DRAFT
PROGRAMMATIC
ENVIRONMENTAL ASSESSMENT

Proposed Stream Restoration Program
at U.S. Army Garrison
Fort George G. Meade, Maryland

OCTOBER 2020

DEPARTMENT OF THE ARMY

Fort George G. Meade
Fort Meade, Maryland 20755-5115

DRAFT FINDING OF NO SIGNIFICANT IMPACT

PROGRAMMATIC ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED STREAM IMPROVEMENTS AT FORT GEORGE G. MEADE, MARYLAND

1.0 INTRODUCTION

This Programmatic Environmental Assessment (PEA) has been prepared to analyze the potential environmental, cultural, and socioeconomic effects associated with implementing the proposed restoration activities at eight impaired stream reaches in Midway Branch, Franklin Branch, Rogue Harbor, and Severn Run watersheds at Fort George G. Meade, Maryland (hereinafter referred to as FMMD).

This PEA was prepared pursuant to the National Environmental Policy Act (NEPA) of 1969 (42 United States Code Section 4321 *et seq.*); the Council on Environmental Quality (CEQ) regulations that implement NEPA (Title 40 Code of Federal Regulations [CFR], Parts 1500-1508); and 32 CFR 651.

2.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the Proposed Action is to improve water quality in the stream systems, stabilize stream banks, ensure future improvements to habitat and fisheries, reduce flooding conditions on and off the FMMD property, comply with FMMD's Integrated Natural Resources Management Plan (INRMP), and enhance the overall health of the Chesapeake Bay watershed by complying with FMMD's MD Municipal Separate Storm Sewer System (MS4) Phase II Permit, Chesapeake Bay Total Maximum Daily Load (TMDL) requirements for federal facilities (Permit 13-SF-5501).

The TMDL identifies the necessary pollution reductions of nitrogen, phosphorus and sediment across Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and the District of Columbia and sets pollution limits necessary to meet applicable water quality standards in the Chesapeake Bay and its tidal rivers and embayments. The TMDL is designed to ensure that all pollution control measures needed to fully restore the Bay and its tidal rivers are in place by 2025. The TMDL is supported by rigorous accountability measures to ensure cleanup commitments are met. Proposed restoration actions for the impaired stream reaches include, but are not limited to, rock cross vanes, rock step, constructed riffles, tree protection, bank sloping and matting, step pools, cobble weirs, root wads, and wetland creation and enhancement. As an MS4 Phase II permit holder, FMMD may receive up to 469 impervious-acre TMDL credits by implementing all stream restoration proposals (approximately 23,450 linear feet) identified in the draft *Technical Memorandum: Stream Assessment for Midway Branch, Franklin Branch, Severn Run, and Associated Tributaries on Fort George G. Meade* (USACE 2019).

Figure 3. Culvert Draining to the Severn Run Stream System

Figure 4. Effects of Increased Flow at Severn Run Stream System

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Stream systems within the Midway Branch, Franklin Branch, Rogue Harbor, and Severn Run watersheds were evaluated to determine impacted streams (USACE, 2019). Environmental problems identified during the stream assessments included: channelized stream sections, inadequate stream buffers, fish migration blockages, excessive bank erosion, trash dumping sites, unusual conditions, and pipe outfalls. The stream assessment surveys concluded that existing development on and off the FMMD property has caused unstable conditions. Unless restoration activities are implemented, these current environmental conditions will continue to degrade the stream systems, and potential future development will cause even greater stress, resulting in further incision as well as erosion and flooding at FMMD.

3.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The PEA analyzes two courses of actions: the Proposed Action and the No Action Alternative.

Proposed Action

The Proposed Action, which is the preferred alternative, includes a suite of best management practices that would address the environmental problems noted above in the stream assessment results. These restoration activities include, but are not limited to:

- **Installation of Cobble Weirs** - Designed to specific height and used to prevent flooding and erosion.
- **Installation of Stone Steps** - Designed as a series of pools built with rocks that mimic staircase steps to slow down stream flow.
- **Installation of Root Wads** – Designed as a protection technique that provides immediate riverbank stabilization, protects the toe-of-slope and provides excellent fish habitat, especially for juveniles. Root Wads also provide toe support for bank revegetation techniques and collect sediment and debris that will enhance bank structure over time.
- **Wetland Enhancement and Creation** –Designed to rehabilitate or reestablish a degraded wetland, and/or the modification of an existing wetland to favor specific wetland functions such as flooding from an adjacent stream.
- **Constructed Riffles and Rock Cross Vanes**- Designed as channel-spanning structures that provide grade control, dissipate energy, deflect stream flow to the center of the channel, and create pools. A grade control structure stabilizes the stream channel by preventing changes in bed elevation at that point. It can also protect a streambank from undesirable erosion or migration when the erosion is caused by flows impacting the bank face.

No-Action Alternative

The CEQ requires the analysis of the No Action Alternative even if the agency is under legislative command to act. Analysis of the No Action Alternative provides a benchmark for enabling decision-makers to compare the magnitude of environmental effects of the other action alternatives. Under the No Action Alternative, restoration of degraded streams would not occur at FMMD. The No Action Alternative is not feasible because it would not address excessive erosion and/or excessive flooding; would not be in compliance with the MD Phase II MS4 permit or the Chesapeake Bay TMDL; and would not be in compliance with the FMMD INRMP.

4.0 SUMMARY OF ENVIRONMENTAL IMPACTS

As detailed in this PEA, construction activities associated with the Proposed Action would generate adverse impacts to natural resources, but no significant adverse impacts would occur. This is because these impacts would be temporary, lasting approximately six months during the construction phase for each stream reach. The intensity of the adverse impacts would be limited to the area immediately surrounding the stream reaches. Additionally, the number of human receptors would be limited to a relatively small number of staff and personnel within FMMD. These adverse impacts would end once the construction phases are completed. During operation, significant long-term beneficial impacts would be realized because the stream reach improvements would function to improve water quality, reduce flooding and sedimentation, improve and increase riparian habit, remove trash and other debris that currently foul the reaches, and improve the associated biological quality of both the aquatic and terrestrial environment. While the stream reaches would still be under pressure from upstream development, their resiliency would be greatly increased for withstanding sediment loading and storm-related surges in runoff volume. On a cumulative basis, the stream reach restoration would improve the overall quality of the FMMD watershed. Routine operational maintenance would be required to ensure the stream restoration goals are maintained as designed. Additionally, future development activities (such as new building construction or renovation) must consider the FMMD watershed functions and values to ensure the lasting benefits of the Proposed Action across the FMMD watershed.

Table FNSI-1-1 summarizes the potential consequences the Proposed Action and No Action Alternative would have on resources evaluated in the PEA

Table FNSI-1-1. Potential Consequences of the Proposed Action and No Action Alternatives

Resource	Proposed Action	No Action
Land Use	Short-term minor adverse impact, long-term major beneficial impacts	Minor adverse impacts
Visual Resources	Short-term minor adverse impacts, long-term major beneficial impacts	Minor adverse impacts
Noise	Short-term minor adverse impacts	No impacts
Soils	Short-term minor adverse impacts, long-term major beneficial impacts	Minor adverse impacts
Topography	Short-term minor adverse impacts, long-term minor adverse impacts	Minor adverse impacts
Air quality	Short-term minor adverse impacts	No impacts
Surface Water	Short-term minor adverse impacts, long-term major beneficial impacts	Minor adverse impacts
Floodplains	Short-term minor adverse impacts, long-term major beneficial impacts	Minor adverse impacts
Ground water	No impacts	No impacts
Coastal Zone	No impacts	No impacts
Stormwater	Possible short-term minor adverse impacts, long-term major beneficial impacts	No impacts
Wetlands	Short-term minor adverse impacts, major long-term beneficial impacts	Minor adverse impacts

Resource	Proposed Action	No Action
Vegetation	Short-term minor adverse impacts, long-term major beneficial impacts	Minor adverse impacts
Terrestrial wildlife	Short-term minor adverse impacts, long-term major beneficial impacts	No impacts
Rare, Threatened, or Endangered species	No likely adverse impacts and potential beneficial impacts	No impacts anticipated
Aquatic habitat	Short-term minor adverse impacts, long-term major beneficial impacts	Minor adverse impacts
Cultural Resources	No impacts	No impacts
Hazardous, Toxic and Radioactive materials	No impacts	No impacts
Traffic and Roadways	Short-term minor adverse impacts, no long-term impacts	No impact
Infrastructure and Utilities	No impacts	No impacts
Socioeconomics, Environmental Justice, and Protection of Children	Short-term minor beneficial impacts	No impacts
Cumulative Impacts	No significant impacts	No impacts

5.0 PUBLIC INVOLVEMENT

The Draft PEA was made available online for public review at www.ftmeade.army.mil, and in print at the Medal of Honor Memorial Library at FMMD and at the West County Area Library, Odenton, Maryland. A Notice of Availability of the release of the Draft PEA for a 30-day review period was published in the *Capital Gazette*. All comments received during the 30-day review period, including public and agency responses, will be considered.

6.0 CONCLUSION AND FINDING OF NO SIGNIFICANT IMPACT

I have reviewed the PEA and find that the Proposed Action to implement stream improvement projects on Fort Meade will have no significant impacts on the natural environment, cultural resources, or the human environment. Based on these findings, an Environmental Impact Statement is not required for this project and a Finding of No Significant Impact shall be issued.

CHRISTOPHER M. NYAND
COL, IN Commanding

Date

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PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

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1.0 INTRODUCTION

This Programmatic Environmental Assessment (PEA) analyzes the potential impacts from implementing the proposed restoration activities at eight impaired stream reaches in Midway Branch, Franklin Branch, Rogue Harbor, and Severn Run watersheds on Fort George G. Meade (FMMD), MD (Figure 1). These reaches fall into one of two different 12-digit Hydrologic Unit Codes (HUC) identified as 021311050949 (Franklin, Midway, and Rogue Harbor) and 021310021002 (Severn Run). Restoring stream systems in these watersheds will improve water quality, reduce flooding, enhance fish habitat, prevent further stream degradation, and provide numerous co-benefits for FMMD and neighboring communities, while also helping FMMD maintain compliance with federal and state water quality requirements.

As part of FMMD's comprehensive stream assessment and restoration efforts, FMMD is working with the U.S. Fish & Wildlife Service (USFWS) on the proposed restoration actions, the first of which is located in the Severn Run watershed. Midway, Franklin, and Rogue Harbor watersheds will follow, implementing the same types of practices proposed at the Severn Run stream should they prove to be beneficial.

This PEA is prepared in accordance with the National Environmental Policy Act (NEPA) of 1969; 40 Code of Federal Regulations (CFR), Parts 1500-1508, the Council on Environmental Quality (CEQ) regulations implementing NEPA and 32 CFR Part 651, Environmental Analysis of Army Actions. This PEA provides NEPA analysis and documentation for the Proposed Action, which is to restore degraded stream systems located on FMMD.

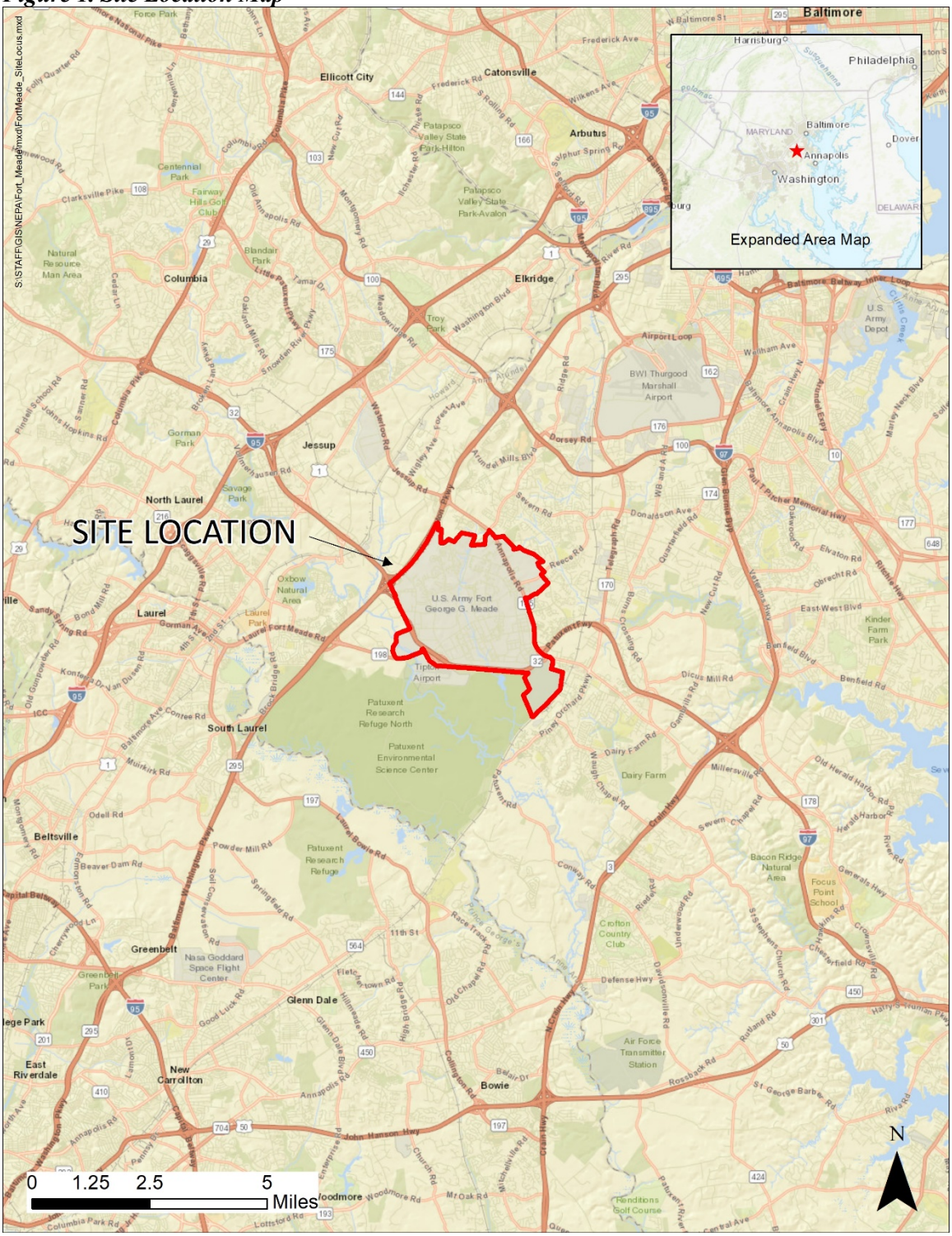
A PEA, by design, allows for greater efficiency in making informed decisions, reflects the need to coordinate multiagency reviews and ensures meaningful public engagement in the decision-making process. The Army expects to gain efficiencies executing the stream restoration actions through a Proposed Action that includes a suite of restoration actions for the various impaired stream conditions. It is essential that FMMD examine each restoration action in the context of each stream system, ensuring the environmental ramifications are within the scope of the Proposed Action and analysis within this PEA. If a circumstance exists where adverse environmental impacts are suspected to be significant and/or outside the scope of this PEA, then the Army would conduct additional environmental review and analysis.

Subsequent NEPA reviews for future actions may be tiered from this PEA, thereby eliminating duplicate discussions where a reference to this document may be appropriate. In most instances, future restoration actions may require a Record of Environmental Consideration (REC) that can be tiered from this PEA, though there may be extenuating circumstances or potential adverse environmental impacts that could require supplemental NEPA documentation. Due to the differences and combination of restoration practices proposed for each stream, a REC will be prepared for each stream system, tiered from this PEA.

1.1 BACKGROUND

FMMD was authorized by Congress in 1917 as a training cantonment during World War I, with the first troops arriving in September. The post was named for Major General George Gordon Meade, whose defensive strategy in the Battle of Gettysburg proved a major factor in turning the tide of the Civil War in favor of the North.

Figure 1. Site Location Map



FMMD became an active permanent U.S. Army installation in 1917 and is located approximately midway between Baltimore, Maryland, and Washington, D.C., encompassing approximately 5,107 acres in Anne Arundel County, Maryland. FMMD supports over 119 tenant organizations from all military services and several federal agencies. The major tenants include the National Security Agency (NSA), the Defense Information School (DINFOS), the 704th Military Intelligence Brigade, 902nd Military Intelligence Group, the U.S. Environmental Protection Agency (USEPA) Science Center, Asymmetric Warfare Group (AWG), Defense Media Activity (DMA), Department of Defense Consolidated Adjudication Facility (DODCAF) and Defense Information System Agency (DISA).

Two major stream systems, Midway Branch and Franklin Branch, and the headwaters of another system, Severn Run, are located on FMMD. Both Midway and Franklin Branches flow from north to south through the center of FMMD. The headwaters of Severn Run are located on the northeastern corner of FMMD, and flow east for approximately 5,000 feet before exiting FMMD and ultimately discharging into the Severn River. Figure 2 shows the FMMD Future Development Plan map of the installation identifying an overall plan to restore watershed areas of interest. Further details of these proposed stream reaches are identified in Table 1.

The headwaters of Midway Branch are located north of FMMD in an urbanized, developed area. Midway flows through the center of FMMD and exits the property where it flows through a culvert under Maryland Route 32. The headwaters of Franklin Branch begin just downstream of 29th Street, flow through a culvert under the MacArthur High School area and eventually drain into Burba Lake (approx. 100-year-old lake). The flow leaves the lake through a dam and joins Midway Branch upstream of Rock Avenue. The Rogue Harbor reach extends approximately 650 LF from 1st Street downstream to the MD32 culvert and includes a failed culvert system at the old Rock Road crossing which is allowing head cutting back to 1st Street. There is also a possible wetland restoration opportunity where an old barrow pit has reverted to phragmites.

Figure 2. Location of the Proposed Stream Reach Restoration Areas

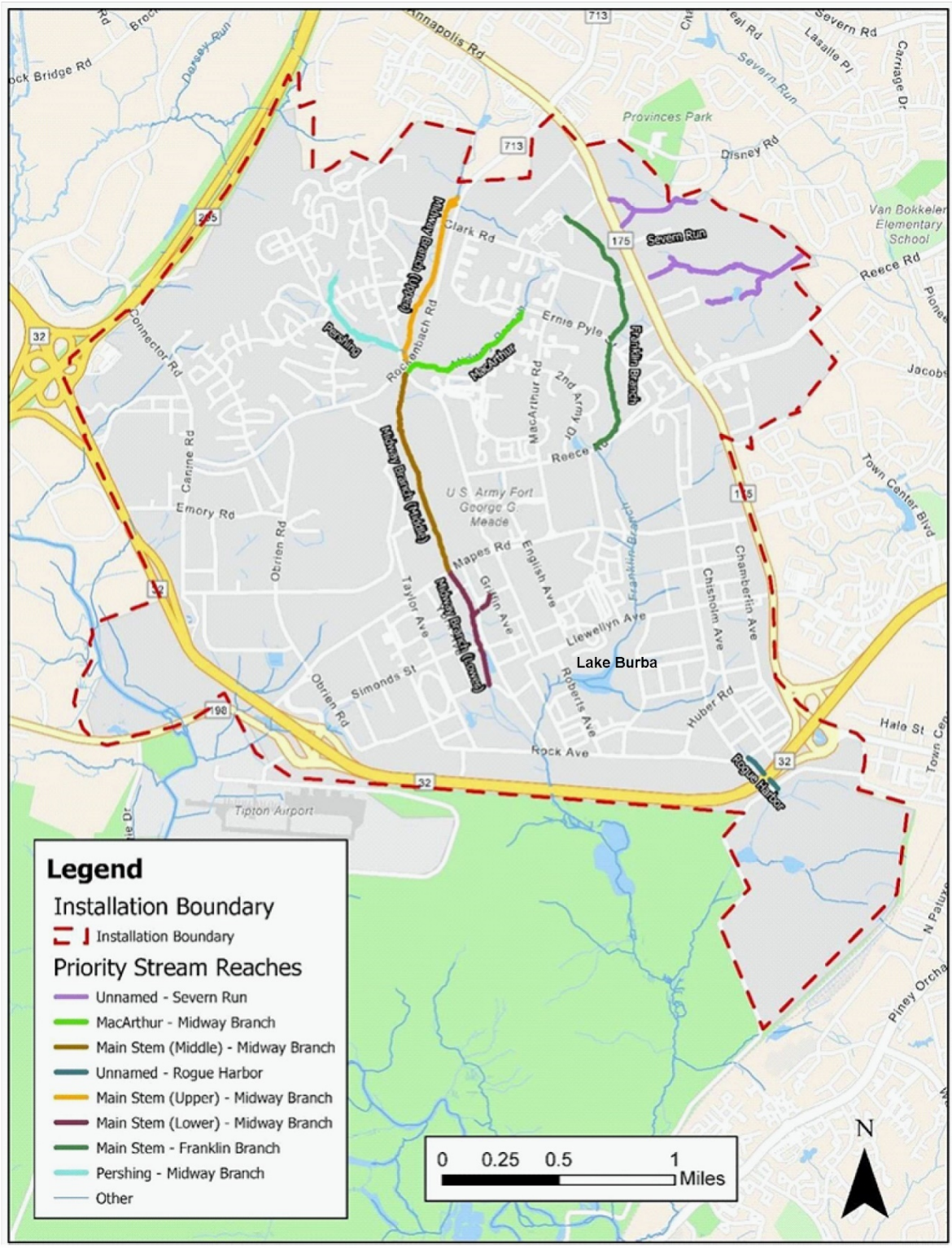


Table 1. Priority Stream Reach Watersheds Planned for Restoration

Stream Reach (Priority for Restoration)	Watershed	HUC-12	Description
Unnamed Tributary (1)	Severn Run	021310021002	Downstream of the Army Reserve RSC and USFWS. Designed beginning at the RSC going downstream to the FMMD property line. Severn Run is a Maryland Use IV Put and Take trout stream that is rapidly urbanizing in the upper head waters.
Unnamed Tributary – MacArthur (2)	Midway Branch	021311050949	Beginning at Ernie Pyle Road crossing going downstream behind MacArthur Middle School and joining Midway Branch at the intersection of Rockenbach Rd and Cooper Ave. This reach of stream is incised and actively eroding. Sediment has aggregated at the end of the reach forming a wetland complex.
Main Stem (Middle) (3)	Midway Branch	021311050949	Old golf course area between NSA and FMMD. The channel has been straightened and armored. There are two fords that act as nick points that have 3-5 feet head cuts.
Unnamed Tributary (4)	Rogue Harbor	021311050949	From 1st Street downstream to MD32 culvert. Possible wetland restoration opportunity. There is a failed culvert system at the old Rock Road crossing allowing head cutting back to 1st Street. An old barrow pit has reverted to phragmites. Approximately 650 LF.
Main Stem (Upper) (5)	Midway Branch	021311050949	There are several select reaches along Rockenbach Road downstream to the confluence with Franklin Branch. Grade is controlled by road crossing. The stream has been straightened and is incised without floodplain connectivity.
Main Stem (Lower) (6)	Midway Branch	021311050949	Gabion basket-lined channel restricted by Murphy Field on one side and stormwater pond on the other.
Main Stem (7)	Franklin Branch	021311050949	Reach location from Ernie Pyle St. to Reece Road. Incised on the upper end, aggregation on the lower end.
Unnamed Tributary – Pershing (8)	Midway Branch	021311050949	From 2nd Calvery Avenue going downstream to Cooper Avenue. Exposed stream banks, lateral instability, sediment.

1.2 ASSESSMENT OF STREAMS

Figure 3 and Figure 4 show the degraded Severn Run stream system. There are at least two main incisions; one system crosses Disney Road and the other larger system crosses Reece Road. Both of these systems move substantial amounts of sediment downstream to the Severn River, exceeding the amount permitted under the Clean Water Act (CWA) Total Maximum Daily Load (TMDL) by the Maryland Department of the Environment (MDE) and the U.S. Environmental Protection Agency (EPA).

