations include the Proposed Action's beneficial and adverse impacts, human health controversies, whether the action establishes a precedent for similar future actions, the level of uncertainty about project impacts, or whether the action threatens environmental protection standards.

The severity of environmental impacts is characterized as negligible, minor, moderate, significant or beneficial:

- **None/Negligible** – No measurable impacts are expected to occur. A negligible impact may locally alter the resource, but would not measurably change its function or character.
- **Minor** – A minor impact would either be isolated and localized or not measurable on a wider scale.
- **Moderate** – Moderate impacts to a resource would be measurable on a wide scale (e.g., across the entire Installation or region). If moderate impacts are adverse, they would not exceed limits of applicable local, state, or Federal regulations.

- **Significant** – A significant impact may exceed limits of applicable local, state, or Federal regulations or would untenably alter the function or character of the resource. This type of impact would be considered significant unless mitigable to a less-than-significant level.
- **Beneficial** – Impacts would benefit the resource/issue.

To maintain a consistent evaluation of impacts in the EA and in accordance with the Army NEPA Regulations, significance thresholds were used for each resource (see Table 3.1-1). Although some designated thresholds are based on legal or regulatory limits or requirements, others reflect the Army's discretionary judgment regarding military readiness while fulfilling conservation stewardship responsibilities.

The Army uses quantitative and qualitative analysis to determine the threshold capacity. Based on these analyses, this EA identifies the effects of potential environmental impacts.

Each resource's region of influence (ROI) is determined based on the potential impacts to the affected resource. The ROI was limited to the specific project area (e.g., utility ROWs) for Valued Environmental Components (VECs) including cultural resources, biological resources, wetlands, and hazardous materials and wastes. These VECs are directly connected to specific existing conditions at the site and proposed uses at the site. For the remaining VECs, the ROI was generally expanded to include larger geographic areas, such as airsheds for air quality and watersheds for surface waters.

3.1.3 LEVEL OF VEC ANALYSIS

In compliance with the NEPA and CEQ regulations, the description of the affected environment focuses on the resources and conditions potentially subject to the effects of the Proposed Action. In an effort to comply with CEQ regulations encouraging NEPA analyses to be as concise and focused as possible (40 CFR Part 1500.1(b) and 1500.4(b)), Table 3.1-1 presents each VEC and its corresponding ROI and threshold of significance. The table also identifies VECs that are dismissed from further analysis or fully analyzed in this EA, as well as the rationale for dismissing or analyzing each VEC. A qualified SME reviewed the potential effects of the Proposed Action and the No Action Alternative relative to each VEC and analyzed the existing conditions of each VEC within the Proposed Action's ROI. The SME determine that, for several VECs, the adverse effects of the Proposed Action would be negligible.

Table 3.1-1. VEC Assessment Criteria and Level of Assessment

VEC	ROI	Thresholds of Significance	Dismissed from further Analysis?	Rationale for Level of Assessment
Land Use Conflict and Compatibility	Land use within and adjacent to the project area.	Significant impacts would occur if the land use were incompatible with existing military land uses and designations (including recreation). These impacts may conflict with Army land use plans, policies, or regulations, or conflict with land use off-post.	Yes	During construction, short-term disruptions could occur to adjacent land along the utility alignments and near substation and switching station construction. Power line replacement and construction would follow existing ROW or existing roadway networks, and would not result in long-term conflicts with existing land use. New substations and switching stations would be sited to avoid major facilities and residential areas and to avoid land use conflicts. No long term impacts to land use or viewsheds are anticipated; therefore, no further analysis is required.
Air Quality and Greenhouse Gases	Metropolitan Baltimore Intrastate Air Quality Control Region and Installation boundary.	An impact to air quality would be considered significant if were to affect the achievement or maintenance of National Ambient Air Quality Standards.	No	Construction activities would potentially result in short-term fugitive dust emissions and greenhouse gas emissions during the Proposed Action implementation period. This resource area is further discussed in Section 3.2.
Noise	Areas adjacent to and within the project area.	Impacts would be considered significant if noise from Army actions were to cause harm or injury to on- or off-post communities, or exceed applicable environmental noise limit guidelines.	No	Construction would occur throughout the cantonment area, possibly near potential sensitive receptors. Noise levels would be typical of construction equipment and could result in short-term, minor impacts. This resource area is further discussed in Section 3.3.
Soil Erosion	Soils within the project area.	Impacts on geology, topography, and soils would be considered significant if: • The landscape could not be sustained for military training, • Excessive soil loss were to impair plant growth, or	Yes	During construction, temporary soil disturbance would occur along the power line route during trenching and burial of power lines, removal of existing poles, installation of new aboveground power lines, and demolition and construction of new substations and switching stations. Based on the scale of the project, a detailed ESCP would be required (see Section 3.6, Water Resources). The majority of the soils in the project area have already

Table 3.1-1. VEC Assessment Criteria and Level of Assessment

VEC	ROI	Thresholds of Significance	Dismissed from further Analysis?	Rationale for Level of Assessment
		• Federal, state, or local laws pertaining to this resource were violated.		been disturbed and the area generally lacks steep slopes. Appropriate stabilization and construction BMPs would be utilized to limit off-site soil migration. Following installation, trenches would be stabilized, vegetated, or re-surfaced as necessary. During operation, no long term impacts to soil would occur; therefore, no further analysis is required.
Cultural Resources	Cultural Resources within the project area.	Impacts to cultural resources would be considered significant if Army actions were to diminish the integrity of a historic property or archaeological site such that it would no longer be eligible for listing in the National Register of Historic Places.	Yes	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. As the Proposed Action would involve limited surface disturbance within predominantly previously-disturbed locations, it is unlikely that significant adverse effects would occur to archaeological resources. Areas of new underground line construction would be directionally drilled, below the potential surface layers where archaeological deposits may occur. Any new overhead lines (other than replacement lines) will be reviewed by the APG Cultural Resources Office prior to work to confirm views of and from historic buildings are not affected. In addition, if cultural resources are encountered during construction, 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. While some historic buildings and historic districts are located within APG, the Proposed Action would involve removal of existing overhead secondary

Table 3.1-1. VEC Assessment Criteria and Level of Assessment

VEC	ROI	Thresholds of Significance	Dismissed from further Analysis?	Rationale for Level of Assessment
				lines and burial of the secondary feeder distribution systems connecting into facilities. Viewsheds within the historic districts and of historic buildings would be improved through burial of existing overhead lines. No adverse effects to historic buildings or districts are anticipated. Therefore, no further analysis is required.
Water Resources	Watersheds, state-designated stream segments associated with the project area; groundwater aquifers below the project area.	Impacts to water resources would be considered significant if Army actions: • Exceed applicable Federal and state regulatory limits for surface water quality or result in unpermitted direct impacts to waters of the U.S. • Substantially affect surface water drainage or stormwater runoff. • Substantially affect groundwater quantity or quality. • Are inconsistent with enforceable policies under the Maryland Coastal Zone Management Act.	Yes (groundwater) No (surface waters)	Due to the proximity of surface waters to the project area, the potential exists for the Proposed Action to adversely impact surface water quality. Project areas may be located within and have impacts on the 100-foot Critical Area buffer and 1,000-foot Critical Area. In addition, all of APG lands and project areas are located within the Maryland Coastal Zone. As a result, this resource area is further discussed in Section 3.6. Construction and operations would not require use of groundwater aquifers, nor would they require trenching to a depth that could result in groundwater impacts. The potential for groundwater contamination by accidental hazardous materials spills would be mitigated via implementation of the hazardous waste management procedures (see Section 3.7 Hazardous Materials and Waste); therefore, the discussion of groundwater is dismissed from further analysis.
Wetlands	USACE jurisdictional "waters of the U.S." and wetland resources within the project area.	Impacts to wetlands would be considered significant if the Proposed Action does not comply with policies, regulations, and permits related to wetlands conservation and protection.	No	Due to the proximity of the proposed project area to wetland resources, the potential exists for adverse impacts to wetlands. As a result, this resource area is further discussed in Section 3.5.

Table 3.1-1. VEC Assessment Criteria and Level of Assessment

VEC	ROI	Thresholds of Significance	Dismissed from further Analysis?	Rationale for Level of Assessment
Biological Resources	Biological resources within the project area and associated habitat.	Impacts to biological resources would be considered significant if Army actions were to result in: • Long-term loss, degradation, or loss of diversity within unique or high-quality (e.g., riparian) plant communities; • Unpermitted "take" of federally-listed species; • Local extirpation of rare or sensitive species not currently listed under the ESA of 1973; • Unacceptable loss of critical habitat as determined by the USFWS; or • Violation of the Migratory Bird Treaty Act (MBTA) or Bald and Golden Eagle Protection Act (BGEPA)	No	Construction of the Proposed Action could require vegetation and tree removal, which could impact wildlife habitat. In addition, placement of new aboveground electrical infrastructure could impact bird species, including bald eagles. As the Proposed Action could result in adverse impacts to biological resources from construction and operations, the Proposed Action has the potential to exceed the thresholds of significance established for biological resources. As a result, this resource area is further discussed in Section 3.5.
Socio-economics	Socioeconomic and Environmental Justice factors within APG, and immediate surrounding communities and counties.	Impacts to socioeconomics and environmental justice would be considered significant if they were to cause substantial change to the sales volume, income, employment, or population of the surrounding ROI.	Yes	Short-term beneficial economic impacts would occur as a result of a temporary increase in locally employed construction workers and the local purchasing of construction materials. The Proposed Action would not significantly impact sales volume, income, employment, or the local tax base. Additionally, because the Proposed Action would occur entirely on APG on the interior of the Installation, it is unlikely that public services (e.g., fire protection, police enforcement, medical services, education, etc.) would be needed or impacts to low income, minority, or children populations would occur. Overall impacts to

Table 3.1-1. VEC Assessment Criteria and Level of Assessment

VEC	ROI	Thresholds of Significance	Dismissed from further Analysis?	Rationale for Level of Assessment
				socioeconomics and environmental justice would be negligible and further analysis has been dismissed from this EA.
Traffic and Transportation	Public roadways and key access points within and near the Installation; roadways within APG installation boundaries.	Significant impacts would generally occur when a reduction by more than two levels of service (LOS) at roads and intersections within the ROI occurs.	Yes	All underground lines that cross roads would be directionally-drilled within the Edgewood Area, avoiding direct impacts to the road surfaces. Installation of underground 35kV new construction within the Aberdeen area could involve cut and fill trenching through the roadways. Short-term impacts could occur due to lane closures during construction as lines are replaced or installed in locations directly adjacent to the Installation road network. Impacts would be minor and temporary involving single lane closures where part of the roadway is needed for construction equipment. Temporary (1 to 2 days) road closures could be required in the Aberdeen Area as the roadbed is disturbed during placement of new underground 35k kV lines. Proper notification would be provided in advance to reduce adverse impacts and roadbeds would be restored following construction. Construction would involve standard equipment such as tractors, loaders, backhoes, dozers, lifts, bucket trucks, water pumps, air compressors, and deliveries. Deliveries would include one truck trip per day (each) of material delivery and concrete/asphalt delivery. Construction vehicle traffic would have negligible impacts to existing traffic conditions since construction would be phased over five years. Phased construction would reduce the total amount of construction equipment and potential impacts of construction traffic and single lane closures occurring at one time.

Table 3.1-1. VEC Assessment Criteria and Level of Assessment

VEC	ROI	Thresholds of Significance	Dismissed from further Analysis?	Rationale for Level of Assessment
Airspace	Airspace above and surrounding the project area.	An impact to airspace would be considered significant if the Proposed Action violates Federal Aviation Administration safety regulations or causes an infringement on current military, private, and commercial flight activity and flight corridors.	Yes	Construction and operation of aboveground or underground power lines, substations, or switching stations would not impact current airspace designations. No major changes would occur from existing baseline firing conditions. Therefore, no further analysis is required.
Facilities, Energy Demand and Generation, and Utilities	Utilities within APG and immediate surrounding communities and counties.	Impacts to facilities, energy demand and generation, and utilities would be considered significant if the Proposed Action were to cause an impairment of utility service to local communities, homes, or businesses.	Yes	The Proposed Action would upgrade existing utility infrastructure, guaranteeing more dependable and efficient delivery of electricity. The system would be redesigned to ensure reliability, safety, redundancy, visibility and power quality, and would result in beneficial impacts to electrical utilities on the Installation. No potable water, wastewater treatment, gas, or other utilities would be required for construction or operations. Therefore, no further analysis is required.
Hazardous Materials and Hazardous Waste	APG lands, including the alternative-specific project areas.	Impacts to solid waste, hazardous materials, or hazardous waste would be considered significant if the Proposed Action were to: • Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or wastes; or from reasonably foreseeable accident events; • Require remediation of UXO	No	All of the Edgewood Area and parts of the Aberdeen Area of APG are listed on the National Priority List as Superfund sites and extensive historical contamination is present throughout the Installation. Disposal of PCB-containing transformers, waste oil, and potentially hazardous soil drilling fluid or soil cuttings would be required under the Proposed Action. As a result, hazardous materials and hazardous waste is further discussed in Section 3.7. Solid waste generated from the Proposed Action would include construction debris from pole and equipment removal and substation demolition. No appreciable increase of waste would occur during operations, and any solid waste generated during

Table 3.1-1. VEC Assessment Criteria and Level of Assessment

VEC	ROI	Thresholds of Significance	Dismissed from further Analysis?	Rationale for Level of Assessment
		contamination; • Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.		the implementation process would be properly managed in accordance with Federal, state, and applicable Army and garrison-level regulations. Therefore, no further analysis of solid waste is required.

3.1.4 CUMULATIVE EFFECTS

CEQ regulations implementing NEPA define a "cumulative impact" as an environmental impact that "results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7).

USEPA guidance to reviewers of cumulative impacts analyses further adds:

…the concept of cumulative impacts takes into account all disturbances since cumulative impacts result in the compounding of the effects of all actions over time. Thus, the cumulative impacts of an action can be viewed as the total effects on a resource, ecosystem, or human community of that action and all other activities affecting that resource no matter what entity (Federal, non-Federal or private) is taking the action (USEPA, 1999).

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 extent of the Proposed Action across a large portion of APG lands, the Proposed Action's ROI for cumulative effects consists of APG and adjacent lands, including communities around the Installation. 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 3.1-2. 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 3.1-2). "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 3.1-2. Cumulative Actions at APG

Project	Description	Timeframe	
		2011 - 2014	2014 - 2019
Joint Receipts Facility, E3400, E3401 and E3462	The Edgewood Chemical Biological Center proposes to construct and operate a new state-of-the-art facility known as the Sample Receipt Facility within the Edgewood Area. The facility would allow for the safe handling, evaluation, analysis, storage, and treatment of a variety of potentially lethal chemical, biological, radiological, and/or explosive-containing samples.		X
99th Regional Support Command	The U.S. Army proposes to construct and operate a 500-member U.S. Army Reserve Center on approximately 15 acres of land in the Edgewood Area to support the training and mobilization of ten U.S. Army Reserve (USAR) units to meet current requirements.		X
Defense Base Realignment and Closure (BRAC)	The BRAC Commission recommends that certain agencies realign and relocate to APG to facilitate essential mission functions and to improve homeland security. APG is currently implementing BRAC Commission recommendations through a combination of new construction and renovation projects to accommodate incoming BRAC missions.	X	X
Medical Research Institute for Chemical Defense New Facility Complex	The U.S. Army Medical Research Institute of Chemical Defense proposes to consolidate and centralize existing operations by erecting a new facility complex comprised of a new state-of-the-art laboratory and support facilities in the Edgewood Area.		X
Real Property Master Plan	In response to changing conditions at APG, the Army proposes to adopt and implement a Real Property Master Plan 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.		X
Thermal Energy Strategy	APG is proposing a thermal energy strategy to ensure that the existing Edgewood Area steam generation distribution system would continue to meet the area's present and projected heating, steam, and hot water needs after the Waste to Energy Facility shuts down. Upgrades to		X

Table 3.1-2. Cumulative Actions at APG

Project	Description	Timeframe	
		2011 - 2014	2014 - 2019
	Edgewood's existing steam generation and distribution system would increase efficiency, reduce energy use, and allow for future expansion in the Edgewood Area.		
U.S. Army Public Health Command (USAPHC) Headquarters Campus	USAPHC proposes to consolidate and centralize existing operations at the Edgewood Area by constructing a new facility complex. This new facility would provide an operation center at the customer base with flexible, modern facilities housing state-of-the-art equipment.		X
Wastewater Treatment Plant Enhanced Nutrient Removal Upgrade	APG proposes to upgrade the existing Edgewood Area wastewater treatment plant by altering, replacing, or constructing new facilities. Old, obsolete facilities would be removed or repurposed when possible.		X
Spesutie Island Power Line Upgrades	APG recently relocated approximately 11.5 miles of the aboveground overhead electrical distribution system to a primarily underground distribution system at Spesutie Island. Transformers were also installed to provide the required voltage. This conversion eliminated risks posed to bald eagles by overhead electrical lines, transformers, and other equipment.	X	
Installation Information Infrastructure Modernization Program (I3MP) 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	
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 (Harford County, 2013a-d).	X	X

Table 3.1-2. Cumulative Actions at APG

Project	Description	Timeframe	
		2011 - 2014	2014 - 2019
US-40/MD-715 Interchange Improvement Project	Improvements included relocating and widening the ramp from U.S. 40 East to Maryland 715 South, and providing a new spur from the ramp to Maryland 715 North.	X	
I-95/MD-24 Interchange Improvement Project	Construction improvements to the I-95/MD 24 interchange, including upgrades to MD 24 and the reconstruction of the MD 24/MD 924 intersection to a grade-separated interchange.	X	

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3.2 Air Quality and Greenhouse Gases

3.2.1 AFFECTED ENVIRONMENT

3.2.1.1 National Ambient Air Quality Standards and Attainment Status

The USEPA Region 3 and MDE regulate air quality in Maryland. The Clean Air Act (CAA) (42 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 Part 50) that set 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 (Pb). 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. 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.

Table 3.2-1 lists the primary and secondary NAAQS for the above-listed criteria pollutants. Federal regulations designate areas that exceed the NAAQS ambient concentrations as nonattainment areas, and areas in accordance with the NAAQS as attainment areas. According to the severity of the pollution, O_3 and PM_{10} nonattainment areas can be categorized as marginal, moderate, serious, severe, or extreme.

Located in Harford County, APG is in the Metropolitan Baltimore Intrastate Air Quality Control Region (AQCR) (40 CFR 81.28), known as Area III of the State of Maryland Air Quality Control Area. The Metropolitan Baltimore Intrastate AQCR operates under a 10-year maintenance plan for CO, demonstrating continued attainment for this criteria pollutant through 15 December 2015. The region is also in attainment for SO_2, PM_{10}, NO_2, and lead. However, the region is in nonattainment for 8-hour O_3 and the annual $PM_{2.5}$ standards (USEPA, 2013). Specifically, the region is in serious nonattainment for the 1997 8-hour O_3 and moderate nonattainment for the 2008 8-hour O_3 standards. 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 12 states and Washington, D.C.

The CAA defines mandatory Class I Federal areas as certain national parks (over 6,000 acres), wilderness areas (over 5,000 acres), national memorial parks (over 5,000 acres), and international parks that were in existence as of August 1977. The Class I Areas are protected under the Regional Haze Program, which mandates that state and Federal agencies improve air quality and visibility in the Class I Areas. There are no Class I Areas in Maryland. Class I Areas closest to the Proposed Action include Brigantine Wilderness Area, New Jersey (approximately 90 miles to the east); Dolly Sods Wilderness Area, West Virginia (approximately 175 miles to the southwest); and Shenandoah National Park, Virginia (approximately 155 miles to the southwest) (USEPA, 2014a).

Table 3.2-1. National Ambient Air Quality Standards

Pollutant	Standard	Ambient Concentration	Harford County Attainment Status
CO			
1-hour[a] (ppm)	Primary	35	Maintenance
8-hour[a] (ppm)		9	
NO_2			
1-hour[b] (ppb)	Primary	100	Attainment
Annual[c] (ppb)	Primary and Secondary	53	
O_3			
8-hour[d] (ppm)	Primary and Secondary	0.075	Nonattainment
SO_2			
1-hour[e] (ppb)	Primary	75	Attainment
3-hour[a] (ppm)	Secondary	0.5	
$PM_{2.5}$			
24-hour[f] (µg/m^3)	Primary and Secondary	35	Attainment
Annual arithmetic mean[g] (µg/m^3)	Primary	12	Nonattainment
Annual arithmetic mean[g] (µg/m^3)	Secondary	15	
PM_{10}			
24-Hour[h] (µg/m^3)	Primary and Secondary	150	Attainment

Source: 40 CFR 50.1-50.12; USEPA, 2012

CO = carbon monoxide; µg/m$_3$ = 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 O3 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.

3.2.1.2 Regional and Installation-Wide Emissions

The USEPA also tracks hazardous air pollutants (HAPs) emissions for each state. HAPs are pollutants known or suspected to cause cancer and other diseases, or adverse environmental effects. The total HAP emissions for the State of Maryland and the three counties adjacent to APG are shown in Table 3.2-2. 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 construction activities, open burning, detonation of munitions, and roadway traffic.

Table 3.2-2. Regional Hazardous Air Pollutant Emissions for APG

Area	Total HAP Emissions (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 RPMP, 2013.
tpy = tons per year

Title V of the CAA requires states to establish an air operating permit program (40 CFR Part 70). The permits required by these regulations are often referred to as Title V or Part 70 operating permits. Both the Aberdeen and Edgewood areas of APG have separate Title V - Part 70 Operating Permits that consolidate all previous air permits and all applicable CAA and State of Maryland regulatory requirements into single, individual permits for each area. The Installation's current Title V Air Operating Permits, Numbers 24-025-00081 and 24-025-00082, will expire on 31 January 2015 and 21 October, 2014, respectively. These permits regulate devices such as boilers, paint booths, storage tanks, generators, and other emission units. Any new activity to be conducted at the Installation will require an air permit review. Depending on the scope of the proposed activity, a construction permit and/or a revision to the Title V air permit may be warranted.

The Title V permit limits the amount of pollutants from significant emission sources in various ways, depending on the source type (e.g., restricting operating hours, fuel type, throughput amount, and emission rates). As part of the Title V permit requirements, APG must monitor and fulfill recordkeeping requirements to document equipment use, fuel type, fuel consumption, etc. Additionally, the permits require APG to complete annual compliance certification reports for the previous calendar year. Table 3.2-3 summarizes the criteria pollutant emissions at APG from 2004 to 2008.

Table 3.2-3. Criteria Pollutant Emissions for APG (2004-2008) (tpy)

Year	NOx	SOx	PM_{10}	CO	VOC
2008	43	38	5	32	9
2007	43	34	4	52	11
2006	34	33	8	49	12
2005	44	49	8	34	10
2004	40	49	13	28	9

Source: MDE, 2009.
NO_x = nitrogen oxides; SO_x = sulfur oxides; PM_{10} = particulate matter less than 10 microns; CO = carbon monoxide; VOC = volatile organic carbon

The Air Quality Planning Program of MDE develops air quality plans, also called State Implementation Plans (SIPs), which are designed to attain and maintain the NAAQS, and to prevent significant deterioration of air quality in areas cleaner than the standards. SIPs include:

- State regulations that USEPA has approved
- State-issued, USEPA-approved orders requiring pollution control at individual companies

- Planning documents, such as area-specific compilations of emissions estimates and computer simulations (modeling analyses), demonstrating that the air meets air quality standards (USEPA, 2011b)

Maryland has individual SIPs for various pollutants, including NO_2, $PM_{2.5}$, 8-hour O_3, regional haze, lead, etc.

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 and $PM_{2.5}$ NAAQS.

The General Conformity Rule (GCR) specifies threshold emissions levels by pollutant to determine the applicability of conformity requirements for a project. For an area in moderate nonattainment for the 8-hour O_3 NAAQS within the O_3 transport region, the applicability criterion is 100 tons per year (tpy) for NO_x and 50 tpy for volatile organic compounds (VOCs) (40 CFR 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 FR 40420).

3.2.1.3 Climate and Greenhouse Gases

Located in Harford County, Maryland, APG has warm summers and can have very cold winters. Average temperatures at APG range from 33.6 degrees Fahrenheit (°F) in January and 77.0°F in July. The warmest month of the year is July with an average maximum temperature of 87.0°F. APG receives an average of 44.2 inches of precipitation per year. The wettest month of the year is September with an average rainfall of 4.5 inches (Idcide, 2014).

Gases that trap heat in the atmosphere are often called greenhouse gases (GHGs). The principal GHGs that enter the atmosphere as a result of human activities are:

- **Carbon Dioxide (CO_2)**: CO_2 enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., the manufacture of cement). CO_2 is also removed from the atmosphere (or “sequestered”) when it is absorbed by plants as part of the biological carbon cycle.
- **Methane (CH_4)**: Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and from decaying organic waste in landfills.
- **Nitrous Oxide (NO)**: Nitrous oxide is emitted during agricultural and industrial activities and from the combustion of fossil fuels and solid waste.
- **Fluorinated Gases**: Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetically made GHGs emitted during a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances. These gases are typically emitted in smaller quantities, but because they are potent GHGs, they are sometimes referred to as High Global Warming Potential gases.

A carbon dioxide equivalent (CO_2-e) is a metric measure used to compare the emissions from various GHGs based upon their global warming potential. CO_2-e are computed by multiplying the weight of the gas being measured (for example, methane) by its estimated global warming potential (which is 21 for methane).

Regulatory Review and Permitting. Currently USEPA has promulgated two regulations that 1) require annual GHG emissions reporting, and 2) add the requirement to address best available control technology (BACT) 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_2-e threshold for permitting purposes (i.e., construction and operation) of 75,000 tpy for modifications and 100,000 tpy for new sources.

Executive Order 13514. EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance,* expands on the energy reduction and environmental performance requirements for Federal agencies identified in EO 13423. The goal of EO 13514 is *to establish an integrated strategy towards sustainability in the Federal Government and to make reduction of GHG emissions a priority for Federal agencies*. The GHG emissions generated directly and indirectly by an entity such as a Federal agency can be classified into "scopes," based on the source of the emissions:

- **Scope 1 emissions** are direct GHG emissions from sources owned or controlled by the entity. Scope 1 includes emissions from fossil fuels burned on site, emissions from owned or leased vehicles, and other direct sources.
- **Scope 2 emissions** are indirect GHG emissions resulting from the generation of electricity, heating and cooling, or steam generated off-site but purchased by the entity, and the transmission and distribution losses associated with some purchased utilities.
- **Scope 3 emissions** include indirect GHG emissions from sources not owned or directly controlled by the entity but related to the entity's activities. Scope 3 GHG emissions sources currently required for Federal GHG reporting include employee travel and commuting, contracted solid waste disposal, and contracted wastewater treatment.

In response to EO 13514 the Department of Defense (DoD) has set the goal to reduce Scope 1 and 2 GHGs by 34 percent and Scope 3 GHGs by 13.5 percent by FY 2020 (DoD, 2010).

3.2.2 ENVIRONMENTAL CONSEQUENCES

An impact to air quality would be considered significant if it were to affect the achievement or maintenance of National Ambient Air Quality Standards. The following sections discuss potential impacts of the No Action and Proposed Action alternatives.

3.2.2.1 No Action Alternative

Selecting the No Action Alternative would result in no impact to air quality and GHGs from existing baseline conditions. No construction would be undertaken and air quality and GHGs would remain consistent with present levels; therefore, no new direct or indirect impacts would occur. Additionally, since the utility upgrade is anticipated reduce the amount of power outages at APG, there would be a reduction in the use of emergency generators. Therefore, the No Action Alternative would not enable the potential indirect beneficial impacts associated with the reduction in stationary source emissions due to the utility upgrade.

3.2.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, the existing electrical infrastructure at both the Aberdeen and Edgewood areas would be upgraded. Short-term minor and long-term negligible adverse effects on air quality could occur as a result of construction and operation of the Proposed Action. The primary source of air emissions would result from construction activities. Operation of the new and upgraded electrical infrastructure would not require any new stationary sources of emissions and would not result in ongoing emissions of GHGs; therefore, impacts would be negligible.

Construction

The analysis of air emissions presented in this section is based on the best available information at the time this EA was prepared. Current construction plans indicate that construction activities would be phased over five years. The phasing of construction ensures reduced construction emissions per year. The analysis presented in this section uses the first two phases of construction at the Aberdeen Area to represent the most conservative estimate of emissions per year, thus depicting the scenario of maximum construction emissions. All other construction phases for both the Aberdeen and Edgewood areas would result in emissions levels below the annual emissions quantified in this analysis.

Estimated Emissions and General Conformity

The general conformity rule applies only to significant actions in nonattainment and maintenance areas. The general conformity rule requires Federal agencies to determine whether their action(s) would increase emissions of criteria pollutants above preset threshold levels (40 CFR 93.153(b)). These *de minimis* (i.e., of minimal importance) rates vary depending on the severity of the nonattainment and geographic location. Because the region is in nonattainment for 8-hour O_3 and the annual $PM_{2.5}$ standards, the air conformity regulations may apply. To determine the Proposed Action's impact under NEPA, all direct and indirect emissions of criteria pollutants have been estimated and compared to the conformity *de minimis* emissions threshold levels. As described in Section 3.2.1.2, 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 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 FR 40420). As presented in Table 3.2-4, the total emissions associated with construction of the utility upgrades are not anticipated to exceed annual applicability threshold levels; therefore, the general conformity regulations do not apply. A detailed breakdown of construction emissions is presented in Appendix B.

Table 3.2-4. Proposed Action Emissions Compared to Applicability Thresholds

Annual Emissions (tpy)							*De Minimis* threshold (tpy)	Would emissions exceed *de minimis* thresholds? (Yes/No)
Activity	**CO**	**NO_x**	**VOC[a]**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**		
Construction[b]	20.9	42.0	5.36	0.07	49.8	5.3	100 (50)[a]	No
Operations	*<none>*							

For an area in moderate nonattainment for 8-hour O3 NAAQS, the applicability criterion is 50 tpy for VOCs (40 CFR 93.153).

a. Construction emissions represent the most conservatively estimated annual emissions from all components of the proposed project.

During construction, reasonable measures should be implemented to prevent unnecessary amounts of particulate matter from becoming airborne. Such precautions would include:

- Use of water for control of dust during construction operations
- Covering open equipment used for conveying or transporting material likely to create objectionable air pollution when airborne
- Promptly removing spilled or tracked dirt or other materials from paved streets

Construction-related emissions would be further reduced through the implementation of industry standard BMPs, including control of vehicle speeds, the minimization or stabilization of exposed areas to reduce wind erosion, the wetting of exposed areas and roads with water or appropriate surfactants, the reduction or elimination of equipment idling time, and the use of properly maintained equipment.

Operations

Since the Proposed Action would not require any new stationary sources of emissions, there would be no direct ongoing GHG emissions from the operation of the new electrical infrastructure. Indirect operational emissions would result from mobile sources of emissions (i.e., vehicle/equipment) during maintenance activities such as ROW maintenance and clearing. It is anticipated that maintenance activities would be minimal and since no new stationary sources of emissions would be added due to the proposed project, operations would have negligible impacts on air quality and GHGs. Furthermore, since the utility upgrade is anticipated reduce the amount of power outages at APG, there would be a reduction in the use of emergency generators. This would result in a reduction in stationary source air emissions at APG and a potential for indirect beneficial impact associated with the utility upgrade.

3.2.3 CUMULATIVE EFFECTS

The Proposed Action would have short-term minor and long-term negligible cumulative effects on air quality. The state of Maryland takes into account the effects of all past and present emissions in the state by maintaining a structure of rules and regulations contained in the SIP. SIPs are regulations and other materials used to meet clean air standards and associated CAA requirements. SIPS include:

- State regulations approved by USEPA
- State-issued, USEPA-approved orders requiring pollution control at individual companies
- Planning documents, such as area-specific compilations of emissions estimates and computer simulations (modeling analyses), demonstrating that the air meets air quality standards (USEPA, 2014b)

The SIPs are designed to prevent air quality deterioration for areas that are in attainment with the NAAQS, and to reduce criteria pollutants emitted in nonattainment areas to levels that will achieve compliance with the NAAQS. No large-scale projects have been identified in Section 3.1.4 that, when combined with the Proposed Action, would threaten the attainment status of the region, would create substantial GHG emissions, or would violate any Federal, state, or local air regulations. Construction activities occurring both regionally and at APG would have a temporary effect on air quality as a result of construction emissions; however, cumulative effects would not be expected to result in emissions levels that could affect regional air quality.

3.2.4 PROPOSED IMPACT REDUCTION MEASURES

Minor short-term and negligible long-term impacts to air quality would be anticipated due to the Proposed Action. However, emissions would be reduced with the implementation of industry standard BMPs, including control of vehicle speeds, the minimization or stabilization of exposed areas to reduce wind erosion, the wetting of exposed areas and roads with water or appropriate

surfactants, the reduction or elimination of equipment idling time, and the use of properly maintained equipment.

In addition, reasonable measures would be implemented during construction to prevent unnecessary amounts of particulate matter from becoming airborne. Such precautions would include:

- Use of water for control of dust during construction operations
- Covering open equipment used for conveying or transporting material likely to create objectionable air pollution when airborne
- Promptly removing spilled or tracked dirt or other materials from paved streets.

3.3 Noise

3.3.1 AFFECTED ENVIRONMENT

3.3.1.1 Noise Overview

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and sensed by the human ear. Noise is defined as any unwanted sound. 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).

The common sound descriptors used to evaluate the way the human ear interprets dB from various sources are as follows:

- **A-Weighted Sound Level**: A measure of noise level designed to reflect the acuity of the human ear, which is less efficient at low and high frequencies than at medium or speech-range frequencies. This descriptor is typically used to evaluate noise from aircraft and ground transportation.
- **Day-Night Sound Level (DNL)**: A method to measure the impact of noise using the A-weighted sound level for a 24-hour period, with an additional 10 dB imposed on the equivalent sound levels for nighttime hours from 2200 to 0700. The DNL will always be higher than the equivalent sound level (defined below) due to the nighttime dB penalty. The DNL is the primary descriptor for military noise, except small arms.
- **A-Weighted Day-Night Level (ADNL)**: A measure of noise that uses the A-weighted sound level with an additional 10 dB penalty added to nighttime noises.
- **C-Weighted Day-Night Level (CDNL)**: A measurement of the peak noise level from impulsive sounds (e.g., blasts). This descriptor is typically used to evaluate noise from large caliber weapons fire and explosives.
- **PK15(met)**: The peak noise level likely exceeded only 15 percent of the time for that type of firing event, factoring in the statistical variations caused by weather (atmospheric conditions). There is an 85 percent certainty that sound from this event would be below the PK15(met). The PK15(met) noise metric is effective for demolition events because it accounts for that the variation of sound levels due to atmospheric conditions.

The adjusted scales are useful for gauging and comparing the subjective loudness of sounds to humans. As shown in Table 3.4-1, the threshold of perception of the human ear is approximately 3 dB. A 5-dB change is considered to be clearly noticeable to the ear, and a 10-dB change is perceived as an approximate doubling (or halving) of the noise level (MPCA, 1999). Table 3.4-2 presents a list of sounds encountered in daily life and their approximate levels in dBA.

Table 3.4-1. Perceived Change in Decibel Level

Change in Sound Level (dB)	Perceived Change to the Human Ear
± 1	Not perceptible
± 3	Threshold of perception
± 5	Clearly noticeable
± 10	Twice (or half) as loud
± 20	Fourfold (4x) change

Source: MPCA, 1999
dB = decibel

Table 3.4-2. Sound Level and Loudness of Typical Noises

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: Liu and Lipták, 1997
dBA = A-weighted sound level in decibels

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, etc.) (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.

3.3.1.2 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. In 1974, the USEPA provided information suggesting that continuous and long-term noise levels in excess of DNL 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 3.4-3.

Table 3.4-3. 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, noise levels emanating from construction or demolition site activities cannot exceed 90 dBA during daytime hours. Noise levels beyond the property line of a source must not cause or permit vibrations severe enough to move objects.

3.3.1.3 Noise Management

The Federal Interagency Committee on Urban Noise (FICUN) developed land use guidelines for areas on and/or near noise-producing activities such as highways and airports. The guidelines were developed based on annual average noise levels and annoyance caused by amplified sound levels. These guidelines were adopted by the U.S. Army in Army Regulation (AR) 200-1, *Environmental Protection and Enhancement* to define Noise Zones resulting from aircraft operations. For other specific noise sources, such as small arms, large-caliber weapons, and demolition activity, the Noise Zone descriptions in AR 200-1 were adjusted to metrics appropriate for assessing the particular type of noise source (APG 2006).

In order to best prevent conflicts between military operations and civilian land use, the Army developed Operational Noise Management Plans (ONMP). These plans are established on a statewide level, called a Statewide Operational Noise Management Plan, and are specific to the Installation, called an IONMP. These noise plans provide the Installation(s) and land use planners with information, strategies, and guidance through items such as noise contour maps and planning strategies to limit noise potential. The noise plans would extend beyond the Installation boundaries, implementing “good neighbor” programs and providing guidance for complaint management public relations.

In accordance with AR 200-1, the APG IONMP defines three noise zones, each representing areas of increasing noise (e.g. Noise Zones I, II, and III), and a more informal zone called the Land Use Planning Zone (LUPZ). Noise impacts are modeled, analyzed, and placed on noise contour maps. The zones are used to readily see which areas are impacted and to what degree. The zones help to create a picture of where sensitive receptors (e.g., schools, residences, and churches) should be placed to reduce adverse impacts, and thus how the zones relate to land use. The following list describes the various Noise Zones, and Table 3.4-4 presents their respective noise levels.

- **Noise Zone I** is acceptable with all noise-sensitive land uses. This zone is usually the furthest zone from the noise source.
- **Noise Zone II** is normally not recommended for noise-sensitive land uses. Noise exposure here is considered significant and the use of land in this zone should generally

be limited to activities such as manufacturing, warehousing, transportation, and resource protection. Residential use is strongly discouraged; however, if the community determines that this land must be used for houses, then specific noise mitigation measures should be incorporated into the design and construction.

- **Noise Zone III** is not recommended with noise-sensitive land uses. The noise level in this area is so severe that no noise-sensitive uses should be considered.
- **Land Use Planning Zone (LUPZ)** is generally acceptable with most noise-sensitive land uses. This zone represents the upper end of Noise Zone I, and is typically used to categorize locations that have a seasonal variability in their operations (or several unusually busy days during certain times of the year). Averaging those busier days over the course of a year effectively dilutes their impact. This zone can signal to planners when complaints might arise.

Table 3.4-4. Noise Limits for Military Noise Zones

		Noise Limits (dB)		
Noise Zone	**Noise Zone Description**	**Aviation (ADNL)**	**Small Arms PK15(met)**	**Impulsive (CDNL)**
LUPZ (Noise Zone II)	Compatible with noise-sensitive land use	60 - 65	N/A	57 - 62
Noise Zone I	Compatible with noise-sensitive land use	<65	<87	<62
Noise Zone II	Normally incompatible with noise-sensitive land use	65 - 75	87 - 104	62 - 70
Noise Zone III	Incompatible with noise-sensitive land use	>75	>104	>70

Source: AR 200-1, APG, 2006

ADNL = A-weighted day-night levels; CDNL = C-weighted day-night levels; dB = decibel, LUPZ = land use planning zone, N/A = not applicable; < = less than; > = greater than

3.3.1.4 Existing Noise Environment

The APG IONMP outlines policies and procedures for mapping and limiting noise impacts from APG to the surrounding communities. Noise at APG may originate from blasts, aircraft, test vehicles, 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 and aircraft noises during over-flights. At 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.

3.3.1.4.1 Mobile Sources of Noise

Mobile sources of noise at APG include traffic noise from Army and civilian vehicles, test vehicles, and aircraft. Aircraft noise at APG is associated with both fixed-wing and helicopter operations. Neighboring residents and facilities may hear aircraft take-off and landing, but there are not enough aircraft operations at APG to generate noise contours outside of the immediate vicinity of the runways. When off of the Installation, the aircraft follow Federal Aviation Administration guidelines and maintain a minimum flight altitude of 500 feet above ground level (AGL) over low density populated areas, and minimum altitude of 1,000 feet AGL over highly populated areas, except when training designates low-level training areas (APG, 2006).

3.3.1.4.2 Stationary Sources of Noise

Stationary sources of noise originate from weapons testing (e.g., artillery firing), explosives demolition, and limited small-unit training. Large caliber weapons firing and explosives can be heard off of the Installation. Blast noise can be heard by residents across the Chesapeake Bay and can cause complaints related to noise and vibrations (APG, 2013a). Weather conditions can vary the level and directionality of noise levels, and APG employs BMPs to avoid conducting high-noise producing operations when weather conditions can amplify or send noise toward sensitive receptors. Small arms activities at APG take place on ranges already contained within Noise Zones II and III from large caliber weapons firing.

3.3.1.4.3 Construction Noise

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

3.3.1.4.4 Off-Post Noise Environment

APG conducted daytime and night time short-term and off-peak measurements in the surrounding communities to achieve baseline data on ambient daytime, peak, and off-peak noise levels. The study found that ambient daytime peak period noise levels varied from 49 to 65 dBA when Amtrak train activity on adjacent tracks increased noise levels. Off-peak noise levels varied from 53 to 63 dBA, with Amtrak and local construction noise contributing to noise levels. Overall, none of the noise levels exceeded the 65 dBA criterion for daytime noise levels. Night-time levels ranged from 47 to 63 dBA, with Amtrak train noise contributing to the highest night-time noise levels. When trains were not passing the area, the night-time sound levels were below the night-time criterion of 55 dBA (APG, 2013a).

3.3.2 ENVIRONMENTAL CONSEQUENCES

Impacts to the noise environment would be considered significant if noise from Army actions caused harm or injury to on- or off-post communities, or exceeded applicable environmental noise limit guidelines. The following sections discuss potential impacts of the No Action and Proposed Action alternatives.

3.3.2.1 No Action Alternative

Under the No Action Alternative there would be no new construction or ground disturbance, and the current electrical infrastructure would be maintained. There would be no change in the existing noise environment, and overall impacts would be negligible.

3.3.2.2 Proposed Action Alternative

3.3.2.2.1 Construction

Minor, short–term, adverse noise impacts would be expected during construction due to site preparations, horizontal directional drilling, construction of new substations and switching stations, demolition activities, vehicle traffic, and other associated construction activities. Individual construction equipment typically generates noise levels of 80 to 90 dBA at a distance of 50 feet; however, multiple pieces of equipment may operate simultaneously, temporarily increasing noise levels during work hours at construction sites. The zone of relatively high

construction noise levels typically extends to distances of 400 to 800 feet from the site of major equipment operations. Locations more than 800 feet from construction sites seldom experience appreciable levels of construction noise. Table 3.4-5 shows sound levels typical of construction activity and equipment that would occur under the Proposed Action. Construction would be phased over five years, and would occur throughout APG. Because of the extent of construction, it is possible that short-term impacts could occur to sensitive receptors on post (e.g., Kirk Army Health Clinic, installation housing, recreational facilities), and residences near the Installation border.

Table 3.3-5. Common Noise Levels Associated with Outdoor Construction

Equipment	Typical Noise Level at 50 feet (dBA)	Noise Level at 500 feet (dBA)	Noise Level at 1,000 feet (dBA)
Ground Clearing	84	64	58
Excavation, Grading	89	69	63
Foundations	78	58	52
Building Construction/Demolition	85	65	59
Finishing	89	69	63
Directional Drilling Rig	82	62	56

Source: Bolt et al. 1971; OregonLNG, 2008
dBA = A-weighted sound level in decibels

Noise generated by construction activities for the electrical upgrades would be naturally attenuated by trees and vegetation, or masked by noise from other man-made activities, such as traffic on adjacent roadways. In addition, sensitive receptors within buildings would experience reduced sound levels between 15 and 30 dBA, depending on whether windows were open or closed and the type of window in the building (APG, 2006). Therefore, it is anticipated that noise levels from construction or demolition site activities would not exceed 90 dBA during daytime hours and would be compliant with COMAR 26.02.03.02. Locations more than 1,000 feet from construction sites would seldom experience noteworthy levels of construction noise. Overall noise impacts would be short-term and temporary.

Vibrations created by trenchless drilling operations could be perceptible to receptors nearby construction sites depending on the distance to the construction site; however, vibration levels would be below limits for potential structural damage.

3.3.2.2.2 Operations

There would be little to no noise generated during operations of the upgraded electrical system as there would be no permanent stationary noise sources constructed. New substations would generate a slight humming noise, but are not anticipated to result in adverse impacts. Based on comparably-sized switching stations, noise levels would be approximately 50 dBA at 50 feet away, which would be slightly quieter than a low conversation (see Table 3.4-2) (NEMA, 2000). Overall noise impacts at APG would decrease with the reduction of the number of substations. Short-term noise could be generated during routine or needed maintenance; however, these events are anticipated to be infrequent and not result in adverse noise impacts.

3.3.3 CUMULATIVE EFFECTS

No projects have been identified in Section 3.1.4 that, when combined with the Proposed Action, would cause harm or injury to on- or off-post communities, or exceeded applicable environmental noise limit guidelines. Localized short-term adverse noise impacts would be anticipated during construction of proposed facilities. Construction of these projects would be phased over time, and would be short term in nature. Overall cumulative adverse impacts to the noise environment would be minor.

3.3.4 PROPOSED IMPACT REDUCTION MEASURES

As previously stated, minor short-term impacts to the noise environment would be anticipated during construction. The following impact reduction measures would be utilized during construction:

- Contractors would limit construction to normal weekday business hours
- Contractors would properly maintain construction equipment mufflers
- Personnel involved with project activities would adhere to hearing protection requirements defined in health and safety plans

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3.4 Biological Resources

3.4.1 AFFECTED ENVIRONMENT

3.4.1.1 Vegetation

APG encompasses over 72,000 acres, 46 percent of which contain the open estuarine waters of the Chesapeake Bay and its tributaries (see Section 3.7, Water Resources). The remaining acreage includes a variety of uplands (35 percent) and wetlands (19 percent) as listed in the National Wetlands Inventory (NWI) (see Section 3.6, Wetlands). Upland areas consist mainly of forest vegetation but also include maintained lawn/landscaped areas, fields, and developed areas with buildings and roads. Vegetation on APG is generally typical of the Atlantic Plain physiographic province. Specifically, terrestrial vegetation communities identified within APG include: upland forest with mature trees, small riparian forests along stream banks and shorelines, reforestation plots, shrubs, fields/grasslands, and mowed and maintained areas near buildings (DOA, 2007). Approximately 90 percent of APG lands were farmland prior to military use; however, forests now cover approximately 15,862 acres of APG, primarily in association with the numerous streams and creeks. Forested areas on APG are largely discontinuous and fragmented by water bodies, wetlands, open fields, and roads (APG, 2009).

Development at APG has largely been concentrated within the Cantonment areas of Aberdeen and Edgewood. As a result, APG has large tracts of undeveloped areas with diverse terrestrial habitats outside of the Cantonment areas. Training and testing activities have resulted in the potential for UXO in many areas. As a result, many previously utilized areas have been allowed to revert to forest. Some forested areas have been made available for timbering; however, only about 2,400 acres (i.e., less than 16 percent of forests) are considered to be of potential commercial use due to widespread UXO concerns. The majority of forestland available for commercial use is located adjacent to Phillips Field and along Old Baltimore Road in the Aberdeen Area. The most common forest type at APG is the sweet gum/red maple association (APG, 2009).

Developed areas including the Cantonment areas of the Aberdeen Area and Edgewood Area consist of existing development and “maintained habitat” (i.e., lawns, fields, and scattered landscaping). Patches of forested habitat also occur within the developed area but are largely fragmented and surrounded by developed or maintained areas (APG, 2009).

Common tree species observed at APG include sweet gum (*Liquidambar styraciflua*), red maple (*Acer rubrum)*, silver maple (*Acer saccharinum)*, flowering dogwood (*Cornus florida)*, green ash (*Fraxinus pennsylvanica)*, American holly (*Ilex opaca)*, red cedar (*Juniperus virginiana)*, pin oak (*Quercus palustris*), hickory (*Carya* sp.), and sassafrass (*Sassafras albidum)*. Common shrubs and understory species include Virginia creeper (*Parthenocissus quinquefolia*), poison ivy (*Rhus toxicodendron)*, Japanese honeysuckle (*Lonicera japonica)*, blackberry (*Rubus fruticosus)*, greenbrier (*Smilax* spp.), and sweet pepperbush (*Clethra alnifolia)*. Abundant species in the grassland areas of APG include broom sedge (*Carex scoparia*), woody reedgrass (*Calamagrostis* spp.), brome species (*Bromus* spp.), and Canada wild rye (*Elymus canadensis)*. Wetlands are dominated by common reed (*Phragmites australis*), sedges (*Carex* spp.), wild iris (*Iris* sp.), cattails (*Typha* spp.), and bulrushes (*Scirpus* spp.) (APG, 2009).

Non-native invasive plant species on APG are found in the upland and wetland areas. Common reed (*Phragmites australis*), which is a perennial grass associated with wetlands, is widespread on APG. Purple loosestrife (*Lythrum salicaria*), an emergent aquatic plant of Eurasian origin, is considered an invasive plant species and is difficult to control. The only known occurrence of purple loosestrife on APG was found along Delph Creek, and the plant(s) were removed;

however, no surveys have been conducted to determine the presence of additional occurrences of purple loosestrife at APG. Other invasive plant species at APG include Japanese stiltgrass (*Microstegium vimineum*), which is a major forest understory invasive species. Shrub species, such as multiflora rose (*Rosa multiflora*), autumn olive (*Elaeagnus umbellata*), and Japanese barberry (*Berberis thunbergii),* are also found in upland vegetation communities within APG (APG, 2009).

Unfragmented forest blocks greater than 100 acres, and riparian forests of at least 300 feet in width, that occur adjacent to stream channels or Chesapeake Bay shoreline at APG are managed in accordance with the Maryland Forest Conservation Act (FCA) and the Critical Area Act (see Section 3.6, Water Resources).

Terrestrial resources for the Aberdeen Area and the Edgewood Area are depicted on Figures 3.4-1 through 3.4-4.

3.4.1.1.1 Submerged Aquatic Vegetation

Submerged aquatic vegetation (SAV) is a diverse group of rooted aquatic plants found in shallow water areas, including the Chesapeake Bay. SAV stabilizes sediments, supplies oxygen to the water column, and provides food and shelter for many organisms. The Virginia Institute of Marine Science conducts annual aerial surveys to determine SAV distribution in the Chesapeake Bay. SAV found within shallow waters of APG include native species: American eelgrass (*Vallisneria americana*), grassleaf mudplantain (*Heteranthera dubia*), claspingleaf pondweed (*Potamogeton perfoliatus*), horned pondweed (*Zannichellia palustris*), Canadian waterweed (*Elodea canadensis*), coon's tail (hornwort; *Ceratophyllum demersum*). Two non-native species (that are also dominant species) are also found: Eurasian watermilfoil (*Myriophyllum spicatum*) and waterthyme (hydrilla; *Hydrilla verticillata*) (APG, 2009).

The distribution and abundance of SAV within the Chesapeake Bay, coastal bays, and tributaries varies from year to year depending upon factors associated with water temperature, wind and wave action, and nutrient and sediment loads from surrounding upland areas. APG monitors SAV as part of a cooperative partnership with a variety of Federal, state, and local agencies (APG, 2009).