The USACE, at the direction of FMMD, conducted stream assessments beginning in October 2011 to identify potential sources of sediment and nutrients (nitrogen and phosphorous) that lead to stream eutrophication and chemical impairment. Additionally, best management practices (BMPs) and stream restoration activities that would reduce loadings of these contaminants into FMMD streams while achieving the Chesapeake Bay TMDLs were identified.

Figure 3. Culvert Draining to the Severn Run Stream System

Figure 4. Effects of Increased Flow at Severn Run Stream System

Two separate stream assessments were conducted to identify sources of stream impairment at FMMD streams: (1) a physical assessment of streams and streambanks along Franklin and Midway Branches and Severn Run, and (2) a water quality assessment of these streams during both wet and dry weather events. Stream corridors were evaluated to determine impacted reaches using methods adapted from Stream Corridor Assessment (SCA) Survey Protocols (Yetman 2001). SCA protocols were developed in 2001 by Maryland Department of Natural Resources (MDDNR). The SCA approach allowed for rating and prioritizing problems in the watershed so that resource managers could focus limited funding to where it most benefited each resource.

The objective of these survey protocols was to provide:

- A list of observable environmental conditions and problems within a stream and along its riparian corridor;
- Sufficient data on each problem to make a preliminary determination of the severity and correctability;
- Sufficient data to prioritize restoration efforts; and
- A quick assessment of both in- and near-stream habitat conditions to make comparisons among the conditions of different stream segments.

1.3 SURVEY OF ENVIRONMENTAL CONDITIONS AND PROBLEMS

The method used in this study was consistent with the SCA survey protocol and consisted of walking the entire length of streams within the boundaries of FMMD and identifying and evaluating environmental problems that impact streams. Potential environmental problems identified during the stream assessment included: inadequate buffers, excessive bank erosion, channelized stream sections, fish migration barriers, pipe outfalls, exposed pipes, trash dumping, and unusual conditions such as bank stabilization issues. In addition, information on the location of problem sites, general condition of in-stream and riparian habitats, and estimates of the extent of impact (e.g. linear feet of bank erosion) were recorded on data sheets. A description of the types of problem sites evaluated during the physical stream assessment is provided below.

1.3.1 Inadequate Buffers

Forested stream buffers maintain stream health by providing shade to prevent excessive heating of the stream and stabilizing the stream bank. Adequate buffers reduce nutrients, sediment and other pollutants carried in runoff; slow water flow into the stream; mitigate floods; and provide food and habitat for wildlife and aquatic animals. Generally, adequate buffers are vegetated and 50 feet wide on either side of the stream corridor. For this stream assessment, inadequate buffers were considered to be forested buffers less than 50 feet wide on either side of the stream corridor.

1.3.2 Erosion Sites

Erosion is a natural process necessary to maintain aquatic habitats in streams; however, excessive erosion can lead to destabilization of banks, destruction of in-stream habitat, and increase sediment loads to the stream. Erosion problems can result from alterations of the stream's hydrology or sediment supply associated with watershed changes or road crossings. For this stream assessment, erosion sites were defined as areas where stream bank erosion was at least minor (heights over 1 foot) and/or vegetative roots along the stream bank were unable to hold the soil onto the banks.

1.3.3 Channel Alteration

Channel alteration sites are stream sections that have been altered by dredging, straightening, or widening streams using rocks, gabion baskets, or concrete to reduce flooding or lower the groundwater table. Road crossings were identified as channel alteration sites if the alteration seemed to significantly impact the stream flow, habitat, or banks. Stream channelization can reduce in-stream habitat for aquatic organisms; act as barriers to migratory fish; and may increase flooding in downstream channels.

1.3.4 Fish Migration Barriers

Fish barriers include obstructions in the stream channel that can interfere with the upstream or downstream movement of fish. Unobstructed stream channels are important for migratory and resident fish that travel upstream and downstream during different stages of their life cycle. Fish barriers can isolate stream sections, endangering trapped fish and reducing biological diversity.

1.3.5 Pipe Outfalls

Pipe outfalls refer to any pipe or small man-made channel discharging into a stream through a stream corridor. Pipes can carry uncontrolled runoff and pollutants such as oil, heavy metals, and nutrients into streams.

1.3.6 Exposed Pipes

Exposed pipes include pipes in the stream or along the stream's immediate banks that could be punctured by a high flow event. In urban areas, pipelines and other utilities are commonly placed along stream corridors. As streams erode and migrate, exposed pipes become vulnerable to puncture and can cause water quality problems should their contents be released into the stream.

1.3.7 Trash Dumping

Trash dumping refers to any site where large amounts of trash are inside the stream corridors; either as a site of deliberate dumping or a place where trash tends to accumulate, possibly allowing the release of pollutants such as microplastics, detergents, etc. into the watershed.

1.3.8 Unusual Conditions/Observations

Unusual conditions refer to any site in which out of the ordinary conditions were observed, or for which comments were provided on specific problems observed during the survey.

Both Midway and Franklin Branches have major stability issues that require immediate attention. The rapid development on FMMD has caused the current unstable conditions of both systems, and potential future development will cause even greater stress resulting in further incision, erosion and flooding at FMMD. The Severn Run headwater starts from storm drains conveying the stormwater flows draining both travel directions of Maryland Route 175.

There is also a stormwater management facility nearby causing additional concentrated flows at the outfall, adding to this already unstable stream system. The erosion and head cutting are extremely active to the extent that sediment washed away from upstream and deposited in the middle of the stream and is now going through the head cutting again. The Severn Run is the priority due to its close proximity to the FMMD property line and current and future adverse impacts off and on the installation.

2.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the Proposed Action is to improve water quality in the stream systems, stabilize stream banks, ensure future improvements to habitat and fisheries, reduce flooding conditions on and off the FMMD property, comply with FMMD's Integrated Natural Resources Management Plan (INRMP), 1999 – 2004 (currently under revision), and enhance the overall health of the Chesapeake Bay watershed by complying with FMMD's MD Municipal Separate Storm Sewer System (MS4) Phase II Permit, Chesapeake Bay TMDL requirements for federal facilities (Permit 13-SF-5501). The TMDL identifies the necessary pollution reductions of nitrogen, phosphorus and sediment across Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and the District of Columbia and sets pollution limits necessary to meet applicable water quality standards in the Chesapeake Bay and its tidal rivers and embayments. The TMDL is designed to ensure that all pollution control measures needed to fully restore the Bay and its tidal rivers are in place by 2025. The TMDL is supported by rigorous accountability measures to ensure cleanup commitments are met. Proposed restoration actions for the impaired stream reaches include, but are not limited to, rock cross vanes, rock step, constructed riffles, tree protection, bank sloping and matting, step pools, cobble weirs, root wads, and wetland creation and enhancement. As a MS4 Phase II permit holder, FMMD may receive up to 469 impervious acre TMDL credits by implementing all stream restoration proposals (23,450 linear feet) identified in the draft *Technical Memorandum: Stream Assessment for Midway Branch, Franklin Branch, Severn Run, and Associated Tributaries on Fort George G. Meade* (USACE 2019). MDE allows 0.02 credit/LF as a planning level approximate only, therefore the proposed action could yield an equivalent or larger credit total.

Stream systems within the Midway Branch, Franklin Branch, Rogue Harbor, and Severn Run watersheds were evaluated to determine impacted streams using methods adapted from SCA Survey Protocols (Yetman 2001). Environmental problems identified during the stream assessments included: channelized stream sections, inadequate stream buffers, fish migration blockages, excessive bank erosion, trash dumping sites, unusual conditions, and pipe outfalls. The stream assessments concluded that existing development on and off the FMMD property has caused unstable conditions. These current environmental conditions will continue to degrade the stream systems, and potential future development will cause even greater stress, resulting in further incision as well as erosion and flooding at FMMD. Thus, implementing the proposed restoration activities is necessary to reduce further degradation.

2.1 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

This PEA is intended to address the potential environmental consequences of proposed restoration activities at eight degraded streams in Midway Branch, Franklin Branch, Rogue Harbor, and Severn Run watersheds on FMMD. A PEA can adequately evaluate area-wide environmental impacts of those programs that are similar in nature or broad in scope (32 CFR Part 651.14), such as similar and subsequent stream restoration projects. Thus, it is anticipated that this PEA will adequately address a number of FMMD's forthcoming stream restoration projects that may cause some land disturbance impacts. FMMD's NEPA Program Manager will review each proposed activity on a case-by-case basis, consulting with various subject matter experts on natural, environmental and cultural resources as needed. In turn, the Program Manager will determine whether the subsequent proposed activity is adequately addressed by this PEA and whether or not a REC or other level of NEPA review is required. If it is determined that this PEA does not cover

the proposed activity, then FMMD's NEPA Program Manager would proceed with additional NEPA analysis.

This PEA covers the restoration of streams at Midway Branch, Franklin Branch, Rogue Harbor, and Severn Run watersheds. The Severn Run stream reach proposed for improvement is approximately 7,500 feet in length, with improvements estimated to occur approximately 50 feet on either side of the stream channel (total area is approximately nine acres). Restoration activities include, but are not limited to, using equipment, physical land improvements, debris removal, and monitoring to ensure the long-term effectiveness of restoration activities. It is anticipated that the Proposed Action will provide long-term environmental benefits for FMMD and neighboring communities, as all proper procedures would be followed for the restoration of the streams. Severn Run would be the first stream to be restored. Should any adverse impacts be identified during the restoration process, then measures to minimize those adverse impacts would be developed and applied to subsequent restoration activities at other watersheds.

2.2 ENVIRONMENTAL LAWS AND REGULATIONS

The National Environmental Policy Act (NEPA) of 1969 requires all Federal agencies to give appropriate consideration to potential environmental effects of proposed major actions in planning and decision-making. The CEQ is responsible for issuing regulations (40 Code of Federal Regulations [CFR] 1500-1508) and implementing the provisions of NEPA. CEQ regulations in turn are supplemented by procedures adopted on an agency-specific basis. For the Department of the Army (DA), the pertinent regulations are contained in 32 CFR Part 651, *Environmental Analysis of Army Actions*. This PEA was developed pursuant to these laws and regulations.

Environmental Analysis of Army Actions, 32 CFR Par 651, specifically includes in its list of Army actions that normally require an EA [32 CFR 651.33 (c)], changes to established FMMD land use that generate impacts on the environment. An EA is intended to assist agency planning and decision-making. While required to assess environmental impacts and evaluate their significance, the EA is routinely used as a planning document to evaluate environmental impacts, develop alternatives and mitigation measures, and allow for agency and public participation (32 CFR 651.20).

Laws and regulations that may apply to the Proposed Action could include the Clean Air Act of 1970 (CAA) (as amended), Clean Water Act (CWA) (1972, as amended), Toxic Substances Control Act (TSCA) (1976, as amended), Noise Control Act (NCA) (1972), Endangered Species Act (ESA) (1973, as amended), Coastal Zone Management Act (CZMA) (1972, as amended), National Historic Preservation Act (NHPA) (1966), Archaeological Resources Protection Act (ARPA) (1979), Resource Conservation and Recovery Act (RCRA) (1976), Executive Order (EO) 11593, *Protection and Enhancement of the Cultural Environment*, dated May 13, 1971; EO 11988, *Floodplain Management*, dated May 24, 1977; EO 11990, *Protection of Wetlands*, dated May 24, 1977; EO 12088, *Federal Compliance with Pollution Control Standards*, dated October 13, 1978; EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, dated February 11, 1994; EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, dated April 21, 1997; EO 13112, *Invasive Species*, dated February 3, 1999; EO 13508, *Chesapeake Bay Protection and Restoration*, dated May 12, 2009; and EO 13693, *Planning for Federal Sustainability in the Next Decade,* dated March 19, 2015, which has since been revoked by EO 13834, *Efficient Federal Operations*, dated May 17, 2018. Note that this list is not all-inclusive and other federal, state, and local regulations may apply.

2.3 PUBLIC INVOLVEMENT

Coordination with federally recognized tribes; federal and state agencies, including the U.S. Fish and Wildlife Service (USFWS); the MD DNR; and the Maryland Historic Trust (MHT) was initiated for the Proposed Action via letters mailed on May 7, 2020. Copies of coordination letters and agency responses are located in Appendix A: Agency Coordination.

The Draft PEA was made available online for public review at www.ftmeade.army.mil, and in print at the Medal of Honor Memorial Library at FMMD and at the West County Area Library, Odenton, Maryland. A Notice of Availability of the release of the Draft PEA for a 30-day review period was published in the *Capital Gazette*. Comments on the Draft PEA may be submitted in writing to: ATTN - Fort Meade Programmatic Stream Restoration Programmatic Environmental Assessment, US Army Corps of Engineers, Baltimore District Planning Division, 2 Hopkins Plaza, 10th Floor, Baltimore, MD 21201; or via email to FtMeadePEA@usace.army.mil and Ms. Suzanne Kopich, US Army Garrison Fort George G. Meade DPW, Environmental Division at suzanne.m.kopich.civ@mail.mil. All comments received during the 30-day review period, including public and agency responses, will be considered.

3.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

3.1 ALTERNATIVES CONSIDERED

3.1.1 Preferred Alternative

The Preferred Alternative is to execute the Proposed Action which includes a suite of best management practices that can address the environmental problems noted above in the stream assessment results. Appendix B serves as an example of possible restoration activities that support regenerative stormwater conveyance and natural channel design; these restoration activities include, but are not limited to:

- **Installation of Cobble Weirs** - Designed to specific height and used to prevent flooding and erosion.
- **Installation of Stone Steps** - Designed as a series of pools built with rocks that mimic staircase steps to slow down stream flow.
- **Installation of Root Wads** – Designed as a protection technique that provides immediate riverbank stabilization, protects the toe-of-slope and provides excellent fish habitat, especially for juveniles. Root Wads also provide toe support for bank revegetation techniques and collect sediment and debris that will enhance bank structure over time.
- **Wetland Enhancement and Creation** –Designed to rehabilitate or reestablish a degraded wetland, and/or the modification of an existing wetland to favor specific wetland functions such as flooding from an adjacent stream.
- **Constructed Riffles and Rock Cross Vanes**- Designed as channel-spanning structures that provide grade control, dissipate energy, deflect stream flow to the center of the channel, and create pools. A grade control structure stabilizes the stream channel by preventing changes in bed elevation at that point. It can also protect a streambank from undesirable erosion or migration when the erosion is caused by flows impacting the bank face.

3.1.2 No-Action Alternative

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

Under the No Action Alternative, restoration of degraded streams would not occur on FMMD. The No Action Alternative is not feasible for the following reasons: 1) excessive erosion; 2) excessive flooding; 3) non-compliance with MD Phase II MS4 permit, Chesapeake Bay TMDL; and 4) non-compliance with INRMP.

4.0 AFFECTED ENVIRONMENT

This section describes the affected environment or existing conditions of the natural, infrastructure, and community resources of the project area. The affected environment focuses on those features of the environment that could potentially be impacted by implementation of the Proposed Action. The region of influence (ROI) delineates the geographic extent of the affected environment and subsequent environmental effects analysis, which is included in Section 5.0. For this PEA, the ROI encompasses the immediate vicinity of the Proposed Action Alternative site locations as well as the immediate surrounding vicinity.

Each environmental, cultural, and social resource category typically considered in an EA was reviewed for its potential to be affected by the Proposed Action. All of the proposed stream improvement sites are within the boundaries of FMMD. Exposure by the public to these sites is limited, as the general public cannot freely access FMMD. During times of construction, crews will display any necessary warnings of possible safety concerns within the site area.

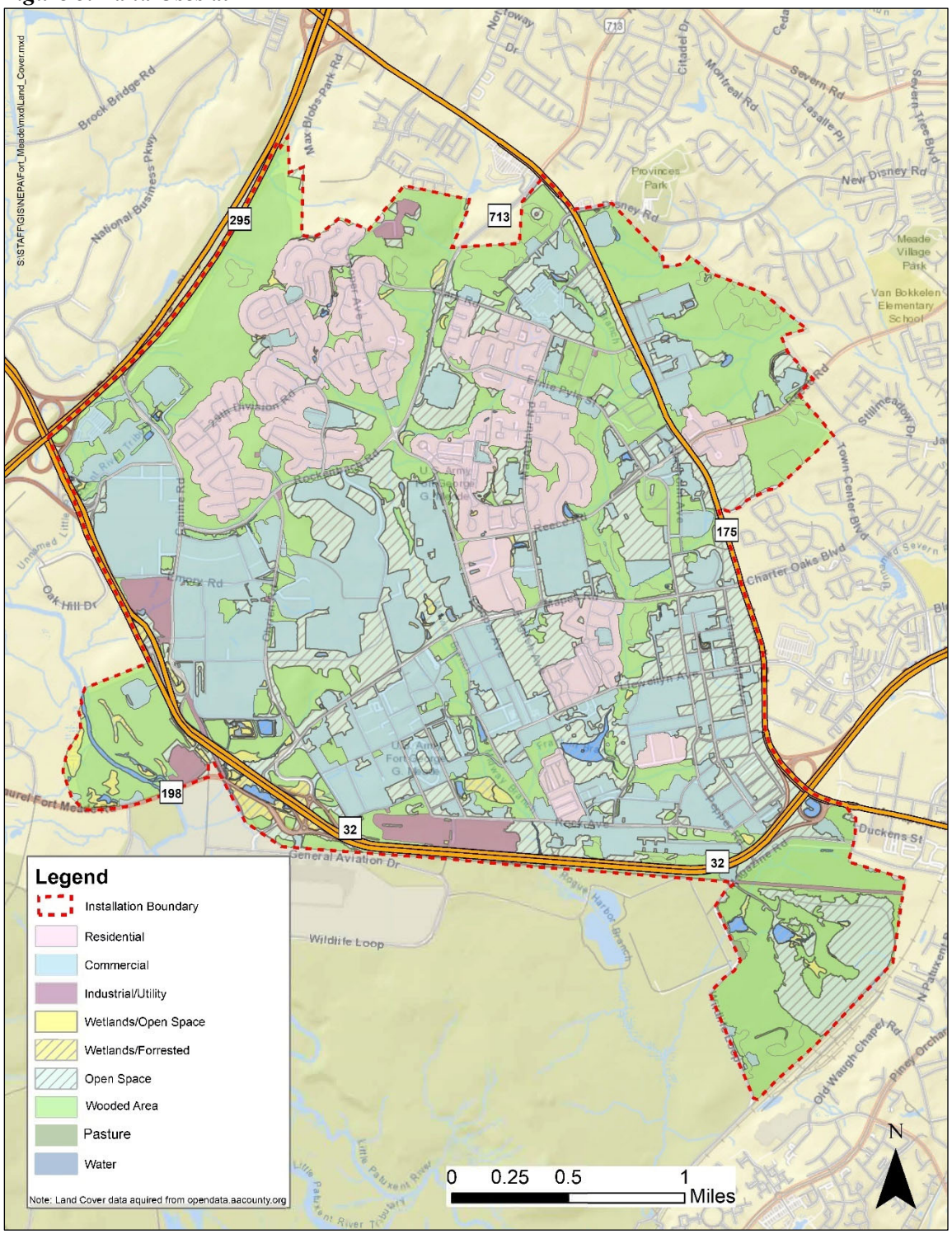
4.1 LAND USE

4.1.1 Regional Land Use

FMMD encompasses approximately 5,500 acres and is located in the northwest corner of Anne Arundel County, Maryland approximately 17 miles southwest of downtown Baltimore and 24 miles northeast of Washington, DC. The state capitol city of Annapolis lies approximately 14 miles southeast. FMMD includes a main administrative area, seven Army Family Housing areas, the National Security Agency complex, an industrial and maintenance areas, the exchange mall complex, and the Kimbrough Ambulatory Care Clinic. Land uses within FMMD are displayed on Figure 5.

FMMD is bounded by the Baltimore-Washington Parkway (MD 295) to the northwest, Annapolis Road (MD 175) to the east, Patuxent Freeway (MD 32) to the south and west, and the Mid-America Regional Council Penn Line and AMTRAK Line to the southeast. Other significant nearby transportation arteries include US Route 1 and Interstate 95, which run parallel to and just north of the Baltimore-Washington Parkway. Interstate 97, which connects Baltimore and Annapolis is located several miles east of FMMD and can be reached by taking MD 175 or MD 32 east. FMMD is predominately surrounded to the north, west, and east by residential areas, commercial centers, a mix of light industrial uses, and undeveloped areas. Directly to the south of FMMD are the Tipton Airport and 12,750-acre Patuxent Research Refuge, part of the U.S. Fish and Wildlife Service's (USFWS) National Wildlife Refuge System.

Figure 5. Land Uses at FMMD



4.2 Visual Resources

NEPA declares the responsibility of the federal government to use all practicable means to consider visual impacts for their potential to affect scenic resources that use the landscape and the scenic experiences of those who view the landscape.

Visual resources can be defined as the natural and man-made features that constitute the aesthetic qualities of an area. Natural visual resources occur in the landscape typically without human assistance and include native or mostly undisturbed landforms, water bodies, vegetation, and animals, both wild and domesticated. Visual quality is defined as the impression a particular landscape has on its observers. The importance of visual resources and any changes in the visual character of an area is influenced by social considerations, including the public value placed on the area, public awareness of the area, and community concern for the visual resources in the area.

Visual resources also can include viewsheds, defined as the geographical area that is visible from a specific location. Viewsheds include all surrounding points that are in the line-of-sight with that location and excludes any points that are beyond the horizon or obstructed by other features.

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

The proposed stream reach restoration areas are located entirely within the boundaries of FMMD. Both Midway and Franklin Branches flow from north to south through the center of FMMD. The headwaters of Severn Run are located on the northeastern corner of FMMD, and flow east for approximately 5,000 feet before exiting FMMD and ultimately discharging into the Severn River. Rogue Harbor flows northwest to southeast and flows through a culvert beneath MD 32, then eventually flows beyond the FMMD boundary to converge with Rogue Harbor Branch.

4.3 TOPOGRAPHY AND GEOLOGY

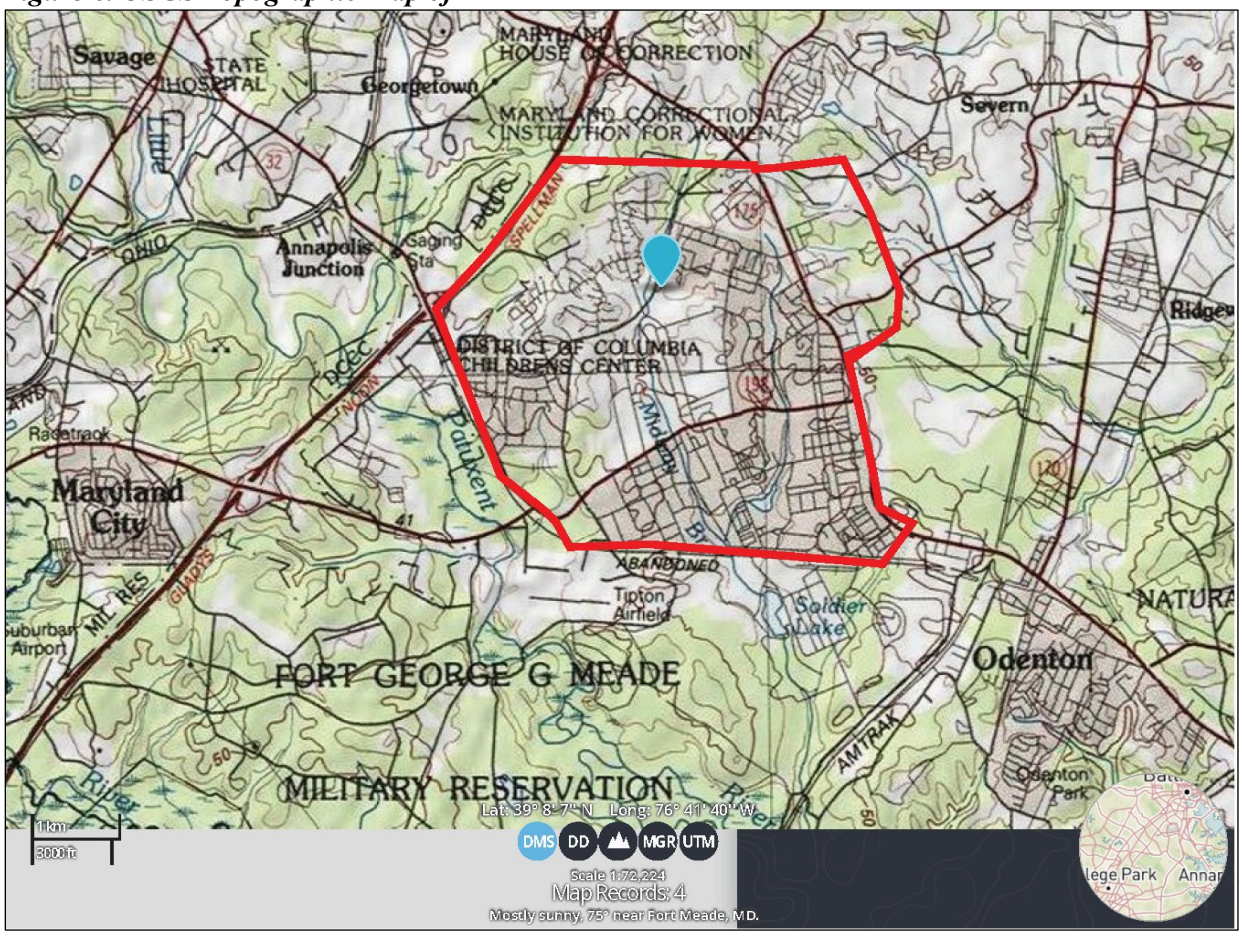
4.3.1 Topography

FMMD lies in the Atlantic Coastal Plain Physiographic Province which is characterized by relatively flat topography that slopes towards the east (Maryland Geological Survey, 2020). FMMD has approximately 210 feet of topographic relief (Figure 6). The highest point, 310 feet mean sea level (msl), occurs at the First Army Radio Station Tower, located in the northern most central portion of FMMD. The lowest elevation, less than 100 feet, occurs in the southwestern corner of FMMD, along the Little Patuxent River. Most of the FMMD property slopes gradually to the south and southwest. Slopes at FMMD are generally less than 10 percent grade (USACE 2007). Slopes exceeding ten percent are rare and occur primarily in pockets in the north-central and central parts of FMMD and along stream corridors. These steep slopes usually occur in natural wooded areas, and are ideally suited as vegetated buffer zones for more developed areas.

4.3.2 Geology

The geologic history of the eastern United States is characterized by mountain-building processes and the cyclical opening and closing of a proto-Atlantic Ocean (USGS 2000). During the mountain building event called the Alleghenian Orogeny, shallow water marine sediments were uplifted, forming the Blue Ridge-South Mountain anticlinorium. During the Cenozoic Era (1.65 million years before present to recent), the Blue Ridge-South Mountain anticlinorium began to erode, depositing Atlantic Coastal Plain sediments. Unconsolidated sand, clay, and silt compose the Atlantic Coastal Plain physiographic province. These sediments thicken towards the southeast, forming a wedge. Precambrian crystalline rocks underlie the sediments, and are exposed along the boundary between the Coastal Plain and Piedmont provinces several miles to the west of FMMD.

Figure 6. USGS Topographic Map of FMMD



FMMD lies in the Atlantic Coastal Plain Physiographic Province (Maryland Geological Survey, 2020). It is underlain by unconsolidated sediments that lie over a crystalline substrate consisting of gabbro, diorite, and other igneous and metamorphic rocks (Mach and Achmad 1986). Sediments underlying FMMD include interbedded, poorly sorted sand and gravel deposits up to 90 feet thick from the Pleistocene Epoch (100,000 to 1.65 million years before present); and the Patapsco Formation (0 to 400 feet thick), the Arundel Clay (0 to 100 feet thick), and the Patuxent Formation (0 to 250 feet thick) of the Potomac Group, which were deposited during the Cretaceous period (138 to 63 million years before present) (MGS 2000). Metamorphic Precambrian bedrock underlies the Patuxent Formation at a depth of 600 feet above mean sea level (amsl). The Arundel Clay has low vertical hydraulic conductivity and is the confining layer between the Lower Patapsco Aquifer and the Patuxent Aquifer, in the Patapsco and Patuxent Formations, respectively. Above the Lower Potomac Aquifer is an unnamed confining layer composed of tough variegated clay composed of red, gray, and brown grains with some ironstone nodules and plant fragments that also exhibits low vertical hydraulic conductivity, although some layers are permeable. Alluvium underlies all of FMMD's streams and wetlands, and consists of interbedded sand, silt, and clay with small gravel inclusions (Mach and Achmad, 1986).

4.4 SOILS

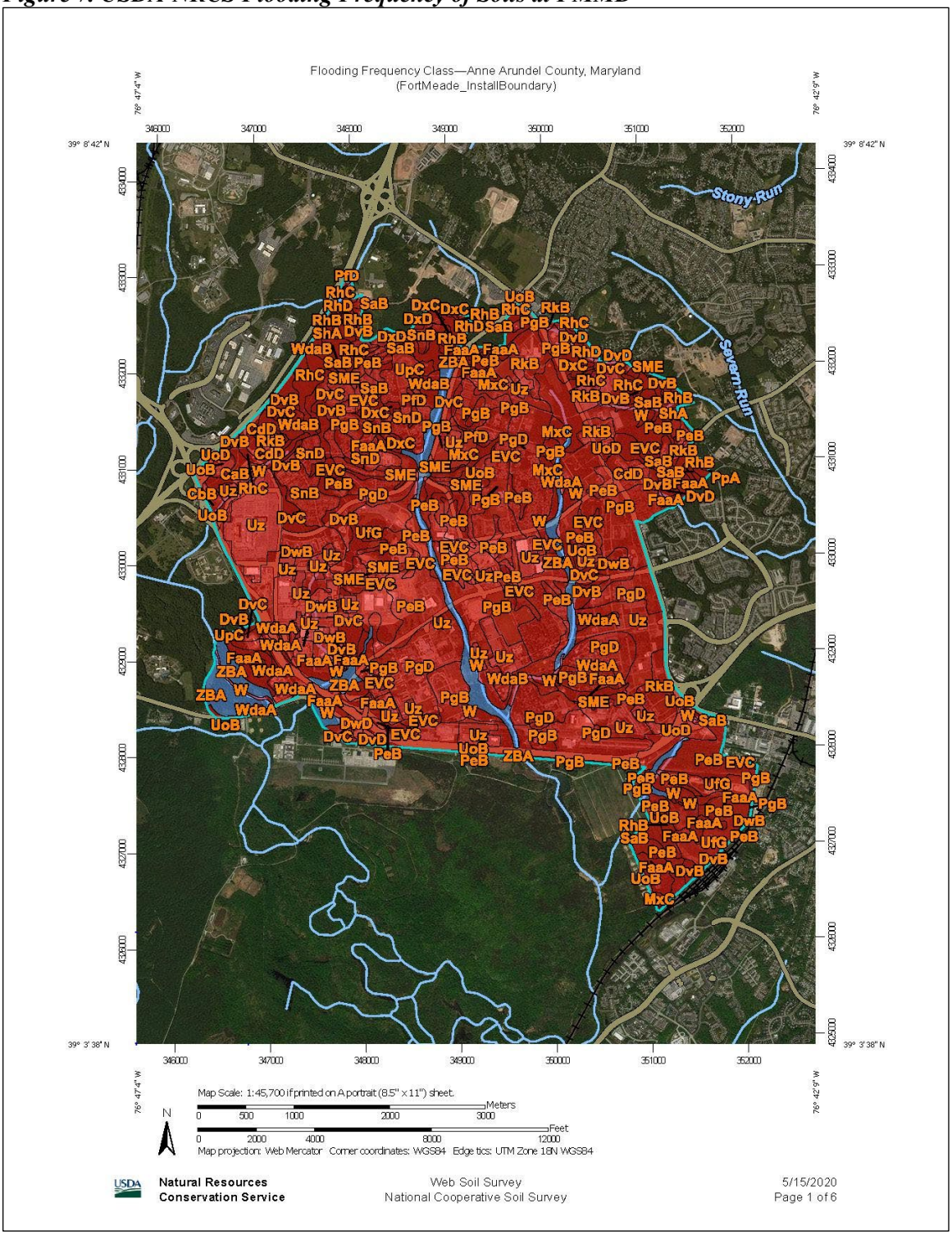
USDA NRCS has mapped 39 distinct soil types at FMMD (USDA-NRCS, 2020). The most prevalent soil types at FMMD include Evesboro and Galestown complexes, covering approximately 42 percent of the FMMD property (NRCS, 2020).

Evesboro soil is a very deep, excessively drained sandy loam soil which has only been slightly modified from the geologic parent material. Other soil series occurring on FMMD include the Bibb-Iuka, Downer, Hambrook, Hammonton, Ingleside, Keyport, Muirkirk, Patapsco, Runclint, Sassafras, Udorthents, and Woodstown. Bibb and Evesboro soils are Entisols, which are recent mineral soils that have been only slightly modified from the geologic material in which they formed. All the other soil series are Ultisols, which are excessively weathered soils with well-developed horizons and argillic B horizons.

"Urban land" and "Cut and fill land" were also identified as map units in the soil survey (NRCS, 2020). Urban land includes areas in the vicinity of pavements and buildings. Cut and fill land includes miscellaneous soil types in severely disturbed areas to the extent that identification by soil series cannot be determined. Both Urban and Cut and fill lands are common in developed sites that have been severely modified by earth-moving equipment.

An additional useful NRCS soil description is flooding frequency class. Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding. Soils bordering the stream reaches are classified as Zekiah and Issue silt loams, and are in the "frequent" flooding frequency class (NRCS, 2020), depicted in blue on Figure 7 (see also Table 2). Additionally, these soils are in the B/D hydrologic group, indicating they have moderate potential for erosion from run-off. "Frequent flooding" means that flooding is likely to occur often under normal weather conditions. The chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year. All other soils at FMMD are classified in the "none" category, depicted in red on Figure 7. "None" means that flooding is not probable, the chance of flooding is nearly 0 percent in any year, and flooding occurs less than once in 500 years (NRCS, 2020).

Figure 7. USDA-NRCS Flooding Frequency of Soils at FMMD



***Notes**: Blue coloration indicates frequent flooding frequency. The chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year. Red coloration indicates flooding is not probable and flooding occurs less than once in 500 years.*

Table 2. NRCS Soil Map Units at FMMD

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CaB	Chillum loam, 2 to 5 percent slopes	26.9	0.5%
CbB	Chillum-Urban land complex, 0 to 5 percent slopes	7.0	0.1%
CdD	Christiana-Sassafras-Urban land complex, 5 to 15 percent slopes	33.5	0.6%
DvB	Downer-Hammonton complex, 2 to 5 percent slopes	148.5	2.8%
DvC	Downer-Hammonton complex, 5 to 10 percent slopes	90.7	1.7%
DvD	Downer-Hammonton complex, 10 to 15 percent slopes	37.3	0.7%
DwB	Downer-Hammonton-Urban land complex, 0 to 5 percent slopes	214.4	4.1%
DwD	Downer-Hammonton-Urban land complex, 5 to 15 percent slopes	5.7	0.1%
DxC	Downer-Phalanx complex, 5 to 10 percent slopes	21.5	0.4%
DxD	Downer-Phalanx complex, 10 to 15 percent slopes	6.7	0.1%
EVC	Evesboro and Galestown soils, 5 to 10 percent slopes	351.8	6.7%
FaaA	Fallsington sandy loams, 0 to 2 percent slopes, northern coastal plain	204.6	3.9%
MxC	Mattapex-Butlertown complex, 5 to 10 percent slopes	41.4	0.8%
PeB	Patapsco-Evesboro-Fort Mott complex, 0 to 5 percent slopes	473.9	9.0%
PfD	Patapsco-Fort Mott complex, 10 to 15 percent slopes	18.2	0.3%
PgB	Patapsco-Fort Mott-Urban land complex, 0 to 5 percent slopes	784.8	14.9%
PgD	Patapsco-Fort Mott-Urban land complex, 5 to 15 percent slopes	548.7	10.4%
PpA	Pepperbox loamy sand, 0 to 2 percent slopes	0.0	0.0%
RhB	Russett-Christiana-Hambrook complex, 0 to 5 percent slopes	184.1	3.5%
RhC	Russett-Christiana-Hambrook complex, 5 to 10 percent slopes	84.6	1.6%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
RhD	Russett-Christiana-Hambrook complex, 10 to 15 percent slopes	20.5	0.4%
RkB	Russett-Christiana-Urban land complex, 0 to 5 percent slopes	167.4	3.2%
SaB	Sassafras fine sandy loam, 2 to 5 percent slopes	95.6	1.8%
SaD	Sassafras fine sandy loam, 10 to 15 percent slopes	4.7	0.1%
ShA	Sassafras-Hambrook complex, 0 to 2 percent slopes	8.0	0.2%
SME	Sassafras and Croom soils, 15 to 25 percent slopes	94.3	1.8%
SnB	Sassafras-Urban land complex, 0 to 5 percent slopes	89.0	1.7%
SnD	Sassafras-Urban land complex, 5 to 15 percent slopes	146.9	2.8%
UfG	Udorthents, refuse substratum, 0 to 50 percent slopes	103.8	2.0%
UoB	Udorthents, loamy, 0 to 5 percent slopes	306.4	5.8%
UoD	Udorthents, loamy, 5 to 15 percent slopes	73.5	1.4%
UpB	Udorthents, reclaimed gravel pits, 0 to 5 percent slopes	4.1	0.1%
UpC	Udorthents, reclaimed gravel pits, 5 to 10 percent slopes	4.9	0.1%
Uz	Urban land	405.4	7.7%
W	Water	24.4	0.5%
WdaA	Woodstown sandy loam, 0 to 2 percent slopes, Northern Coastal Plain	61.0	1.2%
WdaB	Woodstown sandy loam, 2 to 5 percent slopes, Northern Coastal Plain	74.3	1.4%
WrB	Woodstown-Urban land complex, 0 to 5 percent slopes	19.3	0.4%
ZBA	Zekiah and Issue soils, 0 to 2 percent slopes, frequently flooded	271.7	5.2%
Totals for Area of Interest		**5,259.6**	**100.0%**

4.5 NOISE

Noise is traditionally defined as unwanted sound that interferes with normal activities in a way that reduces the quality of the environment. Magnitudes of sound, whether wanted or unwanted, are usually described by sound pressure. There are two primary types of sound sources that generate noise: stationary and transient. Sounds produced by these sources can be intermittent or continuous. A stationary source is usually associated with a specific land use or site, such as construction activities or the operation of generators. Transient sound sources, such as vehicles and aircraft, move through the area. The human auditory system is sensitive to fluctuations in air pressure above and below the barometric static pressure. The loudness of sound as heard by the human ear is measured on the A-weighted decibel (dBA) scale.

The NCA of 1972 establishes a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare. The Act also serves to (1) establish a means for effective coordination of federal research and activities in noise control; (2) authorize the establishment of federal noise emission standards for products distributed in commerce; and (3) provide information to the public with respect to the noise emission and noise reduction characteristics of such products. The Act provided the framework for states and local authorities to establish noise regulations.

According to the DoD, the Federal Aviation Administration, and the U.S. Department of Housing and Urban Development criteria, residential units and other noise-sensitive land uses are "clearly unacceptable" in areas where the noise exposure exceeds the day-night level (DNL) of 75 dB, "normally unacceptable" in regions exposed to noise between the DNL of 65 to 75 dB, and "normally acceptable" in areas exposed to noise where the DNL is 65 dB or less (Table 3). The Federal Interagency Committee on Noise developed land use compatibility guidelines for noise in terms of DNL. For outdoor activities, USEPA recommends DNL of 55 dB as the sound level below which there is no reason to suspect that the general population will be at risk from any of the effects of noise.

Table 3. Common Sound Levels and Exposure Conditions

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

Source: USEPA, 1986.

The use of heavy equipment typically occurs sporadically throughout the daytime hours. Any of the Proposed Action projects may generate noise levels during the earth moving phase (site clearing activities involving pieces of equipment) that could range from 72 to 98 dBA when measured 50 feet from the respective piece of equipment.

FMMD is relatively quiet with no notable sources of noise beyond personal and commercial vehicular traffic. Noise elements in and around the proposed project areas are consistent with that of any residential military installation with business and administrative activities. In addition to traffic, the normal noise environment may also contain military unit physical training, pedestrian activities, and intermittent construction activities. Seasonal noise additions include the normal operation of heating, ventilation, and air conditioning (HVAC) systems, lawn maintenance, snow removal, and increased pedestrian activities. None of these operations or activities produce excessive levels of noise.

The stream reaches are exposed to intermittent noise from traffic and pedestrians. Midway Branch has the widest stream valley with service roads running parallel for the majority of the reaches identified for restoration. Additionally, roads cross Midway at the top and bottom of the reaches (i.e. Rockenbach Road and Mapes Road). The tributaries to Midway begin in residential areas. MacArthur Tributary adjoins school land and is crossed by roads with a community path and American Water service path running parallel and adjacent. Pershing Tributary begins in a residential area and also has a community walking path running parallel.

Franklin is not as proximal to tenants or residential areas, the closest road being Ernie Pyle Street, but American Water does have a maintenance trail running parallel.

Severn Run is an undeveloped tract that adjoins residential areas at the FMMD property boundary. The headwaters for the Severn Run Site 1 Stream Restoration Design begin at MD 175 highway.

The unnamed tributary for Rogue Harbor is located next to MD 32, where vehicle traffic is evident and garrison support services are located.

Therefore, like most areas throughout FMMD, the stream reaches are exposed to intermittent noises primarily from nearby roadway traffic and other routine maintenance activities (landscaping, construction).

4.6 AIR QUALITY

4.6.1 Regional Climate

The climate of the project area is affected by its proximity to the Chesapeake Bay, Delaware Bay, and Atlantic Ocean. The daily average high temperatures range from 40 degrees Fahrenheit (°F) during January to 87°F during July. Daily average low temperatures range from 23°F during January to 67°F during July. The record minimum and maximum temperatures are -7°F and 105°F, respectively. The annual average precipitation amounts to 41 inches and is uniformly distributed throughout the year. The annual average snowfall amounts to 20 inches. At least a trace of precipitation occurs on approximately one-third of the days during the year. Prevailing winds are from the west-northwest. Southwesterly winds are more frequent during the summer months and northwesterly winds are more frequent during the winter months. The region is frequently under the influence of the Bermuda High Pressure System during the summer months. Air quality problems in the region are typically associated with this summer phenomenon (USACE 2007).

4.6.2 National Ambient Air Quality Standards and Attainment Status

The United States Environmental Protection Agency (EPA) Region 3 and MDE regulate air quality in Maryland. The Clean Air Act (CAA) (42 4 U.S. Code [USC] 7401–7671q), as amended, gives the EPA the responsibility to establish the primary and secondary National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50, National Primary and Secondary Ambient Air Quality Standards, amended 1 July 2016, hereafter referred to as 40 CFR 50) acceptable concentration levels for seven criteria pollutants: particulate matter less than 10 microns (PM10), particulate matter less than 2.5 microns (PM2.5), sulfur dioxide (SO2), carbon monoxide (CO), nitrogen oxides (NOx), ozone (O3), 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 (see Table 4). Each state has the authority to adopt standards stricter than those established under the Federal program. MDE has adopted the NAAQS and is responsible for maintaining air quality standards for the State of Maryland.

Primary and secondary NAAQS for the aforementioned criteria are presented in areas that exceed the NAAQS ambient concentration (i.e., have poor air quality) and are labeled as nonattainment areas designated by Federal regulations. According to the severity of the pollution problem, areas exceeding the established NAAQS are categorized as marginal, moderate, serious, severe, or extreme nonattainment. Maintenance areas have recently met NAAQS but are considered to be at risk of not remaining in attainment if efforts are not continued to maintain better air quality.

FMMD is within the Metropolitan Baltimore Intrastate Air Quality Control Region (AQCR) for the state of Maryland (40 CFR Part 81.28). Anne Arundel County is classified as a nonattainment area for the 8-hour O3 and for SO2 NAAQS, and in attainment for all other criteria pollutants (USEPA, 2020).

In addition to the ambient air quality standards for criteria pollutants, national standards exist for hazardous air pollutants (HAPs). The National Emission Standards regulate 188 HAPs based on available control technologies. The majority but not all HAPs are Volatile Organic Compounds (VOCs) (USEPA, 2020). Sources of HAP emission at FMMD include stationary, mobile, and fugitive emissions. 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 and roadway traffic.

4.6.3 Clean Air Act Conformity

State agencies (in Maryland, MDE) develop air quality plans, which are also referred to as State Implementation Plans (SIPs), designed to attain and maintain the NAAQS and to prevent significant deterioration of air quality in areas which demonstrate air that exceeds NAAQS standards. Maryland has individual SIPs for various pollutants, including NO_2, $PM_{2.5}$, 8-hour O_3, regional haze, lead, etc. Federal agencies must ensure that their actions conform to the SIP in a nonattainment area, and do not contribute to new violations of ambient air quality standards, or an increase in the frequency or severity of existing violations, or a delay in timely state and/or regional

Table 4. Federal and State Ambient Air Quality Standards

NAAQS Pollutant	Primary/ Secondary	Averaging Time	Level(1)	Form
Carbon Monoxide	Primary	8-hour	9 ppm	Not to be exceeded more than once per year
		1-hour	35 ppm	
Nitrogen Dioxide	Primary	1-hour	100 ppb	98th percentile, averaged over 3 years
	Primary and secondary	Annual	53 ppb	Annual Mean
Ozone	Primary and secondary	8-hour	70 ppb	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particular Matter ($PM_{2.5}$)	Primary	Annual	12 µg/m^3	Annual mean, averaged over 3 years
	Secondary	Annual	15 µg/m^3	Annual mean, averaged over 3 years
	Primary and secondary	24-hour	35 µg/m^3	98th percentile, averaged over 3 years
Particular Matter (PM_{10})	Primary and secondary	24-hour	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Lead	Primary and secondary	Rolling 3-month average	0.15 µg/m^3	Not to be exceeded
Sulfur Dioxide	Primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

1 - Units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb) by volume, and micrograms per cubic meter of air (µg/m^3)

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attainment standards. 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 (GCR) is to:

- Ensure Federal activities do not interfere with the budgets in the SIPs
- Ensure the attainment and maintenance of NAAQS
- Ensure actions do not cause or contribute to new violations of NAAQS

The 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 Part 93, Determining Conformity of Federal Actions to State or Federal Implementation Plans, dated November 24, 1993, hereinafter referred to as 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 the SO_2 NAAQS.

The GCR specifies threshold emissions levels by pollutant to determine the applicability of conformity requirements for a project. Due to the proximity to the urbanized east coast of the United States, Baltimore County is considered an Ozone Transport Region (OTR). The OTR has a marginal 8-hour ozone (2015) and moderate 8-hour ozone (2008) nonattainment classification (USEPA, 2020c). Because ozone formation is driven by other direct emissions, the air quality analyses focus on ozone precursors that include volatile organic compounds (VOCs) and NOx. In accordance with USEPA policy, precursors that form $PM_{2.5}$ (NOx and SO_2) have also been evaluated. The applicable emission *de minimis* thresholds established by USEPA are summarized in Table 5.