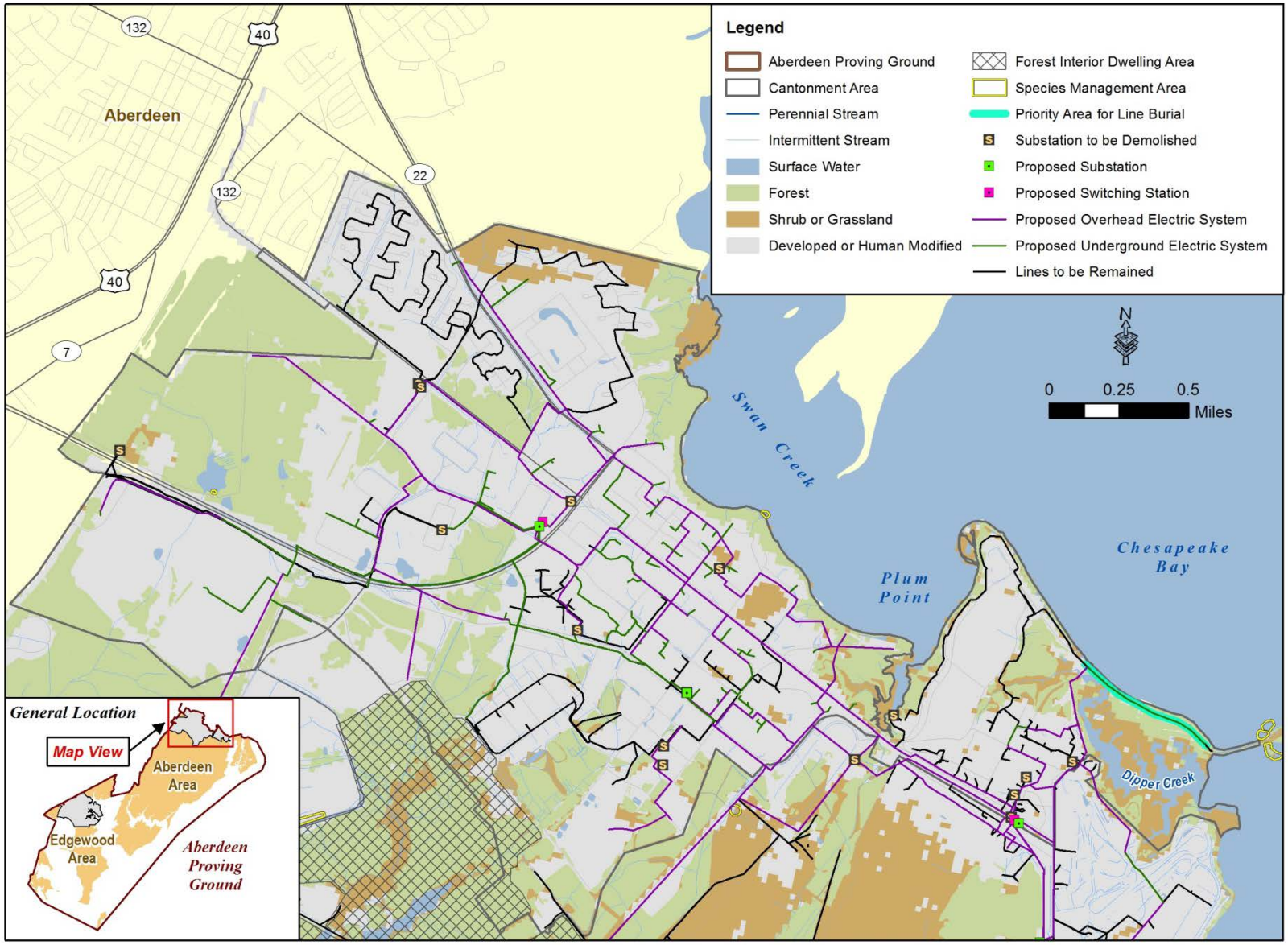

Figure 3.4-1. Aberdeen Cantonment Area Terrestrial Resources

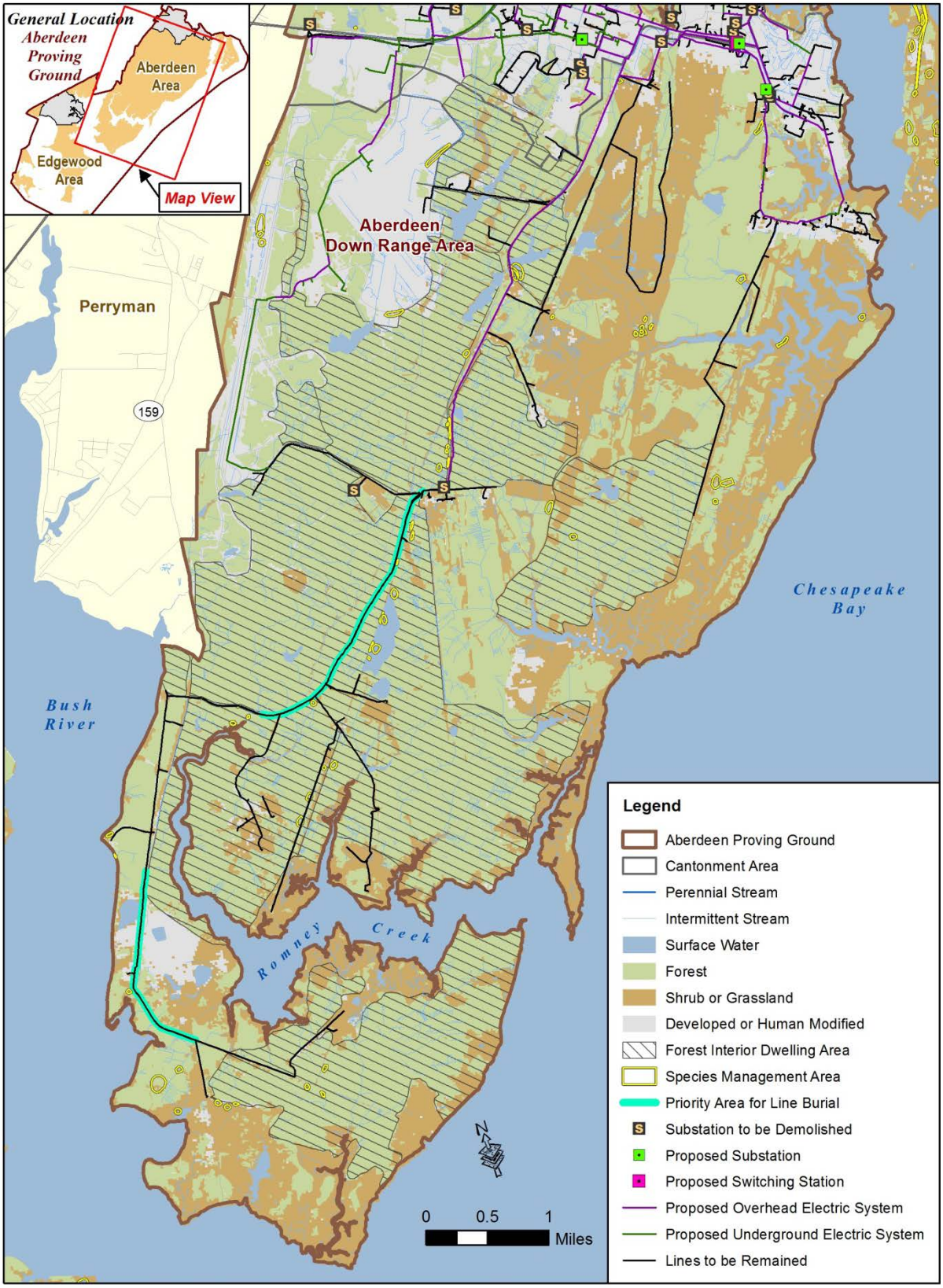

Figure 3.4-2. Aberdeen Down Range Area Terrestrial Resources

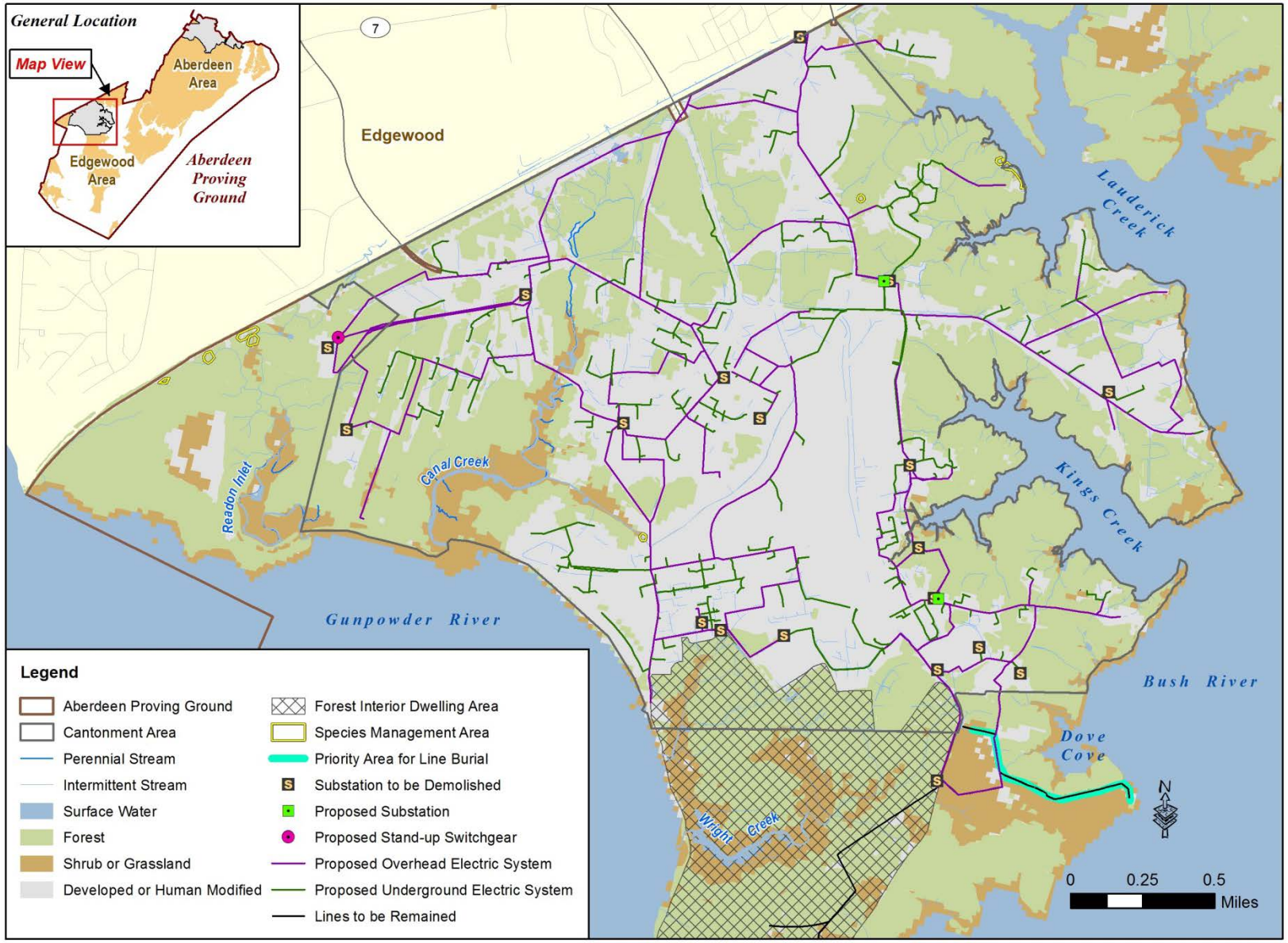

Figure 3.4-3. Edgewood Cantonment Area Terrestrial Resources

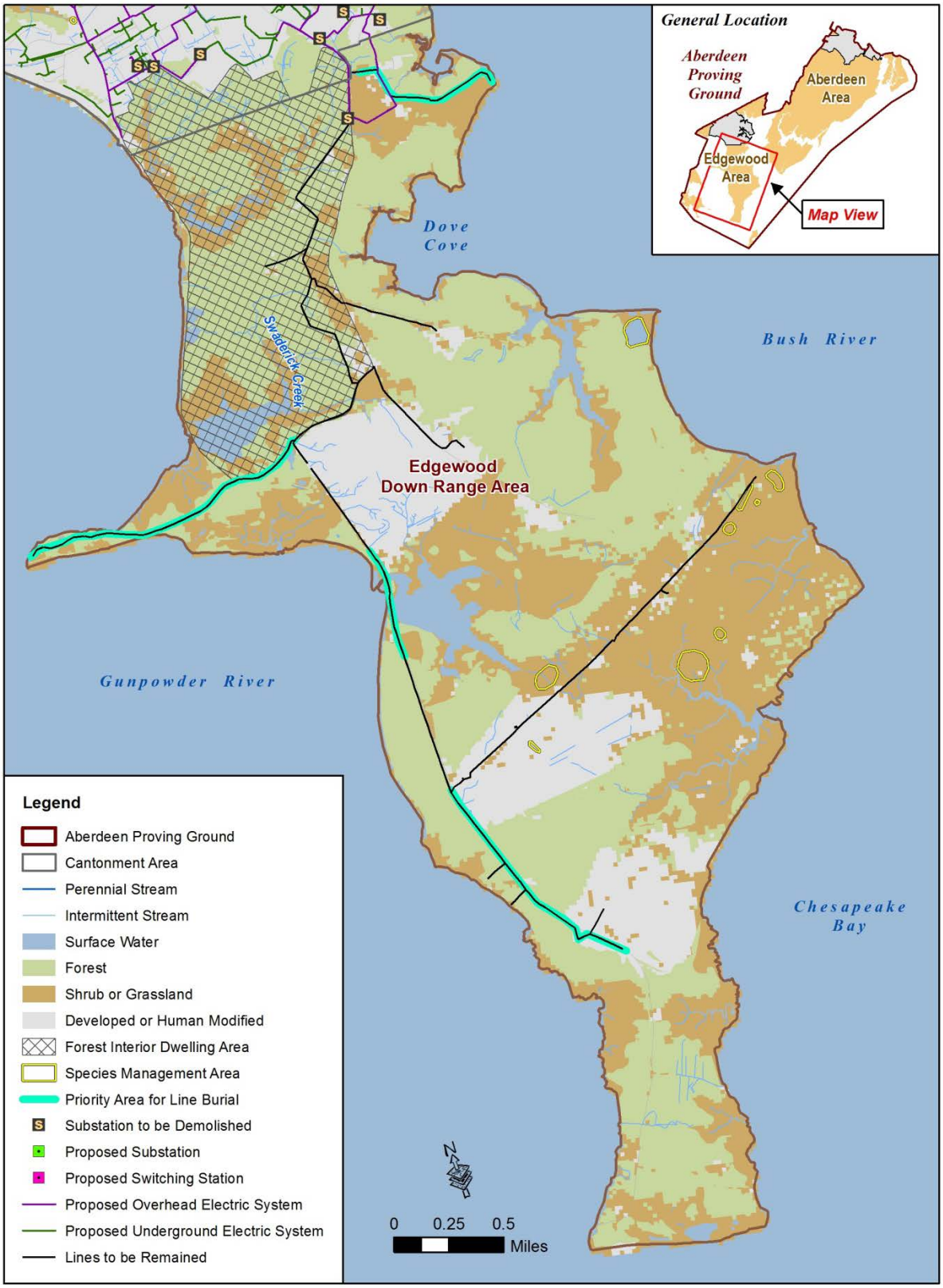

Figure 3.4-4. Edgewood Down Range Area Terrestrial Resources

3.4.1.2 Wildlife and Aquatic Life

Mammals. Suitable habitat for more than 40 mammal species occurs at APG, and 24 species have been reliably recorded within the site. Common mammals found on APG include 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*), groundhog (*Marmota monax*), and beaver (*Castor canadensis*). River otters (*Lontra canadensis*) and small mammals, such as the white-footed mouse (*Peromyscus leucopus*), short-tailed shrew (*Blarina brevicauda*), meadow vole (*Microtus pennsylvanicus*), pine vole (*M. pinetorum*), and chipmunk (*Tamias striatus),* are also common. Coyotes (*Canis latrans*) are also present on the Installation. As is the case throughout much of Maryland, white-tailed deer at APG are overpopulated, which results in human/deer conflicts (e.g., vehicle collisions) and impacts to natural and ornamental vegetation resulting from over-browsing (APG, 2009).

A 2011 survey documented 5 of the 10 possible bat species at APG, including hoary (*Lasiurus cinereus*), big brown (*Eptesicus fuscus*), eastern red (*Lasiurus borealis*), little brown (*Myotis lucifugus*), and tri-colored (*Perimyotis subflavus*). Eastern red bats and big brown bats were detected at nearly all stationary survey points and on all transects. None of the species detected are listed under the ESA; however, the little brown bat is currently undergoing a status review as a result of increased mortality rates caused by White Nose Syndrome and wind energy development (APG, 2013a).

Birds. The diverse habitats at APG and the adjacent waters of Chesapeake Bay support approximately 250 species of birds throughout the year, including 108 species of land birds and 29 species of waterfowl that use the adjacent waters of Chesapeake Bay (APG, 2009). The Installation is located in the upper Chesapeake Bay and Atlantic Flyway, a major bird migratory route. The diverse landscape and large expanses of undeveloped land at APG make it particularly important for a number of bird groups, including waterfowl, colonial water birds, raptors, neotropical migrants, and forest interior dwelling birds. Migratory birds at APG are protected under the Migratory Bird Treaty Act (MBTA), which forbids military installations from the taking of migratory birds intentionally or unintentionally.

Table 3.4-1. Bird Species Observed at APG

Breeding Waterfowl	Canada goose (*Branta canadensis*) Mallard (*Anas platyrhynchos*) American black duck (*A. rubripes*) Wood duck (*Aix sponsa*)[a] Hooded merganser (*Lophodytes cucullatus*)[a]
Colonial Water Birds	Blue heron (*Ardea herodias*) Green heron (*Butorides virescens*)[b] Black-crowned night heron (*Nycticorax nycticorax*) Great egret (*Ardea alba*) Snowy egret (*Egretta thula*)
Neotropical Migratory Birds	Common yellowthroat (*Geothylpis trichas*) Indigo bunting (*Passerina cyanea*) Eastern towhee (*Pipilo erythrophthalmus*) Gray catbird (*Dumetella carolinensis*) White-eyed vireo (*Vireo griseus*) Yellow warbler (*Dendroica petechia*)

Table 3.4-1. Bird Species Observed at APG

	Yellow-breasted chat (*Icteria virens*)[c] Prairie warbler (*D. discolor*)[c] Brown-headed cowbird (*Molothrus ater*)[c] Grasshopper sparrow (*Ammodramus savannarum*) Eastern meadowlark (*Sturnella magna*)
Forest Interior Dwelling Species	Wood thrush (*Hylocichla mustelina)* American redstart (*Setophaga ruticilla)* Worm-eating warbler (*Helmitheros vermivorus)* Kentucky warbler (*Oporornis formosus)* Hooded warbler (*Wilsonia citrina)* Scarlet tanager (*Piranga olivacea)* Hairy woodpecker (*Picoides villosus*) Pileated woodpecker (*Dryocopus pileatus*) Red-headed woodpecker (*Melanerpes erythrocephalus*)
Raptor	American kestrel (*Falco sparverius*) Eastern screech owl (*Megascops asio*) Great horned owl (*Bubo virginianus*) Barred owl (*Strix varia*) Turkey vulture (*Cathartes aura*) Black vulture (*Coragyps atratus*) Osprey (*Pandion haliaetus*) Red-tailed hawk (*Buteo jamaicensis*) Bald eagle (*Haliaeetus leucocephalus*)
Bird Species Common to Cantonment	House sparrow (*Passer domesticus*) House finch (*Carpodacus mexicanus*) European starling (*Sturnus vulgaris*) Common grackle (*Quiscalus quiscula*) American robin (*Turdus migratorius*) Blue jay (*Cyanocitta cristata*) American crow (*Corvus brachyrhynchos*)

a. Nest in tree cavities in wooded swamps and may be particularly vulnerable to tree clearing activities.
b. Documented as breeding.
c. Not observed but habitat present.

APG is a participant in the North American Waterfowl Management Plan and has established approximately 600 acres as the APG Waterfowl Sanctuary System to protect important nesting and feeding areas (APG, 2009).

Colonial water bird habitats at APG include tidal marshes, other wetlands, and shallow waters along shorelines. Isolated riparian forests serve as seasonally important heronry habitat. Heronries have historically been present within APG.

APG conducted an inventory of land birds in 1995 and 1996 that identified over 50 neotropical bird species. The majority of the species identified were associated with forest edges, thickets, and early successional forest habitats.

Large blocks of contiguous forests (i.e., 100 acres or greater with large pole trees) and wide riparian forests (i.e., 300 feet or greater) support forest-dwelling species on APG; however,

these species are generally uncommon, likely due to habitat fragmentation at APG and the surrounding area (APG, 2009). Common raptor species observed at APG use a variety of habitats, from forested areas to open uplands and open water habitats. Many common species that are tolerant of and/or adapted to human activities and habitat are expected to occur within developed areas of APG, During the spring and fall migrations, birds use a variety of habitats and can be found as transients in any area (APG, 2013a).

Bald Eagles. Due to a recovery in population, the USFWS removed the bald eagle from the ESA on 8 August 2007 (USFWS, 2014a). In Maryland, the bald eagle was removed from the state list of threatened and endangered species on 5 April 2010, although it receives Federal protection under the Bald and Golden Eagle Protection Act (BGEPA) and the MBTA. National guidelines for nest site protection that have been adopted by the Federal government also apply to nest sites in Maryland (MDNR, 2014b). APG manages and protects bald eagles in accordance with these Federal regulations, U.S. Army Regulations, and the APG Bald Eagle Management Plan.

APG is located in the upper Chesapeake Bay bald eagle concentration area that supports breeding, migratory, and wintering bald eagle populations. The bald eagle population at APG has been increasing, doubling on average every 5.9 years as of 2010. Approximately 65 nesting territories are located within APG. During the 2012 nesting season, 34 nests were active in the Aberdeen Area, and 16 nests were active in the Edgewood Area. Of these, 47 nests were successful and fledged 93 young. All but one nest were located in relatively undeveloped forest habitat (APG, 2013a). Most nests are located within 1,640 feet of tidal shoreline, and those nests located farther from the shoreline occur within 278 feet of a large wetland (DOA, 2007).

In addition to providing nesting habitat, post-nesting and sub-adult bald eagles converge at APG from breeding populations throughout the southeast and northeast regions of the United States and Canada. Between 2002 and 2012, midwinter surveys identified 117 to 249 bald eagles on APG and at the foraging area along the Susquehanna River downstream of Peach Bottom, Pennsylvania. Communal roosts, where eagles gather and perch overnight, are typically located near major foraging areas, isolated from human disturbance, protected from harsh weather, and have a clear movement corridor between the roost and foraging areas. At APG, year-round roosting locations include Mosquito Creek, Romney Creek, Woodcrest Creek, Coopers Creek, and Sod Run. Many smaller seasonal roosts are also located along wooded shorelines of the Installation. Habitat that supports nesting, roosting, and foraging bald eagles is located within the Cantonment areas of both the Aberdeen Area and the Edgewood Area. Because the number and location of bald eagle nests at APG varies, APG performs an annual assessment of bald eagle habitat and nest activity. Monitoring of bald eagles on the Installation is conducted through surveys and monitoring programs, including land-based and aerial nest surveys, radio telemetry, nest cameras, roost counts, and shoreline surveys (APG, 2009).

The tidal waters and marshes at APG that are generally isolated from human disturbance provide potential foraging habitat for bald eagles. Within the Cantonment areas, foraging areas at APG include the portion of Swan Creek located on the Aberdeen Area and Gunpowder River, Kings Creek, and Lauderick Creek located on the Edgewood Area (DOA, 2007). Eagles forage most intensely within one hour of sunrise, with a smaller peak in foraging activity during the early afternoon. Nesting season for bald eagles extends from 15 December through 15 June, although these dates are flexible and may vary between individual nests. APG implements 500-meter protection zones (buffers) around known nests and roosts. These buffers restrict habitat alteration year-round and limit human activity during the nesting season or roosting hours (dusk to dawn) (APG, 2007a).

Recognizing the potential for mission activities to impact the bald eagle population, APG has consulted informally and formally with the USFWS since the early 1980s. In January 2005, the Army prepared and submitted a Biological Assessment to the USFWS pursuant to ESA Section 7(c) (1) to evaluate the potential effects of activities at APG on the bald eagle. The USFWS issued its Biological Opinion in December 2006, finding that "…actions at APG are not likely to jeopardize the continued existence of the bald eagle" (DOA, 2007). The Biological Opinion grants APG a take allowance for eagle mortalities and nest disturbances that result incidentally from mission activities. Specifically, APG is allowed an average of 6 eagle mortalities per year not to exceed 18 in a 3-year period, and three nest disturbances per year. Under the Biological Opinion, APG is required to comply with specific terms and conditions to reduce eagle mortalities and disturbances. These terms and conditions include burying overhead power lines in select priority areas, installing protective equipment (e.g., diverters, insulators, and excluders) on electrical infrastructure, and conducting long-term biological studies (APG, 2013a).

After the bald eagle was delisted from the ESA, APG was issued a 50 CFR Part 22.28 permit which "grandfathered" in the ESA incidental take allowance under the BGEPA. The permit required continued compliance with the terms and conditions of the Biological Opinion. The USFWS issued this short-term permit to continue the incidental take authorization until a new eagle take permit (and application process) was available. The 50 CFR Part 22.28 permit was renewed in 2011 and expired in 2013. APG has applied for a 50 CFR Part 22.26 programmatic permit which authorizes bald eagle take that is associated with, but not the purpose of, an activity. The programmatic permit will replace the expired 50 CFR Part 22.28 permit and supersede the incidental take allowance, terms, and conditions of the 2006 Biological Opinion. The new permit will authorize a higher incidental take allowance to account for the expanding eagle population at APG. The programmatic permit is expected to be issued in 2015. Until the new permit is issued, APG continues to operate in accordance with the Biological Opinion.

Reptiles and Amphibians. More than 40 species of amphibians and reptiles may occur in streams, ponds, wetlands, and forests on APG (APG, 2009). The most common amphibian species observed at APG are the bullfrog (*Rana catesbeiana*), green frog (*Rana clamitans melanota*), northern cricket frog (*Acris crepitans*), northern spring peeper (*Pseudacris crucifer*), southern leopard frog (*Rana sphenocephala*), American toad (*Bufo americanus*), Fowler's toad (*B. fowleri*), and red-backed salamander (*Plethodon cinereus*). Common reptile species include the spotted turtle (*Clemmys guttata*), eastern mud turtle *(Kinosternon subrubrum*), common snapping turtle (*Chelydra serpentina*), eastern box turtle (*Terrapene carolina carolina*), black rat snake (*Elaphe obsoleta obsoleta*), northern water snake (*Nerodia sipedon sipedon*), and eastern garter snake (*Thamnophis sirtalis*) (APG, 2009).

Presence of amphibians and reptiles within the Cantonment areas is expected to be limited to areas that provide the necessary life requisites for a given species (e.g., wetlands and riparian areas for amphibians). Developed areas are expected to be used by species such as garter snakes and American toads that are tolerant of and/or adapted to human activities and maintained habitats with little diversity.

Fish. The diversity of aquatic habitats, including the presence and abundance of SAV in shallow water areas around APG, provides habitat for approximately 50 species of fish and provides important nursery areas for several commercially and recreationally important fish species (APG 2009). Common freshwater species include largemouth bass (*Micropterus salmoides*), pumpkinseed (*Lepomis gibbosus*), bluegill (*Lepomis macrochirus*), yellow perch (*Perca flavescens*), brown bullhead (*Ameiurus nebulosus*), channel catfish (*Ictalurus punctatus*), white catfish (*Ameiurus catus*), and carp (*Cyprinus carpio*). Estuarine fish species known to occur in open water habitat at or adjacent to APG include bay anchovy (*Anchoa mitchilli*), banded killifish (*Fundulus diaphanous*), and Atlantic silversides (*Menidia menidia*). Anadromous fish (i.e.,

species that live in saltwater and migrate to freshwater to spawn) include American shad (*Alosa sapidissima*), hickory shad (*A. mediocris*), alewife (*A. pseudoharengus*), blueback herring (*A. aestivalis*), striped bass (*Morone saxatilis*), and white perch (*M. americana*). The American eel (*Anguilla rostrata*) is the only catadromous species (i.e., species that migrates from freshwater to saltwater to spawn) known to occur in the waters of APG (APG, 2009).

While blue crabs (*Callinectes sapidus*) are culturally, economically, and ecologically important to the Chesapeake Bay and are found in APG waters, the low salinity of APG waters does not support blue crab spawning (APG, 2009).

3.4.1.3 Threatened and Endangered Species

Protection of rare, threatened and endangered species is regulated by the Endangered Species Act (ESA) and administered by USFWS, National Oceanic and Atmospheric Administration (NOAA) Fisheries, and MDNR. Section 7 of the ESA requires that Federal agencies consult with USFWS, NOAA Fisheries, and the appropriate state agencies to determine if proposed actions may affect listed or candidate species or designated critical habitat.

The primary state law that governs the listing of endangered species is the Nongame and Endangered Species Conservation Act (Annotated COMAR 10-2A-01). The Act is supported by regulations that contain the official State Threatened and Endangered Species list. MDNR's Wildlife and Heritage Service, Natural Heritage Program is responsible for tracking the statuses of native plants and animals that are considered rare in Maryland. In addition, MDNR's Fisheries Service is responsible for maintaining an official list of game and commercial fish species that are designated as threatened or endangered in Maryland (MDNR, 2014a).

For this EA, lists of Federal- and state-listed rare, threatened, or endangered species include species that are known to occur or have the potential to occur because requisite habitat occurs on the Installation. These lists were generated based on species listed by Maryland in COMAR 03.08.08 and species known from inventories and monitoring conducted by the Installation. A total of 7 federally-listed and 15 state-listed species are found or have the potential to occur at APG (MDNR, 2014a). Table 3.5-2 provides a list of known and potential federally-listed threatened, endangered, and protected species at APG, their associated habitat, and the probability of occurrence within the project area. Figures 3.4-1 through 3.4-4 present areas of habitat that support or may support threatened and endangered flora and fauna species within the Aberdeen Area and the Edgewood Area.

The eastern tiger salamander (*Ambystoma tigrinum*) is the only state-endangered amphibian species occurring within APG, while the bog turtle (*Glyptemys muhlenbergii*) is the only state-endangered reptile. State endangered birds at APG include black rail (*Laterallus jamaicensis)* and sedge wren (*Cistothorus platensis*). State-threatened birds at APG include least tern (*Sternula antillarum*) and Henslow's sparrow (*Ammodramus henslowii*). State-endangered plants include prickly hornwort (*Ceratophyllum echinatum*), featherfoil (*Hottonia inflata*), slender blue flag (*Iris prismatica*), Torrey's rush (*Juncus torreyi*), vetchling peavine (*Lathyrus palustris*), slender clubmoss (*Lycopodium caroliniana*), leafy pondweed (*Potamogeton foliosus*), grass-like beakrush (*Rhynchospora globularis*). The lone state threatened plant species found within APG is lowland loosestrife (*Lysimachia hybrida*).

Sixty-two vascular plant species listed by the Maryland Natural Heritage Program and two species under consideration for listing (Delmarva beggarticks [*Bidens bidentoides*] and butternut [*Juglans cinerea*]) have been documented at APG. Surveys documented 40 species growing in appropriate habitats on the Aberdeen Area, of which six are state-listed (prickly hornwort, featherfoil, slender blue flag, vetchling peavine, slender clubmoss, and lowland loosestrife). Twenty species are found on the Edgewood Area, including four state-listed species (prickly

hornwort, slender blue flag, Torrey's rush, and leafy pondweed) (APG, 2013a). Many species are associated with wetland habitats and many of the populations of rare plants at APG were found to be threatened by human activity such as mowing or by the non-native invasive common reed (APG, 2009).

Table 3.4-2. Threatened, Endangered, and Protected Species that Could Occur at APG

Scientific Name	Common Name	Status	Habitat	Potential to Occur Within the Project Area
Mammals				
Myotis sodalis	Indiana Bat	FE SE	Hibernates during winter in caves or abandoned mines. Migrates to wooded areas in spring where it usually roosts under loose tree bark on dead or dying trees.	Potential summer habitat within roost trees near utility alignment.
Birds				
Cistothorus platensis	Sedge Wren	SE	Nests in dense tall sedges and grasses in wet meadows, hayfields, and marshes. Winters in grassy marshes and dry grass fields.	Suitable habitat occurs throughout APG.
Laterallus jamaicensis	Black Rail	SE	Nests in high portions of salt marshes, shallow freshwater marshes, wet meadows, and flooded grassy vegetation.	The most appropriate habitat for black rail is located on Carroll and Spesutie Islands.
Ammodramus henslowii	Henslow's Sparrow	ST	Large, flat fields with no woody plants, and with tall, dense grass, a dense litter layer, and standing dead vegetation.	Potential habitat exists in the Edgewood and Aberdeen areas of APG. One was documented during the 1999 breeding season, but no Henslow's sparrows have been observed since.
Sternula antillarum	Least Tern	ST	Seacoasts, beaches, bays, estuaries, lagoons, lakes, and rivers. Breeds on sandy or gravelly beaches and banks of rivers or lakes.	Most of the APG shoreline does not offer adequate breeding sites because the shoreline is tidal marsh, artificially stabilized with riprap, or only narrow strips of beach. This species was observed on APG in 2001 and 2012, but least terns are not likely to inhabit the Proposed Action area.