Regulated under 40 CFR 93(b), the GCR also prohibits any department, agency, or instrumentality of the Federal Government from engaging in, providing financial assistance for, approving, or supporting any activity that does not conform to applicable SIP designated for areas being in nonattainment of established NAAQS. A SIP is a compilation of a state's air quality control plans and rules, approved by the USEPA, in an effort to reduce or eliminate the severity and number of NAAQS violations and achieve expeditious attainment of these standards.

Table 5. General Conformity de minimis Threshold Values

Criteria Pollutant	Tons/year
40 CFR 93.153(b)(1) – For purposes of paragraph (b) of this section the following rates apply in nonattainment areas (NAAs):	
Ozone (VOC's or NOx):	
Serious NAA's	50
Severe NAA's	25
Extreme NAAs	10
Other ozone NAA's outside ozone transport region:	100
Other ozone NAA's inside an ozone transport region:	
VOC	50
NOx	100
Carbon Monoxide: All maintenance areas	100
SO2 or NOx: Al NAA's	100
PM10:	
Moderate NAA's	100
Serious NAA's	70
PM2.5 (direct emissions, S02, NOx, VOC, and Ammonia):	
Moderate NAA's	100
Serious NAA's	70
Pb: All NAA's	25
40 CFR 93.153(b)(2) – For purposes of paragraph (b) of this section the following rates apply in maintenance areas:	
Ozone (NOX), SO2 or NO3	
All maintenance areas	100
Ozone (VOCs)	
Maintenance areas inside an ozone transport region	50
Maintenance areas outside an ozone transport region	100
Carbon monoxide: All maintenance areas	100
PM10: All maintenance areas	100
PM2.5 (direct) emissions: SO2, NOX, VOC, and ammonia	100
All maintenance areas	100
Pb: All maintenance areas	25

4.6.5 Greenhouse Gas Emissions

Greenhouse gases (GHGs) are compounds that contribute to the greenhouse effect. The greenhouse effect is a natural phenomenon where gases trap heat within the surface-troposphere (lowest portion of Earth's atmosphere) system, causing heating at Earth's surface. The primary long-lived GHGs directly emitted by human activities are CO_2, methane (CH_4), nitrous oxide (NO_2), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

The heating effect from these gases is considered the probable cause of the global warming observed over the last 50 years (NASA, 2019). Global warming and climate change can affect many aspects of the environment. In the past, the USEPA has recognized potential risks to public health or welfare and signed an endangerment finding regarding GHGs under Section 202(a) of the CAA (74 Federal Register 66496, December 15, 2009), which found that the current and projected concentrations of the six key well-mixed GHGs— CO_2, CH_4, NO_2, HFCs, PFCs, and SF_6—in the atmosphere threaten the public health and welfare of current and future generations. To estimate global warming potential (GWP), all GHGs are expressed relative to a reference gas, CO_2, which is assigned a GWP equal to 1. All six GHGs are multiplied by their GWP and the

results are added to calculate the total equivalent emissions of CO_2 (CO_{2e}). However, the dominant GHG gas emitted is CO_2, accounting for 81% of all GHG emissions as of 2018, the most recent year for which data is available (USEPA, 2020).

Current GHG emission sources at FMMD include combustion engines, boilers, chillers, water heaters, and emergency generators.

It is noted that EO 13783 rescinded the final guidance issued on August 5, 2016 by the CEQ that had previously required Federal agencies to consider GHG emissions and the effects of climate change in NEPA reviews. On June 26, 2019, CEQ published draft guidance on how NEPA analysis and documentation should address GHG emissions (Federal Register, Vol. 84, No. 123). The draft guidance states, "Agencies should attempt to quantify a proposed action's projected direct and reasonably foreseeable indirect GHG emissions when the amount of those emissions is substantial enough to warrant quantification" and that "Agencies should consider whether quantifying a proposed action's projected reasonably foreseeable GHG emissions would be practicable and whether quantification would be overly speculative." The guidance does not address what a "substantial" amount of GHG emissions would be, but states that "agencies should address effects when a sufficiently close causal relationship exists between the proposed action and the effect". Additionally, DoD has committed to reduce GHG emissions from non-combat activities by 42 percent by 2025 (Department of Defense [DoD], 2016). Accordingly, estimated CO_{2e} emissions associated with the Proposed Action are provided in this PEA for informative purposes.

4.6.6 Emission Sources

Current emission sources at FMMD are associated with staff and visitor vehicles, building heating/ventilation and air conditioning, and routine grounds maintenance activities.

4.6.7 Sensitive Receptors

CEQ NEPA regulations require evaluation of the degree to which the proposed action affects public health (40 CFR 1508.27). Children, elderly people, and people with illnesses are especially sensitive to the effects of air pollutants; therefore, hospitals, schools, convalescent facilities, and residential areas are considered to be sensitive receptors for air quality impacts, particularly when located within one mile from the emissions source. FMMD houses religious institutions, residential areas, one hospital, seven schools, Child and Youth Services Centers and four Child Development Centers (CDCs). There are several sensitive receptors, including other hospitals, schools, religious institutions, and elderly and childcare facilities within one mile of FMMD.

4.7 WATER RESOURCES

4.7.1 Surface Water

FMMD is located within the greater Chesapeake Bay watershed. The Chesapeake Bay is North America's largest and most biologically diverse estuary, home to more than 3,600 species of plants, fish, and animals (Chesapeake Bay Program, 2000). To protect and restore this valuable ecosystem, Maryland joined a consortium of state and federal agencies to establish the Chesapeake Bay Program partnership. The Army's conservation mission supports the Chesapeake Bay Programs, and FMMD is implementing BMPs that support the guidelines established by the partnership.

FMMD lies almost entirely within the Little Patuxent River watershed (MD watershed code number 02131105) of the Patuxent River Basin. A very small area in the northeast corner of

FMMD drains to the Severn River and is in the Severn Run Watershed. The Patuxent River drains an area of 932 square miles before emptying into the Chesapeake Bay on the western shore and is designated a "scenic river" under the Maryland Scenic and Wild Rivers Act of 1968. The Act mandates the preservation and protection of natural values associated with each designated river, and state and local governments are required to take whatever actions necessary to protect and enhance the qualities of the designated rivers. The Little Patuxent River runs along a part of the southwest corner of FMMD and is currently listed on Maryland's list of impaired waters under Section 303(d) of the CWA. Impairments include sediments, metals (cadmium) and biological. As TMDL for these impairments are developed, facilities could be impacted by requirements for reducing loads in the watershed.

FMMD contains approximately 38,000 linear feet (7.2 miles) of perennial streams, as well as other intermittent and ephemeral channels. (FMMD, 2017). Two major stream systems, Midway Branch and Franklin Branch, and the headwaters of Severn Run, are located on FMMD (Figure 2). Along with the 100-year-old, 8.2-acre Burba Lake, Franklin Branch and Midway Branch are the most significant water resources on FMMD. Burba Lake is on Franklin Branch near its confluence with Midway Branch and is a man-made surface water reservoir used for fishing and outdoor recreation and is the only enclosed water body on FMMD. The majority of FMMD is drained by Midway Branch and its primary tributary, the Franklin Branch. Both flow from north to south through the center of FMMD. The Midway Branch is a tributary to the Little Patuxent River.

The headwaters of Severn Run are located on the northeastern corner of FMMD and flow east for approximately 5,000 feet before exiting FMMD and ultimately discharging into the Severn River.

The headwaters of Midway Branch are located north of FMMD in an urbanized, developed area. Midway flows through the center of FMMD for the entire length, north to south, before exiting FMMD, where it flows through a culvert under Maryland Route 32 and confluences with the Little Patuxent River off-site. Midway drains some 1,461 acres of the FMMD property.

The headwaters of Franklin Branch are offsite, just downstream of 29th Street. From there, it flows through a culvert under the MacArthur High School area and onsite from the northern end where it eventually empties into Burba Lake, draining 1,176 acres of the eastern half of FMMD. Franklin Branch cuts through some of the sandiest soils in the county, namely Evesboro and Galestown sandy loam soils. Consequently, the reach identified for restoration is currently a losing stream with rarely any flow as it is choked by sand in the hyporheic zone, which is the region of sediment and porous space beneath and alongside a stream bed where there is mixing of shallow groundwater and surface water. The sand is also trapped by three downstream fish passage blockages and the undersized culvert at Reese Road on the bottom end of the proposed restoration reach. The flow leaves the lake through a dam and confluences with Midway Branch upstream of Rock Avenue. The dam is a 16-foot earthen embankment with a tunnel spillway and is approximately 100 years old.

Franklin Branch merges with Midway Branch at FMMD's southern boundary where it is characterized by sediment blockage and aggregation in the lower reach, further compounded by an undersized culvert which restricts transportation. This leads to the Rogue Harbor Branch that flows off of FMMD into the man-made Lake Allen (formerly Soldier's Lake), south of MD 32.

Riparian buffers were incorporated into the FMMD Comprehensive Expansion Management Plan and subsequent BRAC projects to minimize impacts and degradation to waterbodies leading to the Chesapeake Bay. FMMD maintains a voluntary 100-foot riparian forest buffer along streams and

abutting wetlands to the maximum extent practical.

Wetland resources on FMMD are described in Section 4.8.6. It is noted that FMMD has approximately 217 acres of wetlands, most of which occur along the Little Patuxent River floodplain in the southwestern portion of FMMD and along Midway Branch, Franklin Branch, and their tributaries. There are also several stormwater management features, particularly ponds, spread across FMMD.

The TMDL identifies the necessary pollution reductions of nitrogen, phosphorus and sediment across Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia and the District of Columbia and sets pollution limits necessary to meet applicable water quality standards in the Chesapeake Bay and its tidal rivers and embayments (USEPA, 2020b). The TMDL is designed to ensure that all pollution control measures needed to fully restore the Bay and its tidal rivers are in place by 2025. The TMDL is supported by rigorous accountability measures to ensure cleanup commitments are met. Proposed restoration actions for the impaired stream reaches of FMMD include, but are not limited to, rock cross vanes, rock step, constructed riffles, tree protection, bank sloping and matting, step pools, cobble weirs, root wad, and wetland creation and enhancement. As a MS4 Phase II permit holder, FMMD may receive up to 469 impervious acre TMDL credits by implementing all stream restoration proposals (23,450 linear feet) identified in the draft *Technical Memorandum: Stream Assessment for Midway Branch, Franklin Branch, Severn Run, and Associated Tributaries on Fort George G. Meade* (USACE, 2019).

4.7.2 Floodplains

EO 11988, *Floodplain Management*, requires federal agencies to determine whether a proposed action would occur within a floodplain. The determination of whether a proposed action occurs within a floodplain typically involves consultation of appropriate Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs), which contain enough general information to determine the relationship of the project area to nearby floodplains. EO 11988 directs federal agencies to avoid floodplains unless the agency determines that there is no practicable alternative to undertaking the action in a floodplain. Where the only practicable alternative is to site in a floodplain, a specific step-by-step process must be followed to comply with EO 11988 and its further amendments. One of the amendments regards the definition of a floodplain. Instead of establishing the floodplain based on the area subjected to a one percent or greater chance in any given year, the floodplain shall be:

> (i) the elevation and flood hazard area that result from using a climate-informed science approach that uses the best-available, actionable hydrologic and hydraulic data and methods that integrate current and future changes in flooding based on climate science. This approach will also include an emphasis on whether the action is a critical action as one of the factors to be considered when conducting the analysis;
>
> (ii) the elevation and flood hazard area that result from using the freeboard value, reached by adding an additional 2 feet to the base flood elevation for non-critical actions and by adding an additional 3 feet to the base flood elevation for critical actions;
>
> (iii) the area subject to flooding by the 0.2 percent annual chance flood; or
>
> (iv) the elevation and flood hazard area that result from using any other method identified in an update to the FFRMS [Federal Flood Risk Management Standard].

A flood zone area is an area that FEMA has defined according to varying levels of flood risk. These zones are depicted on a community's or county's FIRM or Flood Hazard Boundary Map. Each zone reflects the severity or type of flooding in the area. Examples of flood zones include the 1-percent-annual-chance flood hazard area (this is also known as a 100-year flood event) and the 0.2-percent-annual-chance flood hazard area (this is also known as a 500-year flood event). United States Army Corps of Engineers (USACE) conducted a floodplain study in 2008 to map areas along the streams on FMMD. For this investigation, areas with a drainage area of greater than one-square mile within the FMMD boundaries were included in the hydrologic, hydraulic, and digital floodplain mapping efforts. This included all of Midway Branch within the FMMD boundaries and the majority of Franklin Branch. Locations on Franklin Branch with drainage areas less than one-square mile were included in this investigation because of the amount of development along this flooding source (USACE, 2008). Floodplains at FMMD are generally located along the stream reaches, as depicted in Figure 8.

Historically, storm damage at FMMD and in Anne Arundel County has resulted from severe thunderstorms and from tropical storms and hurricanes that follow a northern route along the Atlantic coastline. Based upon conversations with FMMD Directorate of Public Works staff, significant riverine flooding has not historically been a concern at FMMD. However, with the potential for future development at FMMD, a strong understanding of the potentially flooded areas is essential in planning efforts.

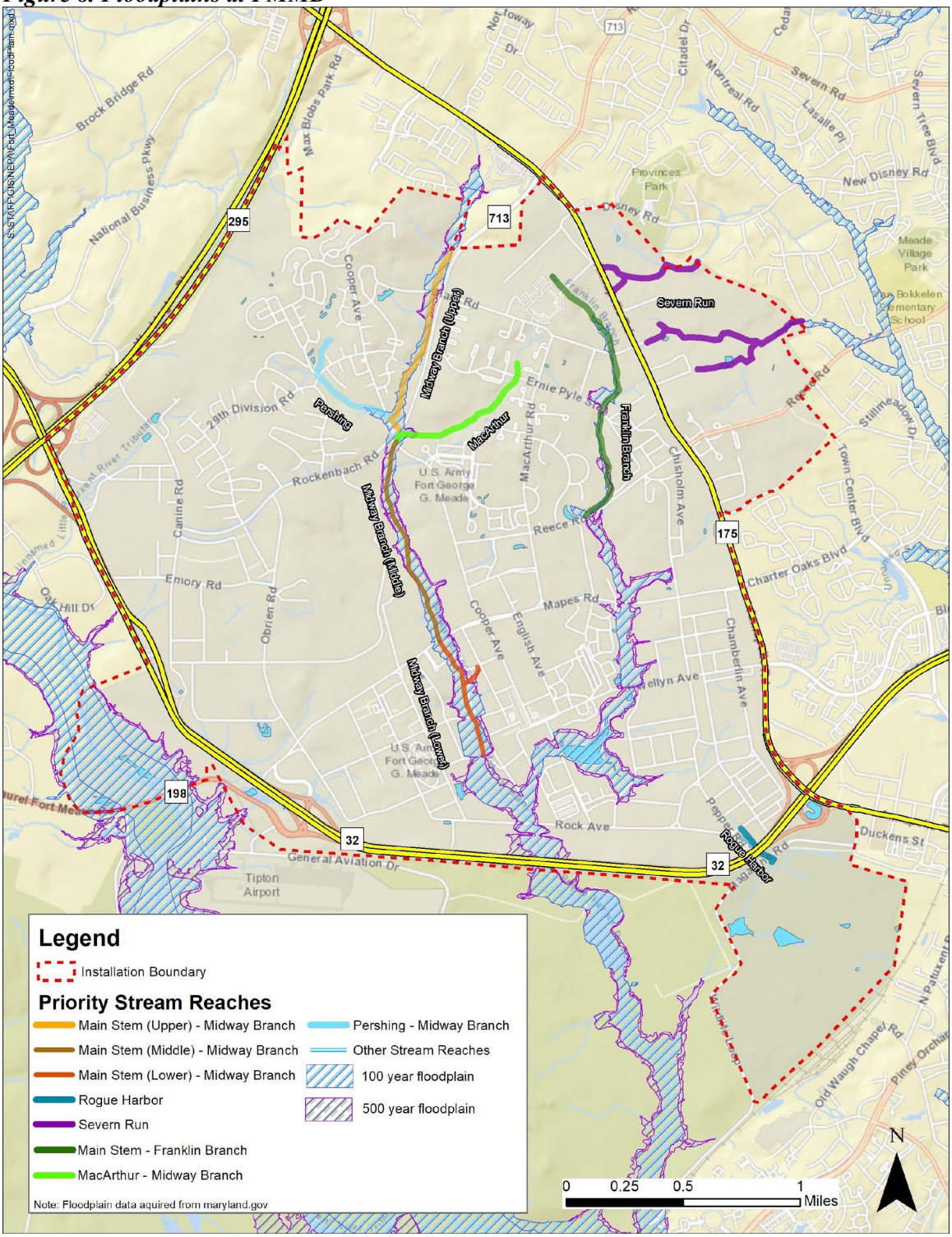
There are currently no structural flood protection measures, such as levees and/or floodwalls, at FMMD. Burba Lake on FMMD provides stormwater reduction benefits. The lake reduces peak flows for a two-year and ten-year event by approximately two-thirds. Lake Allen, outside the FMMD boundaries, also provides peak flow reduction for downstream areas. Stormwater management BMPs, such as stormwater ponds, have been utilized extensively in upland areas of FMMD to mitigate runoff from the increase in impervious area. In addition, several road crossings on FMMD have been modified to act as a stormwater detention facility during storm events. These areas include Clark Road on Midway Branch and Clark Road and Ernie Pyle Street on Franklin Branch.

4.7.3 Groundwater

The Patuxent, Upper Patapsco, and Lower Patapsco aquifers lie under the FMMD property (Michael Baker Jr. Inc., 2007). The Lower Patapsco and Patuxent aquifers are separated by the Arundel Clay formation. The Patuxent Aquifer consists of lenticular interfingering sands, silts, and clays capable of yielding large quantities of water. This aquifer is 200 to 400 feet thick and is the deepest of the three aquifers beneath FMMD. The Upper Patapsco Aquifer is unconfined and is considered the water table aquifer.

American Water owns and operates the potable water system that serves FMMD. American Water obtains potable water from six wells under a Water Appropriation and Use permit from the MDE: two wells are located north of Route 32 and four wells are located south of Route 32 (Atkins, 2011). The wells draw from the Patuxent Aquifer and range in depth from 500 to 800 feet below ground surface. Individual wells range in capacity from 720 gallons per minute (GPM) to 1,000 GPM (USACE, 2007). Total capacity of the wells is 5,000 GPM or 2.75 million gallons per day (MGD). The Water Appropriation and Use Permit (Permit No. AA1969G021[7]) allows an average withdrawal of approximately 3.3 MGD from these wells.

Figure 8. Floodplains at FMMD



4.7.4 Coastal Zone Management

The Coastal Zone Management Act (CZMA) of 1972 (16 United States Code [USC] §1451, et seq., as amended) provides assistance to states, in cooperation with federal and local agencies, for developing land and water use programs in the coastal zone. CZMA policy is implemented through state coastal zone management programs. Federal lands are excluded from the jurisdiction of these state programs. However, activities on federal lands are subject to CZMA federal consistency requirements if the federal activity would affect any land or water or natural resource of the coastal zone, including reasonably foreseeable effects. Specifically, in accordance with Section 307 of the CZMA and 15 CFR 930 subpart C, federal agency activities affecting a land or water use or natural resource of a State's coastal zone must be consistent to the maximum extent practicable with the enforceable policies of the State's coastal management program.

According to 15 CFR 930.41, the reviewing state has 60 days from receipt of the Consistency Determination to "concur" or "object". States are not required to concur with a Negative Determination. However, if a response from the state is not received by the 60th day of submittal (unless a one-time extension was requested), the federal agency may presume state agency concurrence. Additionally, 15 CFR 930.43 provides that should a state object to a Consistency Determination, the state and federal agencies should attempt to resolve their differences. However, if no resolution can be met, the federal agency may proceed if federal law prohibits the agency from being fully consistent or if that federal agency has concluded that its proposed action is fully consistent with the enforceable policies of the management program, though the state agency objects. If a federal agency decides to proceed with a federal agency activity that is objected to by a state agency, or to follow an alternative suggested by the state agency, the federal agency shall notify the state agency of its decision to proceed before the project commences.

All of FMMD is located within Maryland's Coastal Zone, and therefore subject to regulations pursuant to Maryland's Coastal Zone Management (CZM) Program. This includes the Chesapeake Bay, into which water from streams and their tributaries on FMMD flow. MDE regulates activities that are proposed within the CZM Program through federal consistency requirements. Under these requirements, applicants for federal and state licenses or permits must certify their proposed activity will be conducted in a manner consistent with the State's CZM Program. If a state permit is not required for a project, MDE has the authority to "concur" or "object" to the federal consistency determination.

4.7.5 Stormwater

Stormwater runoff at FMMD is conveyed to the three primary drainages, with the majority carried by Midway and Franklin Branches. All the natural drainages discharge into the Little Patuxent River, which ultimately drains into Chesapeake Bay. Runoff from developed areas at FMMD is conveyed through an extensive network of drainpipes and associated drainage structures, supplemented by swales, ditches, other drains, and retention ponds (FGGM, 2005). In recent years, FMMD has followed federal and MDE environmental site design standards for development. Additionally, FMMD has a Stormwater Management Plan and employs a number of stormwater management initiatives, including low impact development, to manage stormwater. Some examples of these include rain gardens and stormwater ponds, and replacing concrete storm drains with grass swales.

Energy Independence and Security Act of 2007

Section 438 of the Energy Independence and Security Act of 2007 (EISA) instructs federal agencies to "use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate," for any project with a footprint that exceeds 5,000 square feet.

In December 2009, USEPA issued the "Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act" focusing on a step-by-step framework that will help federal agencies maintain pre-development site hydrology by retaining rainfall on-site through infiltration, evaporation/transpiration, and re-use to the same extent as occurred prior to development. Implementation of Section 438 of the EISA can be achieved through the use of stormwater management practices often referred to as "green infrastructure" or "low impact development" practices which are described in the guidance. The intent of the statute is to maintain or restore the pre-development site hydrology during the development or redevelopment process. More specifically, this requirement is intended to maintain or restore stream flows such that receiving waters are not negatively impacted by changes in runoff temperature, volumes, durations, and rates. Site designers must design, construct, and maintain stormwater management practices to preserve or restore the hydrology of the site during the development or redevelopment process in compliance with Section 438. Site designers have two options to meet this standard. Option 1 provides site designers with a process to design, construct, and maintain stormwater management practices that manage rainfall on-site, and prevent the off-site discharge of stormwater from all rainfall events less than or equal to the 95th percentile rainfall event. Option 2 allows site designers to design, construct, and maintain stormwater management practices using a site-specific hydrologic analysis to determine pre-development runoff conditions instead of using the estimated volume approach of Option 1. Under Option 2, pre-development hydrology would be determined based on site-specific conditions and local meteorology by using continuous simulation modeling techniques, published data, studies, or other established tools.

Federal agencies have many alternatives for meeting the requirements of Section 438, including green infrastructure or low impact development management approaches and technologies that enhance or mimic the natural hydrologic cycle processes of infiltration, evapotranspiration, and use. Federal agencies can also use footprint-reduction practices (e.g., building up instead of out) to reduce their stormwater impact. Practices that agencies can use to meet Section 438 include but are not limited to the following:

- **Rain gardens, bioretention, and infiltration planters** to promote infiltration of stormwater, and allow for evapotranspiration to occur.
- **Porous pavements** which allow stormwater to infiltrate where traditional impervious pavements would otherwise be used.
- **Vegetated swales and bioswales** to treat stormwater runoff as it flows through these channels.
- **Green roofs** which absorb and store rainfall, thereby reducing runoff volume. Green roofs also help reduce energy costs.
- **Trees and tree boxes** to help break up the landscape of impervious surfaces and absorb stormwater runoff.
- **Pocket wetlands** which are small wetland systems designed to treat stormwater.

- **Reforestation/revegetation** practices to help restore areas to more natural vegetative cover, which promote infiltration.
- **Protection and enhancement of riparian buffers and floodplains** which ensure that streams are protected and shaded, improving water quality.
- **Rainwater harvesting** (e.g., irrigation, air conditioning cooling water, non-potable indoor uses such as watering plants) which uses cisterns and rain barrels to capture and use stormwater.

Code of Maryland Stormwater Regulations

Provisions of Code of Maryland Regulations (COMAR) 26.17.02.01 (*Maryland Department of the Environment, Water Management, Purpose and Scope*) require that all jurisdictions in Maryland implement a stormwater management program to control the quality and quantity of stormwater runoff resulting from new development. The regulations state:

- The primary goals of the State and local stormwater management programs are to maintain after development, as nearly as possible, the predevelopment runoff characteristics, and to reduce stream channel erosion, pollution, siltation and sedimentation, and local flooding by implementing environmental site design to the maximum extent practicable and using appropriate structural best management practices only when necessary.
- These regulations for stormwater management apply to the development or redevelopment of land for residential, commercial, industrial, or institutional use, but do not apply to agricultural land management practices. These provisions specify the minimum content of county and municipal ordinances, responsibilities of the Administration regarding the review of the county and municipal stormwater management programs, and approval of State-constructed projects for stormwater management by the Department of the Environment.
- These provisions apply to all new development and redevelopment projects that do not have final approval for erosion and sediment control and stormwater management plans by May 4, 2010.

COMAR Title 26.17.02.05 (*When Stormwater Management is Required*) exempts any developments that do not disturb over 5,000 square feet (SF) of land area or 100 Cubic Yard (CY) of earth. Conversely, developments disturbing over 5,000 SF of land or 100 CY of earth require stormwater management. The Stormwater Management Plan (SWP) requirements are outlined in COMAR 26.17.02.09.

Environmental Site Design (ESD) requires a developer to demonstrate that all reasonable opportunities for meeting stormwater requirements using ESD have been exhausted by using natural areas and landscape features to manage runoff from impervious surfaces and that structural BMPs have been used only where absolutely necessary. The 2015 Stormwater Management Guidelines for State and Federal Projects will be implemented to the maximum extent technically feasible for the Proposed Action.

FMMD maintains a Stormwater Pollution Prevention Plan (SWPPP) that provides BMPs for controlling and preventing siltation and contaminants associated with construction and industrial activity sites from reaching area surface waters.

Municipal Separate Storm Sewer System (MS4) Phase II

The FMMD, Environmental Division, Stormwater Program is required to meet the Municipal Separate Storm Sewer System (MS4) Phase II permit requirements for the treatment of approximately 200 acres of impervious surface.

Stream restoration is a cost-effective way to meet these permit requirements. The Stormwater and Natural Resource Programs have shared interest for meeting regulatory requirements and providing ecosystem benefits. The approach has been to assess the restoration potential for select streams and apply means and methods to the maximum ecological extent practical to meet programmatic goals. The Stream Functions Pyramid Framework and the EPA Chesapeake Bay – Stream Restoration Expert Panel Protocols are used to accomplish this goal.

The FMMD Stormwater Program's goal is to meet MS4 permit requirements by using stream restoration for TMDL wasteload reductions that result in impervious surface acreage equivalent credits. Projects are designed to improve degraded urban stream systems by providing for functional (stream mechanics) and biological lift (abundance/diversity of organisms).

The FMMD, Directorate of Public Works, Stormwater Program has established goals for stream restoration to achieve TMDL credits under the MS4 program. The goals include achieving co-benefits through ecological functional improvements to meet Natural Resource Program goals. The State MS4 program allows for the use of alternative practices including stream restoration to reduce wasteload allocations for nitrogen, phosphorus, and total suspended solids (TSS). MDE has provided MS4 Phase II permit holders with guidance on stream restoration crediting. The guidance allows for a default rate of 0.02 impervious acreage equivalency (IAE) per linear foot of stream restored. The guidance also allows for use of the Chesapeake Stormwater Network and Center for Watershed Protection's *Recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects* using any of the four listed protocols (Chesapeake Stormwater Network, 2014).

Stream Functions Pyramid Framework

The Stream Functions Pyramid Framework (SFPF) provides the scientific basis for developing the goals and objectives of stream restoration (USEPA, 2012). The Stream Functions Pyramid includes five functional categories: Level 1 = Hydrology, Level 2 = Hydraulics, Level 3 = Geomorphology, Level 4 = Physicochemical, and Level 5 = Biology, as depicted in Figure 9. The Pyramid is based on the premise that lower-level functions support higher-level functions and that they are all influenced by local geology and climate. Each functional category is defined by a functional statement. For example, the functional statement for Level 1, Hydrology is "the transport of water from the watershed to the channel," which supports all higher-level functions.

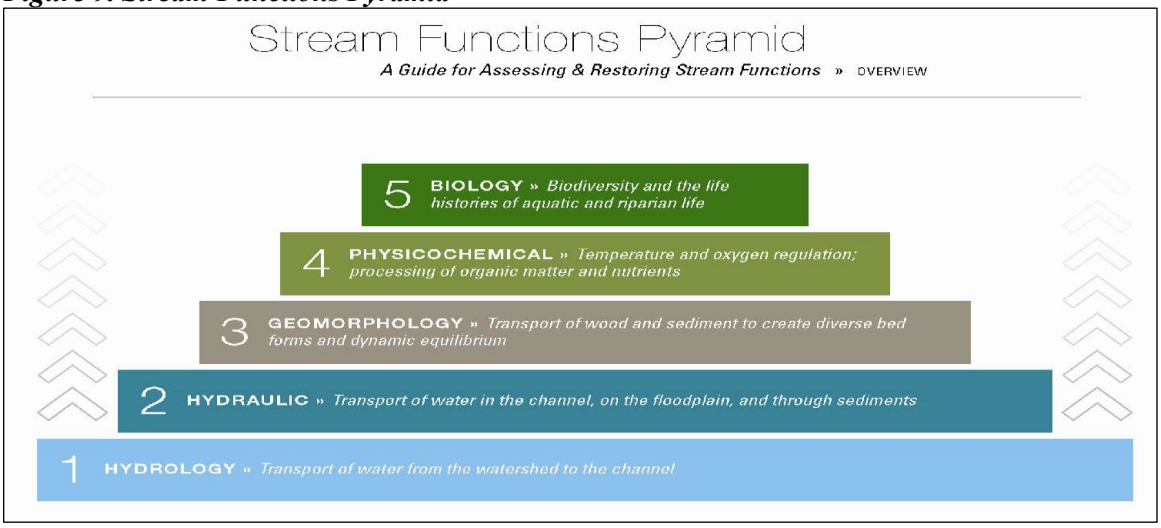
The Stream Functions Pyramid alone shows a hierarchy of stream functions but does not provide a specific mechanism for addressing functional capacity, establishing performance standards, or communicating functional lift. The Pyramid concept has been expanded into a more detailed framework to quantify functional capacity, establish performance standards, show functional lift, and establish function-based goals and objectives.

The base level restoration goal for the Proposed Action would be a Level 3. For several of the selected stream reaches, a higher-level functional capacity may be obtained. These stream reaches include the Severn Run (MDE Use IV Put and Take Fishery) and the Unnamed Tributary to Rogue Harbor (wetland enhancement opportunities). The Severn Run presents enhanced potential for

functional lift in a downstream direction following the implantation of upstream BMPs and stream restoration projects. The unnamed tributary to Rogue Harbor has a potential to restore a degraded floodplain wetland with potential Level 4 and 5 benefits.

The stream reaches identified in the USACE FMMD Stream Assessment (FMMD, 2019) all have potential for higher levels of function. The restoration potential for each of these areas will be independently conducted as resources become available.

Figure 9. Stream Functions Pyramid



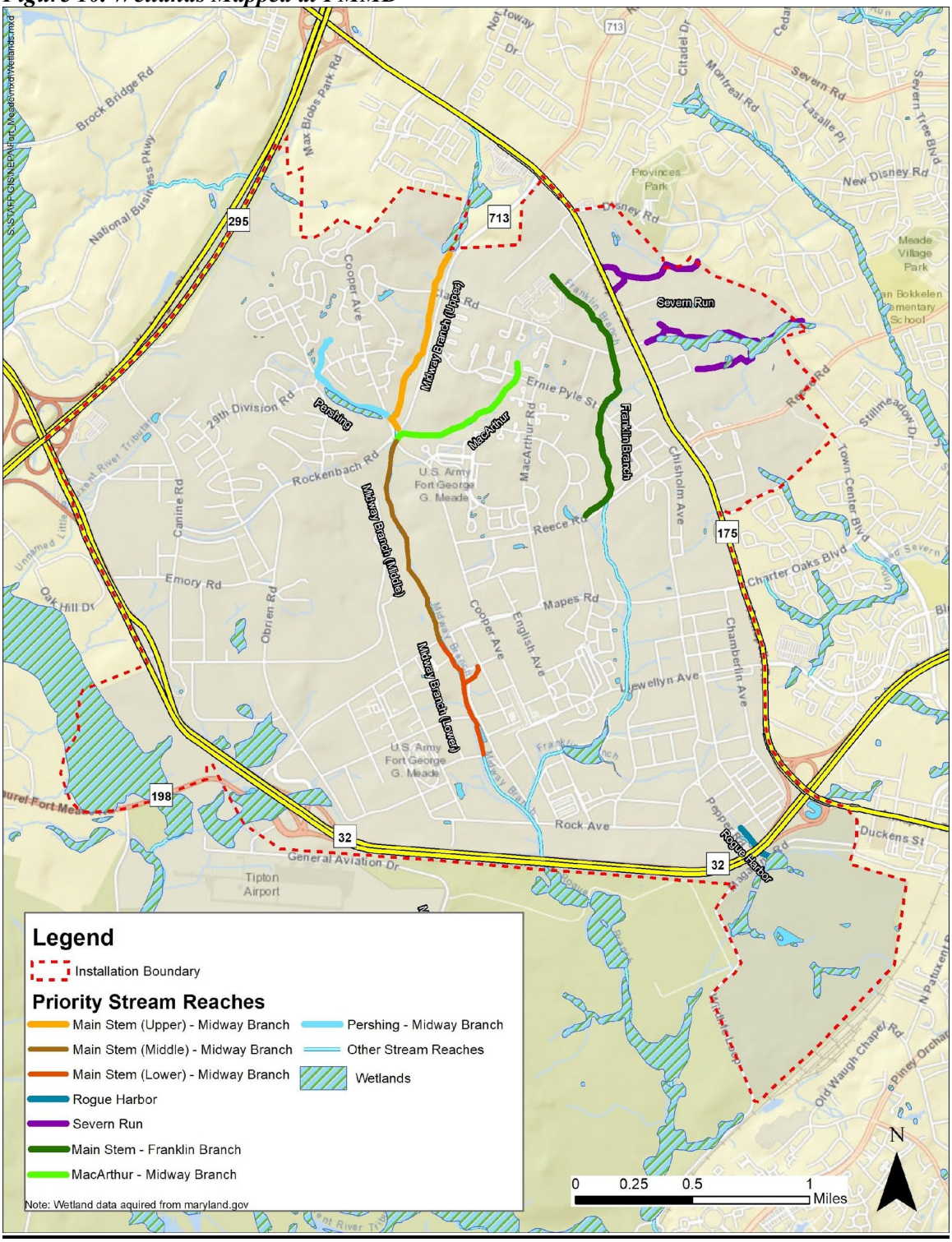
4.7.6 Wetlands

Wetlands are protected under the Clean Water Act (CWA). Jurisdictional wetlands are those wetlands subject to regulatory protection under Section 404 of the CWA and EO 11990.

USACE defines wetlands as "those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR Part 328). Important wetland functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, storm water attenuation and storage, sediment detention, and erosion protection.

FMMD has approximately 217 acres of wetlands, most of which occur along the Little Patuxent River floodplain in the southwestern portion of FMMD and along Midway Branch, Franklin Branch, and their tributaries, as depicted in Figure 10. Most of the wetlands on FMMD are palustrine forested (PFO) (typically includes sweetgum, red maple, white oak, tulip tree, loblolly pine, tupelo, blueberry) along the Little Patuxent River and in the northwestern portion of FMMD. Smaller areas of wetland within FMMD include palustrine emergent (PEM) and palustrine scrub shrub (PSS). Wetlands are present along the stream reaches where restoration is planned.

Figure 10. Wetlands Mapped at FMMD



4.8 BIOLOGICAL RESOURCES

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

4.8.1 Vegetation

Vegetative cover at FMMD consists of forestland, open land/meadow, and developed areas with maintained turf and street trees. These components constitute FMMD's green infrastructure. Maryland's green infrastructure was mapped into hubs and corridors using satellite imagery, road and stream locations, biological data, and other information. Hubs are typically unfragmented forest areas hundreds or thousands of acres in size, and are vital to maintaining the state's ecological health. They provide habitat for native plants and animals, protect water quality and soils, regulate climate, and perform other critical functions. Corridors are linear remnants of natural land such as stream valleys and mountain ridges that allow animals, seeds, and pollen to move from one area to another. They also protect the health of streams and wetlands by maintaining adjacent vegetation. Preserving linkages (corridors) between the remaining blocks of habitat (hubs) will ensure the long-term survival and continued diversity of Maryland's plants, wildlife, and environment. FMMD maintains both green infrastructure hubs and corridors.

Less than one-third of the FMMD property, approximately 1,500 acres, is forested. Many native forests were cleared prior to the formation of FMMD for agriculture. Larger remaining forested tracts are located towards the perimeter of FMMD. Many of these larger tracts are connected by riparian forest corridors. Larger tracts are around 70 years old, but some stands predate the installation. Development at FMMD has resulted in forest fragments and recently reforested areas.

As described in the INRMP, extensive development has resulted in the retention of few areas of native vegetation at FMMD, most of which are associated with stream corridors (FGGD, 2004). The largest wooded area at FMMD is in the southwest corner and is associated with the Little Patuxent River. The dominant vegetation in this area is red maple (*Acer rubrum*), sweet gum (*Liquidambar styraciflua*), black gum (*Nyssa sylvatica*), northern arrowwood (*Viburnum recognitum*), Japanese honeysuckle (*Lonicera japonica*), greenbriar (*Smilax rotundifolia*), and poison ivy (*Toxicodendron radicans*).

As stated in the INRMP, smaller wooded areas are scattered throughout FMMD in the uplands (FGGM, 2004). They are dominated by white, red, and chestnut oak (*Quercus alba, Q. rubra, Q. prinus*); mockernut and pignut hickory (*Carya tomentosa* and *C. glabra*); flowering dogwood (*Cornus florida*); blueberry (*Vaccinium corymbosum*); greenbriar; loblolly and pitch pine (*Pinus taeda* and *P. rigida*); and poison ivy.

Most of the developed portions of FMMD have been landscaped using a combination of turf grasses, interspersed with native and exotic trees and shrubs, including elm (*Ulmus* sp.), maple (*Acer* sp.), flowering cherry (*Prunus* sp.), black willow (*Salix nigra*), flowering dogwood, and an assortment of holly cultivars (*Ilex* sp.) (FGGM, 2004).

EEE Consulting, Inc. prepared a *Planning Level Vegetation Surveys* report in 2014 (EEE, 2014). The report included three components: a Flora Planning Level Survey Update and Floristic

Inventory, an RTE Species Planning Level Survey Update, and a Vegetation Communities Planning Level Survey and Forest Mapping.

The surveys identified 450 taxa, including 28 invasive species, one state- endangered plant (Torrey's Rush, *Juncus torreyi*), and 134 taxa not previously identified in prior surveys conducted in 1994, 2001, or 2009 surveys. There were 711 total taxa identified within FMMD from 1994 to 2013. No federally-listed plants were identified (EEE, 2014).

USACE conducted field surveys on FMMD from 19 to 23 September 2011 and 3 to 7 October 2011. The team surveyed approximately 1,315 acres of the total 5,253 acres of FMMD. Invasive species were observed on approximately 540 acres of the surveyed area. Thirty-two invasive species were identified during the surveys. The species with the most surveyed occurrences were Asiatic bittersweet (*Celastrus orbiculatus*), Japanese honeysuckle (*Lonicera japonica*), Nepalese browntop (*Microstegium vimineum*), and mile-a-minute (*Persicaria perfoliata*).

Forest Conservation Act

It is the intent of FMMD to maintain a campus-like environment and conserve forested areas to the maximum extent practical in accordance with the Maryland Forest Conservation Act (FCA) while continuing to sustain and support current and future missions. This includes managing the FMMD forest conservation program in accordance with the 2013 Memorandum of Understanding (MOU) between the State of Maryland and the DoD concerning federal consistency requirements of the Coastal Zone Management Act.

Development and construction projects are required to follow the current FMMD FCA and Tree Management Policy. In keeping with the MD FCA standards, FMMD requires that the equivalent of 20% of a project area be forested. All projects 40,000 SF or larger must comply with the FMMD FCA policy. Other projects are evaluated on a case-by-case basis. Site developments must preserve or establish 20% forest cover, regardless of whether or not the site was forested before the construction. Generally, linear utility and road projects are only required to preserve or establish 20% of the forest cover removed for the actual project. Should existing forest mitigation areas require disturbance, the project proponent shall replace the existing mitigation area at a two to one (2:1) ratio above the required 20%. Street trees are to be replaced at a minimum of a 1:1 ratio, with preference given to the preservation of specimen trees. Specimen tree replacement ratios would be calculated on a case-by-case basis. Forestry practices that cannot feasibly be performed within the project area shall be performed on other designated land areas within FMMD.

FMMD participates in the Army's conservation reimbursable and fee collection program for forestry. This program exists to provide ecosystem-level management that supports and enhances the land's ability to support each installation's respective military missionscape, while simultaneously obtaining ecologically responsible results that satisfy all federally mandated requirements for natural resources. Program revenues are generated through the sale of forest products. The fair market value of all forest products removed due to the Proposed Action shall be deposited into the Army's Reimbursable Forestry Account to be utilized for natural resource activities and ecosystem management at Army installations.

4.8.2 Terrestrial Wildlife Resources

In 2013, Environmental Systems Analysis, Inc. (ESA, Inc.) conducted a study for fauna and wildlife populations, including breeding amphibians and a Burba Lake fisheries study. Most of the observed animal species are common to Anne Arundel County and the Central Maryland area.

During the fauna study, a total of 13 bird and 11 mammal species were identified (Table 6). During the amphibian breeding study, 11 reptile and amphibian species were identified (Table 7). The species observed during the 2013 survey were very similar to those found during the 2009 flora and fauna survey performed by USACE (USACE, 2009).

Table 6. Mammals and Birds Present at FMMD in 2013

Scientific Name	Common Name
Odocoileus virginianus	White-tailed deer
Procyon lotor	Raccoon
Sciurus carolinensis	Eastern gray squirrel
Urocyon cinereoargenteus	Gray fox
Homo sapien	Human
Didelphimorphia	Opossum
Lepus curpaeums	Eastern cottontail
Zenaida macroura	Mourning dove
Vulpes	Red fox
Anas platyrhynchos	Mallard
Butorides virescens	Green heron
Cardinalis cardinalis	Northern cardinal
Agelaius phoeniceus	Redwing blackbird
Felis catus	Domestic cat
Cyanocitta cristata	Eastern blue jay
Quiscalus quiscula	Common grackle
Passeridae sp.	Sparrow
Fringillidae sp.	Finch
Branta canadensis	Canada goose
Corvus brachyrhynchos	American crow
Marmota monax	Groundhog
Species unknown	Mouse
Dumetella carolinensis	Gray Catbird
Turdus migratorius	American robin

Table 7. Reptiles and Amphibians Present at FMMD in 2013

Scientific Name	Common Name
Pseudacris crucifer (frog)	Spring peeper
Lithobates clamitans (frog)	Green frog
Lithobates sylvatica (frog)	Wood frog
Acris crepitans (frog)	Eastern cricket frog
Lithobates sphenocephalus (frog)	Southern leopard frog
Anaxyrus americanus (toad)	American toad
Ambystoma opacum (salamander)	Marbled salamander
Ambystoma maculatum (salamander)	Spotted salamander
Terrapene carolina (turtle)	Eastern box turtle
Chelydra serpentina (turtle)	Common snapping turtle
Plestiodon fasiatus (lizard)	Common five-lined skink

4.8.3 Rare, Threatened, or Endangered (RTE) Species

Under the ESA, an "endangered species" is defined as any species in danger of extinction throughout all or a significant portion of its range. A "threatened species" is defined as any species likely to become an endangered species in the foreseeable future. The ESA also provides for recovery plans to be developed describing the steps needed to restore a species population. Critical

habitat for federally listed species includes "geographic areas on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protection." Critical habitat can include areas not occupied by the species at the time of the listing but that are essential to the conservation of the species. The Sikes Act provides for cooperation by the Department of the Interior and DoD with State agencies in planning, development, and maintenance of fish and wildlife resources on military reservations throughout the United States.

On FMMD there are 8 species listed as either Endangered, Threatened or candidate species under the auspices of the ESA (Table 8).

Table 8. Federally listed species that occur or may occur on FMMD.

Common Name	Scientific Name	Federal listing	Maryland State listing	Installation Presence
Northern long-eared bat	*Myotis septentrionalis*	*Threatened*	Threatened S1	Present, but Transient (Acoustic only)
Indiana bat	*Myotis sodalis*	*Endangered*	Endangered S1	Present, but Transient (Acoustic only)
Tricolored Bat	*Perimyotis subflavus*	*Under Review (Candidate)*	Endangered S1	Present, but Transient (Acoustic only)
Wood Turtle	*Glyptemys insculpta*	*Under Review (Candidate)*	Vulnerable S3	Known[1] presence
Spotted Turtle	*Clemmys guttata*	*Under Review (Candidate)*	Vulnerable S3	None known, Occurs on a neighboring parcel
Rusty Patch Bumble Bee	*Bombus affinis*	*Endangered*	SH	Historic-locally extirpated
Little Brown Bat	*Myotis lucifugus*	*Under Review (Candidate*	Critically imperiled S1	Known presence
Monarch	*Danaus plexippus*	*Under Review (Candidate*	Secure S5B	Present

As of April 2, 2015, the Northern Long Eared Bat (NLEB) (*Myotis septentrionalis*) was listed as a federally threatened species under the ESA, due largely to the impacts of white-nose syndrome. FMMD lies within the eastern range of the NLEB and contains suitable habitat, mixed hardwood forests over three inches diameter at breast height, for summer roost trees. The presence of the NLEB has been detected acoustically on FMMD, but no active summer roost trees or hibernacula have been confirmed at FMMD or in in Anne Arundel County to date. FMMD recently conducted a NLEB survey, and it is being submitted to the USFWS. USFWS signed a Programmatic Biological Opinion (BO) 5 January 2016 on the Final 4(d) Rule that addresses effects to the NLEB by federal actions and provides for a streamlined section 7 consultation. USFWS has not yet designated critical habitat for NLEB.

[1] A single individual was found near Burba Lake that may have been a pet release. Surveys are ongoing to determine if a population exists at FMMD.

FMMD used the streamlined Section 7 consultation process with the USFWS Chesapeake Bay Field Office to evaluate potential impacts to the NLEB from the Proposed Action (internal correspondence from May 5, 2020). USFWS indicated that Proposed Action may affect the NLEB; therefore, consultation with the Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.) is required. However, based on the information provided, the Proposed Action may rely on the Service's January 5, 2016, Programmatic Biological Opinion on Final 4(d) Rule for the NLEB and Activities Excepted from Take Prohibitions to fulfill its Section 7(a)(2) consultation obligation.