Table 3.4-2. Threatened, Endangered, and Protected Species that Could Occur at APG

Scientific Name	Common Name	Status	Habitat	Potential to Occur Within the Project Area
Reptiles				
Glyptemys muhlenbergii	Bog Turtle	SE	Freshwater bogs, fends, wet meadows, marshes, spring seeps, and wet cow pastures that are periodically flooded and have patches of grassy vegetation.	Potential habitat only occurs on the Churchville Test Area. No bog turtles are likely to inhabit the project area.
Amphibians				
Ambystoma tigrinum	Eastern Tiger Salamander	SE	Sandy pine barrens areas with temporary or permanent pools for breeding.	This species was released on APG in the 1970s as part of a cooperative partnership with John Hopkins University. No individuals have been observed since the release.
Fish				
Acipenser brevirostrum	Shortnose Sturgeon	FE SE	Freshwater and low-salinity estuaries in winter; river channels in the spring when they migrate to the middle reaches of tidal rivers to spawn.	Potential to occur in adjacent waterways; however, irregularly found in Chesapeake Bay waters adjacent to APG.
Acipenser oxyrinchus	Atlantic Sturgeon	FE	Subadults and adults live in coastal waters and estuaries when not spawning (i.e., resting), in shallow (32 to 164 feet depth) nearshore and areas dominated by gravel and sand substrates.	Potential to occur in adjacent waterways; however, no documented occurrence of Atlantic sturgeon in the Chesapeake Bay in the vicinity of APG.
Etheostoma sellare	Maryland Darter	FE SE	Specialized habitat of streams with swift riffles.	Unlikely to occur in project area. Never documented on APG. May be extinct according to several authorities.
Insects				
Cicindela dorsalis dorsalis	Northeastern Beach Tiger Beetle	FT SE	Along Atlantic coast from Cape Cod to central New Jersey and within beaches along the Chesapeake Bay.	Unlikely to occur. 1997 survey concluded that no population exists on APG.
Cincindela puritana	Puritan Tiger Beetle	FT SE	Connecticut and the Chesapeake Bay.	Unlikely to occur. 1997 survey concluded that no population exists on APG.

Table 3.4-2. Threatened, Endangered, and Protected Species that Could Occur at APG

Scientific Name	Common Name	Status	Habitat	Potential to Occur Within the Project Area
Shellfish				
Alasmidonta heterodon	Dwarf Wedge mussel	FE SE	Freshwater mussel found on muddy sand, sand, and gravel bottoms in creeks and rivers of various sizes where it requires areas of slow to moderate current with good water quality and little silt deposition.	Could potentially occur in adjacent waterways.
Plants				
Ceratophyllum echinatum	Prickly Hornwort	SE	Quiet waterways with soft water and a low pH.	Could potentially occur in waterbodies within APG.
Hottonia inflata	Featherfoil	SE	Swamps, ditches, and shallow ponds with relatively stable water levels.	Could potentially occur in waterbodies within APG.
Iris prismatica	Slender Blue Flag	SE	Marshes, shores, or meadows along the coast.	Could potentially occur in waterbodies within APG.
Juncus torreyi	Torrey's Rush	SE	Wet prairies, prairie swales, sloughs, borders of ponds and streams, and roadside ditches.	Could potentially occur in waterbodies within APG.
Lathyrus palustris	Vetchling Peavine	SE	Wet meadows and marshes.	Could potentially occur in waterbodies within APG.
Lycopodium caroliniana	Slender Clubmoss	SE		Could potentially occur in waterbodies within APG.
Potamogeton foliosus	Leafy Pondweed	SE	Spring-fed streams, slow-moving creeks, ponds, sheltered areas of lakes, drainage canals, and ditches that contain water during most of the year.	Could potentially occur in waterbodies within APG.
Rhynchospora globularis	Grass-Like Beakrush	SE	Upland prairies, sandy and rocky stream banks, sink-hole ponds, open rocky or sandy areas.	Unlikely due to lack of suitable habitat.

Table 3.4-2. Threatened, Endangered, and Protected Species that Could Occur at APG

Scientific Name	Common Name	Status	Habitat	Potential to Occur Within the Project Area
Lysimachia hybrida	Lowland Loosestrife	ST	Wetlands, wet meadows, riverbanks, and pond edges.	Could potentially occur in waterbodies within APG.

FE = federally-endangered; FT = federally-threatened; SE = state-endangered; ST = state-threatened

As shown in the table, the only federally-listed species with the potential for occurrence within the project area is the Indiana bat. The USFWS recognizes “suitable habitat" for Indiana bats. Suitable winter habitat (hibernacula) is restricted to underground caves and cave-like structures (e.g., abandoned mines, railroad tunnels); none of which are known to be present within the Proposed Action project area. Suitable summer habitat for Indiana bats consists of the variety of forested/wooded habitats where they roost, forage, and travel; forested blocks, linear features such as wooded fencerows, riparian forests, and other wooded corridors are all suitable summer habitat. Suitable summer habitat varies from dense to loose aggregates of trees with variable amounts of canopy closure (USFWS, 2014b).

3.4.2 ENVIRONMENTAL CONSEQUENCES

Impacts to biological resources would be considered significant if Army actions resulted in: long-term loss, degradation, or loss of diversity within unique or high-quality (e.g., riparian) plant communities, unpermitted “take” of federally-listed species, local extirpation of rare or sensitive species not currently listed under the ESA of 1973, unacceptable loss of critical habitat as determined by the USFWS; or violation of the MBTA or BGEPA. The following sections discuss potential impacts of the No Action and Proposed Action alternatives.

3.4.2.1 No Action Alternative

Under the No Action Alternative there would be no new construction, and faunal and floral populations and habitat would remain unchanged over existing conditions. No new direct or indirect impacts to biological resources would occur.

3.4.2.2 Proposed Action Alternative

Impacts to Vegetation

Overall, adverse impacts from the proposed utility upgrades would be minor. Table 3.4-3 estimates the likely vegetation impacts resulting from all components of the Proposed Action. Acreages of forest removal in Table 3.4-3 represent a conservative estimate based on aerial imagery and landcover data. For example, forest removal acreage estimates in locations where existing ROW would be expanded to accommodate parallel lines are likely exaggerated by the tree canopy and drip line extending into the existing ROW, which is non-forested. Actual amounts of forest removal would be determined during the forest stand delineation and forest management and conservation planning stages.

Table 3.4-3. Impacts to Vegetation under the Proposed Action

	Aberdeen Area	Edgewood Area	Total	Aberdeen Area			Edgewood Area		
				Forest	Shrub and Grassland	Developed or Human Modified	Forest	Shrub and Grassland	Developed or Human Modified
				acres	acres	acres	acres	acres	acres
New OH Line (miles)	1	7.7	8.7	0.3	0	2.6	2.1	0	19.2
New UG Line Cut & Fill (miles)	4.4	0	4.4	0.4	0.2	8.0	0	0	0
New UG Line directional drilled (miles)	5.1	13.1	18.2	0.6	0.8	19.9	4.5	0	47.6
New OH Line parallel to existing Right-of-Way (miles)[1]	15.5	15.5	30.7	2.5	1.2	49.5	10.9	0.1	45.0
New UG Line parallel to existing Right-of-Way Cut & Fill (miles)[1]	0	1.2	1.2	0.4	0.2	8.0	0	0	0
New UG Line parallel to existing Right-of-Way directional drilled (miles)[1]	3	4.5	7.5	1.6	1	10.9	1.6	0	21.6
Reconductored OH Line (miles)	19	12.5	31.5	N/A	N/A	N/A	N/A	N/A	N/A
Reconductored UG (miles)	15.3	1	16.3	0.1	0.6	17.5	0.1	0	2.4
Reconductored UG Cut & Fill Line (miles)	0	0	0	0	0	0	0	0	0

Of the 125.4-acre Aberdeen Area project footprint, 115.3 acres are already developed or have been substantially altered or disturbed by anthropogenic activity. The remaining 10.1 acres include approximately 4.1 acres of shrubland or grassland and approximately 5.9 acres of forest. At the Edgewood Area, 123.9 acres of the 143.8-acre project footprint that could be disturbed by the Proposed Action have already been developed or otherwise substantially altered by human activity. The remaining land includes 0.9 acres of shrubland or grassland and 19.2 acres of forest. Forest disturbed during the installation of new overhead or underground lines would be permanently converted to grassland in order to create the required ROWs, representing a long-term loss. Grass or shrubs disturbed during the construction phase of the Proposed Action would recover during the long-term operation of the utility lines; this recovery would be aided by revegetation efforts following ground disturbance.

The total of 25.1 acres of forested land permanently lost during implementation of the Proposed Action represents only a minor long-term adverse impact to the overall installation area of over 72,000 acres. Of the 25.1 acres of forest removal, approximately 5.5 acres are located within the Chesapeake Bay Critical Area, while the remaining 19.6 acres are located outside of the 1,000-foot Critical Area. Clearing of forest outside of the Chesapeake Bay Critical Area (see Section 3.7 regarding the Critical Area Act) would be subject to the Maryland FCA as the project will require construction and grading over 40,000 square feet. Prior to implementation of each project phase, a forest stand delineation would be conducted and a forest conservation plan would be prepared in areas where forest removal would occur. The forest conservation plan would identify areas of forest retention and detail types of protective devices to be used during construction activities to protect trees and areas of forest designated for conservation. Forest clearing within the Chesapeake Bay Critical Area will require preparation of a Critical Area Management Plan and reforestation within the Critical Area at a 1:1 ratio, or up to 5.5 acres. Maryland FCA requirements will also require reforestation, likely at a 1:1 ratio or up to 19.6 acres.

Existing ROWs, as well as new ROWs created by the Proposed Action, are maintained and mowed so that vegetation consists of perennial grasses below a high of 6 inches. As such, grassland disturbed by implementation of the Proposed Action would recover and remain as grassland, but would be maintained and shift to the “Developed or Human Modified” category of Table 3.4-3. The habitat would remain available for small mammals and birds, but would be subject to human activity during the long-term maintenance of the ROW. Disturbance of existing grassland or existing ROW areas would represent only negligible short- and long-term impacts to vegetation.

Impacts to Wildlife and Aquatic Life

Implementation of the Proposed Action would have only negligible adverse impacts to existing wildlife populations within the APG. Vegetation removal during the creation of new ROWs would require the use of vehicles and heavy machinery; any incidental losses of wildlife during this process would not seriously reduce regional wildlife population levels. Larger, more mobile species would likely avoid the construction areas altogether.

Wildlife species inhabiting proposed construction footprints, including migratory birds, would be displaced. This impact would be negligible and temporary, because wildlife is mobile and would return to the area at the conclusion of construction activities. In order to protect migratory birds, tree removal would only occur outside of the nesting period (i.e., February through August) in accordance with the MBTA. As the majority of the Proposed Action would occur within or adjacent to existing maintained ROWs, local wildlife would already be accustomed to the presence of humans during maintenance (i.e., disturbance) activities. Vegetation losses resulting from construction would represent habitat losses for terrestrial wildlife currently utilizing

the herbaceous and forested habitats onsite. Onsite habitats currently experience ongoing levels of human disturbances (e.g., noise, vehicular movement, and general human presence and activity), which have likely resulted in some degree of avoidance of the area by wildlife. The movement and use of construction vehicles and equipment could cause accidental mortality of relatively small, less mobile species via collisions. None of the aforementioned impacts would result in any population level effects or losses of habitat critical to the survival of any wildlife species. While wildlife impacts that occur during the construction phase of the Proposed Action would be short-term and temporary in nature, limited areas of forested habitat conversion and the ongoing disturbance of ROWs through maintenance and mowing activities would represent long-term negligible impacts.

The proposed overhead lines would be installed in a vertical configuration, as opposed to the horizontal configuration currently seen across the Installation. The vertical configuration reduces line-to-line contacts during large bird landings on a power line. This in turn reduces the potential for bird mortality from this type of contact and reduces the potential for unplanned power outages from faulting. Vertical configuration, however, would increase the vertical plane of power lines and could increase the potential for unintentional bird strikes during flight and associated injuries or mortality. Potential injuries and electrocutions of bald eagles caused by contact with electrical lines and infrastructure would be reduced through the use of appropriate avian protective equipment (suspended line markers or "flappers"; insulating covers on wires, conductors, cutouts and bushings; and elevated perches). Identified priority areas for electrical line burial (i.e., areas where bald eagle mortality has already occurred due to collisions with electrical lines) occur within the Proposed Action. Approximately 0.5 mile of new underground line is proposed to replace existing overhead lines within the priority line burial areas; an additional 6.4 miles of electrical line occur within priority areas, but the lines would remain “as is” and would not be altered by the implementation of the Proposed Action. As the 0.5 mile of new underground line occurring within priority areas would replace overhead line, this would reduce the overall amount of overhead electrical line within APG, lower the risk of bald eagle mortality due to striking electrical lines, and result in a minor positive impact on local bald eagles. APG would comply with the guidelines of the BGEPA by maintaining proper buffers around known nest and roost sites during construction.

As discussed in Section 3.7, Water Resources, the Critical Area Act protects land within 1,000 feet of the mean high water line of tidal waters, the Chesapeake Bay, and its tributaries. Other stipulations of this act include protecting colonial bird nesting sites within the Critical Area during the breeding season (i.e., April through mid-September) to protect the habitat of interior forest dwelling bird species. APG would adhere to the Critical Area Act; construction activities occurring within the 1,000-foot buffer surrounding the Chesapeake Bay and its tributaries (i.e., the Critical Area) would not take place during the nesting season. As such, potential adverse impacts to colonial nesting bird species would be avoided. The Proposed Action does not involve forest clearing within identified interior forest dwelling bird habitat (see Figures 3.4-1 through 3.4-4); no impacts to interior forest dwelling bird habitat would occur.

Impacts to Threatened and Endangered Species

As summarized in Table 3.4-2, the only federally-listed species with the potential for occurrence within the project area are the Indiana bat and dwarf wedge mussel. However, the dwarf wedge mussel is not likely to experience adverse impacts due to its habitat. This species lives in creeks and rivers, which would be avoided by the Proposed Action through the use of horizontal directional drilling. Construction activities would result in the clearing of mature trees which could provide suitable roosting habitat for Indiana bats. In order to avoid impacts to roosting

maternity colonies, the following avoidance and minimization mitigation measures are recommended:

- Cutting of suitable forested areas should be avoided between April 1 and October 15 to avoid direct impacts to maternity colonies. If a forested area has to be cut during this time frame, a habitat survey should be conducted by a qualified biologist familiar with the biology of the Indiana bat and its habitat requirements. If no suitable habitat exists, the area could be timbered.
- If surveys determine suitable habitat does exist, clearing should be avoided until a time when the bats are not present (October 16 through March 31) to avoid direct impacts to maternity colonies.

State-listed species potentially inhabiting the APG include the sedge wren, black rail, and the nine identified species of wetland plants (see Table 3.4-2). The sedge wren nests in wet meadows and marshes; wetland areas occurring within areas intersecting the Proposed Action would be avoided through the use of horizontal directional drilling. Such drilling techniques would also avoid impacting wetland plants. The most suitable black rail habitat within the APG occurs on Spesutie Island. Potential habitat areas fall within the Chesapeake Bay Critical Area, so impacts to this species would be avoided through adherence to the rules set forth in the Critical Area Act.

As such, no impacts or negligible impacts to protected species would result from implementation of the Proposed Action. Any potential impacts would be reduced or avoided by complying with existing regulations and implementation of BMPs.

3.4.3 CUMULATIVE EFFECTS

Overall, the Proposed Action's contribution to cumulative impacts would be minor and consist of vegetation and associated habitat loss. The projects presented in Table 3.1-2, in combination with the Proposed Action, would not be anticipated to result in a cumulative significant adverse impact to biological resources. Minor cumulative adverse impacts would be anticipated.

3.4.4 PROPOSED IMPACT REDUCTION MEASURES

As discussed within this section, no significant impacts to biological resources are anticipated. To reduce adverse impacts to biological resources, all temporary construction-related disturbances would be revegetated with appropriate native species according to the INRMP. The following avoidance and minimization mitigation measures would be implemented to reduce or prevent impacts to biological resources:

- An approved Forest Conservation Plan and Critical Area Management Plan would be required for the removal of up to 25.1 acres of forest within APG. A 1:1 ratio of reforestation will be required for forest removed.
- In order to protect migratory birds, tree removal would only occur outside of the nesting period (i.e., February through August) in accordance with the MBTA.
- Forest removal within the Chesapeake Bay Critical Area would be avoided during the colonial bird breeding season (i.e., April through mid-September) to protect nesting sites.
- Construction within the 500-meter protection zones (buffers) established by APG to minimize impacts to eagle nests and roosts would be avoided during the nesting season (December 15 through June 15) and peak roosting hours (dusk to dawn)
- Cutting of suitable forested areas should be avoided between April 1 and October 15 to avoid direct impacts to Indiana bat maternity colonies. If a forested area has to be cut during this time frame, a habitat survey should be conducted by a qualified biologist familiar with

the biology of the Indiana bat and its habitat requirements. If no suitable habitat exists, the area could be timbered.

- If surveys determine suitable habitat does exist, clearing should be avoided until a time when the bats are not present (October 16 through March 31) to avoid direct impacts to maternity colonies.
- Installation of appropriate avian protective equipment (suspended line markers or "flappers"; insulating covers on wires, conductors, cutouts and bushings; and elevated perches) to minimize potential of bird injuries and electrocutions from contact with electrical lines and infrastructure.

3.5 Wetlands

3.5.1 AFFECTED ENVIRONMENT

3.5.1.1 Regulatory Framework

Wetlands are defined as lands that transition between terrestrial and aquatic systems, where the water table is usually at or near the surface, or the land is covered by shallow water at a frequency and duration adequate to support hydrophytic vegetation (Cowardin et. al. 1979). Specifically, three indicators are used to identify wetlands: wetland hydrology, hydric soil, and hydrophytic vegetation.

Under the authority of Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act, the USACE regulates activities in wetlands that are waters of the United States. The Baltimore District of the USACE issued Maryland State Programmatic General Permit-4 (MDSPGP-4) in October 2011; this permit authorizes work in waters of the United States within the state of Maryland, so long as the activities would cause no more than minimal adverse environmental effects. MDSPGP-4 applies a maximum threshold (Category B) of the discharge of dredged or fill material and/or the placement of structures, including all attendant features, which individually and/or cumulatively result in direct or indirect impacts not to exceed 1.0 acre or 2,000 linear feet of waters of the United States. As MDSPGP-4 is designed to authorize certain activities covered by the Nationwide Permit program and institute a streamlined USACE regulatory process, the USACE has suspended many of the Nationwide Permits which are applicable to activities qualifying for MDSPGP-4 authorization. This includes Nationwide Permit #12, Utility Line Activities. MDSPGP-4 authorizes activities including the construction, maintenance, repair, and removal of utility lines and associated facilities in waters of the United States, provided such activities adhere to permit requirements.

In addition, EO 11990 *Protection of Wetlands,* directs Federal agencies to provide leadership and take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities. Federal agencies must also avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds that: (1) there is no practicable alternative to such construction, and (2) the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use.

MDE also regulates activities in wetlands under authority of the Tidal Wetlands Act and the Non-tidal Wetlands Protection Act. Under the Tidal Wetlands Act, MDE manages tidal wetlands to provide reasonable use while furnishing essential resource protection through regulating filling of open water and vegetated wetlands; construction of piers, bulkheads, and revetments; dredging; and marsh establishment. The Non-tidal Wetland Protection Act protects against overall net loss of non-tidal wetland acreage and function. To achieve this, MDE regulates grading or filling, excavating or dredging, changing existing drainage patterns, disturbing the water level or water table, and destroying or removing vegetation within non-tidal wetlands or the associated 25-foot buffer. Applicants proposing to conduct a regulated activity in wetlands or within a 25-foot buffer must submit a joint Federal/state permit application to MDE and obtain a state wetlands permit, a state water quality certification, and a Federal Section 401/404 permit. Applicants must demonstrate that the proposed action is water-dependent or has no practicable alternative, and that the regulated activity will first avoid and then minimize impacts to non-tidal wetlands. Wetlands that are destroyed during development must be mitigated (i.e., new wetlands must be created or existing wetlands restored or enhanced). The Critical Area Act acknowledges that the land immediately surrounding the Chesapeake Bay and its tributaries

has the greatest potential to affect its water quality and wildlife habitat, including wetlands. The Critical Area Act aims to protect riparian areas within the 1,000-foot Critical Area by regulating and restricting land development. The Act also establishes a 100-foot Critical Area buffer landward from the mean high water line of tidal waters, tributary streams, and tidal wetlands (See Sections 3.5, Biological Resources, and 3.7, Water Resources).

DoD and USEPA maintain a cooperative agreement concerning Chesapeake Bay activities that requires the DoD to identify, protect, enhance, restore, and create wetlands. The DoD and Army are signatory partners in the Chesapeake Bay Program. The Chesapeake Bay Program's agreement, *Chesapeake 2000*, calls for signatories to restore an overall total of 30,000 acres of tidal and non-tidal wetlands by 2025 within the Chesapeake Bay basin. As of 2012, 18 percent of the restoration goal had been achieved (Chesapeake Bay, 2014).

3.5.1.2 APG Tidal and Non-Tidal Wetlands

Topographical relief of APG is relatively low (i.e., approximately 0 to 70 feet mean sea level) with a relatively shallow water table. The USFWS NWI mapping identifies a variety of wetlands that cover an estimated 13,600 acres of land area at APG (34.5 percent of the land area at APG), including both non-tidal and tidal wetland areas. Non-tidal wetlands are scattered throughout the Installation: along creeks and drainages, in natural depressions, and on poorly drained soils. The total area covered by non-tidal wetlands is approximately 6,434 acres (APG, 2009). Tidal wetlands at APG total approximately 7,152 acres along 103 miles of tidal shoreline, including along the Chesapeake Bay, Bush River, and Gunpowder River.

The most common type of wetlands on APG is emergent wetlands that may be tidal or non-tidal; these wetlands may be dominated by either herbaceous, shrub, or forested vegetation communities. Irregularly flooded tidal emergent wetlands are flooded by high "spring" tides and storms. Non-tidal emergent wetlands include wet meadows and herbaceous areas in ponds, streams, and marshes. Emergent wetlands are dominated by persistent herbaceous vegetation, such as cattail species (*Typha* spp.) and common reed (*Phragmites australis*). Species present within scrub-shrub wetlands include groundsel bush, wax myrtle species, dewberry, and Japanese honeysuckle. Common tree species found within forested wetlands at APG include red maple, sweetgum, willow oak, American elm, ash species (*Fraxinus* spp.), pin oak, and swamp chestnut oak (APG, 2009).

APG has identified management areas for special flora species, many of which are associated with wetland habitats (see Section 3.5, Biological Resources).

APG wetlands have been mapped by the Installation, USFWS (NWI mapping), and the Maryland Department of Natural Resources (State Wetland Mapping). These data sources rely on aerial mapping classifications and inventories, and are based on the interpretation of aerial photography and limited ground-truthing surveys. This is an acceptable method for general planning purposes; however, detailed wetland delineations in accordance with USACE methods are necessary for potential development areas to accurately identify, classify, and map jurisdictional wetlands for regulatory permitting requirements (APG, 2009).

A wetland and waters identification and delineation report has prepared as a part of the Proposed Action within the proposed utility alignments to verify and characterize the presence of wetlands within the project area (see Appendix D). Results of the study and delineation identified approximately 4.3 acres of wetlands, primarily emergent, and approximately 1 acre of wetlands are located within areas of new line construction. Figures 3.5-1 through 3.5-4 show both general GIS wetland mapping and those wetland areas field-delineated as part of the wetland and waters identification and delineation study. Appendix D contains additional detail on field-delineated wetlands.

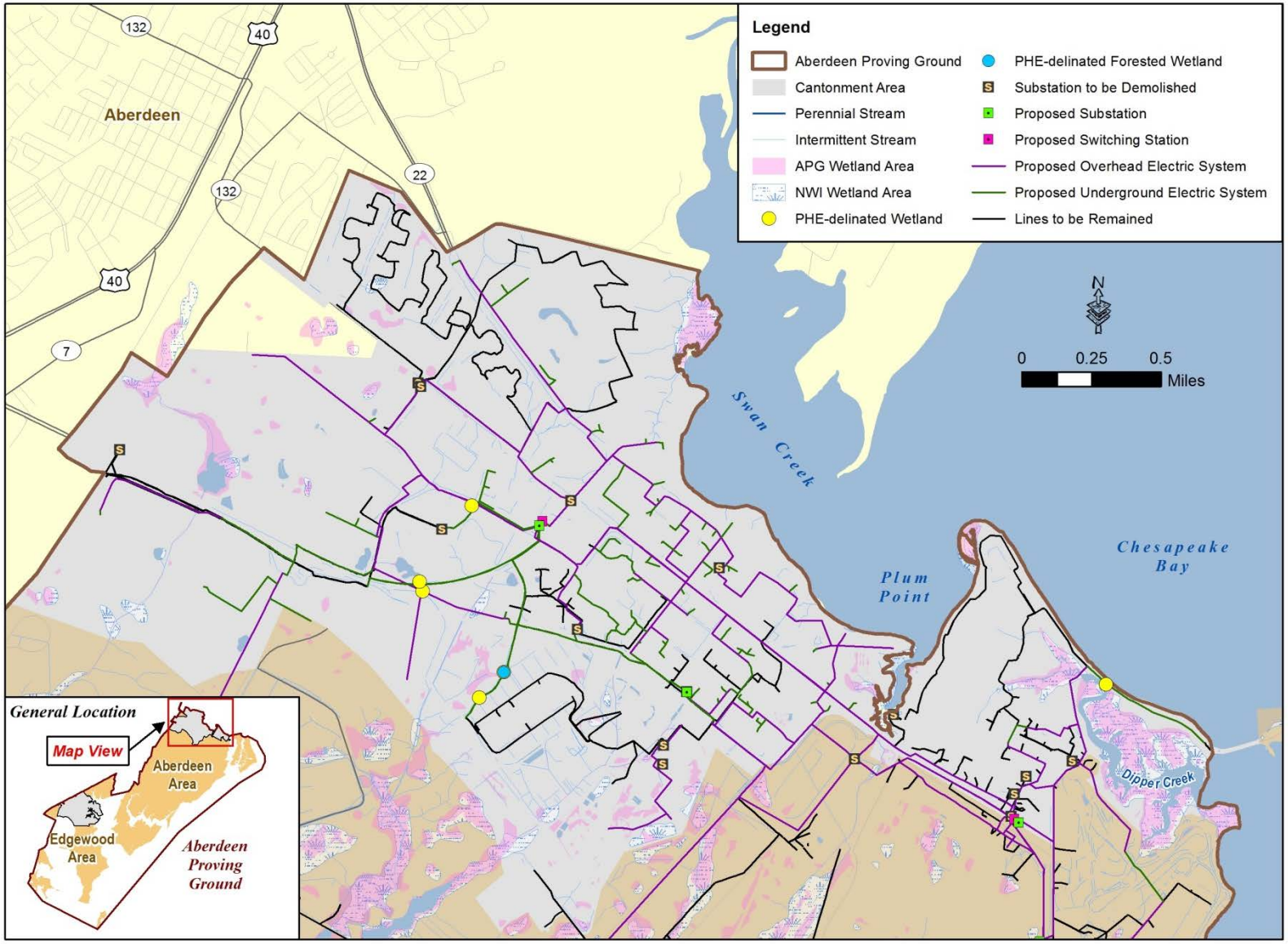

Figure 3.5-1. Aberdeen Cantonment Area Wetlands

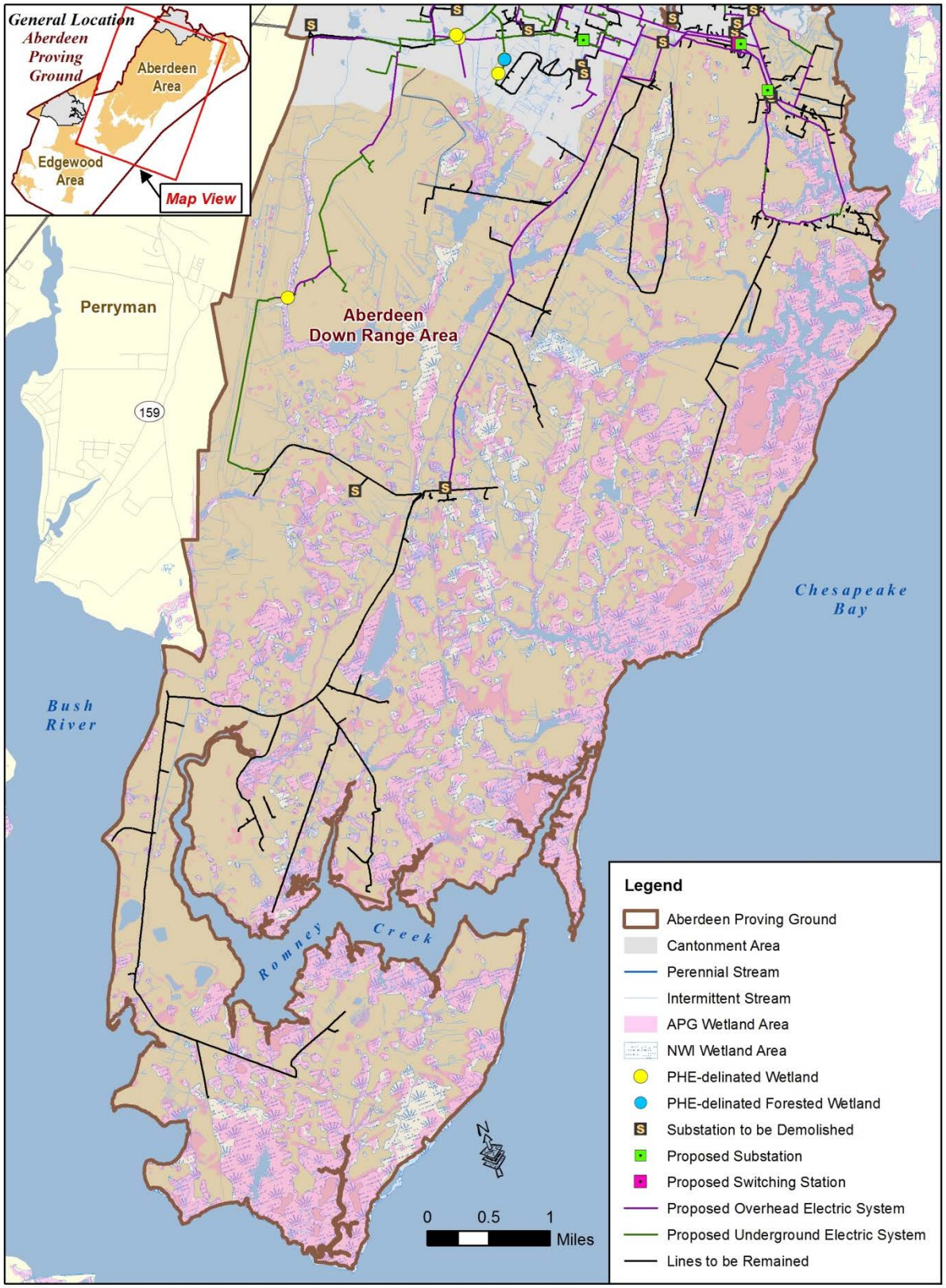

Figure 3.5-2. Aberdeen Down Range Area Wetlands

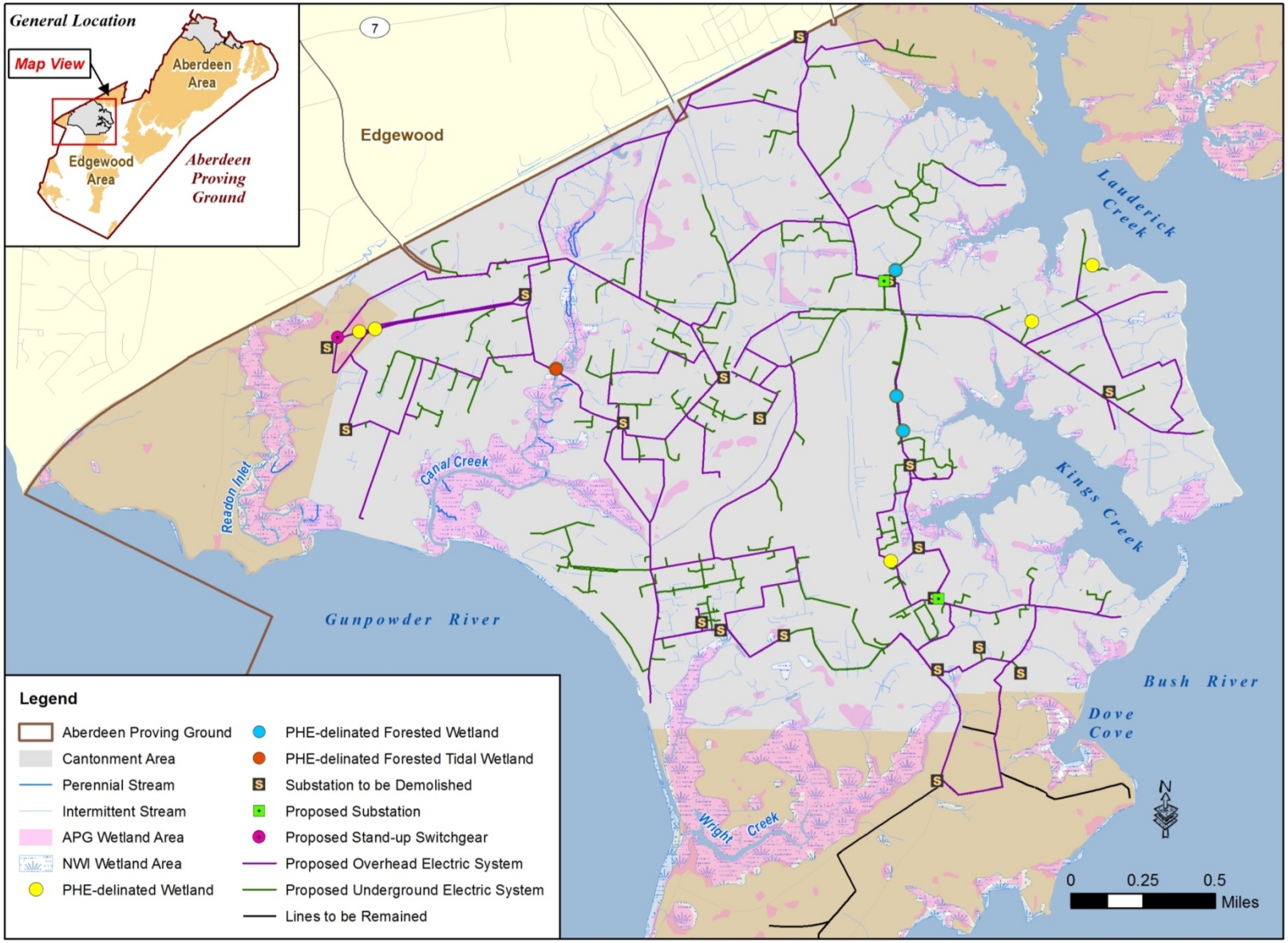

Figure 3.5-3. Edgewood Cantonment Area Wetlands

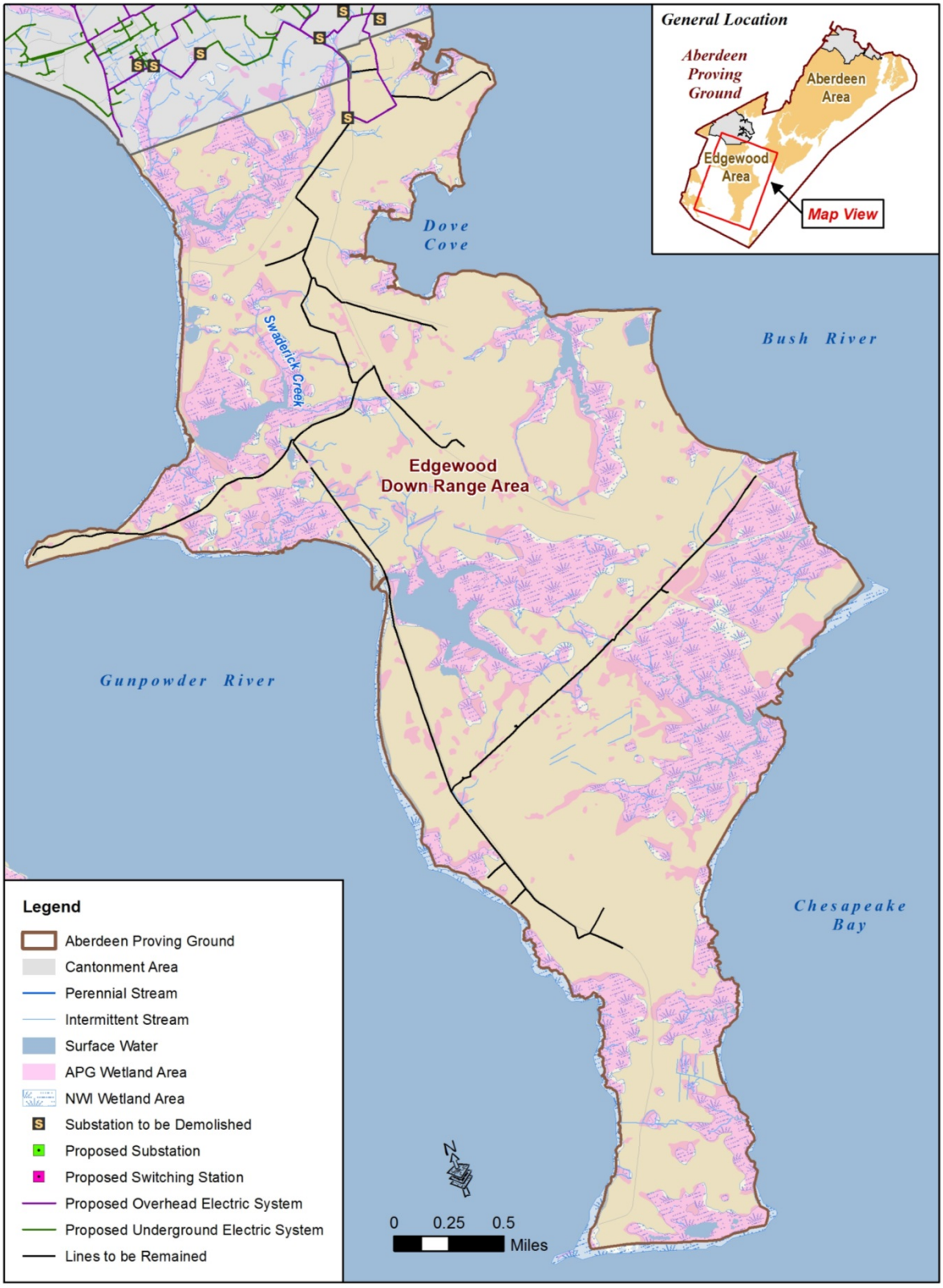

Figure 3.5-4. Edgewood Down Range Area Wetlands

The APG INRMP details provisions to protect water quality and wetlands, including the objective of management for "no net loss of wetlands" (APG, 2009).

3.5.2 ENVIRONMENTAL CONSEQUENCES

Impacts to wetlands would be considered significant if the action did not comply with policies, regulations, and permits related to wetlands conservation and protection. The following sections discuss potential impacts of the No Action and Proposed Action alternatives.

3.5.2.1 No Action Alternative

Under the No Action Alternative, there would be no new construction and the condition of existing wetland features would remain unchanged. Therefore, no direct or indirect impacts to wetlands would occur.

3.5.2.2 Proposed Action Alternative

The wetland and waters identification and delineation study conducted in association with this EA identified a total of 15 wetlands within proximity to the study area of the utility upgrades, including five within the Aberdeen Area and seven within the Edgewood Area (EnviroProjects, LLC 2014). Wetland areas were all located within the ROWs; no wetland areas were identified within the proposed substation locations. Comparing these identified wetlands to the route of the Proposed Action, approximately 11 wetland crossings may occur due to new ROW which have the potential to impact up to 1 acre of wetlands.

Cut and fill impacts associated with new underground line installation would be avoided through horizontal directional drilling. In addition, installation of poles along new overhead lines would avoid wetland locations. Habitat conversion would occur to approximately 0.26 acres of forested wetlands located within the new ROW. Areas of forested wetlands within new ROW would have to be cleared to accommodate the new line. Conversion of forested wetland to emergent would require mitigation at a 1:1 ratio (see Section 3.5.4). Therefore, approximately 0.26 acres of forested wetland mitigation, or the purchase of an established and approved wetland mitigation bank will be required. Overall, impacts to wetlands would be minor.

Operational maintenance of the newly-established and existing ROW would require occasional and re-occurring vegetation management. These activities would be similar to the on-going routine maintenance actions of the existing infrastructure and would be conducted in accordance with the INRMP. No additional disturbance, beyond the maintenance of non-forested conditions within the ROWs, would occur to wetlands.

3.5.3 CUMULATIVE EFFECTS

Overall, the Proposed Action's contribution to cumulative impacts would be negligible. The projects presented in Table 3.1-2, in combination with the Proposed Action, would not be anticipated to result in a cumulative significant adverse impact to wetlands, as strict regulations restrict activities occurring within wetlands.

3.5.4 PROPOSED IMPACT REDUCTION MEASURES

In general, impacts to wetlands would be avoided by siting proposed construction activities (including placement of poles for new overhead lines) outside of identified wetlands and their associated 25-foot regulatory buffers, and through the use of horizontal directional drilling techniques in the vicinity of wetland features for underground line installation. Additional measures to reduce impacts to wetlands include implementing soil and sedimentation control

measures around construction sites (also refer to Section 3.6.4). These actions would reduce runoff rates to wetlands while retaining significant quantities of nutrients and sediments.

As previously stated, approximately 0.26 acres of forested wetland would be converted to emergent wetland. This impact falls within MDSPGP-4 Category B limits; the total temporary and permanent impacts to non-tidal waters of the United States, which includes non-tidal wetlands, streams, rivers, and other open waters, are not to exceed 1.0 acre. Per MDSPGP-4 requirements, an application must be submitted to MDE for USACE authorization prior to tree removal within forested wetlands.

Table 3.5-1 identifies wetland mitigation ratios which could apply for this Proposed Action; 0.26 acres of forested wetland mitigation may be required based on the 1:1 ratio for conversion of forested wetlands to emergent.

Table 3.5-1. Proposed Electrical Improvements and Potential Mitigation

Activity	Impact type	Wetland Type	Mitigation Ratio
New underground line	Habitat Conversion	Forested	1:1
		Shrub & Emergent	None
New Overhead Line	Habitat Conversion	Forested	1:1
		Shrub & Emergent	None
Fill Placement	Permanent Loss	Forested	2:1
		Shrub & Emergent	1:1
Upgrades to existing infrastructure	Temporary	Forested	None
		Shrub & Emergent	None

Source: EnviroProjects, LLC, 2014

3.6 Water Resources

3.6.1 AFFECTED ENVIRONMENT

3.6.1.1 Surface Waters and Floodplains

Surface Waters

Surface water systems are typically defined in terms of watersheds, which are hydrologically-defined areas in which biotic and abiotic components function interactively. The watershed boundary generally follows the drainage divide or the highest ridgeline around stream channels, which meet at the bottom or lowest point of the land where water flows out of the watershed, commonly referred to as the mouth of the waterway. Any activity that affects water quality, quantity, or rate of movement at one location within a watershed has the potential to affect the characteristics of locations downstream.

APG is contained entirely within the Upper Maryland Western Shore watershed, which encompasses an area of 920 square miles. The Aberdeen Proving Ground watershed, which primarily consists of APG, is one of three sub-watersheds in the Upper Maryland Western Shore Watershed (APG, 2009).

APG is located on the western shore of the upper Chesapeake Bay. The Bush River and Gunpowder River are located within the Installation boundaries, in addition to numerous creeks (see Figures 3.6-1 through 3.6-4). Surface waters on APG tend to be shallow and sluggish, with tidal estuaries forming the mouths of the waterways and marshes bordering their shorelines. Surface waterbodies account for approximately 37,000 acres of APG's total acreage (APG, 2009).

Surface drainage at APG is to the Chesapeake Bay through the Bush and Gunpowder River estuaries, or through creeks that discharge to these water bodies. The northern portion of the east branch of Romney Creek, and to a lesser extent Swan Creek, drain the Cantonment area of the Aberdeen Area. The east branch of Romney Creek is non-tidal and the largest waterway on the Aberdeen Area, draining into the Chesapeake Bay southwest of the Cantonment area. Swan Creek is tidal and drains northward into the Chesapeake Bay. Both creeks are associated with large wetlands areas (see Section 3.6, Wetlands). On the Edgewood Area, Canal Creek and East Branch Canal Creek drain the Cantonment area to the Gunpowder River and ultimately to the Chesapeake Bay.

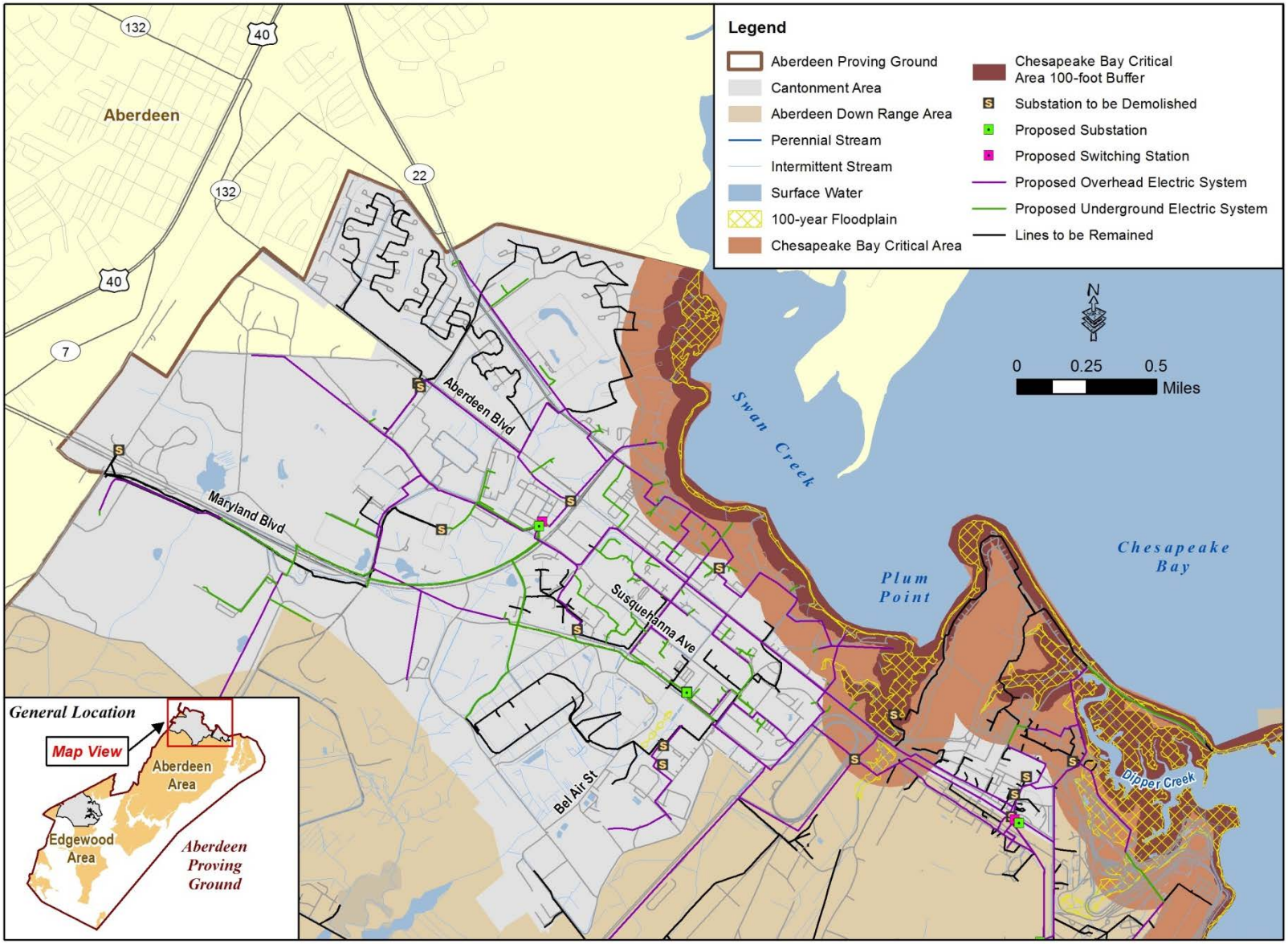

Figure 3.6-1. Aberdeen Cantonment Area Water Resources

Figure 3.6-2. Aberdeen Down Range Area Water Resources

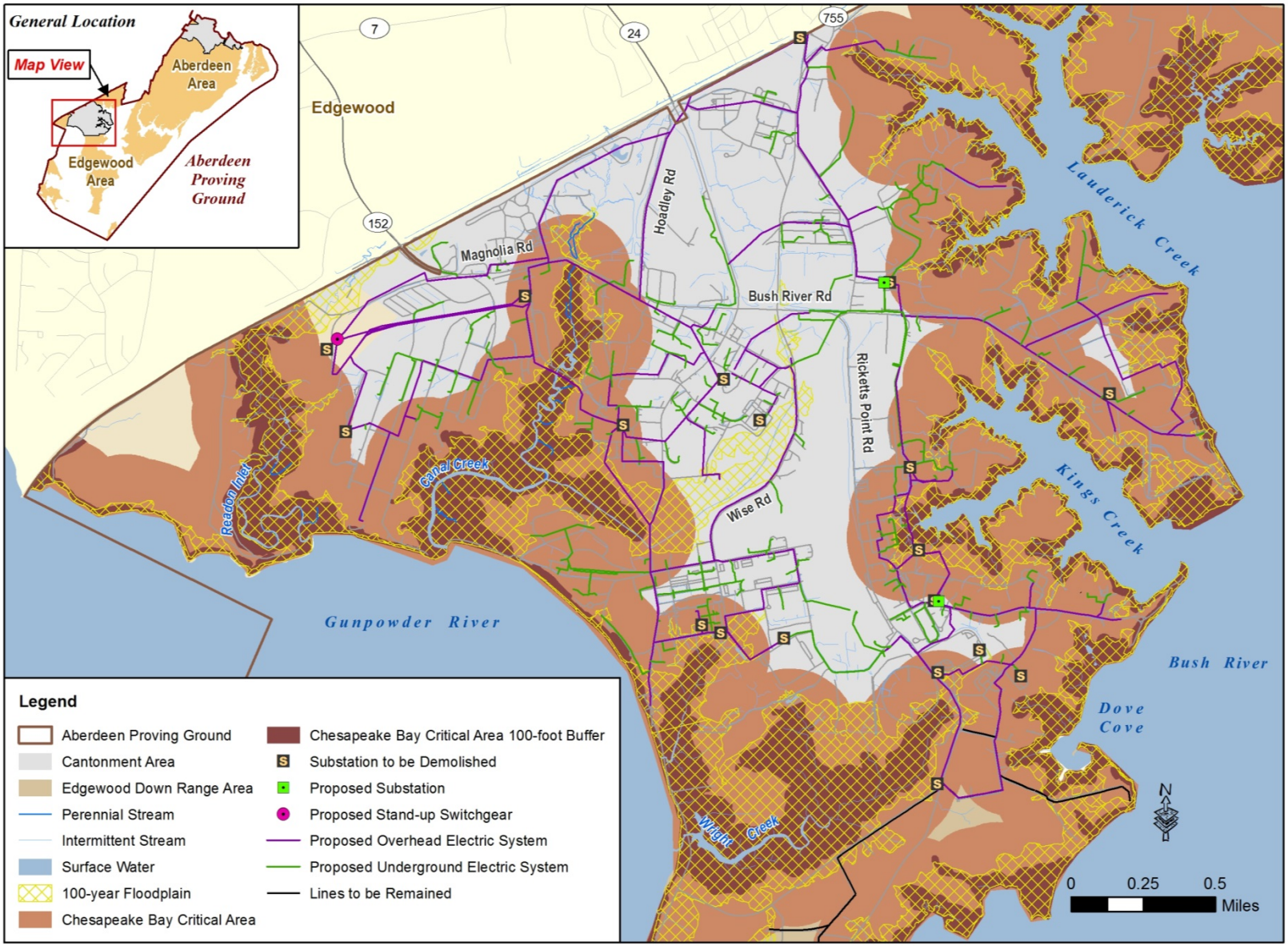

Figure 3.6-3. Edgewood Cantonment Area Water Resources

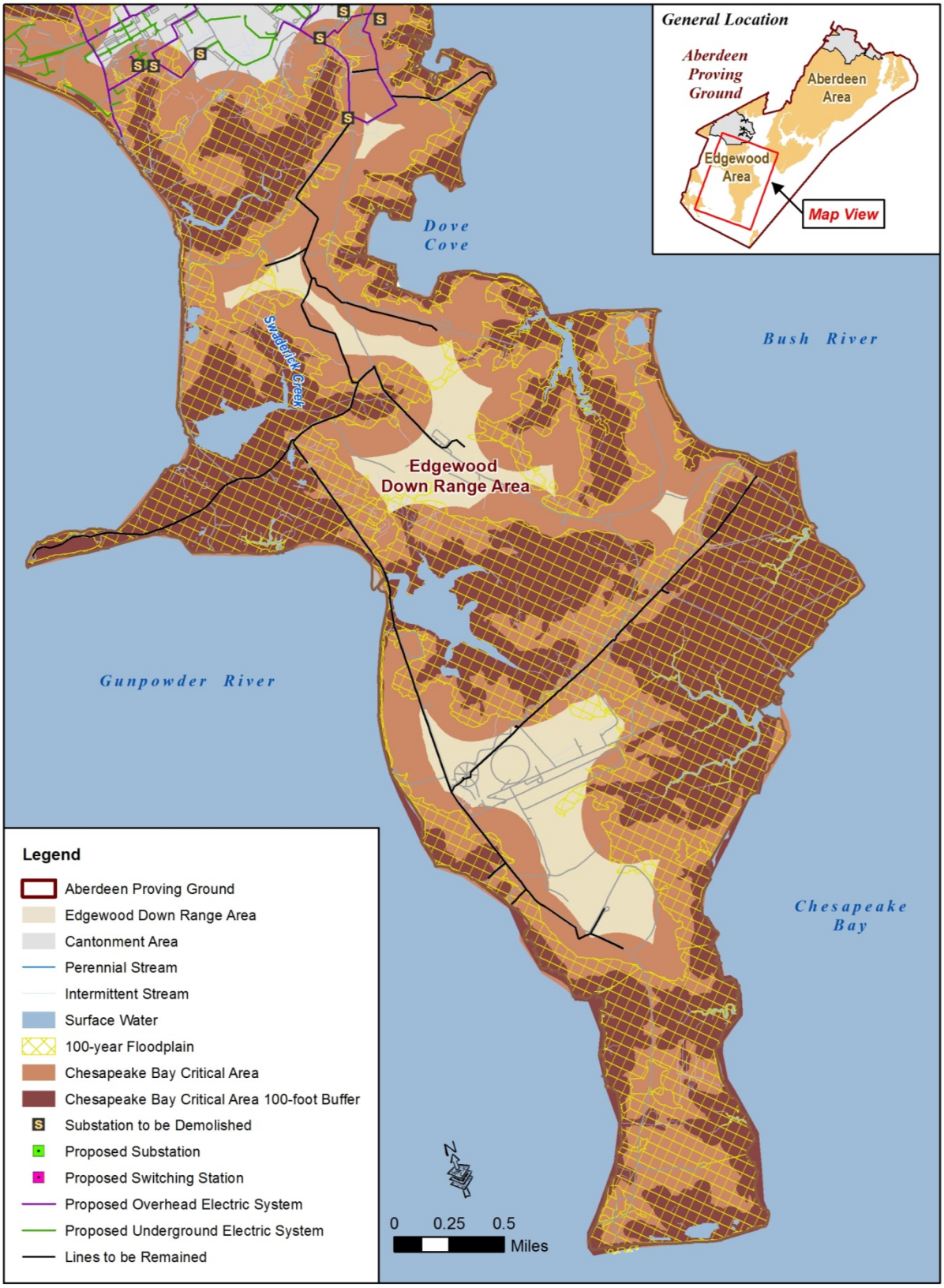

Figure 3.6-4. Edgewood Down Range Area Water Resources

Floodplains

Floodplains, or Special Flood Hazard Areas, are defined as land that has a 1 percent or greater chance of flooding each year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. The 100-year floodplain is normally used for assessing the potential impact of human activities within a floodplain. When a critical action is involved, (i.e., an action for which even a slight chance of flooding has a great impact), the 500-year floodplain is to be used for impact assessment (44 CFR Part 9). The 500-year floodplain is defined as land that has a 0.2 percent chance of a flooding each year (FEMA, 2014). Critical actions include those that produce, use, or store highly volatile, flammable, explosive, or toxic materials. FEMA floodplain management regulations require such project facilities to be located outside the applicable floodplain to minimize floodplain impacts (APG, 2009).