Indiana bats (*Myotis sodalist*) were listed for protection under the ESA in 1967 and are currently listed as endangered. Indiana bats live in the forests and caves of the Northeast and Southeast, but primarily in the Midwest. The bats congregate in winter and summer colonies, migrating between the two sites in the spring and fall. These bats live in wooded or semi-wooded areas during the summer and form maternity colonies and roosts in dead standing trees. Indiana bats forage along river and lake shorelines, in the crowns of trees in floodplains, and in upland forests consuming primarily flying insects.

The presence of the Indiana bat was detected on FMMD during 2016 and 2017 field surveys for the northern long-eared bat (Deeley 2017, Deeley and Emrick 2018) but no active summer roost trees or hibernacula have been confirmed in Anne Arundel County and the Chesapeake Bay Field Office of the USFWS does not consider Ann Arundel County within the range of the Indiana bat (USFWS 2017). FMMD submitted the results of the 2016 survey to the USFWS Chesapeake Bay Field Office-Ecological Services office for review and they have determined not to regulate the Indiana bat on FMMD since it is out of their historical range.

An RTE plant species survey was performed in 2013 by EEE Consulting, Inc. (EEE, 2014). No federally-listed plants were documented on FMMD.

Additionally, a 2013 study for fauna and wildlife populations (ESA Inc., 2014), ESA Inc. provided updates on the glassy darter (*Etheostoma vitreum*). The glassy darter was observed and documented in previous fish surveys conducted on FMMD, from 1992 through 2004. The glassy darter has been identified as occurring at FMMD, within the 9500 Tract of the Little Patuxent River, and immediately downstream and off-site of FMMD.

All RTE plant species observed during the 2013 survey are presented in Table 9.

State-Listed Species

State-listed species are not protected under the ESA; however, whenever feasible, FMMD cooperates with State authorities in an effort to identify and conserve State-listed species (Army and Air Force Exchange Service, 2006). The state listed faunal species that have been detected on FMMD include the glassy darter (*Etheostoma vitreum,* American brook lamprey (*Lethenteron appendix*), coastal plain swamp sparrow (*Melospiza georgiana nigrescens*) and Northern waterthrush (*Parkesia noveboracensis*). Three state listed floral species have been detected on FMMD. These include blunt-lobe grapefern (*Sceptridium oneidense*), Torrey's rush (*Juncus torreyi*), and partridge pea (*Chamaecrista fasciculate var. macrosperma*), and one state-wide extirpated species spotted Joe-pye-weed (*Eutrochium maculatum*). During the 2013 RTE plant species survey, two of the previously identified state-listed RTE species were found: American chestnut (*Castanea dentata*) and dwarf azalea (*Rhododendron atlanticum*) (EEE, 2014). One

Maryland Watch List plant, *Anaphalis margaritacea*, was found within the Firing Range Powerline and the Range Road Corridor; one Maryland State Rare/Watch List plant, *Bidens coronate*, was found within the Firing Range Powerline.

Table 9. Rare, Threatened, and Endangered and State-listed Flora at FMMD in 2013

Species	Location				
	Range Road Corridor	**Range Road Obstacle Course**	**Rock Avenue Shrub Swamp**	**Firing Range Powerline**	**Berman Tract**
Anaphalis margaritacea **Western pearly everlasting**	Present	---	---	Present	---
Castanea dentata **American chestnut**	---	Present	---	--	---
Bidens coronata **Crowned beggarticks**	---	---	---	Present	---
Juncus torreyi **Torrey's rush**	---	---	---	--	Present
Rhynchospora microcephala **Tiny-headed beakrush**	---	---	---	--	Present

4.8.4 Aquatic Habitat

Water bodies that flow through FMMD provide habitat for a number of aquatic organisms (USACE, 2007). Over two dozen species of fish are known to occur on FMMD, including, but not limited to, the creek chubsucker (*Erimyzon oblongu*), eastern mudminnow (*Umbra pygmaea*), tessellated darter (*Etheostoma olmstedi*), American brook lamprey (*Lampetra appendix*), American eel (*Anguilla rostrata*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), glassy darter (*Etheostoma vitreum),* redbreast sunfish (*Lepomis auritus),* bluegill (*Lepomis macrochirus*), and pumpkinseed (*Lepomis gibbosus).*

A total of five species and 422 fish were collected as part of the 2013 Burba Lake survey effort (ESA Inc., 2014). The most abundant species collected was bluegill (*Lepomis machrochirus*), followed by green sunfish (*Lepomis cyanells*), red ear sunfish (*L. microlophus*), mosquito fish (*Gambusia afinis*), and largemouth bass (*Macropterus salmoides*), in descending order of abundance.

Currently there is no aquatic organism connectivity at the lower reach of Franklin Branch due to sediment aggregation and blockages.

4.9 CULTURAL RESOURCES

Cultural resources can include prehistoric and historic sites, structures, districts, or any other physical evidence of human activity considered important to a culture, a subculture, or a community for scientific, traditional, religious, or any other reason. Depending on their condition and use, these resources can provide insight into the living conditions of previous existing civilizations, or retain cultural and religious significance to modern groups, referred to as Traditional Cultural Properties (TCPs).

Archaeological resources are locations where prehistoric or historic activity measurably altered the earth or produced deposits of physical remains. Architectural resources include standing buildings, districts, bridges, dams, and other structures of historic significance. Traditional cultural properties include locations of historic occupations and events, historic and contemporary sacred and ceremonial areas, prominent topographical areas that have cultural significance, traditional hunting and gathering areas, and other resources that Native Americans or other groups consider essential for the persistence of their traditional culture.

Several federal laws and regulations have been established to manage cultural resources. Cultural resources are "historic properties" as defined by the National Historic Preservation Act (NHPA) of 1966, "cultural items" as defined by the Native American Graves Protection and Repatriation Act of 1979 (NAGPRA), "archaeological resources" as defined by the Archaeological Resource Protection Act of 1979 (ARPA), "sacred sites" as defined by EO 13007 to which access is afforded under the American Indian Religious Freedom Act of 1987 (AIRFA), and collections and associated records as defined in 36 CFR 79. In order for a cultural resource to be considered significant, it must meet one or more of the following criteria for inclusion on the National Register of Historic Places (NRHP):

> *The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and: 1) that are associated with events that have made a significant contribution to the broad patterns of our history; or 2) that are associated with the lives or persons significant in our past; or 3) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or 4) that have yielded, or may be likely to yield, information important in prehistory or history.*

The NHPA, as amended, as well as Federal legislation, and Department of Defense regulations (particularly Army Regulation 200-1, *Environmental Protection and Enhancement*), requires the Army and other Federal agencies to locate, identify, evaluate, and treat cultural resources under their ownership, administration, and control in a manner that fosters the preservation of the resources.

The most recent Integrated Cultural Resources Management Plan (ICRMP) for FMMD was finalized in March 2020 by USACE, Baltimore District (USACE, 2020) as an update to the existing 2011 ICRMP. The new ICRMP covers the period from 2018 through 2022 and provides guidelines and procedures to enable FMMD to meet its legal responsibilities related to historic preservation and cultural resources management at FMMD.

The entirety of FMMD has undergone Phase I-level archaeological investigations for the presence of archaeological resources, therefore no new archaeological fieldwork was completed for the 2020 ICRMP update.

Buildings

Previous investigations identified and evaluated all buildings located on FMMD that were built prior to 1960 for NRHP eligibility. The Base Realignment and Closure Act of 2005 led to a variety of construction actions, which required cultural resource reviews and some field investigations, however no new cultural resources were identified during these projects.

Twenty-four buildings were evaluated for the NRHP from 2015 to 2018 and draft forms submitted to the Maryland Historical Trust (MHT) for their concurrence. The Maintenance Guidelines for the Historic District were updated in 2018. FMMD also did an exhaustive review of their complete building inventory from 2017 to 2018 to confirm which buildings had been evaluated for the NRHP and found ineligible, with clear concurrence from the MHT. Twenty-three buildings were then evaluated in 2019 as part of the effort to clear up any discrepancies between MHT and FMMD's records.

Historic Properties

Currently, there are no properties on FMMD listed in the NRHP, although FMMD has 14 eligible historic properties that include the water treatment plant (Building 8688) and a mix of barracks and administrative and support buildings. Additionally, there are three culverts that were constructed by German Prisoners of War (POW) during World War II (WWII) that are NRHP-eligible (see following paragraph for additional information). In 2003, ownership and management of 113 historic family housing units were transferred to a private, non-Federal entity, as part of the 1996 Military Housing Privatization Initiative.

Culverts

A portion of the southwestern area of FMMD was utilized as a POW camp during WWII. The first group of POWs, consisting of 1,632 Italian and 58 German soldiers, arrived at FMMD in September of 1943. In May 1944, the FMMD POW camp was expanded to house 2,000 German POWs. In 1944, the German POWs began operating the laundry at FMMD and may have been involved in conducting maintenance and repair work in the military family housing residences on FMMD. Additionally, German POWs constructed three culverts at FMMD, all of which were designed by the USACE. The culverts are located at stream crossings on Llewellyn, Redwood, and Leonard Wood Avenues where they cross over Franklin Branch Creek. These culverts are among the few tangible reminders of the POW presence at FMMD and in Maryland during WWII.

Archaeological Sites

There are 42 known archaeological sites on FMMD but none are listed in the NRHP. All of the sites have been evaluated for NRHP eligibility and only one site, 18AN1240, was found to be eligible. Thirty-three other sites have been evaluated for NRHP eligibility and were found ineligible. The remaining seven sites are historic cemeteries, which were evaluated in the 2007 ICRMP update and found to be ineligible for the NRHP, although they will be maintained due to the presence of buried human remains and recommended for avoidance.

4.10 HAZARDOUS, TOXIC, AND RADIOACTIVE SUBSTANCES

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

The promulgation of TSCA (40 CFR Parts 700 to 766) represented an effort by the federal government to address those chemical substances and mixtures for which it was recognized that the manufacture, processing, distribution, use, or disposal may present unreasonable risk of personal injury or health of the environment, and to effectively regulate these substances and mixtures in interstate commerce. The TSCA Chemical Substances Inventory lists information on more than 62,000 chemicals and substances. Toxic chemical substances regulated by USEPA under TSCA include asbestos and lead, which for the purposes of this PEA, are evaluated in the most common forms found in buildings, namely asbestos-containing materials (ACM) and lead-based paint (LBP). ACM includes materials that contain more than 1 percent asbestos and is categorized as either friable or non-friable. LBP includes paint having lead levels equal to or exceeding 0.5 percent by weight. In addition to asbestos and lead, renovation/demolition activities have the potential to disturb mercury and poly-chlorinated biphenyl (PCBs). These materials are also regulated under TSCA as RCRA Universal Waste. Buildings may contain liquid mercury in thermostats and thermometers, and fluorescent lighting fixtures typically contain elemental mercury in the fluorescent light bulb; compact fluorescent lamps also contain mercury. In addition, fluorescent lighting fixtures have potential to contain ballasts containing PCBs. None of the proposed improvements for stream reaches involve impacts to buildings. Therefore, analysis of ACM, LBP, PCBs, or mercury is excluded from further analysis in this PEA.

RCRA defines hazardous waste as wastes or combination of wastes that, because of quantity, concentration, or physical, chemical or infectious characteristics, may either cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible illness, or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of or otherwise managed. All hazardous wastes are classified as solid wastes. A solid waste is any material that is disposed, incinerated, treated or recycled except those exempted under 40 CFR 261.4.

FMMD's Directorate of Public Works Environmental Division is responsible for managing hazardous materials and waste. FMMD operate under a Spill Prevention Control and Countermeasures Plan (SPCCP)/Installation Spill Contingency Plan (ISCP) for all facilities where hazardous materials are stored. The SPCCP/ISCP Plan delineates measures and practices that require implementation to prevent and/or minimize spill/release from storage and handling of hazardous materials to protect ground and water surfaces. The ISCP provides emergency response instructions for spills and uncontrolled releases of hazardous materials. Instructions include

notification, probable spill routes, control measures, exposure limits and evacuation guidelines. Material Safety Data Sheets (MSDS) that provide information about health hazards and first-aid procedures are included in the ISCP.

Installation Hazardous Waste Management

FMMD also has an Installation Hazardous Waste Management Plan (FGGM, 2011). Those who handle or manage hazardous materials or hazardous waste are trained in accordance with federal, state, local and Army requirements. Each facility has appointed an emergency management coordinator who is responsible for emergency response actions until relieved by hazardous materials spill response personnel.

Pesticides and Herbicides

The Integrated Pest Management Plan (IPMP) provides a framework through which pest problems can be effectively addressed at FMMD. The latest plan was prepared in 2017 and is a five-year plan valid for 2017-2022. Elements of the program, including health and environmental safety, pest identification, pest management, pesticide storage, transportation, use, and disposal are defined within the plan. Used as a tool, this plan reduces reliance on pesticides, enhances environmental protection, and maximizes the use of integrated pest management techniques. Pesticides are stored at the entomology building and used on FMMD in accordance with all applicable federal, state, and installation guidelines.

National Priorities List

The USEPA placed FMMD on the National Priorities List (NPL) in 1998 after an evaluation of contamination due to past storage and disposal of hazardous substances at the Defense Reutilization and Marketing Office (DRMO), Closed Sanitary Landfill (CSL), Clean Fill Dump (CFD), and Post Laundry Facility. Contaminants at these sites included solvents, pesticides, polychlorinated biphenyls (PCBs), heavy metals, waste fuels, and waste oils. Based on the Army's conclusion that all actions necessary to protect human health and the environment have been conducted for the Tipton parcel, the EPA removed the Tipton parcel from the FMMD NPL listing on 1 November 1999. The FMMD NPL includes the entire current installation, from fence line to fence line (FGGM, 2015).

Installation Restoration Program

The DoD established the Installation Restoration Program (IRP) in 1975 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 FMMD IRP is to protect human health, safety and the environment. The IRP is carried out in accordance with all federal, state and local laws. The primary federal laws are CERCLA and Superfund Amendments and Reauthorization Act (SARA). In 2009, FMMD signed a Federal Facility Agreement (FFA) with the USEPA, U.S. Department of the Interior (DoI) and U.S. Architect of the Capitol (AOC). This document establishes the role that FMMD and the USEPA each play in the restoration of the installation and the formal mechanisms of this process. The IRP's staff works closely with the USEPA, MDE, and local government agencies to ensure that cleanup processes are conducted properly and efficiently. The staff also receives input from community groups and nearby residential areas.

Military Munitions Response Areas

In addition, the DoD developed the Military Munitions Response Program (MMRP) in 2001 to address munitions-related concerns, including explosive safety, environmental, and health hazards from releases of unexploded ordnance (UXO), discarded military munitions (DDM), and munitions constituents (MC) found at locations other than operational ranges on active BRAC installations and Formerly Used Defense Sites (FUDS) properties. The MMRP addresses non-operational range lands with suspected or known hazards from munitions and explosives of concern (MEC) which occurred prior to September 2002, but are not already included with an IRP site cleanup activity.

FMMD maintains an active Munitions Response Areas (MMRP), which includes two Munitions Response Areas (MRAs): Inactive Landfill No. 2 and the Former Mortar Range. As part of the mission for training of troops, the 291-acre Former Mortar Range was reportedly used as a training mortar range and maneuver area from the 1920s until the 1940s. The majority of the former range and training area has been used as a golf course since 1956. The northwestern portion of the MRA is DoD property and is developed with buildings and associated paved surfaces (i.e., roadways, parking lots, and walkways). The golf course was closed in 2012 and construction of additional DoD buildings began onsite.

4.11 TRAFFIC AND ROADWAYS

FMMD is located in Anne Arundel County and is served by the surrounding roadway network:

- Baltimore-Washington Parkway (Maryland [MD] Route 295).
- MD Route 175 (Annapolis Road).
- MD Route 32.
- MD Route 198.
- FMMD is accessible from the following five access control gates:
  - Gate 1: Mapes Road and MD Route 32,
  - Gate 2: Mapes Road and MD Route 175
  - Gate 3: Rockenbach Road and MD Route 175 (currently closed for renovations), and
  - Gate 7: Reece Road and MD Route 175 (Demps Visitor Control Center).

The roadway network within FMMD provides sufficient access for any heavy equipment that might be needed to perform stream restoration work. No modifications to roadways or temporary travel restrictions would be required for roadways within or outside of FMMD. Additionally, the proposed stream restoration construction would not modify any parking structures or capacity. Therefore, this topic is not analyzed further in this PEA.

4.12 INFRASTRUCTURE AND UTILITIES

FMMD utilizes utilities supplied by several different entities. A summary of these utilities is provided in the following sections. However, the proposed stream restoration would have no impact on the utility infrastructure or the utilization demand either within FMMD or in the surrounding community. Therefore, this topic is not further analyzed in this PEA.

4.12.1 Potable Water

American Water owns and operates the potable water system that serves FMMD. Water is drawn from six groundwater wells located throughout FMMD to American Water's water treatment plant,

which is located in the southwest quadrant of the cantonment area near the intersection of Mapes and O'Brien Roads. The maximum allowed draw capacity permitted by MDE is 3.3 MGD, or approximately 1,200 million gallons per year (Permit No. AA1969G021 (07), effective 1 June 2012, expires 1 June 2024).

4.12.2 Domestic and Industrial Wastewater

Sanitary sewer collection and pumping system at FMMD consists of 58 miles of piping on and around the property, 55 miles of gravity sewers, three miles of force mains, and nine pumping stations. The pipe diameter of the gravity sewers, installed between 1941 and 1987, range from 4 to 30 inches. The force mains have pipe diameters that range from 3 to 24 inches. Wastewater from the gravity sewers and force mains flow to two major pump stations: the Leonard Wood and the East Side pump stations. Each station has three pumps, each rated at approximately 1500 GPM, at average operating head, thereby providing total station capacity of 4500 GPM (9000 GPM between the two stations). The wastewater treatment plant (WWTP) has a design flow of 12.3 MGD. The average flow the WWTP is approximately 2.5 MGD. American Water is responsible for the operation and maintenance of the wastewater system at FMMD.

4.12.3 Electric and Gas

Electrical power is supplied to FMMD by Baltimore Gas and Electric (BG&E) through four distribution substations. The primary source for FMMD is a 110 kilovolt (kV) redundant feeder pair from the BG&E Waugh Chapel Power Station along the south and east sides of FMMD, and along MD Route 32 that terminates at Substation #3. A second pair of 110 kV feeders originates in the BG&E High Ridge Power Station west of FMMD and back feeds the substation utilizing the Waugh Chapel distribution line. FMMD also has 18 engine-driven emergency standby generators at 15 locations should there be a BGE power outage.

Natural gas is supplied by BG&E to the Defense Energy Support Center, a DoD agency, which in turn provides it to FMMD. Natural gas is supplied via high-pressure (100-pound force per square inch gauge) mains owned by BG&E, which form a loop at FMMD. The extensive natural gas distribution system includes BG&E and government owned systems. Most buildings are within a few hundred feet of an active supply line (USACE, 2007).

4.12.4 Telecommunications

The Network Enterprise Center has oversight for the communication system at FMMD. Fiber-optic cable is used exclusively at FMMD (NSA, 2010).

4.12.5 Solid Waste Management

No active landfills are located at FMMD; all solid waste is transported to a permitted facility located off site.

4.13 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, AND PROTECTION OF CHILDREN

The ROI for socioeconomic impacts is Anne Arundel County, Maryland. This ROI was selected because it represents the geographic area that is most directly and indirectly impacted by major activities occurring at FMMD. Socioeconomic data is provided in this section to establish baseline conditions. Data consists primarily of publicly available information for Anne Arundel County and provides perspective with regard to the State of Maryland.

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" was signed in 1994, declaring that each federal agency make environmental justice part of its mission. Environmental justice focuses on the protection for racial and ethnic minorities and/or low-income populations to be disproportionately affected by project-related impacts. Analysis of environmental justice is initiated by determining the presence and proximity of these segments of the population relative to the specific locations that would experience adverse impacts to the environment. As defined for the purposes of identifying relevant populations, minority areas are census block groups with a 50 percent or greater proportion of the population consisting of racial minorities, including those of Hispanic origin. Poverty areas are defined as census block groups where 20 percent or more of the population lives in households with incomes below the poverty line.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, requires federal agencies to identify, assess, and address disproportionate environmental health and safety risks to children from federal actions.

Demographics

Based on data from the 2018 American Community Survey, the total populations for Anne Arundel County are compared with Maryland and the United States (USCB, 2020). As shown in Table 9, Anne Arundel County had an estimated population of 567,696. Anne Arundel County has a lower minority population than Maryland, and generally similar to that of the nation as a whole.

In 2017, the ethnic composition of the population of FMMD, MD was composed of 5.39K White Alone residents (53.4%), 2.06K Black or African American Alone residents (20.4%), 1.24K Hispanic or Latino residents (12.3%), 811 Two or More Races residents (8.04%), 462 Asian Alone residents (4.58%), 107 Some Other Race Alone residents (1.06%), and 18 American Indian & Alaska Native Alone residents (0.178%).

In 2018, the ethnic composition of the population of Anne Arundel County, MD was composed of 387K White Alone residents (67.1%), 95.1K Black or African American Alone residents (16.5%), 46.6K Hispanic or Latino residents (8.08%), 22K Asian Alone residents (3.82%), 21.6K Two or More Races residents (3.74%), 3.19K Some Other Race Alone residents (0.554%), 952 American Indian & Alaska Native Alone residents (0.165%), and 61 Native Hawaiian & Other Pacific Islander Alone residents (0.01%).

Socioeconomic Conditions

FMMD is the Army's second largest installation by population with more than 56,000 employees that represent the Army, Navy, Air Force, Marines and Coast Guard (FMMD, 2020e). FMMD's 119 agencies include the Department of Defense's newest Combatant Command, US. Cyber Command, the National Security Agency, Defense Information Systems Agency/Joint Forces Headquarters for the Department of Defense Information Network, Defense Media Activity, the Asymmetric Warfare Group and several non-DoD agencies including the Environmental Protection Agency and Architect of the Capitol.

Table 10. Demographic Data

Geographic Area	Population	Ethnicity							
		White	Black	Hispanic/ Latino	Asian	Indian	Islan-der	Other	Two or More
FMMD, MD	9,327	5,390 53.4%	2,060 20.4%	1,054 12.3%	462 4.58%	18 0.178%	0	107 1.06%	811 8.04%
Anne Arundel County, MD	567,696	387,000 67.1%	95,100 16.5%	46,600 8.08%	22,000 3.82%	952 0.165%	61 0.01%	3,190 0.554%	21,600 3.74%
Maryland	6,003,435	3.4M 56.2%	1.8M 29.8%	556,000 9%	374,277 6.2%	15,644 0.3%	3,059 0.1%	249,815 4.2%	199,369 3.3%
United States	3.23M	234M 72.7%	40.9M 12.7%	52M 16.7%	17.6M 5.4%	2.699M 0.8%	582,718 0.2%	15.8M 4.9%	10.4M 3.2%

FMMD and the National Security Agency together generate a total of $17.8 billion in economic activity in Maryland, or 49.4 percent of the total $36 billion in economic impact from all of the military installations (FMMD Alliance, 2020). It is the largest level of employment, payrolls and purchases in Maryland. FMMD and the NSA create or support 125,729 jobs earning an estimated $9.2 billion in employee compensation. The direct FMMD and NSA employment of 48,389 accounts for 1.4 percent of all employment in Maryland and when multiplier impacts are included, the 125,729 jobs created or supported by FMMD and the NSA account for 3.6 percent of all employment in Maryland. Median household income in Anne Arundel County, MD is $97,814 (USCB, 2020). Males in Anne Arundel County, MD have an average income that is 1.27 times higher than the average income of females, which is $64,257.

Median household income in FMMD, MD is $71,045 (USCS, 2020). Males in FMMD, MD have an average income that is 1.26 times higher than the average income of females, which is $61,332. The income inequality in FMMD, MD (measured using the Gini index) is 0.461, which is lower than the national average.