EO 11988, *Floodplain Management*, directs Federal agencies to avoid, to the extent possible, adverse impacts associated with the modification of floodplains and to avoid floodplain development when there is a practicable alternative. In addition, the agency must minimize potential harm to or within the floodplain and take appropriate steps to notify the public where alternatives are impractical.

Floodplain review is achieved through CWA Section 401/404 permit process (See Section 3.6, Wetlands). Permit decisions are made by the USACE in conjunction with the involved state. As part of the Section 404 permitting process per 33 CFR Part 320.4(l)(2) and 33 CFR Part 320.4(l)(3), USACE is to consider in its approval decision impacts associated with the modification of floodplains and avoid such impacts to the extent practicable.

Portions of APG within the 100-year floodplain include areas bordering the Chesapeake Bay, Bush River, and Gunpowder River. On the Aberdeen Area, the 100-year floodplain is located along portions of the shoreline, as well as along Swan and Dipper creeks. On the Edgewood Area, the 100-year floodplain is associated with Doves Cove and the east and west branches of Canal, Lauderick, Kings, Gun Club, and Wright creeks. The 500-year floodplain does not extend into the Cantonment areas.

3.6.1.2 Surface Water Quality

Water quality standards are issued by the MDE and USEPA under the Federal Safe Drinking Water Act and the CWA. Section 303(d) of the CWA requires states to identify and develop a list of impaired waterbodies where technology-based and other required controls have not provided attainment of water quality standards. Section 305(b) of the CWA requires states to assess and report the quality of their waterbodies. The state of Maryland has combined its 303(d) and 305(b) lists into one report, referred to as the Integrated 305b/303d Report. This report details the quality of water in the streams, lakes, and reservoirs of all major river basins in the state; identifies waterbodies that are impaired and do not meet designated uses; and establishes total maximum daily loads (TMDLs) for the pollutants of concern. The TMDL process uses a watershed management approach to establish allowable pollutant loadings or parameters and allows water quality controls to be developed to reduce pollution and to restore and maintain water quality.

The Chesapeake Bay has been designated by USEPA and MDE as impaired for excessive pollutant contributions of total nitrogen, total phosphorus, and total suspended solids that result in the depletion of dissolved oxygen. The Chesapeake Bay TMDL was established in 2010 pursuant to Section 117(g)(1) of the CWA 810 and EO 13508, *Chesapeake Bay Protection and Restoration*, to restore the waters of the Chesapeake Bay and the region's streams, creeks, and rivers, and to address nutrients and sediment impairments. In addition, both Romney and Swann creeks have been designated as impaired (biological impairment).

Past activities have affected surface water quality within APG boundaries and the vicinity. 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 and organic chemicals have been detected at concentrations exceeding water quality criteria in streams draining from APG (APG, 2009).

Pollutant releases from APG are a minor source of pollution to the Chesapeake Bay (APG, 2009). Concentrations of contaminants in the Chesapeake Bay are influenced primarily by the volume of inflow from the Susquehanna River. The Chesapeake Bay at APG ranges from brackish tidal estuarine waters to tidal freshwater.

Under Section 401 of the CWA, a Federal agency cannot issue a permit or license for an activity that may result in a discharge to waters of the U.S. until the state where the discharge would originate has granted or waived Section 401 Water Quality Certification. In addition, under the MDSPGP-4, construction may not occur within the State of Maryland in waters of the United States, including wetlands and navigable waters, without a permit. Water Quality Certification and the MDSPGP-4 can be obtained via a joint permit application.

3.6.1.3 Stormwater Management

Stormwater is defined as rainwater that flows overland, accumulates in gutters, ditches, and culverts, and travels through storm drains to streams. Properly-functioning stormwater management systems can reduce sediments and other contaminants that would otherwise flow directly into surface waters. Nonpoint pollutant loading comprises a wide variety of sources not subject to point source control via National Pollution Discharge Elimination System (NPDES) permits. The most significant nonpoint sources are those associated with precipitation, runoff, and erosion, which may move pollutants from the land surface to waterbodies.

As stipulated in AR 200-1 and the NPDES rules and regulations, APG complies with the provisions of the CWA and Federal, state, and local regulations to manage stormwater. In addition, APG must comply with Section 438 of the Energy Independence and Security Act of 2007, which addresses stormwater management for the development or redevelopment of over 5,000 square feet. MDE issues state requirements for NPDES stormwater permits. APG holds an Individual Industrial Discharge Permit and a Phase II Small Municipal Separate Storm Sewer Permit (MS4) for the regulation of stormwater. Under these permits, APG is required to implement best management practices (e.g., construction site runoff control, post-construction stormwater management, detection and elimination of illicit discharges) to prevent and control pollution from stormwater. These BMPs and other requirements for managing stormwater are further detailed in the Installation Stormwater Pollution Prevention Plan (SWP3).

Construction activities at APG are also subject to the NPDES General Permit for Stormwater Associated with Construction Activity, dated January 1, 2015. This permit regulates pollution (primarily sediment) generated from runoff associated with industrial activities, to include construction disturbing one acre or more, through approved erosion/sediment controls and stormwater management plans, self-inspection, and record keeping. Construction activity includes clearing, grading, excavating, or other earth disturbing activities, as well as related activities that support construction (i.e., staging areas, material storage areas, excavated material disposal areas, or borrow areas).

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, 2009). The Aberdeen Area has stormwater retention ponds to control stormwater runoff. Both the Aberdeen

Area and the Edgewood Area have experienced drainage issues and storm-related flooding in specific areas. Stormwater runoff from the Aberdeen Area and the Edgewood Area flows directly or indirectly by way of tributaries to Chesapeake Bay.

3.6.1.4 Coastal Zone Management and Chesapeake Bay Critical Area

The Coastal Zone Management Act (CZMA) of 1972 (11 USC 1451 et seq), as amended through the Coastal Zone Protection Act of 1996, requires Federal agencies to review its actions for impacts on coastal resources and for consistency with the state's federally-approved Coastal Management Program. Specifically, Federal actions that have a reasonably likely effect on any land or water use or natural resource of the Coastal Zone must go through Federal consistency review. Maryland's Coastal Zone Management Program (CZMP) was established by executive order and approved in 1978 and is a network of state laws and policies designed to protect resources within Maryland's Coastal Zone. In May of 2013 the State of Maryland signed a Memorandum of Understanding with DoD to use the Federal Consistency process to protect coastal resources and uses with any projects with the potential to affect Maryland's Coastal Zone. Prior to providing a consistency determination, the DoD should confer with relevant Maryland agencies early in the planning process on the nature and expected complexity of planned projects. For Federal agency projects and activities that have reasonably foreseeable effects on any coastal use or coastal resource on Maryland's Coastal Zone, the DoD would submit a consistency determination in accordance with 15 CFR 930, identifying the relevant Maryland Enforceable Coastal Policies and demonstrating the consistency of the project or activity with those Policies.

Maryland's Coastal Zone is comprised of the 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. The Maryland Coastal Zone extends from the inland boundary of the 16 counties and the City of Baltimore that border the Atlantic Ocean, Chesapeake Bay, and the Potomac River to the District of Columbia, and extends seaward to a distance of 3 miles into the Atlantic Ocean. All of APG lies within the Maryland's Coastal Zone (APG, 2009).

Maryland's federally-approved CZMP incorporates implementation of the Maryland Chesapeake Bay Critical Area Act (Critical Area Act). The Critical Area Act protects the Bay's environment and created a statewide Critical Area Commission to oversee the development and implementation of local land use programs directed toward the Critical Area. Under the Critical Area Act, all lands within 1,000 feet of the tidal waters' edge or from the landward edge of adjacent tidal wetlands are designated as "Critical Areas". Land development in these areas is regulated and restricted in accordance with the Critical Area Act. In addition, development is further restricted within a 100-foot 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. The shoreline and portions of creeks and stream drainages located within the Aberdeen and Edgewood Areas are designated Chesapeake Bay Critical Areas (see Figures 3.6-1 through 3.6-4). The Maryland CZMP also applies to work in non-tidal streams, 100-year floodplain, or non-tidal wetlands, including a 25-foot buffer (see Section 3.5, Biological Resources, and Sections, 3.6 Wetlands).

The Critical Area Act protects forest interior dwelling species (FIDS) habitat, and the CZMP incorporates implementation of FIDS habitat protective measures in determinations of Coastal Zone consistency. FIDS Habitat is defined as a forest tract that meets either of the following conditions: a) Greater than 50 acres in size and containing at least 10 acres of forest interior habitat (forest greater than 300 feet from the nearest forest edge), or b) Riparian forests that

are, on average, at least 300 feet in total width and greater than 50 acres in total forest area (MDNR, 2014d).

The CZMP also incorporates implementation of the Maryland FCA requirements. APG manages its forest conservation program in accordance with the MDNR. In keeping with the FCA standards, mitigation for forest disturbances is a 1:1 ratio in the Maryland-defined Critical and non-Critical Area when a project disturbs 40,000 square feet of land or more. Maryland-defined Critical Area forest and FIDS habitat mitigation is calculated using MDNR specifications.

Many of APG's natural resource management policies and programs are already structured to comply with the Critical Area Program. APG is developing a Coastal Zone and Critical Area Management Plan and a Shoreline Protection Plan to prevent facility loss and enhance Chesapeake Bay habitat. Goals of the plan include the conservation of fish, wildlife, and plant habitat; maintaining, and if possible increasing the amount of forested area within the Maryland Coastal Zone at APG; and monitoring and controlling development within the Critical Area (APG, 2009).

See Appendix C for a full list of Coastal Zone enforceable policies and a description of the actions that would be taken for consistence with the Maryland CZMA.

3.6.2 ENVIRONMENTAL CONSEQUENCES

Impacts to water resources would be considered significant if Army actions: exceed applicable Federal and state regulatory limits for surface water quality or result in unpermitted direct impacts to waters of the U.S., substantially affect surface water drainage or stormwater runoff, substantially affect groundwater quantity or quality, or are inconsistent with enforceable policies under the Maryland CZMA. The following sections discuss potential impacts of the No Action and Proposed Action alternatives.

3.6.2.1 No Action Alternative

Under the No Action Alternative there would be no new construction or ground disturbance, and the current electrical infrastructure would be maintained. There would be no impacts to surface waters, floodplains, or the Maryland Coastal Zone, and overall impacts would be negligible.

3.6.2.2 Proposed Action Alternative

3.6.2.2.1 Construction

Surface Waters, Floodplains, Surface Water Quality, and Stormwater

As shown in Table 2-1, up to APG GIS surface water mapping indicates 294 intermittent and one perennial (Canal Creek in the Edgewood Area) stream crossings occur within the overall electrical upgrade footprint. A large portion of the intermittent features, however, are non-jurisdictional roadside swales and ditches. Construction of overhead lines and reconductoring would not impact streams. New overhead crossings would consist of pole replacement or installation on either side of the waterway, and power lines draped over surface waters. Cut and fill construction of underground lines could temporarily impact intermittent streambeds and banks; however, most in-stream construction would be avoided by directional drilling. All underground lines within the Edgewood Area would be directionally-drilled, avoiding impact to streams. Horizontal directional drilling would be at a depth that would not impact surface waters. One roadside ditch along Maryland Avenue within the Aberdeen Area was identified within the APG GIS mapping which could be temporarily impacted during cut and fill construction. This

feature, however, was determined to be non-jurisdictional and upland during the wetland identification and delineation study.

Ground disturbing activities (e.g., trenching, horizontal directional drilling, localized excavation, etc.) would occur during construction near waterways that would expose soils and increase potential for sedimentation of nearby waterways. As noted in Section 3.7, potentially contaminated soils are located within the project area, which could impact waterways in the event of offsite soil migration into waterways. Additionally, potential surface water contamination from accidental spills of hazardous material could occur during construction activities.

Under the Proposed Action, greater than one acre of land would be disturbed through clearing, grading, excavating, or other earth disturbing activities, or related support activities. In addition, it is anticipated that more than 5,000 square feet of land would be disturbed or greater than 100 cubic yards of earth would be moved offsite; therefore, the Proposed Action would be subject to the General Permit for Stormwater Associated with Construction Activity and an ESCP and a SWP3 would be prepared. ESCPs and SWP3s would be developed and submitted through to MDE for review and approval. In addition, a Joint Application Approval for Section 401 Water Quality Certification and approval under the MDSPGP-4 would be prepared and submitted to MDE for approval prior to the start of any construction. Implementation of the ESCP and SWP3 would limit potential for contaminated stormwater runoff or offsite migration of sediment exposed during trenching or other construction activities. In addition, implementation of the SPCCP would limit any impacts to surface waters from spills. After construction, all temporarily disturbed areas would be revegetated and stabilized (e.g., vegetation planting, protective fabric/matting). With implementation of BMPs, it is anticipated that impacts to surface waters during construction would be temporary and minor.

Implementation of ESCP Plan, SWP3, and other construction BMPs is also anticipated to reduce any potential for impact of sedimentation or potential spills adversely affecting the TMDL status of the Chesapeake Bay or impairment status of local waterways.

Up to 22 acres of construction would occur within the 100-year floodplain as show in Figures 3.6-1 through Figures 3.6-4; however, the replacement or installation of power lines is not anticipated to alter or otherwise result in impacts to the floodplain.

Approximately 0.7 acres of previously undeveloped land could be converted to impervious surfaces as a result of the construction new switching stations, substations, concrete pads, and crushed gravel; however, overall impervious surface would decrease as a result of the net reduction in substations. Approximately 5.8 acres of impervious surface removal could occur as a result of substation demolition, resulting in a net reduction in 5.1 acres of impervious surface at APG.

Coastal Zone

Long term, minor adverse impacts to the Maryland Coastal Zone area and Chesapeake Bay Critical Area are anticipated that would be mitigated through a buffer management plan and a Forest Conservation Plan/Critical Area Management Plan, as well as stormwater management BMPs and erosion and sediment controls. Approximately 121 acres of construction would occur within the Maryland-defined Critical Area, and 10 acres of disturbance would occur within the 100-foot buffer. Because construction would occur within the 100-foot buffer, a buffer management plan would be prepared to ensure that impacts to the buffer area are limited.

Approximately 5.5 acres of forest removal are anticipated within the Critical Area, with 19.6 acres within FCA areas. Less than 1 acre of forest removal would occur within the Critical Area buffer. In accordance with FCA standards and Critical Area Act requirements, mitigation of

these forest impacts would be on a 1:1 ratio, and up to 25.1 acres of forest will be mitigated at a 1:1 ratio in accordance with a Forest Conservation Plan/Critical Area Management Plan to be prepared for the site.

Erosion and sediment control plans and stormwater management plans would be designed and approved by MDE prior to project construction and would include measures to protect the Maryland-defined Critical Area. A Federal Consistency Determination demonstrating consistence of the Proposed Action with the relevant Maryland Enforceable Coastal Policies is included in Appendix C.

3.6.2.2.2 Operations

Overall adverse impacts from operations of the upgraded electrical system would be negligible. Occasional maintenance would be required which could increase the potential for spills that could reach waterways; however, the potential for a spill from maintenance is considered to be low and would be managed in accordance with the SPCCP.

3.6.3 CUMULATIVE EFFECTS

The Proposed Action is not expected to degrade surface water quality directly. However, the indirect impacts from the Proposed Action, the development of other projects, and general development anticipated to occur in the surrounding region could incrementally impact surface water quality. Each of the reasonably foreseeable projects identified for inclusion in this analysis (Table 3.1-2) has or would cause some degree of sedimentation to water resources during construction. The probability that impacts occur would increase with the proximity of construction activities to the surface water resources; the greatest probability for impact would occur when project features cross a surface water resource. Upon completion of any construction work, it is expected that disturbed areas would be revegetated, as practicable, to reduce or eliminate any long-term effects to water quality. Cumulatively, these projects, in combination with the temporary minor soil erosion and sedimentation to result from the Proposed Action, would not result in significant cumulative impacts.

3.6.4 PROPOSED IMPACT REDUCTION MEASURES

As discussed within this section, no significant impacts to water resources are anticipated. To prevent water quality deterioration, all temporary construction-related footprint disturbances would be revegetated with appropriate plant species. The following BMPs and impact reduction measures would be implemented to reduce or prevent impacts to water resources:

- Use of silt fencing, storm drain protection mechanisms, geotextile fabrics, dust control measures, etc. during construction
- Minimize disturbance of vegetation during construction and restore vegetation within temporarily disturbed areas post-construction to reduce the potential for erosion
- Develop and implement ESCPs and SWP3s
- Preparation of a Critical Area Management Plan would be required for construction activities within the Chesapeake Bay Critical Area; up to 5.5 acres of reforestation will be required within the Critical Area to mitigate for forest removal

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3.7 Hazardous Materials and Hazardous Waste

3.7.1 AFFECTED ENVIRONMENT

3.7.1.1 Regulatory Background

AR 200-1 establishes policies and procedures to protect the environment, including environmental responsibilities for the DA, major commands, and installations. Specifically, 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 (EPCRA), Resource Conservation and Recovery Act (RCRA), and Comprehensive Environmental Response, Compensation, and Liability Act (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.

APG policies and regulations include: AR 200-1, Environmental Protection and Enhancement; 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; APGR 200-60, Hazardous Waste Management; APGR 200-61, Handling of Polychlorinated Biphenyls; and APGR 385-7, Excavation Permit Program.

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 (DOA, 2010). APG maintains a Hazardous Materials Management Procedures Manual that establishes procedures for handling and tracking hazardous materials. The manual includes procedures for the maintenance of inventory data and for procuring, receiving, and tracking hazardous materials. In addition, APG also maintains a Hazardous Waste Tracking System (HWTS) to track all hazardous wastes, from their generation to their subsequent off-site disposal.

3.7.1.2 Hazardous Materials

Hazardous materials include 1) any item or chemical that is a health hazard or physical hazard as defined by the Occupational Safety and Health Administration in 29 CFR 1910.1200, 2) any item or chemical that is reportable, potentially reportable, or notifiable as inventory under the requirements of hazardous chemical reporting (40 CFR Part 370) or as an environmental release under the requirements of the Toxic Chemical Release Reporting: Community Right to Know (40 CFR Part 372), 3) listed by the U.S. Department of Transportation as hazardous materials under 49 CFR 172.101 and appendices, or 4) as defined in 40 CFR 335 and 40 CFR 370, EPCRA implementing regulations.

These substances may present an unacceptable risk to public health or welfare, or to the environment because of their quantity, concentration, or physical, chemical, or toxic characteristics if released into the environment. Certain hazardous materials become hazardous or industrial wastes following 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 EPCRA.

3.7.1.3 Hazardous Waste Treatment, Storage, and Disposal

USEPA regulates generators of hazardous waste based on quantity of waste produced. Large quantity generators (LQGs) produce 1,000 kilograms per month or more of hazardous waste, more than 1 kilogram per month of acutely hazardous waste, or more than 100 kilograms per month of acute spill residue or soil. Small quantity generators (SQGs) produce more than 100 kilograms, but less than 1,000 kilograms, of hazardous waste per month. Conditionally Exempt Small Quantity Generators (CESQGs) generate 100 kilograms or less per month of hazardous waste, or 1 kilogram or less per month of acutely hazardous waste, or less than 100 kilograms per month of acute spill residue or soil. LQGs and SQGs are required to obtain a USEPA identification number to identify generators by site prior to treating, storing, disposing, or transporting hazardous waste. Depending on the generator status, specific regulations apply regarding on-site accumulation quantities and time limits; storage, handling, and transport requirements; reporting; and contingency plans and emergency procedures (USEPA, 2014c).

APG is regulated as a large quantity generator by the MDE. Typical hazardous waste generation is 300,000 to 500,000 pounds annually, with special projects and restoration activities that sometimes 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 weapons cleaning and repair, fueling and lubricating operations, vehicle cleaning and aircraft washing operations, maintenance activities, pest management applications, and mechanical work. 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 are required to properly collect, manage, and characterize their wastes prior to transport for treatment and disposal. Once approved, waste may be moved to a 90-day temporary storage site. APG operates up to 15 90-day storage facilities and more than 200 satellite accumulation sites. The Installation Environmental Coordinator reviews the records prior to approval of shipment to an off-site commercial treatment/storage/disposal facility (TSDF). When shipped, all materials are transported in U.S. Department of Transportation-approved containers provided by the contractor. An onsite TSDF is located on APG's Southern Peninsula; however, this facility is strictly used as a storage facility and does not provide treatment or disposal practices similar to other commercial TSDFs. In addition, there are nine permitted hazardous waste storage and/or treatment units at APG.

The utility privatization contractor is not currently considered a generator of hazardous waste; however, the contractor would likely be regulated as a generator of hazardous waste depending upon the volume of wastes that could be generated during the construction and operation of the Proposed Action. The contractor would obtain a USEPA identification number, as necessary, in consideration of its future status as a generator of hazardous waste. The contractor would be required to establish and maintain waste storage facilities and to arrange for the transportation and disposal of hazardous wastes.

3.7.1.4 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 the Edgewood Area. 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 (PCBs), polycyclic aromatic hydrocarbons (PAHs), radionuclides, semivolatile organic compounds (SVOCs), 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, 2011b). Groundwater plumes are also located across both the Aberdeen and Edgewood areas, with some plumes highly contaminated with VOCs. As such, vapor intrusion into buildings is a concern throughout the Installation. Due to contamination issues at APG, soil sampling was conducted within the project area of the Proposed Action. Results are summarized in Section 3.7.1.6.

3.7.1.5 Installation Restoration Program

The DoD's 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, including 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). 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, the Michaelsville Landfill in the Aberdeen Area was listed on the National Priorities List (NPL), while in 1990 all of the Edgewood Area was listed on the NPL. 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.

APG and the Army signed a Federal Facility Agreement in 1990 with USEPA Region III which established a procedural framework and schedule for the execution of APG's IRP in compliance with CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA) in 1986, the National Oil and Hazardous Substances Pollution Contingency Plan, RCRA, and other applicable Federal and state laws and regulations. The DoD developed the IRP to identify, evaluate, and clean up contamination from past operations on military bases worldwide. The IRP is designed to ensure DoD compliance with Federal and state regulations that protect the environment.

In accordance with APG's participation in the IRP, APG prepared an Installation Action Plan (IAP) and updates it annually. The IAP defines IRP requirements and proposes methods to address future investigation and remedial efforts at the IRP sites. The IAP identifies 254 sites at the APG, of which 139 are considered "Response Complete" and thus require no further action. Efforts to remediate contamination at APG are ongoing, and long-term cleanup of the entirety of the Edgewood Area is the focus of long-term remedial projects. Sites may be restricted from development based on the existing conditions, costs of cleanup, proposed use(s), and project review by the Site Approval Board at APG. No IRP sites with on-going remedial actions are located within the project areas included in the Preferred Alternative.

APG's IRP staff works in conjunction with the U.S. Army Environmental Command, USEPA Region III, and MDE to assess and inspect sites, conduct remedial investigations and feasibility studies, create remedial designs, and conduct long-term monitoring and/or remedial action operations to ensure that cleanup processes are conducted properly and efficiently.

3.7.1.6 Project Area Soil Sampling Results

Soil sampling was conducted in support of the Proposed Action to assess existing soil contamination within the proposed project area (see Appendix E). Limited amounts of contaminated soils in excess of MDE and USEPA soil standards were identified in soils samples within the project areas. Soils were sampled primarily for arsenic, but also benzo[a]pyrene (a PAH compound). Soils were also sampled for PCB and target compound list pesticides contamination. Some contamination was detected; however, all samples were well below the MDE Soil NRC Standards.

At both the Aberdeen and Edgewood Areas, arsenic was identified in all soil samples, at concentrations ranging from 2.8 to 8.6 mg/kg, close to or slightly above the MDE and USEPA nonresidential/industrial standards of 1.9 mg/kg and 3.0 mg/kg, respectively. At the Edgewood Area, one area of additional contamination was observed along the south and western sides of Building E5265 on Hoadley Road. This area contained a concentration of benzo[a]pyrene of 0.58 mg/kg, slightly in excess of the MDE Soil Non-Residential Cleanup (NRC) Standard of 0.39 mg/kg. Other soil samples were observed to have contamination of benzo[a]pyrene, but below their respective MDE Soil NRC Standards.

Arsenic is a common contaminant observed at military installations, but it is also a naturally-occurring metalloid (metal-like) element that is common across many areas of the U.S., including Maryland. Arsenic was used in military applications (i.e., weapons), but also used as a pesticide throughout the 1950s, in wood preservation and medicinal applications. Naturally-occurring arsenic concentrations in soils in the eastern and central regions of Maryland typically range from non-detectable to a maximum of 10 mg/kg (MDE, 2007). The mean arsenic concentrations in the eastern and central regions of the state are estimated to be 2.3 mg/kg and 3.3 mg/kg, respectively, although localized areas within the eastern and central regions may have lower and higher naturally-occurring concentrations of arsenic. Sampling conducted by the U.S. Army Environmental Center in the early 1990s results in arsenic concentrations from 1.04 mg/kg to 5.29 mg/kg with an arithmetic mean concentration of 2.57 mg/kg. The current soil study was unable to conclude whether the observed arsenic was naturally-occurring, a result of anthropogenic contamination, or both; however, whether man-made or natural, the arsenic concentrations observed onsite exceed applicable MDE and USEPA Region II soil criteria.

Benzo(a)pyrene is a PAH compound and is a byproduct of incomplete combustion of organic (carbon-containing) items, such as cigarettes, gasoline, and wood. It is commonly found with other PAHs in automotive exhaust, in grilled and broiled foods, and as a by-product of many industrial processes. Benzo[a]pyrene partitions strongly to soil, but will break down when exposed to ultraviolet (UV) radiation in sunlight. It is also commonly found in ambient (outdoor) air, indoor air, and in some water sources. Benzo[a]pyrene is also considered a probable human carcinogen. At elevated concentrations, acute exposure can irritate and burn the eyes, or cause a rash or burning sensation on skin. Chronic exposure can result in cancers of the stomach, skin, lung, blood, spleen, pancreas, and other organs.

3.7.1.7 Special Hazards

APG manages hazardous materials and substances, including the following which present special hazards: UXO, polychlorinated biphenyl (PCB)-containing oil; lead-based paint, asbestos, pesticides, and radiation. These items are maintained in compliance with programs regulated by USEPA and MDE, as well as local regulations that implement Federal statutory requirements (i.e., U.S. Army regulations listed in Section 3.7.1). No buildings or structures containing lead-based paint or asbestos would be renovated, demolished, or affected under the

Proposed Action. In addition, no activities would be conducted that would generate radiation or electromagnetic radiation.

Unexploded Ordnance. UXO refers to conventional or chemical agent-containing munitions. UXO are present primarily within the Ranges and Training and Industrial land use areas, but can be encountered virtually anywhere on the Installation including in benthic sediments of surface waterbodies. The majority of UXO at APG is found within two feet of the surface, though larger projectiles and bombs can be found at greater depths (10 to 20 feet). These UXO objects slowly migrate to the surface as a result of freeze-thaw cycles. 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. All UXO clearance activities are conducted under APG *Specification for General Contracts, Section 02010, Perform Unexploded Ordnance Detection, Preliminary Identification and Removal Coordination*.

PCB-Containing Transformers. PCB-containing oil was historically used as a dielectric fluid inside transformers, circuit breakers, high voltage switches, and high voltage capacitors because of their useful quality as being a fire retardant. Electrical equipment at APG, specifically PCB-containing transformers, remain in place until they are either replaced or damaged. There are over 3,000 transformers at APG. Testing for the presence of PCBs has been conducted for each transformer and a database is maintained by APG with the locations and testing results for each transformer. PCB transformers are transformers containing greater than 500 parts per million (ppm) of PCBs; PCB-contaminated transformers are transformers containing between 50 ppm and 499 ppm of PCBs. Current inventories indicate that approximately 2 PCB transformers and 12 PCB-contaminated transformers are located in Aberdeen Area, and approximately 26 PCB-contaminated transformers are located in Edgewood Area (Personal Communication, Weintraub, November 2014). PCB transformers are inspected every three months; PCB-contaminated transformers are inspected yearly.

Pesticides. The DPW Pest Control Office oversees pest management at APG. The Integrated Pest Management Plan is implemented based on mechanical, physical, cultural, biological, and chemical controls (APG, 2009). Integrated pest management utilizes non-chemical controls to the fullest extent possible before pesticides are used. When necessary, pesticides are applied by certified pesticide applicators in compliance with the DoD Plan for the Certification of Pesticide Applicators. The Integrated Pest Management Plan establishes the framework for pest management on the Installation.

3.7.2 ENVIRONMENTAL CONSEQUENCES

Impacts to hazardous materials and hazardous waste would be considered significant if the action were to: create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or wastes; require remediation of UXO contamination; or impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

3.7.2.1 No Action Alternative

Under the No Action Alternative there would be no new construction or ground disturbance, and the current electrical infrastructure would be maintained. The existing electrical system would continue to experience component failures, which could increase over time and would result in the need for incremental replacement or maintenance as needed. Replacement or maintenance would generate both solid and hazardous wastes (e.g., PCB-containing transformers) that would require disposal. Fueling of generators required to power infrastructure due to component failures would continue to result in an increased potential for spills. Disposal would be managed

in accordance with applicable Federal, state, and applicable Army and garrison-level regulations, and would result in minor impacts. The following sections discuss potential impacts of the Proposed Action alternative.

3.7.2.2 Proposed Action Alternative

3.7.2.2.1 Construction

The use of hazardous materials would temporarily increase during construction. Construction equipment would utilize fuels and other petroleum, oil, and lubricant products, which could lead to an increased potential for accidental releases. Any materials involved in an accidental release would be immediately cleaned up in accordance with the SPCCP and disposed of in accordance with Federal, state, and applicable Army and garrison-level regulations. Any liquid material storage would be located in staging areas and equipped with secondary containment to prevent a release of these liquids to the environment. These materials would not likely be stored onsite although, if necessary, small containers (i.e., less than 30 gallons) may be stored onsite for daily equipment operation and maintenance. All fuel sources will be equipped with redundant shut-off valves. Personnel would be trained and equipped to respond to spills in accordance with the SPCCP. Overall impacts from the increased use of hazardous materials would be short term and minor.

During construction, horizontal directional drilling and trenching would generate wastes, which could include potentially-contaminated soil and drilling fluid. The drilling fluids would be recycled or recovered to the greatest extent possible. The pits used for the management of drilling fluids would primarily be located in approved areas within the right-of-way. Contractors would implement appropriate construction BMPs when establishing these pits, which would utilize appropriate design specifications to prevent the migration of drilling fluids or cuttings offsite. Dried cuttings would be managed or reused on site in accordance with Federal, state, and applicable Army and garrison-level regulations.

In the event saturated soils are encountered during trenching, de-watering discharge would be appropriately handled and retained in approved vegetated areas on site and allowed to evaporate or infiltrate into soils. De-watering discharge from IRP areas would be stored, treated, and appropriately disposed of. Contractors would implement appropriate construction BMPs when establishing these areas, and would utilize appropriate design specifications to prevent the migration of de-watered discharge offsite.

Soils stockpiled during trenching or localized excavation (i.e., for placement of new poles) could increase the potential for offsite migration of contaminated soils; however, appropriate BMPs and mitigation measures (e.g., implementation of the ESCP) would be employed to limit soil movement offsite. Trenches would be repacked following construction. Any soils requiring disposal would be characterized and disposed of in accordance with Federal, state, and applicable Army and garrison-level regulations. Implementation of impact reduction measures identified in Section 3.7.4 would limit potential impacts resulting from contaminated soil to minor.

Construction of system upgrades would generate discarded wooden poles, pole trimmings, scrap wires, metal from old power lines, and PCB-contaminated transformers. Based on laboratory analysis performed by APG in the past, waste utility poles would not be considered hazardous waste. Demolition of existing substations and transformers would likewise generate construction debris in the form of scrap metal, parts, wires, and waste oil. Hazardous and non-hazardous wastes would be collected and disposed of in accordance with Federal, state, and applicable Army and garrison-level regulations to permitted landfills, with appropriate

coordination with the MDE Hazardous Waste Management Division. Overall increase in hazardous waste generation would be temporary and would result in minor impacts.

Prior to construction, excavation permits would be obtained, which would address utility and UXO clearance. Utility clearance would include identification and avoidance measures for existing chemical sewer lines. Soil sampling plans would be prepared and site categorization would occur to determine suspected or known contamination within project areas. In addition, a health and safety plan would be prepared for construction. Excavation activities would be conducted according to APG's *Guidance for Proper Management of Excavated Soil* (APG, n.d.). Potentially contaminated soils or other suspected hazardous wastes will require waste characterization prior to disposal. Contractors would adhere to Federal, state, and applicable Army and garrison-level regulations when excavating soil and disposing of materials.

UXO may be found within both Aberdeen and Edgewood areas, but may be more present in the Edgewood Area. Any UXO materials uncovered will be disposed of in accordance with all current Army regulations and standard operating procedures. See Sections 2.1.2 and 2.1.4 for further discussion of excavation permits, UXO clearance, soil sampling, and site categorization.

Workers could be exposed to soils contaminated with the hazardous constituents described in Section 3.7.1.6 during construction via ingestion, inhalation, or dermal contact. Based on the risk analysis prepared for the soil sampling report, no contamination was identified that would present an unacceptable risk to construction workers working within the proposed construction areas for the project. However, soil risk assessments prepared for APG during prior CERCLA investigations identified that onsite soils in some areas could pose an unacceptable risk to construction workers via the ingestion exposure pathway. Prior to construction, further assessment of potential hazards would be conducted as part of the excavation permit process. Additional impact reduction measures beyond those discussed in Section 3.7.4 would be implemented as necessary under the excavation permit process to reduce risk of worker exposure, and overall impacts to construction workers from exposure to contaminated soils would be minor. See Appendix E for further discussion and the Soil Sampling Report.

3.7.2.2.2 Operations

Maintenance of the electrical system could result in the generation of small amounts of hazardous waste (e.g., waste oil). Operation of the upgraded electric system would result in fewer long term component failures and a reduced long-term need to replace or repair equipment. This would result in a reduction in the amount of solid and potentially hazardous waste (e.g., PCB-containing transformers, waste oil, etc.) that is generated during utility operations, when compared to existing operations. The use of hazardous materials and the generation of hazardous wastes would have negligible impacts on waste management. In addition, there would be minimal risk of human or environmental exposure to hazardous materials used or hazardous wastes generated during operation. Overall impacts from use of hazardous materials or generation of hazardous wastes would be negligible.

3.7.3 CUMULATIVE EFFECTS

Less than significant cumulative impacts are predicted from the slight, temporary increase in hazardous materials usage and hazardous waste generation. The Proposed Action combined with other past, present, or future planned projects and activities at the Installation and surrounding area identified in Table 3.1-2 would have minor adverse impacts in the amount of hazardous materials used and hazardous waste generated.

3.7.4 PROPOSED IMPACT REDUCTION MEASURES

Adherence to Federal, state, and applicable Army and garrison-level regulations would limit the potential for impacts from hazardous materials or hazardous waste. Any UXO materials uncovered will be disposed of in accordance with all current Army regulations and standard operating procedures. Implementation of the SPCCP and a project-specific ESCP would limit the potential for migration of potential hazardous materials or wastes off site.

During construction, the following precautions should be taken when handling potentially contaminated soils:

- Any soils excavated from an area of known or suspected contamination should be placed on plastic sheeting and covered at the end of the day to prevent wind and water erosion.
- Any soil proposed for off-site disposal should be characterized for waste disposal prior to transport. Sample analyses should be based upon prior soil data; personnel knowledge or familiarity with the site, including IRP staff; and disposal facility requirements.
- During windy or dry periods, dust control measures should be implemented through the use of a watering truck or other methods, as applicable. If dust control measures are not sufficient to control airborne soil transport, consider conducting air monitoring downwind adjacent to potential receptors to monitor exposure levels.
- Construction employees should wear gloves when handling soil and take other appropriate measures to limit exposure to soil.
- Coordinate closely with IRP and facility safety personnel during all construction activities involving ground disturbance.
- Follow all APG safety procedures and protocols as directed.

4 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

This section summarizes the anticipated level of impact to the VECs under the No Action and Proposed Action alternatives as discussed in Chapter 3. Table 4-1 also outlines measures identified in Chapter 3 to reduce and avoid adverse effects of the Proposed Action.

Table 4-1. Summary of Potential Environmental Effects from Baseline Conditions

VEC	Activity	No Action	Proposed Action	Permits, Plans, and Measures Identified for Reduction of Adverse Impacts
Air Quality	Construction	No Impact	Minor	Vehicle emissions would be reduced with the implementation of industry standard BMPs including: • Control of vehicle speeds, reduction or elimination of equipment idling time, and use of properly maintained equipment Reduction of airborne particulate matter would be accomplished through: • Stabilizing exposed areas to reduce wind erosion and dust, and wetting of exposed areas and roads with water or appropriate surfactants. • Covering open equipment used for conveying or transporting material likely to create objectionable air pollution when airborne • Promptly removing spilled or tracked dirt or other materials from paved streets
	Operations	No Impact	Negligible	None identified
Noise	Construction	No Impact	Minor	Reduction of noise would be accomplished through: • Limiting construction to normal weekday business hours • Properly maintaining construction equipment mufflers • Personnel involved with project activities would adhere to hearing protection requirements defined in health and safety plans
	Operations	No Impact	Negligible	None identified

Table 4-1. Summary of Potential Environmental Effects from Baseline Conditions

VEC	Activity	No Action	Proposed Action	Permits, Plans, and Measures Identified for Reduction of Adverse Impacts
Biological Resources	Construction	No Impact	Minor	Reduction of impacts to biological resources would be accomplished through: • Revegetation of all temporary construction disturbances with appropriate native species The following conditions would be required by regulations: • An approved Forest Conservation Plan and Critical Area Management Plan would be required for the removal of up to 25.1 acres of forest within APG; a 1:1 ratio of reforestation will be required for forest removed • Tree removal would occur outside of the nesting period (i.e., February through August) in accordance with the MBTA • Construction within the 500-meter protection zones (buffers) established by APG to minimize impacts to eagle nests and roosts would be avoided during nesting season (December 15 to June 15) and peak roosting hours (dusk to dawn) • Forest removal within the Chesapeake Bay Critical Area would be avoided during the colonial bird breeding season (i.e., April through mid-September) • Cutting of suitable forested areas would be avoided between April 1 and October 15 to avoid direct impacts to Indiana bat maternity colonies, otherwise tree removal during this period will require a habitat survey by a qualified biologist to verify no suitable Indiana bat habitat exists
	Operations	No Impact	Minor	Reduction of impacts to avian species would be accomplished through: • Installation of appropriate avian protective equipment (suspended line markers or "flappers"; insulating covers on wires, conductors, cutouts and bushings; and elevated perches) to minimize potential of bird injuries and electrocutions from contact with electrical lines and infrastructure

Table 4-1. Summary of Potential Environmental Effects from Baseline Conditions

VEC	Activity	No Action	Proposed Action	Permits, Plans, and Measures Identified for Reduction of Adverse Impacts
Wetlands	Construction	No Impact	Minor	Reduction of impacts to wetlands would be accomplished through: • Siting proposed construction activities (including placement of poles for new overhead lines) outside of identified wetlands and their associated 25-foot regulatory buffers • Use of horizontal directional drilling techniques in the vicinity of wetland features for underground line installation • Implementing soil and sedimentation control measures around construction sites (also refer to Water Resources) to reduce runoff rates to wetlands The following would be required by regulations: • Per MDSPGP-4 requirements, an application must be submitted to MDE for USACE authorization prior to tree removal within forested wetlands for the potential 0.26 acres of forested wetland conversion to emergent wetland. Up to 0.26 acres of forested wetland mitigation will be required.
	Operations	No Impact	Negligible	None identified
Water Resources	Construction	No Impact	Minor	Reduction of impacts to water resources would be accomplished through: • Revegetation (stabilization) of all temporary construction-related footprint disturbances • Use of silt fencing, storm drain protection mechanisms, geotextile fabrics, dust control measures, etc. during construction • Minimizing vegetation disturbance during construction and restoring vegetation within temporarily disturbed areas post-construction to reduce the potential for erosion The following plans would be required by regulations: • Development and implementation of ESCPs and SWP3s • Preparation of a Critical Area Management Plan for construction activities within the Chesapeake Bay Critical Area; up to 5.5 acres of reforestation will be required within the Critical Area to mitigate for forest removal
	Operations	No Impact	Negligible	None identified

Table 4-1. Summary of Potential Environmental Effects from Baseline Conditions

VEC	Activity	No Action	Proposed Action	Permits, Plans, and Measures Identified for Reduction of Adverse Impacts
Hazardous Materials and Hazardous Waste	Construction	No Impact	Minor	During construction, the following precautions would be taken when handling potentially contaminated soils: • Any soils excavated from an area of known or suspected contamination would be placed on plastic sheeting and covered at the end of the day to prevent wind and water erosion • Any soil proposed for off-site disposal should be characterized for waste disposal prior to transport • During windy or dry periods, dust control measures should be implemented through the use of a watering truck or other methods, as applicable; if dust control measures are not sufficient to control airborne soil transport, air monitoring would be conducted downwind adjacent to potential receptors to monitor exposure levels • Construction employees would wear gloves when handling soil and take other appropriate measures to limit exposure to soil • Close coordination would occur with the contractor, IRP, and facility safety personnel during all construction activities involving ground disturbance • Contractor would follow APG safety procedures and protocols as directed Other wastes generated during the Proposed Action, would be handled according to the following: • Potentially hazardous wastes (e.g., PCB-containing transformers) and non-hazardous wastes (e.g., construction debris), would be handled and disposed of in accordance with Federal, state, and applicable Army and garrison-level regulations • Any UXO materials uncovered will be disposed of in accordance with all current Army regulations and standard operating procedures • Spills would be handled in accordance with the SPCCP and disposed of in accordance with Federal, state, and applicable Army and garrison-level regulations
	Operations	No Impact	Negligible	None identified

In addition, as stated in Section 2.1, elements of impact reduction are being incorporated into the siting, design, and construction of the electrical infrastructure upgrades. This includes:

- The proposed design would utilize existing ROWs to the greatest extent practicable.
- Existing holes of demolished poles may be re-used to avoid contamination issues, if present.

- Staging areas would be located in the existing ROW or nearby parking areas, avoiding sensitive areas including wetlands, designated habitat areas for protected species, cultural sites, and critical areas and associated buffers.
- Drilling fluid and soil cuttings would be handled in accordance with Federal, state, and applicable Army and garrison-level regulations due to contamination potential.
- Pits used for the management of drilling fluids would be sited in previously disturbed areas and would avoid sensitive areas similar to staging areas.
- Prior to construction, a sampling plan would be prepared for ground-disturbing activities. The plan would be reviewed by appropriate environmental and IRP personnel. Prior to excavation, contractors would obtain excavation permits, as well as utility and UXO clearance. Excavation activities would be conducted according to APG's *Guidance for Proper Management of Excavated Soil*. All soil disturbances would be stabilized in accordance with the requirements of the MDE's "*Maryland Erosion and Sediment Control Guidelines for State and Federal Projects*." Under these guidelines, a detailed ESCP is required for ground disturbances or excavation activities greater than 5,000 square feet or any excavation activities that exceed 100 cubic yards.
- The Proposed Action will require a Stormwater Management Plan.
- Where feasible, underground lines would be directionally drilled underneath roadways to reduce impacts to road infrastructure and traffic. Proper notification would be provided in advance to APG personnel to reduce adverse impacts of temporary road closures and roadbeds would be restored following construction.
- Following construction, any old equipment (e.g., poles) would be recycled and disposed off-site as necessary in accordance with Federal, state, and applicable Army and garrison-level regulations to permitted landfills.
- Any areas temporarily disturbed either through construction or staging would be stabilized (e.g., reseeded) following construction.

In addition, Table 3.1-1 states if cultural resources are encountered during construction, all work in the area of the discovery would cease immediately and the APG Cultural Resources Manager and the SHPO would be notified.

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5 LIST OF ACRONYMS

Acronym	Definition
AADT	annual average daily traffic
ACSR	aluminum conductor steel-reinforced
ADNL	A-weighted day-night level
AGL	above ground level
APG	Aberdeen Proving Ground
AQCR	Air Quality Control Region
AR	Army Regulation
BACT	best available control technology
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
BRAC	Base Realignment and Closure
CAA	Clean Air Act
CDNL	C-weighted day-night level
CECOM	Communications Electronics Command
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COMAR	Code of Maryland Regulation
CWA	Clean Water Act
CZMA	Coastal Zone Management Act

Acronym	Definition
CZMP	Coastal Zone Management Program
DA	Department of the Army
dB	decibel
dBA	A-weighted decibels
DNL	Day-night sound level
DOA	Department of the Army
DoD	Department of Defense
DRID	Defense Reform Initiative Directive
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESCP	Erosion and Sediment Control Plan
EO	Executive Order
EPCRA	Emergency Planning and Community Right-to-Know Act
ESA	Endangered Species Act
°F	degree Fahrenheit
FCA	Forest Conservation Act
FICUN	Federal Interagency Committee on Urban Noise
FIDS	forest interior dwelling species
FNSI	Finding of No Significant Impact
GCR	General Conformity Rule
GHGs	greenhouse gases
GIS	Geographic Information System
HAPS	hazardous air pollutants
HITS	Hazardous Inventory Tracking System
HMMP	Hazardous Materials Management Policy

Acronym	Definition
I3MP	Installation Information Infrastructure Modernization Program
IAP	Installation Action Plan
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
IONMP	Installation Operational Noise Management Plan
IRP	Installation Restoration Program
kcmil	thousands of circular mils
kV	kilovolt
kVA	kilovolt-amps
LUPZ	Land Use Planning Zone
MBTA	Migratory Bird Treaty Act
MDE	Maryland Department of the Environment
MDNR	Maryland Department of Natural Resources
MDSPGP-4	Maryland State Programmatic General Permit-4
MSDS	Material Safety Data Sheet
MTA	Maryland Transit Authority
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NO_x	nitrogen oxides
NOI	Notice of Intent
NPDES	National Pollution Discharge Elimination System
NRC	Non-Residential Cleanup
NWI	National Wetlands Inventory
O_3	ozone

Acronym	Definition
ONMP	Operational Noise Management Plan
OSHA	Occupational Safety and Health Administration
P2	pollution prevention
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyl
Pb	lead
pk(met)	Peak noise level likely exceeded only 15 percent of the time
PM_{10}	Particulate matter less than 10 microns
$PM_{2.5}$	Particulate matter less than 2.5 microns
ROI	region of influence
RCRA	Resource Conservation and Recovery Act
ROW	right-of-way
RPMP	Real Property Master Plan
SARA	Superfund Amendments and Reauthorization Act
SAV	submerged aquatic vegetation
SHA	State Highway Administration
SHPO	State Historic Preservation Officer
SIPs	State Implementation Plans
SME	Subject Matter Expert
SO_2	sulfur dioxide
SPCCP	Spill Prevention, Contingencies, and Countermeasures Plan
SVOC	semivolatile organic compounds
SWP3	Stormwater Pollution Prevention Plan
TMDL	total maximum daily load
tpy	tons per year

Acronym	Definition
TSDF	treatment/storage/disposal facilities
USACE	U.S. Army Corps of Engineers
USAPHC	U.S. Army Public Health Command
USAR	U.S. Army Reserve
USARC	U.S. Army Reserve Center
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UV	ultraviolet
UXO	unexploded ordnance
VEC	valued environmental component
VOC	volatile Organic Compound

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Appendix A
Agency and Public Involvement

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Appendix B
Air Emissions Calculations

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Table D-1 Construction Equipment Use for Utility Lines

Equipment Type	Number of Units	Hours Per Day	Days on Site	Operating Hours
Digger Truck	2	10	30	600
1-1/2 Ton Utility Truck	2	10	60	1200
Power Bucket	2	10	60	1200
Squirt Bucket	1	10	60	600
Pickup trucks	4	6	120	2880
Crane/Boom Truck	1	5	90	450
Cable Puller	2	5	90	900
Hogg Davis	1	5	90	450
Water Pump/Generator	1	5	60	300
Tractor Trailer	1	10	30	300
Vacuum Excavator Truck	1	10	60	600
Directional Drill & Truck	1	10	60	600
Backhoe/Trackhoe	1	10	60	600
Dump Truck	1	10	90	900
Trencher	1	5	30	150
Dozer	1	5	90	450
Air Blower/Water Pump	1	5	60	300
Air Compressor	1	5	60	300
Wacker - Tamper	1	5	30	150
Roller	1	5	30	150
Paver	1	5	30	150

Construction equipment was estimated based on 5 years of phased construction.

Table D-2 Construction Equipment Emission Factors for Utility Lines (lbs/hour)

Equipment	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	CO_2
Digger Truck	0.3716	0.4501	0.0666	0.0008	0.0298	0.0298	66.8
1-1/2 Ton Utility Truck	0.5974	1.4932	0.1924	0.0027	0.0516	0.0516	260
Power Bucket	0.1837	0.2670	0.0439	0.0004	0.0167	0.0167	34.7
Squirt Bucket	0.4698	1.0967	0.1289	0.0015	0.0460	0.0460	141
Pickup trucks	0.5974	1.4932	0.1924	0.0027	0.0516	0.0516	260
Crane/Boom Truck	0.4395	1.0200	0.1204	0.0014	0.0426	0.0426	129
Cable Puller	0.4698	1.0967	0.1289	0.0015	0.0460	0.0460	141
Hogg Davis	0.4698	1.0967	0.1289	0.0015	0.0460	0.0460	141
Water Pump/Generator	0.2913	0.4717	0.0640	0.0007	0.0268	0.0268	61.0
Tractor Trailer	0.5974	1.4932	0.1924	0.0027	0.0516	0.0516	260
Vacuum Excavator Truck	0.5248	0.7416	0.1064	0.0013	0.0379	0.0379	120
Directional Drill & Truck	0.5022	0.6138	0.0673	0.0017	0.0200	0.0200	165
Backhoe/Trackhoe	0.3716	0.4501	0.0666	0.0008	0.0298	0.0298	66.8
Dump Truck	0.0315	0.0591	0.0093	0.0001	0.0025	0.0025	7.6
Trencher	0.4541	0.6043	0.1274	0.0007	0.0485	0.0485	58.7
Dozer	1.0420	2.2344	0.2721	0.0025	0.0924	0.0924	239
Air Blower/Water Pump	0.2825	0.4121	0.0621	0.0006	0.0267	0.0267	49.6
Air Compressor	0.3257	0.5175	0.0773	0.0007	0.0357	0.0357	63.6
Wacker - Tamper	0.4705	1.0675	0.1116	0.0017	0.0389	0.0389	166
Roller	0.3979	0.5706	0.0851	0.0008	0.0386	0.0386	67.1
Paver	0.5203	0.7607	0.1347	0.0009	0.0526	0.0526	77.9

Source: CARB, 2007a. 2015 Efs

Table D-3 Construction Equipment Emissions for Utility Lines (tpy)

Equipment	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	CO_2
Digger Truck	0.1115	0.1350	0.0200	0.0002	0.0089	0.0089	20.0397
1-1/2 Ton Utility Truck	0.3584	0.8959	0.1154	0.0016	0.0310	0.0310	156.0336
Power Bucket	0.1102	0.1602	0.0264	0.0002	0.0100	0.0100	20.8330
Squirt Bucket	0.1409	0.3290	0.0387	0.0005	0.0138	0.0138	42.3582
Pickup trucks	0.8602	2.1502	0.2770	0.0038	0.0743	0.0743	374.4807
Crane/Boom Truck	0.0989	0.2295	0.0271	0.0003	0.0096	0.0096	28.9419
Cable Puller	0.2114	0.4935	0.0580	0.0007	0.0207	0.0207	63.5373
Hogg Davis	0.1057	0.2468	0.0290	0.0003	0.0104	0.0104	31.7687
Water Pump/Generator	0.0437	0.0708	0.0096	0.0001	0.0040	0.0040	9.1489
Tractor Trailer	0.0896	0.2240	0.0289	0.0004	0.0077	0.0077	39.0084
Vacuum Excavator Truck	0.1574	0.2225	0.0319	0.0004	0.0114	0.0114	35.8741
Directional Drill & Truck	0.1506	0.1841	0.0202	0.0005	0.0060	0.0060	49.4764
Backhoe/Trackhoe	0.1115	0.1350	0.0200	0.0002	0.0089	0.0089	20.0397
Dump Truck	0.0142	0.0266	0.0042	0.0000	0.0011	0.0011	3.4310
Trencher	0.0341	0.0453	0.0096	0.0001	0.0036	0.0036	4.4036
Dozer	0.2344	0.5027	0.0612	0.0006	0.0208	0.0208	53.7957
Air Blower/Water Pump	0.0424	0.0618	0.0093	0.0001	0.0040	0.0040	7.4410
Air Compressor	0.0489	0.0776	0.0116	0.0001	0.0054	0.0054	9.5411
Wacker - Tamper	0.0353	0.0801	0.0084	0.0001	0.0029	0.0029	12.4481
Roller	0.0298	0.0428	0.0064	0.0001	0.0029	0.0029	5.0288
Paver	0.0390	0.0571	0.0101	0.0001	0.0039	0.0039	5.8450
Total	**3.03**	**6.37**	**0.82**	**0.01**	**0.26**	**0.26**	**993.48**

Table D-4 Delivery of Equipment and Supplies for Entire Project (Utility Lines and Substation/Switch Stations)

Number of Deliveries	2						
Number of Trips	2						
Miles Per Trip	30						
Days of Construction	120						
Total Miles	14400						
Pollutant	**CO**	**NO_x**	**VOC**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**
Emission Factor (lbs/mile)	0.0117	0.0129	0.0017	0.0000	0.0005	0.0004	2.8125
Total Emissions (lbs)	168.40	185.04	25.04	0.39	7.24	5.94	40499.7
Total Emissions (tpy)	**0.08**	**0.09**	**0.01**	**0.00**	**0.00**	**0.00**	**20.25**

Source: CARB, 2007b. 2015 Efs
Deliveries are estimated to include 1 material delivery/day and 1 concrete-asphalt delivery/day over the length of construction.

Table D-5 Surface Disturbance for Utility Lines

TSP Emissions	80	lb/acre				
PM_{10}/TSP	0.45					
$PM_{2.5}$/PM_{10}	0.15					
Period of Disturbance	30	days				
Capture Fraction	0.5					
	Area [acres]	**TSP[lbs]**	**PM_{10}[lbs]**	**PM_{10}[tons]**	**$PM_{2.5}$[lbs]**	**$PM_{2.5}$[tons]**
Construction	21.99	52787	23754	11.88	1782	0.89
Total	**21.99**	**52787**	**23754**	**11.88**	**1782**	**0.89**

Sources: USEPA, 1995 and USEPA, 2005.
Acreage of surface disturbance was conservatively estimated based on the phased construction.