The median property value in FMMD, MD is $218,000, and the homeownership rate is 2.32%. The median property value in Anne Arundel County, MD is $371,400, and the homeownership rate is 73.9%.

Based on the 2018 ACS, the poverty rate was 6.9% within FMMD, 7.0% in Anne Arundel County, 9.0% in Maryland, and 11.8% in the U.S. (USCB, 2020).

The number of children (under age 18) accounts for the highest percentage of people (15.7%) in Anne Arundel County, which is similar to the State of Maryland (15.4%) (USCS, 2020). There are no designated play/recreation areas within the stream reaches where the Proposed Action would occur.

5.0 ENVIRONMENTAL CONSEQUENCES

The US Army is committed to fostering responsible stewardship of the natural resources held in its trust and has decreed to be a leader in the field of environmental stewardship. Conservation is a pillar of the Army's environmental mission to ensure the future, including the recognition that the ecological approach to management of natural habitats will yield comprehensive benefits, promote best management practices, and promote beneficial impacts within and beyond the geographic boundaries of FMMD.

This section identifies and evaluates the anticipated programmatic environmental impacts associated with implementing the proposed stream improvements for Midway Branch, Franklin Branch, Rogue Harbor, and Severn Run watersheds on FMMD.

This section also analyzed impacts associated with the No Action Alternative in accordance with CEQ guidelines at 40 CFR Part 1508.8. Under the No Action Alternative, FMMD would not undertake any of the stream improvements in the Midway Branch, Franklin Branch, Rogue Harbor, and Severn Run watersheds. None of the project objectives would be met to improve water quality, reduce flooding, enhance fish habitat, prevent further stream degradation, or provide numerous co-benefits for FMMD and neighboring communities. Additionally, under the No Action Alternative, FMMD would not maintain compliance with federal and state water quality requirements.

The specific criteria for evaluating the potential environmental impacts of the Proposed Action and the No Action alternative are described in the following sections. The significance of an action is also measured in terms of its context and intensity. The context and intensity of potential environmental impacts are described in terms of their duration, magnitude, whether they are direct or indirect, and whether they are adverse or beneficial, as summarized in the following paragraphs:

- **Short-term or long-term.** In general, short-term impacts are those that would occur only for a limited, finite time with respect to a particular activity and only during the time required for construction or installation activities. Long-term impacts are those that are more likely to be persistent and chronic.
- **Direct or indirect.** A direct impact is caused by an action and occurs around the same time at or near the location of the action. An indirect impact is caused by an action and might occur later in time or be farther removed in distance but will still be a reasonably foreseeable outcome of the action and, thus, warrant heightened attention and examination for potential means for mitigation to fulfill the policies set forth in NEPA
- **Less-than-significant (negligible, minor, moderate), or significant.** These relative terms are used to characterize the magnitude or intensity of an impact. Negligible impacts are generally those that might be perceptible but are at the lower level of detection. A minor impact is slight, but detectable. A moderate impact is readily apparent. Significant impacts are those that, in their context and due to their magnitude (severity), have the potential to meet the thresholds for significance set forth in CEQ regulations (40 CFR Part 1508.27) and, thus, warrant heightened attention and examination for potential means for mitigation to fulfill the policies set forth in NEPA. Significance criteria by resource area are presented in the following sections.
- **Adverse or beneficial.** An adverse impact is one having unfavorable or undesirable outcomes on the man-made or natural environment. A beneficial impact is one having positive outcomes on the man-made or natural environment.

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

5.1 LAND USE

Land use impacts are based on the level of land use sensitivity in areas affected by a proposed action and compatibility of proposed actions with existing conditions. Factors considered in evaluating land use impacts include the potential for the Proposed Action to be incompatible with surrounding land uses; result in a change of land use that would degrade mission-essential activities; or be inconsistent or in conflict with the environmental goals, objectives, or guidelines of a community or county comprehensive plan for the affected area.

5.1.1 Impacts from Construction of the Proposed Action

The Proposed Action would occur entirely within the boundary of FMMD. Therefore, the construction phase has no reasonable mechanism to impact or induce changes in regional land use outside of FMMD. Additionally, construction would not reasonably impact or prevent existing or planned activities from occurring within FMMD. Any potential impact associated with the presence of construction equipment on land use with FMMD would cease once the construction

phase was completed.

5.1.2 Impacts from Operation of the Proposed Action

The Proposed Action is expected to have significant, permanent, beneficial impacts to land use where improvements are planned to the streams and riparian corridors from the elimination of trash dumping, reduced flooding, and restoration of a healthy watershed within FMMD. Additionally, indirect beneficial minor impacts to downstream water quality may occur, such as reduced flow rates and reduced streambank erosion potential.

5.1.3 No Action

Under the No Action Alternative, no stream improvements would be made. The direct and indirect beneficial impacts associated with stream restoration would not occur. Minor to Moderate adverse impacts to land use immediately along the stream reaches would occur, as current stream conditions would remain impaired by erosion and sedimentation and continue to cause flooding.

5.2 VISUAL RESOURCES

Visual resources include the natural and human-made physical features that give a particular landscape its aesthetic character and value. An adverse impact would be considered significant if changes to the physical features diminish the aesthetic character and value of the landscape or public viewing opportunities are eliminated. Changes to a viewshed or landscape's visual character could include altering or damaging scenic resources or otherwise degrading the existing visual character of the site and its surroundings or creating a new source of glare or substantial light that would affect the view of a visual resource during the time available for observation.

Impacts that enhance the existing quality of a viewshed or landscape are beneficial. Beneficial impacts would occur if a proposed action improves the visual character of an existing visual resource, increases the opportunity for viewers to see desirable resources, or decreased views of objectionable visual resources. The significance of impacts on viewers is based on the sensitivity of the observer to the alteration of the existing impact.

5.2.1 Impacts from Construction of the Proposed Action

Short-term, minor adverse impacts on visual aesthetics would be expected during the construction period due to the presence of construction vehicles and stream and bank disturbances related to construction activities. Specifically, construction is likely to require minor tree clearing where access to the stream beds and banks is required. The loss of trees would ultimately be offset through tree replacement according the FCA and FMMD's Forestry Management Plan.

The visual impacts associated with the presence of construction equipment would be temporary, lasting only as long as each construction phase occurs. For the Severn Run stream reach restoration, construction is anticipated to last between 6-10 months.

The receptors to the visual impacts would be limited to FMMD residents, visitors, and staff whose offices have a direct view of that segment of the stream reach undergoing restoration. Construction activities regularly occur throughout FMMD. Therefore, activities associated with these restoration projects are not likely to be considered a nuisance or have a significant adverse impact on the aesthetic conditions at FMMD.

5.2.2 Impacts from Operation of the Proposed Action

Implementation of the Proposed Action would permanently, significantly, and beneficially alter the visual characteristics of FMMD as a result of the improvements to the stream reaches and riparian zones. Specifically, improving the stream reaches would include trash removal, expanded buffer zones, decreased sedimentation, burial of exposed pipes, improvement of degraded culverts, and stream channel alterations, all of which would be considered an improvement over the existing appearance of the stream reaches. Additionally, the Proposed Action would encourage a healthier ecosystem where fish and wildlife can proliferate; the presence of wildlife would also be a beneficial improvement compared to existing conditions.

It is noted that any vegetation disturbed during construction would be restored and maintained during the operational phase.

As previously described, views of FMMD are limited to personnel, contractors, and civilians within the property. Therefore, long-term impacts to visual resources from implementation of the Proposed Action would be significantly beneficial for FMMD, its workers, and its residents, but not likely to receptors outside of FMMD.

5.2.3 No Action

Implementation of the No Action Alternative would not alter the existing visual or aesthetic conditions of the stream reaches. None of the benefits of the Proposed Action that would have an immediate beneficial impact on the visual character of the stream reaches would occur, namely expansion of the riparian forested areas, focused trash removal, reduction in flooding, and restoration of culverts and buried pipes. Therefore, the No Action Alternative would have a long-term adverse impact on visual resources at FMMD.

5.3 TOPOGRAPHY AND GEOLOGY

Impacts to topography would be considered significant if the altered topography from the Proposed Action does not comply with the overall topography of adjacent land. Impacts to geology would be considered significant if the Proposed Action removes or alters bedrock in such a way as to cause structural instability to surrounding buildings or infrastructure.

5.3.1 Impacts from Construction of the Proposed Action

Under the Proposed Action, construction activities related to the implementation of the stream improvement projects are not expected to impact the geology at FMMD. Minor, short-term impacts may occur during construction as some localized grading or excavation for each stream reach restoration project may be performed. No significant impacts to the general topographic character of the sites would occur.

5.3.2 Impacts from Operation of the Proposed Action

Minor, long-term impacts to topography may occur as stream improvements would result in an overall beneficial restoration impact to the streams and would better comply with the overall topography of the adjacent land.

5.3.3 Impacts from No Action

Under the No Action Alternative, no beneficial stream improvements would be put in place and impacts to topography and geology would continue to be adverse from erosion, sedimentation, and flooding.

5.4 SOILS

Impacts to soils would be considered significant if impacts result in substantial soil erosion or loss of topsoil, which would result in damage to waterways, ground instability, or impact to animal or human habitats.

5.4.1 Impacts from Construction of the Proposed Action

The Proposed Action construction activities would have short-term minor adverse impacts on soils, but only in the immediate area where restorative construction occurs. The specific acreages would vary depending on final restoration design plans. Construction activities would remove vegetative cover, disturb the soil surface, and compact the soil where heavy machinery is used. Exposed soils would be more susceptible to erosion by stream flow, wind, and surface runoff, leading to a temporary increase in sedimentation of the portion of the stream reach undergoing restoration.

Adverse impacts to soils from construction activities would be minimized by proper construction management and planning, and the use of appropriate site BMPs for controlling runoff, erosion, and sedimentation during construction activities. Appropriate erosion and sediment controls, such as synthetic hay bales and silt fencing, would be installed during construction. The construction would be phased such that areas that are disturbed are stabilized before moving to the next construction area.

Additionally, because the proposed construction would disturb more than one acre of ground surface, FMMD (via the selected contractor) would apply to MDE for either a General or Individual Permit for Stormwater Associated with Construction Activity. In addition, an ESD would be obtained for projects exceeding 5,000 SF in size. These plans would be reviewed and approved by MDE, Water Management Administration. Areas disturbed within the equipment staging area would be reseeded, replanted, and/or re-sodded following construction activities, which would decrease the overall erosion potential of the site and improve soil productivity.

Compliance with EISA Section 438 would not be applicable, because no new impervious surfaces would be constructed under the Proposed Action.

5.4.2 Impacts from Operation of the Proposed Action

Operation of the Proposed Action would have a significant beneficial impact on soil quality. This would be achieved by reducing channelization and stream flow rates such that soils are not as readily eroded by routine and higher-energy flows. Soils would also be less subject to flooding, thereby improving soil health, vegetation quality, and the long-term ability of vegetation to maintain stable soils. This benefit would require routine maintenance of the restoration to ensure it continues to function as designed.

5.4.3 No Action

Implementing the No Action Alternative would result in long-term adverse impacts to soils as a consequence of the continued erosion of unstable stream banks and inadequate buffer zones, continued and increased flooding, channelization of streams, pipe outfalls, and the leaching of pollutants from trash and runoff.

5.5 NOISE

Noise impacts would be significant if the Proposed Action created appreciable long-term noise increases in areas of incompatible land use. Additionally, continuous construction noises above 60 dBA may be considered a nuisance if audible at residential properties during daytime hours.

Noise from construction activities varies with the types of equipment used and the duration of use. Typical stream restoration projects use a combination of heavy equipment depending on the type of materials being used for the job. For these projects, equipment will be tracked and may include the following: excavator, mini excavator, skid-steer loader, small track hauler, dump truck, pumps, and/or a trencher. Maintenance equipment is normally limited to a skid-steer loader and pump equipment used for watering vegetation as needed.

Commonly, the use of heavy equipment occurs sporadically throughout the daytime hours. Any of the Proposed Action projects may generate noise levels during the earth moving phase (site clearing activities involving pieces of equipment) that could range from 72 to 98 dBA when measured 50 feet from the respective piece of equipment.)

5.5.1 Impacts from Construction of the Proposed Action

The Proposed Action construction would generate noise from construction equipment, such as backhoes and loaders, involved with limited vegetation clearing, grading, and materials placement, as well as vehicles transporting materials and equipment to and from each restoration. These noises would cease at the conclusion of the construction phase.

The presence of wooded areas would provide some limited capacity to attenuate sound from reaching receptors outside of the restoration area. As previously described, receptors for construction noise include residents, visitors, and staff at FMMD.

Construction would take place during weekday daylight hours unless there is a specific activity that would directly impact the current operation of FMMD, in which case the activity would occur outside of this normal construction schedule.

Construction equipment would be equipped with noise-dampening equipment (mufflers, noise shields) and turned off when not in use. Additionally, construction workers would be equipped with hearing protection when working near loud equipment in accordance with OSHA requirements.

Therefore, construction of the Proposed Action would have a short-term, less-than-significant adverse impact on sensitive noise receptors.

5.5.2 Impacts from Operation of the Proposed Action

Once the stream restoration construction phase is complete, operation would require maintenance to ensure the improvements function according to the design plans. Maintenance would primarily involve hand labor with small-engine equipment, such as chainsaws and brush hogs, as required to maintain vegetation or bank slopes. This equipment noise would be intermittent and would not reasonably be considered a nuisance to receptors at FMMD due to the many other noise sources from traffic and existing maintenance operations occurring throughout the property. Therefore, operation of the Proposed Action would result in negligible, intermittent, long-term, adverse impacts.

5.5.3 No Action

Under the No Action Alternative, stream channel improvements would not occur, and no additional construction noises would be generated. The current soundscape at FMMD would continue as it presently exists for the foreseeable future.

5.6 AIR QUALITY

5.6.1 Impacts from Construction of the Proposed Action

Construction of the Severn Run stream reach restoration would last approximately six months. The time period for restoration of subsequent stream reaches will vary, depending on the length and elements of the restoration required. For this analysis, air emissions were estimated for a six-month construction period and associated with vegetation clearing, grading, and placement of materials (e.g. root wads, stone, fill). The Severn Run stream reach proposed for improvement is approximately 7,500 feet in length, with improvements estimated to occur approximately 50 feet on either side of the stream channel (total area is approximately nine acres).

Particulates are the main air pollutant of concern from construction projects. Construction activities would generate both coarse and fine particulate emissions. The amount of particulate emissions can be estimated from the amount of ground surface exposed, the type and intensity of activity, soil type and conditions, wind speed, and dust control measures used. To limit these emissions, construction BMPs, generally including water- or chemical-based dust suppression, would be implemented to reduce fugitive dust generation and further prevent it from becoming airborne.

Total suspended particulates were calculated using the emission factor for heavy construction activity operations from "AP-42, Compilation for Air Pollutant Emission Factors" (USEPA, 1995), to provide a conservative estimate of PM emissions. Estimates are shown in Table 10.

Table 11. Estimate of Annual Non-Road Emissions of Criteria Pollutants during Construction of the Proposed Action

Total Area (acres)	Exposed Area (acres)	Construction Duration (months)	Emission Factor (tons/acre/month)[1]	Control Efficiency (%)	Total Suspended Particulate Emissions (tons/year)
9	9	6	**80**	**50**	**0.09**

Notes:
1 - Emission factor for "Heavy Construction Operations" (USEPA, 1995)

Non-road construction vehicles (backhoes, loaders) would emit criteria pollutants during construction. Criteria pollution emissions from construction equipment were calculated assuming the use of two backhoe loaders and smaller support equipment, operating for approximately eight hours per day for a total of 130 weekdays (approximately 6 months). Emissions were estimated using "Off-Road – Model Mobile Source Emission Factors" from the California South Coast Air Quality Management District (SCAQMD, 2020) because Maryland emission factors are not available. Emission factors for year 2022 were used in these calculations, though it is understood that construction activities for other stream reaches would occur farther into the future; emission factors typically decrease over time as new and more efficient equipment is brought to market. Therefore, using year 2022 factors represents a conservative estimate of potential emissions. Table 11 and Table 12 show projected equipment operating hours and equipment emission factors, respectively, while Table 13 summarizes the total annual emissions during the six month construction period. Lead has been removed as a diesel and gasoline additive; therefore, lead is excluded from combustion engine emission estimates.

Table 12. Estimated Annual Operational Hours for Non-Road Construction Equipment

Equipment Type	Number	Hours/Day	Total Days	Total Hours
Generator sets	2	8	130	2080
Tractors/Loaders/Backhoes	2	8	130	2080
Graders	1	8	130	1040

Table 13. SCAB Fleet Average Emission Factors (Diesel)

Equipment/Emission Factor[(1)]	CO (lbs/hr)	NOx (lbs/hr)	PM[(2)] (lbs/hr)	SOx (lbs/hr)	VOC[(3)] (lbs/hr)
Generator Sets	0.2694	0.2783	0.0117	0.0007	0.0340
Tractors/loaders/backhoes	0.3599	0.2302	0.0095	0.0008	0.0384
Graders	0.5732	0.4657	0.0218	0.0015	0.0807

Notes:
1 – South Coast Air Basin (SCAB), emission factor year 2022. Composite emission factors used.
2 - PM emissions represent combined PM_{10} and $PM_{2.5}$ estimates.
3 - VOCs are considered equivalent to ROGs for calculating non-road construction equipment emissions.

Table 13. Total Criteria Pollutant Emissions from Non-Road Construction Vehicles

Criteria Pollutant[1]	CO	NO_x	PM[2]	SO_x	VOCs[3]
Emissions (tons per year [tpy])[4]	0.95	0.77	0.03	0.002	0.117
de minimis threshold (tpy)	100	100	100	100	100

Notes:
1 - PM emissions from non-road construction vehicles are included in the general construction emissions factor applied in the estimates in Table 10, and therefore non-road emissions of PM are not included in this table.
2 – PM emissions represent combined PM_{10} and $PM_{2.5}$ estimates.
3 - VOCs are considered equivalent to Reactive Organic Gases (ROG) for calculating non-road construction equipment emissions.
4 - Calculated using "Off-road Mobile Source Emission Factors (Scenario Year 2022) (SCAQMD, 2020).

Based on these estimates, the annual emissions emitted during construction would not exceed the USEPA NAAQS *de minimis* thresholds; therefore, a significant adverse impact would not be anticipated, and a General Conformity determination is not required. A Record of Non-Applicability for CAA Conformity has been prepared and can be found in Appendix C.

5.6.2 Impacts from Operation of the Proposed Action

Operational sources of air emissions would include small-engine equipment (chainsaws, mowers) used for vegetation control and streambank stabilization to ensure that the improvements continue to meet design requirements. These operational activities would contribute to a negligible increase in overall emissions.

Therefore, overall operation of the Proposed Action would result in no adverse impacts on air quality.

5.6.3 No Action

Under the No Action Alternative, stream reach restoration would not occur, and thus no emissions from additional construction or maintenance equipment activities would be generated. Therefore, the No Action Alternative would have no impact on air quality.

5.7 WATER RESOURCES

Impacts to water resources would be considered significant if impacts (1) substantially deplete groundwater supplies or interfere with groundwater recharge, (2) result in a violation of federal and/or state water quality standards, (3) cause an unpermitted direct impact on a water of the United States or (4) alter existing drainage patterns.

5.7.1 Surface Water

5.7.1.1 Impacts from Construction of the Proposed Action

The goal, as currently stated, is to follow USFWS Natural Resource Program priorities and objectives for stream and riparian habitats, i.e. normal, healthy ranges for mid-Atlantic forested streams with respect to temperature, acidity, turbidity, velocity, and connectivity with the flood plain. Waters located within the boundary of FMMD that would be impacted by the stream improvements are:

- Severn Run Unnamed Tributary: Severn Run is a Maryland Use IV Put and Take trout stream that is rapidly urbanizing in the upper head waters. Stream improvements are designed from the Army Reserve RSC downstream to the FMMD property line. Approximately 7500 LF total.

- Midway Unnamed Tributary MacArthur: Beginning at Ernie Pyle Road crossing going downstream behind MacArthur Middle School and joining Midway Branch at the intersection of Rockenbach Road and Cooper Ave. This reach of stream is incised and actively eroding. Sediment has aggregated at the end of the reach forming a wetland complex.
- Midway Mainstem Upper: There are several select reaches along Rockenbach Road downstream to the confluence with Franklin Branch. Grade is controlled by road crossing. The stream has been straightened and is incised without floodplain connectivity.
- Midway Mainstem Middle: Old golf course area between NSA and FMMD. The channel has been straightened and armored. There are two fords that act as nick points that have 3-5 feet head cuts.
- Midway Mainstem Lower: Gabion basket lined channel restricted by Murphy Field on one side and stormwater pond on the other.
- Midway Unnamed Tributary Pershing: From 2nd Calvery Avenue going downstream to Cooper Avenue. Exposed stream banks, lateral instability, sediment.
- Franklin Mainstem: Reach location from Ernie Pyle St. to Reece Road. Incised on the upper end, aggregation on the lower end. Approximately 2900 LF total.
- Rogue Harbor: From 1st Street downstream to MD32 culvert. Possible wetland restoration opportunity. There is a failed culvert system at the old Rock Road crossing allowing head cutting back to 1st Street. An old barrow pit has reverted to non-native *Phragmites*. Approximately 650 LF.

Note: The five reaches of Midway Stream Improvements are expected to be 13,000 LF in total.

During the design of each separate stream improvement project, appropriate Erosion and Sediment Control Plans (ESCP) would be developed and any necessary permits obtained by FMMD. Moderate, short-term adverse impacts to surface waters are possible during the construction phase of the Proposed Action due to increased sedimentation during in-water and stream bank work. As needed, these impacts would be minimized by creating downstream sedimentation settling ponds, where a temporary dam is established to allow particulates to settle out through the water column, while allowing cleaner water to continue flowing downstream.

Permits would be obtained from USACE under Section 404 of the CWA for impacts on jurisdictional water of the United States. The USACE holds final discretion as to what permit and possible mitigation would be required to authorize individual project construction. Provided that a construction general permit for stormwater has been approved and implemented, runoff of stormwater and pollutants from a construction site is considered to be in compliance with regulatory requirements and to not cause an impairment of surface waters.

FMMD would voluntarily restore and maintain a 100-foot stream buffer zone to the maximum extent practical for all of the proposed stream improvement projects.

5.7.1.2 Impacts from Operation of the Proposed Action

Long-term, direct, significant, beneficial impacts to surface water quality are expected as a result of the project objectives, which include stream bank stabilization, reduced erosion, removal of trash and fish barriers, burial of exposed pipes, and improved water quality from the overall restoration of a healthy watershed.

FMMD will implement a post-construction monitoring program based on required state and federal permit conditions.

5.7.1.3 Impacts from No Action

Water quality within the streams would not improve with the No Action Alternative. Likewise, on a watershed basis, the overall water quality would continue to remain impaired, preventing FMMD from achieving permit compliance. The No Action Alternative would therefore not beneficially alter the current surface water conditions and would have a significant, long-term, adverse impact on water quality.

5.7.2 Floodplains

Impacts to floodplains would be considered significant if impacts (1) threaten or damage unique hydrologic characteristics (2) endanger public health by creating or worsening health hazard conditions, or (3) violate established laws or regulations adopted to protect floodplains.

5.7.2.1 Impacts from Construction of the Proposed Action

Adverse impacts to the floodplain caused by and during instream construction of restoration measures are not anticipated. EO 11988 directs that any new construction must avoid floodplains as much as possible, and if construction in the floodplain cannot be avoided, flood protection measures must be undertaken to reduce the risk of flood-associated damages. These stream improvement designs would be developed in order to avoid and minimize impacts to floodplains, and their construction is not reasonably anticipated to cause negative impacts to flood storage. FMMD would also coordinate with FEMA and local authorities to ensure compliance with applicable floodplain management ordinances, as applicable. Due to these engineering minimization efforts and adherence to floodplain regulations, no increase in flooding or increase in the 100-year and 500-year floodplain elevations are anticipated during the construction phase.