Table D-6 Worker Commutes for Utility Lines

Number of Workers	9						
Number of Trips	2						
Miles Per Trip	30						
Days of Construction	120						
Total Miles	64800						
Pollutant	**CO**	**NO_x**	**VOC**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**
Emission Factor (lbs/mile)	0.0061	0.0061	0.0007	0.0000	0.0001	0.0001	1.1019
Total Emissions (lbs)	397.94	397.94	43.00	0.69	6.00	3.90	71405.0
Total Emissions (tpy)	**0.20**	**0.20**	**0.02**	**0.00**	**0.00**	**0.00**	**35.70**

Source: CARB, 2007b. 2015 Efs
Number of workers was conservatively estimated based on phased construction.

Table D-7 Total Construction Emissions per Area for Utility Lines (Tons per Year)

Activity/Source	**CO**	**NO_x**	**VOC**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**
Construction Equipment	3.03	6.37	0.82	0.01	0.26	0.26	993.48
Delivery of Equipment and Supplie	0.08	0.09	0.01	0.00	0.00	0.00	20.25
Surface Disturbance	0.00	0.00	0.00	0.00	11.88	0.89	0.00
Worker Commutes	0.20	0.20	0.02	0.00	0.00	0.00	35.70
Total Construction Emissions Per Utility Lines (One Area)	**3.31**	**6.66**	**0.86**	**0.01**	**12.15**	**1.16**	**1049.43**

Table D-8 Construction Equipment Use for Substation/Switiching Stations

Equipment Type	Number of Units	Hours Per Day	Days on Site	Operating Hours
Backhoe/Tractor/Loader	2	10	60	1200
Dump Truck	2	10	120	2400
Crane	1	5	120	600
Forklift	1	5	120	600
Dozer	1	5	240	1200
Pickup trucks	3	6	180	3240
Squirt Bucket	1	10	180	1800
Power Bucket	1	10	180	1800
Water Pump/Generator	1	5	120	600
Air Blower/Water Pump	1	5	60	300
Air Compressor	1	5	120	600
Wacker - Tamper	1	5	120	600

Construction equipment w as estimated based on 5 years of phased construction.

Table D-9 Construction Equipment Emission Factors for Substation/Switiching Stations (lbs/hour)

Equipment	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	CO_2
Backhoe/Tractor/Loader	0.3716	0.4501	0.0666	0.0008	0.0298	0.0298	66.8
Dump Truck	0.0315	0.0591	0.0093	0.0001	0.0025	0.0025	7.6
Crane	0.4395	1.0200	0.1204	0.0014	0.0426	0.0426	129
Forklift	0.2200	0.3163	0.0459	0.0006	0.0156	0.0156	54.4
Dozer	1.0420	2.2344	0.2721	0.0025	0.0924	0.0924	239
Pickup trucks	0.5974	1.4932	0.1924	0.0027	0.0516	0.0516	260
Squirt Bucket	0.4698	1.0967	0.1289	0.0015	0.0460	0.0460	141
Power Bucket	0.1837	0.2670	0.0439	0.0004	0.0167	0.0167	34.7
Water Pump/Generator	0.2913	0.4717	0.0640	0.0007	0.0268	0.0268	61.0
Air Blower/Water Pump	0.2825	0.4121	0.0621	0.0006	0.0267	0.0267	49.6
Air Compressor	0.3257	0.5175	0.0773	0.0007	0.0357	0.0357	63.6
Wacker - Tamper	0.4705	1.0675	0.1116	0.0017	0.0389	0.0389	166

Source: CARB, 2007a. 2015 Efs

Table D-10 Construction Equipment Emissions for Substation/Switching Stations (tpy)

Equipment	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	CO_2
Backhoe/Tractor/Loader	0.2229	0.2700	0.0400	0.0005	0.0179	0.0179	40.0794
Dump Truck	0.0378	0.0709	0.0112	0.0001	0.0030	0.0030	9.1493
Crane	0.1319	0.3060	0.0361	0.0004	0.0128	0.0128	38.5892
Forklift	0.0660	0.0949	0.0138	0.0002	0.0047	0.0047	16.3187
Dozer	0.6252	1.3407	0.1633	0.0015	0.0555	0.0555	143.4553
Pickup trucks	0.9678	2.4190	0.3117	0.0043	0.0836	0.0836	421.2908
Squirt Bucket	0.4228	0.9870	0.1160	0.0014	0.0414	0.0414	127.0747
Power Bucket	0.1653	0.2403	0.0395	0.0004	0.0150	0.0150	31.2495
Water Pump/Generator	0.0874	0.1415	0.0192	0.0002	0.0080	0.0080	18.2978
Air Blower/Water Pump	0.0424	0.0618	0.0093	0.0001	0.0040	0.0040	7.4410
Air Compressor	0.0977	0.1553	0.0232	0.0002	0.0107	0.0107	19.0822
Wacker - Tamper	0.1411	0.3203	0.0335	0.0005	0.0117	0.0117	49.7926
Total	3.0084	6.4077	0.8167	0.0097	0.2683	0.2683	921.8205

Table D-11 Surface Disturbance for Substations/Switching Stations

TSP Emissions	80	lb/acre				
PM_{10}/TSP	0.45					
$PM_{2.5}$/PM_{10}	0.15					
Period of Disturbance	30	days				
Capture Fraction	0.5					
	Area [acres]	**TSP[lbs]**	**PM_{10}[lbs]**	**PM_{10}[tons]**	**$PM_{2.5}$[lbs]**	**$PM_{2.5}$[tons]**
Construction	0.48	1154	519	0.26	39	0.02
Total	**0.48**	**1154**	**519**	**0.26**	**39**	**0.02**

Sources: USEPA, 1995 and USEPA, 2005.
Surface disturbance estimated based on one year of substation/switching station construction.

Table D-12 Worker Commutes for Substation/Switching Stations

Number of Workers	9						
Number of Trips	2						
Miles Per Trip	30						
Days of Construction	240						
Total Miles	129600						
Pollutant	**CO**	**NO_x**	**VOC**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**
Emission Factor (lbs/mile)	0.0061	0.0061	0.0007	0.0000	0.0001	0.0001	1.1019
Total Emissions (lbs)	795.88	795.88	86.00	1.39	12.00	7.80	142809.9
Total Emissions (tpy)	**0.40**	**0.40**	**0.04**	**0.00**	**0.01**	**0.00**	**71.40**

Source: CARB, 2007b. 2015 Efs
Number of workers was conservatively estimated based on phased construction.

Table D-13 Total Construction Emissions per Area for Substations/Switching Stations (Tons per Year)

Activity/Source	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	CO_2
Construction Equipment	3.01	6.41	0.82	0.01	0.27	0.27	921.82
Delivery of Equipment and Supplies	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Surface Disturbance	0.00	0.00	0.00	0.00	0.26	0.02	0.00
Worker Commutes	0.40	0.40	0.04	0.00	0.01	0.00	71.40
Per Area Phase I	**3.41**	**6.81**	**0.86**	**0.01**	**0.53**	**0.29**	**993.23**

Table D-14 Total Construction Emissions per Year for Project including Utility Lines and Substations (Tons per Year)

	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	CO_2
Utility Lines (Phase 1)	9.93	19.99	2.57	0.03	36.44	3.47	3148.28
Utility Lines (Phase 2)	3.31	6.66	0.86	0.01	12.15	1.16	1049.43
Total Utility Lines per Year	**13.25**	**26.65**	**3.43**	**0.04**	**48.58**	**4.63**	**4197.71**
	CO	**NO_x**	**VOC**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**
Substations/Switching Stations (Phase 1)	6.81	13.61	1.72	0.02	1.07	0.58	1986.45
Substations/Switching Stations (Phase 2)	0.85	1.70	0.21	0.00	0.13	0.07	248.31
Total Year 2	**7.66**	**15.31**	**1.93**	**0.02**	**1.20**	**0.66**	**2234.76**
Total Construction Emissions per Year for Project including Utility Lines and Substations (Tons per Year)	**20.91**	**41.96**	**5.36**	**0.07**	**49.78**	**5.28**	**6432.47**

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Appendix C
Coastal Zone Consistency Determination

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Determination of Consistency with Maryland's Coastal Zone Management Program

Pursuant to Section 307 of the Coastal Zone Management Act of 1972 (CZMA), as amended, this is a Federal Consistency Determination for the upgrade of electrical infrastructure associated with utility privatization at Aberdeen Proving Ground (APG).

Located about 20 miles northeast of Baltimore, Maryland, APG occupies approximately 72,406 acres, of which approximately 32,722 acres are open water, including portions of the Chesapeake Bay and numerous estuarine rivers. The remainder of APG is located on two peninsulas, the Aberdeen Area, and Edgewood Area along the western shore of the upper Chesapeake Bay.

Maryland's Coastal Zone Management Program (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 resource 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 of its electrical infrastructure construction and operation affecting Maryland's coastal resources or coastal uses with the CZMP. The Army determined that implementation of the Proposed Action could have a minor impact 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 comply with the Maryland CZMP.

Description of the Proposed Action

The Proposed Action is to upgrade the existing electrical infrastructure (5 kV and 35 kV main and secondary power lines) at both the Aberdeen and Edgewood areas of APG with a combination of aboveground and underground power lines, and to replace and construct new substations and switching stations. The new energy distribution system would include a combination 13.2 kV and 35 kV power lines. The current energy distribution system is primarily located along the existing road network and nearly all of the electrical right-of-ways (ROWs) are mowed to prevent vegetative overgrowth and maintain access. The proposed design would utilize these existing ROWs to the greatest extent practicable as an impact reduction measure.

The Proposed Action would require constructing and upgrading new and existing power lines, including the following actions:

- **Burying new electrical infrastructure:** The Proposed Action requires horizontal drilling or trenching in order to install the concrete-encased duct bank, manholes, and conduit and cables. The Proposed Action would require horizontal drilling to install underground power lines in the Edgewood Area in order to avoid contamination and to limit the overall area of disturbance. For the Aberdeen Area, open trench construction would be utilized for 35 kV underground power lines, and directional drilling would be utilized for the 13.2 kV underground system. Any required open trench construction would be up to three feet wide and five feet deep, and would be backfilled and stabilized following installation. Construction would occur primarily along the side of the roadways and paved parking

lots. Transformers, switches, and other equipment would be housed above ground to provide safety and maintenance access. Any planned ground disturbances would incorporate appropriate construction best management practices (BMPs) and would be reseeded or resurfaced when work is complete (i.e., construction and ground-disturbing activities are finished within a specific segment) and in accordance with the ESCP.

- **Constructing new overhead lines:** In undisturbed areas, the Proposed Action could require vegetation clearing, infrastructure removal, minor localized excavation for pole installation, and installation of new electrical infrastructure. These actions would utilize standard construction vehicles and equipment.
- **Reconductoring and upsizing overhead power lines:** The Proposed Action would involve replacing conductors and other electrical infrastructure on existing poles, possibly including poles and cross arms. Minor localized excavation could be required to remove existing poles. New poles would be placed in new holes adjacent to existing poles; however, existing holes may be re-used to avoid contamination issues. Demolition of existing poles would be included as necessary. Trimming of trees along the periphery may be required to maintain ROW clearances. Reconductoring for underground power lines would include extracting and replacing existing cables with new, larger cables.

Construction activities would be phased over a five-year period based on the type of upgrade and geographical area. For upgraded and new lines, standard ROW clearances would be established. Permanent utility ROW for underground lines would be 35 feet wide with a 17.5-foot buffer on either side of the utility line. Permanent utility ROW for aboveground lines would be 30 feet wide with a 15-foot buffer on either side of the utility line. Existing ROW would be largely utilized; however, up to 260.8 acres of new permanent ROW would be necessary under the Proposed Action.

The Proposed Action includes construction and operation of four substations at Aberdeen Area and three substations at Edgewood Area. In the Aberdeen area, three new substations would be constructed and existing Substation 4 would be reused. All of substations at Edgewood Area would be new. Twenty-five of the existing 26 substations across APG would be demolished, excluding the previously discussed Substation 4. Two proposed switching stations constructed in the Aberdeen Area would combine all incoming feeders and the peak shaving plant, increasing the 35 kV system's capacity, redundancy, and reliability. Approximately 0.7 acres of land would require clearing and grading to accommodate new the switching stations, substations, concrete pads, and crushed gravel. A total of 25 existing substations would be demolished, an action that could remove up to 5.8 acres of impervious surface.

An approximate 10,000 square-foot area would be required for non-operational laydown of each location to be directional drilled. Management pits (up to 0.5 acres) would also be utilized for drying of drilling fluid used in directional drilling. Staging areas and management pits would be located in the existing ROW or nearby parking areas, avoiding sensitive areas including wetlands, designated habitat areas for protected species, cultural sites, and critical areas and associated buffers.

Figures 2-1 through 2-4 of the EA show elements of the Proposed Action, and Figures 3.6-1 through 3.6-4 of the EA show the Proposed Action in relation to water resources and Maryland Coastal Zone buffers.

Approximately 121 acres of the Proposed Action would occur in the Maryland defined Critical Area. In addition, 5.5 acres of forest removal would occur in the Critical Area. Wetlands and surface water features are located within the project area; however, these areas would be

horizontally directionally drilled to avoid direct impacts. There is no Forest-Interior Dwelling Species (FIDS) habitat located within the project footprint.

Required permits 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 Plan (ESCP) by MDE. Prior to the start of construction, any required construction-related permits or approvals would be obtained by APG as needed.

A Forest Conservation Plan/Critical Area Management Plan will be developed to address mitigation requirements for forest removal. Erosion and sediment control and stormwater best management practices (BMPs) will be employed to minimize disturbance to water and terrestrial resources. The permits and mitigation measures listed above would prevent or minimize impacts to natural resources, such as wetlands and forests.

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 Code of Federal Regulations (CFR) Part 651. The EA will be made available to the public for 30 days, along with a draft FNSI. A Notice of Availability will be published in local newspapers (Baltimore Sun, Aegis, Cecil Whig, and Kent County News); and will be posted on APG's website under the Public Notices section. Copies of the EA and draft FNSI will be available for review at five local libraries (Baltimore County Public Library, Essex Branch; Baltimore Public Library, Perry Hall Branch; Harford County Public Library, Aberdeen Branch; Harford County Public Library, Edgewood Branch; Kent County Public Library). 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 – see below; Not Relevant – 3-5, 7-10, 13, 14)

1. **Air Quality -** Construction activities would potentially result in short-term fugitive dust emissions and greenhouse gas emissions. Fugitive dust generated during construction, demolition, or renovation activities, would be controlled by adherence to local ordinances, application of water, periodic street sweeping, and wetting down paved roadway surfaces. Emissions could also occur from operation of heavy equipment. Based on the emission totals estimated for the Proposed Action, *de minimis* thresholds for applicable criteria pollutants would not be exceeded, nor would the emissions from construction and operation be regionally significant. Overall long-term impacts from the Proposed Action are anticipated to be insignificant. Infrequent operational emissions would occur from vehicles and equipment during maintenance activities such as vegetation maintenance in the ROWs.

2. **Noise -** Construction would occur throughout the cantonment area, possibly near potential sensitive receptors. Noise levels would be typical of construction equipment and could result in short-term, minor impacts. Short-term effects would be primarily due to heavy equipment noise during construction activities. Construction would be limited to normal weekday business hours in areas adjacent to noise-sensitive land uses such as residential, recreational, and off-Installation areas. In addition, contractors would properly maintain construction equipment mufflers. It is expected that noise levels for adjacent noise-sensitive receptors would not exceed the noise abatement criterion (67 dBA) for residential land uses. Minor increases in noise should not contribute to a violation of any Federal, state, or local regulations or introduce areas of incompatible land use due to noise.

6. **Viewsheds -** Construction of power lines, including any aboveground power lines over surface waters, is not anticipated to alter or adversely impact existing viewsheds at APG.

11. **Soil Erosion -** Soil disturbance during construction would temporarily increase the potential for soil erosion and impacts to nearby surface waters. A soil ESCP would be developed prior to construction and submitted for approval to MDE. A Stormwater Pollution Prevention Plan (SWP3) would be prepared in accordance with Maryland Stormwater Management Act permit regulations and implemented to prevent impacts to nearby surface water bodies. Erosion and sediment controls that could be used during construction include installing silt fencing and sediment traps, re-vegetating disturbed areas after disturbance, and meeting performance standards established by MDE. Operation of the proposed facility would not result in further soil disturbance.

12. **Controlled Hazardous Substances -** APG maintains a Hazardous Materials Management Procedures Manual that sets forth procedures for handling and tracking hazardous materials. The manual includes procedures for maintaining inventory data and for procuring, receiving, and tracking hazardous materials. All APG hazardous and industrial waste-generators are required to properly collect, manage, and characterize their wastes prior to their transport for proper treatment and disposal. Any hazardous substances needed on site (i.e., diesel) 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 Spill Prevention, Contingencies, and Countermeasures Plan (SPCCP).

2. Water Quality (Relevant – see below; Not Relevant – 2, 3, 5-7, 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.

4. **Stormwater Discharge Permit -** A SWP3 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 SWP3 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 would be employed, such as installing silt fencing and sediment traps, re-vegetating disturbed areas after disturbance, employing BMPs, and meeting performance standards established by the MDE. See the EA, Sections 3.6 for more information. A National

Pollution Discharge Elimination System (NPDES) permit for construction activity application will be submitted to MDE.

8. **Small Scale Non-Structural Stormwater Management Practices -** New substations and switching stations would designed with appropriate BMPs and stormwater management measures to mimic natural hydrologic conditions to the maximum extent practicable. Net impervious surface would decrease at the Installation with the demolition of existing substations.

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. In addition, waste oil could be generated during demolition of existing substations and transformers. Hazardous materials and waste generated would be disposed of in accordance with Federal, state, and applicable Army and garrison-level regulations. See the EA, Section 3.7 for more information.

3. Flood Hazards (Relevant – see below; Not relevant: 2, 3)

1. Although some construction would occur within coastal tidal or non-tidal floodplains, no modifications to the floodplain are expected that would affect flooding upstream or downstream, or would have an adverse impact on water quality.

<u>B. COASTAL RESOURCES</u>

1. **The Chesapeake and Atlantic Coastal Bays Critical Area (Relevant – see below; Not relevant: 2, 4, 5, 9, 12-18, 20-25, 27-29)**

   1. **Colonial Water Bird Nesting Sites in the Critical Area** – Construction near potential 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.

   3. **Physical Alterations of Streams in Critical Area** – Stream crossings for utilities would either be directionally drilled or would not require in-water construction, nor would require physical alteration to streams.

   6. **Stream Crossings in Critical Area** – Stream crossings for utilities would either be directionally drilled or would not require in-water construction. Design and construction would prevent increases in flood frequency; retain tree canopy near waterways to the extent practicable; maintain stream water temperature; avoid impacts to streambeds; and minimize adverse water quality and impacts of stormwater through implementation of the ESCP and SWP3.

   7. **Timing of Utility Construction within Buffer** – Utility construction within the 100-foot Critical Area buffer would be prohibited between March 1 and May 15.

   8. **Utility Construction within Buffer** – As noted in Section 3.6, some utility construction would be required within the 100-foot Critical Area buffer. Construction would occur in previously disturbed areas and existing ROW to the extent practicable, although minor amounts of tree clearing (i.e., less than 1 acres) would be required. Construction of underground lines within these areas would serve to benefit wildlife, specifically bald eagles and other bird species, through the burial of power lines. Bald eagle protective measures, such as spinning flight diverters, are currently in use on overhead utility lines at APG and

would be employed as appropriate for the Proposed Action. An ESCP would be prepared and implemented prior to construction to ensure erosion protection and minimize impacts on aquatic life, habitat, and water quality. Any ground disturbance would be stabilized and re-vegetated following construction.

10. **Authorized Disturbance to Buffer** – As noted in Section 1.3 of the EA, the Proposed Action provides necessary upgrades to maintain industry standards for APG's energy distribution system. In addition, as discussed in Sections 3.4 and 3.6 of the EA, construction would minimize adverse effects on water quality and fish, plant, and wildlife habitat. A buffer management plan would be developed in accordance with standards adopted by the Critical Area Commission.

11. **Buffer Management Plan** – As stated above, a buffer management plan would be developed in accordance with standards adopted by the Critical Area Commission.

19. **Tree Cutting in Buffer** – Less than one acre of tree clearing would be required within the 100-foot buffer. Tree clearing would be managed in accordance with the Buffer Management Plan to be prepared for the project.

26. **Soil Erosion and Sediment Control Plan in Critical Area** – The Proposed Action would incorporate erosion and sediment controls and stormwater BMPs to reduce adverse water quality impacts. An ESCP and SWP3 would be prepared and appropriate permits would be obtained from MDE prior to construction. See the response to A.1.11 above.

30. **Critical Areas Determined to be Areas of Intense Development** – Given the developed nature of APG, certain areas can be categorized as Intensely Developed Areas per Code of Maryland Regulations (COMAR) 27.01.02.03. Disturbance to the Critical Area, natural habitat, and forests would be minimized to the maximum extent practicable through utilizing existing ROW in the Critical Area; however, some tree cutting would be required to extend existing ROW and for new ROW. Tree cutting in the Critical Area would be mitigated on a 1:1 ratio in accordance with the Forest Conservation Plan/Critical Area Management Plan. No direct impacts to fish or wildlife are expected in these areas from construction within the Critical Area or as a result of the Proposed Action. Impacts to plant habitats would be temporary and restored following construction. An ESCP would be implemented to prevent off-site migration of soils into waterways. Construction within the Critical Area would not increase or affect the amount of existing impervious surface area. Existing groundcover would be stabilized and revegetated following construction. Existing ROW would be utilized to limit the need for tree removal in the Critical Area. See Section B.1.6 for a discussion of stream crossings in the Critical Area.

31. **Critical Areas that are not Areas of Intense Development** – Disturbance to the Critical Area, natural habitat, and forests were minimized to the maximum extent practicable through utilizing existing ROW in the Critical Area. An ESCP would be implemented to prevent off-site migration of soils into waterways. Any forest removal would be replaced in accordance with the Forest Conservation Plan/Critical Area Management Plan to be prepared for the project with a 1:1 mitigation ratio for impacted forest. Lot coverage would remain the same or would be reduced in the event of power line burial. No construction on slopes greater than 15 percent would occur.

2. Tidal Wetlands

1. There are approximately 0.1 acres of tidal wetlands within the project area; however, all utility crossings would be directionally drilled underground. No direct impacts to wetlands would occur.

3. Non-Tidal Wetlands

1. There are approximately 0.9 acres of non-tidal wetlands within the project area; however, all utility crossings would be directionally drilled underground. No direct impacts to wetlands would occur.

4. Forests (Relevant – see below; Not Relevant – 2-4)

1. Forest Conservation Act – Implementing the Proposed Action would entail the disturbance of greater than 40,000 square feet of land; therefore, the Proposed Action would need to be consistent with the provisions of the Maryland Forest Conservation Act. A Forest Stand Delineation and a Forest Conservation Plan/Critical Area Management Plan would be completed for the Proposed Action prior to construction. The Forest Conservation Plan/Critical Area Management Plan would include a forest protection plan to be employed during construction and a forest mitigation plan for the impacts to forest resources from the proposed project.

5. Roadside Trees – Roadside trees may need to be cut to maintain ROW access so as to allow for maintenance of the electrical system, eliminate potential hazard to the electrical system, and promote public safety.

6. Sediment and Erosion Control Plan - The Proposed Action includes an Erosion and Sediment Control Plan as described in Section A.1.11 above.

5. Historical and Archaeological Sites (Relevant – see below; Not Relevant – 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. As the Proposed Action would involve limited surface disturbance within previously disturbed locations, it is unlikely that significant adverse effects would occur to archaeological resources. If cultural resources are encountered during construction, 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 – see below; Not Relevant – 2-4, 8-14)

1. Threatened and Endangered Species – The only federally-listed species with the potential for occurrence within the project area are the Indiana bat and dwarf wedge mussel. However, the dwarf wedge mussel is not likely to experience adverse impacts due to its habitat. This species lists in creeks and rivers, which would be avoided by the Proposed Action through use of horizontal directional drilling. Construction activities would result in the clearing of mature trees which could provide suitable roosting habitat for Indiana bats.

State-listed species potentially inhabiting the APG include the sedge wren, black rail, and nine identified species of wetland plants (see Table 3.4-2 of the EA). The sedge wren nests in wet meadows and marshes; wetland areas occurring

within areas intersecting the Proposed Action would be avoided through the use of horizontal directional drilling. Such drilling techniques would also avoid impacting wetland plants. The most suitable black rail habitat within the APG occurs on Spesutie Island. Potential habitat areas fall within the Critical Area, so impacts to this species would be avoided through adherence to the rules set forth in the Critical Area Act. See the EA, Section 3.4 for further information.

7. **Aquatic and Terrestrial Habitat Adjacent to or in Non-Tidal Waters:** No in-stream construction in non-tidal waters would occur. The Proposed Action would utilize existing ROW to the extent practicable to limit impacts to terrestrial habitat adjacent to non-tidal waters. An ESCP and SWP3 would be prepared to limit impacts to waterways.

C. COASTAL USES

1. **Mineral Extraction – Not relevant**
2. **Electrical Generation and Transmission – Not relevant**

   Note: The Proposed Action involves upgrades and new construction of distribution lines; no transmission lines or infrastructure would be constructed.

3. **Tidal Shore Erosion Control – Not relevant**
4. **Oil and Natural Gas Facilities (Relevant – see below; Not relevant – 1-4, 6)**
   5. **Above-Ground Oil Storage** - Transformer fuel would be stored on site at new substations and switching stations. Appropriate containment measures would be in place that would prevent spills and leaks that would enter water of the State. See A.1.12 and A.2.9 above for further information.
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 – 3-7, 9-12)**
   1. **Erosion and Sediment Control -** The Proposed Action would include controls to minimize erosion and keep sediment on site, described in Section A.1.11 above.
   2. **Avoid and Minimize Impacts to Wetlands, Water Quality and Natural Habitats, Trees and Historical and Archaeological Resources:** Construction of the Proposed Action would largely occur in previously disturbed areas. Construction would utilize existing ROW to the extent practicable as an impact reduction measure to limit impacts to wetlands, water quality, natural habitat, trees, and historic and archaeological resources. Approximately 5.5 acres of new ROW would be cleared; however, forest reductions would be mitigated in accordance with the Maryland Critical Area Act and Maryland Forest Conservation Act (see Sections B.1.31 and B.4.1 above). No direct impacts to wetlands would occur as all utility crossings of wetlands would be directionally drilled. Water quality impact would be minimized through the net reduction in impervious surface as a result of the Proposed Action, and employing erosion and sediment control, and stormwater management BMPs during construction. Impacts to cultural resources are not anticipated as construction

would occur in previously disturbed areas (see Section B.5.1 above for further discussion on cultural resources).

8. **Public Involvement -** The EA will be made available for public review and comment for 30 days. A notice of availability will be published in local newspapers (Baltimore Sun, Aegis, Cecil Whig, and Kent County News); and will be posted on APG's website under the Public Notices section. Copies of the EA and draft FNSI will be available for review at five local libraries (Baltimore County Public Library, Essex Branch; Baltimore Public Library, Perry Hall Branch; Harford County Public Library, Aberdeen Branch; Harford County Public Library, Edgewood Branch; Kent County Public Library).

10. Sewage Treatment – Not Relevant

D. SUMMARY OF FINDINGS

Based on the above analysis, which is elaborated on in the EA, APG personnel would 1) ensure that contractor personnel use and maintain appropriate BMPs, 2) obtain the requisite permits and approvals for construction and operational work, and 3) implement measures to mitigate potential environmental impacts. APG finds that the proposed implementation of the Proposed Action would be consistent to the maximum extent practicable with the federally-approved enforceable provisions of the Maryland CZMP, pursuant to the CZMA of 1972, as amended and in accordance with 15 CFR 930.30.

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Appendix D
Wetland Identification and Delineation Report

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NOTE: THIS APPENDIX IS FOR OFFICIAL USE ONLY. FOR FURTHER INFORMATION OR TO REQUEST A VIEWING OF THIS APPENDIX AT APG, PLEASE CONTACT: MR. ARNOLD O'SULLIVAN, APG, DIRECTORATE OF PUBLIC WORKS, ENVIRONMENTAL DIVISION AT 410-306-2731 OR BY EMAIL AT ARNOLD.V.OSULLIVAN.CIV@MAIL.MIL.

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Appendix E
Soil Sampling Report

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