5.7.2.2 Impacts from Operation of the Proposed Action

The implementation of stream improvements would reduce the amount of flooding and the continued expansion of floodplains otherwise caused by stream channelization and riparian zone deterioration. Therefore, long-term, direct, significant, beneficial impacts are expected from stream bank stabilization, reduced erosion, removal of debris dams and fish barriers, exposed pipes and dams, and improved water containment from restoration of healthy stream channels and buffer zones. The quantification of impacts to floodplain boundaries is outside the scope of the study, however, the severity of flooding is expected to be reduced and newly improved riparian zones will increasingly absorb floodwaters.

5.7.2.3 No Action

Under the No Action Alternative, stream improvement projects would not be implemented. Flooding would continue to occur and likely increase over time as the stream reaches continue to deteriorate due to the aforementioned factors (e.g. channelization, debris dams). Therefore, the No

Action Alternative would have a long-term, significant adverse impact on flood conditions at FMMD.

5.7.3 Groundwater

Impacts to groundwater would be considered significant if a project (1) reduces water availability or supply to existing users, (2) overdrafts groundwater basins, or (3) endangers public health by creating or worsening health hazard conditions.

5.7.3.1 Impacts from Construction of the Proposed Action

Construction of the Proposed Action would remove debris which could potentially leach into groundwater were it left in place and contained mobile contaminants. The Proposed Action includes removal of this and other physical debris. Other aspects of constructing the stream reach improvements that require instream work, such as restoring stream beds, would temporarily require contact with groundwater. However, the machinery involved in such work would be clean and would therefore not contaminate groundwater.

During construction, accidental releases of petroleum-based fluids from construction equipment could occur and, if not immediately remediated, could adversely impact groundwater quality. To avoid such potential releases and impacts, construction equipment would be properly maintained in good working order and equipped with emergency spill kits, with workers trained in proper deployment and use of these kits. This would ensure that construction contractors are prepared to respond to an emergency release of petroleum-based fluids, contain the release, and prevent adverse impacts to groundwater from occurring. Additionally, construction equipment would be refueled in a designated area equipped with impervious surfaces to avoid potential releases to pervious surfaces and the underlying groundwater.

Therefore, the Proposed Action construction activities are not anticipated to have an adverse impact on groundwater quality.

5.7.3.2 Impacts from Operation of the Proposed Action

The Proposed Action would require maintenance to ensure the stream restoration measures function as designed. Stream bed maintenance may require in-water work, but such work would only temporarily contact groundwater, as previously described, and the potential to adversely impact groundwater quality is negligible. Therefore, operation of the Proposed Action would not have an adverse impact on groundwater quality.

5.7.3.3 No Action

Under the No Action Alternative, stream improvement projects would not be implemented. Debris in and around the stream reaches would remain and have the potential to adversely impact groundwater quality. Therefore, the No Action Alternative would have a long-term, moderate adverse impact on groundwater quality at FMMD.

5.7.4 Coastal Zone Management

Factors considered in evaluating coastal zone management impacts include the potential for the Proposed Action to be inconsistent with the federal and state enforceable policies. The Proposed Action would be considered to have a significant effect on the coastal zone if the Proposed Action was inconsistent with enforceable policies under the Maryland CZMP, and permits and mitigation, if required for construction within the coastal zone, were not obtained.

Anne Arundel County is located within Maryland's Coastal Zone. FMMD is approximately 10 miles west of the Chesapeake Bay.

As part of compliance with the federal CZMA, Maryland's CZMP and Maryland's Chesapeake Bay Critical Area Protection Act, consideration of the location of coastal zones and critical areas is incorporated into the design of the stream improvements and measures would be taken to avoid these areas or minimize adverse impacts wherever possible.

5.7.4.1 Impacts from Construction of the Proposed Action

Construction of the Proposed Action would temporarily impact resources of the Maryland coastal zone due to construction activities that temporarily would impact stream systems which ultimately discharge to the Chesapeake River.

Both construction and implementation of the Proposed Action are expected to be consistent with Maryland's enforceable CZMA policies. FMMD would coordinate with MDE during design and permits would be obtained for any area that would impact wetlands and streams. An ESCP and a SWPPP, including measures to protect coastal zone resources, would be prepared and submitted to MDE for approval prior to construction; no construction would begin until all compliance requirements are met.

In accordance with Maryland CZMP guidelines and the 2013 Memorandum of Understanding (MOU) between Maryland and the DoD concerning Federal consistency requirements of the CZMA (MDNR, 2013), a description of how the Proposed Action would comply with Maryland's CZM Program and request for a negative determination from MDE is provided in Appendix B. As described in Appendix B, the Proposed Action would be designed and constructed in accordance with both the FMMD INRMP and the relevant Maryland CZMA policies. Through this PEA, review and concurrence with the negative determination from MDE is requested prior to initiating the Proposed Action. This would ensure that construction of the Proposed Action is consistent with the Maryland CZMP. Therefore, it is expected that implementation of the Proposed Action would have no significant long-term impact within the coastal zone.

5.7.4.2 Impacts from Operation of the Proposed Action

Following construction, the long-term operation and maintenance of the stream improvements would provide significant, permanent, beneficial impacts to water quality, consistent with the objectives of Maryland's CZMP. The Proposed Action would reduce flooding, trash dumping, erosion, and sedimentation of the stream reaches, thereby providing incremental benefits to Maryland's coastal zone resources as the surface water quality flowing through FMMD would be measurably improved over existing conditions. Therefore, the Proposed Action would have a long-term, beneficial significant impact on Maryland's coastal zone resources.

5.7.4.3 No Action

Under the No Action Alternative, stream improvements would not occur. Although the temporary disturbances associated with constructing the Proposed Action would not occur, overall surface water quality would not be improved. Thus, there would be no impact or overall improvement to coastal zone resources and existing conditions would continue to deteriorate.

5.7.5 Stormwater

In most cases at FMMD, the base level wasteload reduction restoration goal will be a SFPF Level 3. There are several exceptions where higher level functional capacity may be obtained. These

stream areas include the Severn Run (MDE Use IV Put and Take Fishery) and the Unnamed Tributary to Rogue Harbor (wetland enhancement opportunities). The Severn Run stream channel presents enhanced potential for functional lift in a downstream direction following the implantation of upstream BMPs and stream restoration projects. The unnamed tributary to Rogue Harbor has a potential to restore a degraded floodplain wetland with potential Level 4 and 5 benefits.

The stream reaches identified in the USACE FMMD Stream Assessment (USACE, 2019) all have potential for higher levels of function. The restoration potential for each of these areas will be independently conducted as resources become available.

5.7.5.1 Impacts from Construction of the Proposed Action

Construction of the stream channel improvements would not require creating any new impervious surfaces or increases in stormwater volume entering the stream channels. However, construction activities in-water and along the stream banks would temporarily increase sedimentation of the surface water. As previously described in Section 5.7.1, BMPs would be implemented to minimize sedimentation and prevent sediment-laden surface water from migrating off-site. Construction activities on their own would have a short-term, adverse impact on surface water quality, but would not directly increase stormwater runoff volumes. However, these temporary impacts would be necessary to achieve the overall long-term beneficial impacts on surface water quality, as previously described.

5.7.5.2 Impacts from Operation of the Proposed Action

Implementation of the proposed action would not reduce the area of impervious surfaces at FMMD, and therefore would not directly reduce the volume of stormwater generated at FMMD. However, the Proposed Action would improve the function of the stream reaches to reduce waste-loading of FMMD surface water run-off that enters the FMMD stream channels, namely through improvements to riparian zones, stream bank elevations, and reduced channelization. Thus, the Proposed Action would have long-term, significant beneficial impact on the ability of the stream reaches to improve stormwater quality both entering and as it flows through the stream channels at FMMD.

It is important to note that once all stream reaches are improved, the aforementioned benefits would be realized across nearly the entire FMMD watershed. It is also important to note, however, that other measures to reduce stormwater volume and flow rates at FMMD, including from existing and future development at FMMD, should be implemented in order to continue long-term watershed benefits. Such wider-scale improvements would further help FMMD achieve lasting goals to improve water quality that leaves FMMD and ultimately enters Chesapeake Bay.

5.7.5.3 No Action

Under the No Action Alternative, stream reach improvements would not occur. FMMD would not be able to achieve TMDL credits, and stormwater entering and flowing through the FMMD stream reaches would continue to be impaired. No improvements would occur on a watershed basis. Thus, the No Action alternative would have a long-term, significant adverse impact on stormwater quality.

5.7.6 Wetlands

Significant adverse impacts to wetlands would occur if the Proposed Action (1) fills or alters a portion of a wetland that would cause irreversible negative impacts to a species or habitat of high concern, (2) irreversibly degrades the quality of a unique or pristine wetland and (3) reduces population size or distribution of species of high concern.

5.7.6.1 Impacts from Construction of the Proposed Action

Although the Proposed Action would improve wetlands, the construction phase would impact wetlands above the threshold of 5,000 SF in a Maryland "Use Class I-P" (*Water Contact Recreation, Protection of Aquatic Life, and Public Water Supply*) Watershed designation, which requires mitigation, and it would also impact the 25-foot wetland buffer. Thus, prior to construction, a USACE permit pursuant to Section 404 of the CWA and an MDE Wetlands and Waterways permit would be obtained through the Joint Permit Application.

FMMD would comply with all USACE Regulatory and MDE Wetland and Waterways mitigation requirements. A final determination regarding mitigation to Waters of the US and wetlands rests with USACE and MDE, and compensatory mitigation for impacts would be resolved during the permitting phase of the Proposed Action.

5.7.6.2 Impacts from Operation of the Proposed Action

Following construction, the Proposed Action would have significant, beneficial, long-term impacts to wetlands by restoring the riparian and watershed health to each of the improved stream reaches.

Similar to surface water and floodplain benefits, it is important to note that once all of the stream reaches are improved, the aforementioned benefits would be realized across nearly the entire FMMD watershed. It is also important to note, however, that other measures to reduce stormwater volume and flow rates at FMMD, including from existing and future development at FMMD, should be implemented in order to continue long-term watershed benefits. Such wider-scale improvements would further help FMMD achieve lasting goals to improve water quality that leaves FMMD and ultimately enters Chesapeake Bay.

5.7.6.3 No Action

Under the No Action Alternative, stream reach improvements would not occur. Wetlands would continue to be impaired by flooding, sedimentation, refuse and debris, and would underperform in function and value. No improvements would occur to wetlands individually or on a watershed basis. Thus, the No Action alternative would have a long-term, significant adverse impact on wetland quality.

5.8 BIOLOGICAL RESOURCES

Factors considered in the analysis of potential impacts to biological resources include the anticipated short-term adverse impacts as well as the expected long-term beneficial impacts to fish and wildlife habitat and behavioral patterns and compliance with FMMD's obligations as outlined in their INRMP. The goal as currently stated with USFWS is to implement Natural Resource Program priorities/objectives for stream and riparian habitats, which defines normal, healthy ranges for mid-Atlantic forested streams with respect to temperature, acidity, turbidity, velocity, and connectivity with the flood plain.

5.8.1 Vegetation

Substantial impacts to vegetation would occur if the Proposed Action (1) would result in a permanent net loss of habitat at a landscape scale or (2) could result in a long-term loss or impairment of a substantial portion of local habitat on which native species depend.

5.8.1.1 Impacts from Construction of the Proposed Action

Minor, short-term, direct, adverse impacts to vegetation within stream reaches undergoing improvements are anticipated during construction. Limited removal and disturbance of riparian vegetation and trees may be temporarily required to reach portions of the stream channel undergoing improvements, and to install improvement measures such as root wads and stone. Temporary construction access points will be limited to reduce impacts to forest and floodplain soils, thereby limiting construction impacts on vegetative habitat to the immediate project areas and would be minor, particularly when compared to the overall significant benefits from the improvements. Where best stream restoration practices can benefit by working instream with flow diversion, this will be considered the preferred method to avoid unnecessary impacts to trees in the riparian zone. Staging of temporary stockpiles and equipment will be limited to areas outside of the floodplain.

FMMD is required to provide for avoidance and minimization of impacts to trees consistent with the FMMD FCA and Tree Management Policy (FMMD, 2009). In order to meet the stream restoration goals there will necessarily be impacts to existing trees, however it is expected that impacts would be mitigated on-site at not less than a ratio of 1:1. Where and if there are existing resources of significant value the Natural Resource Program Manager reserves the right to modify the mitigation ratio to compensate for loss. The mitigation ratio for tree loss may also be adjusted when the project area includes forest conservation areas. When mitigation requirements exceed capacity for the site, the Natural Resource Project Manager has the authority to prescribe plantings in other locations on the garrison.

Tree planting and landscaping would be composed of native, non-invasive plant species. No invasive species would be planted. Invasive species would be removed or controlled on the project sites, including potential restoration areas, prior to acceptance from the FMMD Directorate of Public Works. This would assist the Army to remain in compliance with the Invasive Species EO 13112.

5.8.1.2 Impacts from Operation of the Proposed Action

The Proposed Action would result in significant, long-term, direct, beneficial impacts to vegetation through bank stabilization, riparian zone restoration, stream velocity reduction, trash removal, and related improvements. Routine maintenance would be performed to ensure the stream restoration improvements continue to function as designed.

5.8.1.3 No Action

The No Action Alternative would have a significant, long-term, direct, adverse impact on vegetation as soil erosion and inadequate riparian buffer zones continue to negatively impact vegetation health and diversity. Invasive species would continue to be unmanaged, and soil quality would not be improved.

5.8.2 Terrestrial Wildlife Resources

Substantial impacts to terrestrial wildlife resources would occur if the Proposed Action (1) would result in a permanent net loss of habitat at a landscape scale or (2) could result in a long-term loss or impairment of a substantial portion of local habitat on which native species depend.

5.8.2.1 Impacts from Construction of the Proposed Action

Construction activities would have a short-term, negligible, direct, adverse impact on terrestrial wildlife resources located within the immediate work area. Equipment noise and limited vegetation removal would temporarily displace individual species of common wildlife residing in areas where construction activity occurs. There may be limited mortality to individual species that are not able to relocate during construction. However, population-level impacts would not reasonably occur due to the relatively small size of the construction areas; and construction would not occur simultaneously over the entire length of the stream reach, but would occur in shorter segments, allowing most mobile species to safely avoid equipment. Methods for minimizing the minimal short-term adverse impacts on wildlife during construction include creating temporary barriers and the seasonal timing of activities. Time of year restrictions on tree clearing would also be implemented to avoid impacts to the NLEB, as discussed in the following section heading 5.8.3.

5.8.2.2 Impacts from Operation of the Proposed Action

Significant, long-term, direct, beneficial impacts to terrestrial wildlife resources in all of the riparian zones along the streams would occur as a result of associated improvements to the habitat in these zones. While no new species are anticipated to occur within the restoration areas, the number of individuals within a species may increase due to increased habitat quality. These beneficial impacts are anticipated to occur shortly following completion of the construction phase, when noise levels would return to pre-construction conditions, allowing wildlife to return to the newly improved stream corridors.

5.8.2.3 No Action

This alternative would have a long-term, direct, adverse impact on terrestrial wildlife resources as stream bank erosion, sedimentation, trash, fish barriers, and inadequate riparian buffer zones would continue to proliferate.

5.8.3 Rare, Threatened, or Endangered Species

Significant adverse impacts to RTE species would occur if the proposed action would (1) jeopardize the continued existence of any federally-listed threatened or endangered species or result in destruction of critical habitat or (2) eliminate a sensitive habitat such as breeding areas, habitats of local significance, or rare or state-designated significant natural communities needed for the survival of a species.

5.8.3.1 Impacts from Proposed Action during Construction

Any impacts to RTE species during construction are expected to be short term, direct, minor, and adverse. The Proposed Action has the potential to impact NLEB summer roost habitat. Consultation with the USFWS on May 5, 2020 has determined that the action may affect the NLEB; however, any take that may occur as a result of the Proposed Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless otherwise notified, the consultation determination verifies that the Service's January 5, 2016, Programmatic Biological Opinion satisfies and concludes the proposed project responsibilities for the Proposed

Action under ESA Section 7(a)(2) with respect to the NLEB. USFWS has not designated critical habitat for NLEB to date. Projects would be designed to increase positive impacts and avoid negative impacts to forest, riparian forest, and wetland areas to the maximum extent practical to conserve potential day roost and foraging habitat. In order to further avoid impacts to NLEBs, the stream improvement projects would adhere to applicable conservation measures such as, but not limited to, restricted time periods for any tree removal or construction work, as deemed appropriate by USFWS and IMCOM. Therefore, impacts are not likely to adversely impact the NLEB.

FMMD has submitted recent bat survey data to USFWS to determine potential impacts to the Indiana bat. While the presence of the bat has been detected at FMMD, there is a low chance of maternity colony presence. FMMD will continue to coordinate with USFWS to determine project requirements. FMMD will also continue to coordinate with USFWS as appropriate as the northern red-bellied cooter and the spotted turtle surveys are completed.

No other RTE species are known to exist within the stream reaches; therefore, the Proposed Action is not likely to adversely impact any other RTE species.

5.8.3.2 Impacts from the Proposed Action during Operation

Impacts to RTE species during operation are expected to be long-term, direct, significant, and beneficial due to improved habitat and a healthier watershed, due to improved stream bank stabilization and water quality, reduced erosion, restoration of healthy buffer zones, and the removal of trash, fish barriers, and debris dams. FMMD would perform routine maintenance of restoration measures to ensure they continue to function as designed.

As is the case for other biological resources, the extent of benefits would be greatest and long lasting once all of the stream reaches are improved and if other development projects at FMMD consider the health and function of the entire FMMD watershed when designed, constructed, and operated.

5.8.3.3 No Action

The No Action Alternative would avoid potential adverse impacts to RTE species. However, the habitat along the stream reaches would not be improved; therefore, the No Action Alternative may have an overall negative impact on RTE species as the stream quality and riparian zone habitat quality continues to deteriorate and suitable nesting, resting, or foraging habitats decline.

5.8.4 Aquatic Species and Habitat

Significant adverse impacts to aquatic habitat would occur if the Proposed Action would (1) cause an exceedance of the TMDL, (2) cause a change in impairment status of a surface water or (3) cause an unpermitted direct impact on waters of the US.

5.8.4.1 Impacts from Construction of the Proposed Action

For aquatic species and habitat, minor, short-term, direct, adverse impacts could result from disruption of the stream and riparian corridors during construction activities, particularly in-water work and along banks. Construction would require direct disturbance to these components of the stream channels while restoration improvements are made. These impacts would be temporary, lasting approximately 6 months for Severn Run. The construction phase would vary for other stream reaches based on their length and extent of restoration required.

As previously described for surface water resources, short-term adverse impacts would be minimized by installing erosion and sediment controls to reduce bank erosion and sedimentation of water flowing downstream. Specifically, controls may include silt fencing, synthetic hay bales, and inwater sedimentation traps and pools, which would contain sediment-laden water to only a short segment of stream where restoration is actively under construction.

5.8.4.2 Impacts from Operation of the Proposed Action

In general, significant, long-term beneficial impacts are anticipated for all aquatic species and their habitat during operation of the proposed stream restoration by stabilizing the stream banks, improving water quality through reduced erosion and sedimentation, restoring healthy buffer zones, and removing trash, fish barriers, and debris dams.

Similar to other biological resources, the extent of these benefits would be greatest and long lasting once all of the stream reaches are improved and if other development projects at FMMD consider the health and function of the entire FMMD watershed when designed, constructed, and operated.

5.8.4.3 No Action

Under the No Action Alternative, no improvements to any of the stream reaches would occur. This would have an overall significant, long-term, negative impact on aquatic species and their habitat at FMMD, as erosion, sedimentation, trash, inadequate buffers, fish barriers, exposed pipe outfalls, and other detrimental conditions continue. Additionally, there would be no indirect improvements to water quality downstream of the FMMD border.

5.9 CULTURAL RESOURCES

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

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

5.9.1 Impacts from Construction and Operation of Proposed Action

No historic properties have been identified within the stream reaches proposed for restoration. However, there is the potential for adverse impacts to cultural resources in the event of an inadvertent discovery during construction work that requires vegetation removal or causes subsurface disturbance.

To ensure impacts to historical and archaeological sites are avoided, FMMD initiated Section 106 consultation with the Maryland State Historic Preservation Officer (SHPO) to ascertain potential impacts of the proposed action to historical and archaeological sites prior to implementing the

Proposed Action. On June 12, 2020, the Maryland Historical Trust issued a letter of determination stating that the project will have "no effect" on historic properties and that the federal and/or State historic preservation requirements have been met. A copy of the letter is included in Appendix A.

Additionally, to minimize the potential impact to previously unknown cultural resources during subsurface work, FMMD would implement an "Accidental Discovery" plan to comply with the NHPA, Archaeological Resources Protection Act of 1979, Native American Graves Protection and Repatriation Act (NAGPRA), American Indian Religious Freedom Act, 36 CFR Part 79, and Executive Order 13007: Indian Sacred Sites. Under this plan, if prehistoric or historic artifacts that could be associated with Native American, early European, or American settlement are encountered at any time during construction or operation of the expansion areas, FMMD would cease all activities involving subsurface disturbance in the vicinity of the discovery. Should human remains or other cultural items, as defined by NAGPRA, be discovered during project construction, construction work would immediately cease until the FMMD Cultural Resources Manager, Maryland SHPO, and selected Native American Tribes are contacted to properly identify and appropriately treat discovered items in accordance with applicable state and federal law(s). Implementation of these measures would ensure that the Proposed Action would have "No Adverse Effect" on historic properties or cultural resources.

No additional impacts are anticipated from operation and maintenance of the stream restoration improvements.

5.9.2 No Action

Under the No Action Alternative, no improvements to any of the stream reaches would occur. There would be no intentional ground disturbances that could impact archaeological, architectural, or Native American resources. Continued deterioration and erosion of the stream bank would occur and potentially expose unknown resources.

5.10 HAZARDOUS, TOXIC, AND RADIOACTIVE SUBSTANCES

The significance of potential impacts associated with hazardous materials and wastes is based on the toxicity, transportation, storage and disposal of these substances. Hazardous materials and waste impacts would be considered significant if the storage, use, transportation or disposal of these substances substantially increases the human health risk or environmental exposure.

5.10.1 Impacts from Construction and Operation of Proposed Action

Hazardous, toxic, or radioactive substances would not be used during the construction of the proposed stream improvement projects.

To minimize the potential for a release of petroleum-based fluids (i.e. diesel fuel, hydraulic fluid) from construction equipment to the environment, all construction equipment would be maintained in good working order by the contractor on a daily basis. Should an accidental release of a hazardous material occur, construction equipment would be equipped with an emergency spill kit and workers would be trained on how to properly deploy the equipment to respond to a release. Additionally, all construction equipment would be refueled in a designated impervious area and away from pervious grounds. Depending on the type and severity of an accidental release, an action that resulted in a release, or a discovery of a previous contamination, would have to be added to the IRP and could be subject to the CERCLA process.

Any solid waste, including excess vegetation or sediment debris, would be properly composted, reused, or disposed of at a permitted facility. Additionally, all contractors involved in the construction of stream restoration work would be responsible for adhering to FMMD's policies and procedures, as well as state and federal regulations for storage, handling and disposal of hazardous wastes.

5.10.1.1 Installation Restoration Program

The southern part of Severn Run, Site 6, consists of a stream with a fork. The southern fork flows from an active IRP site named "OU-1". This site was a former Trap and Skeet range that now contains lead and polycyclic aromatic hydrocarbons (PAH) contamination within the site sediments. It is not anticipated that these contaminated sediments had traveled downstream and out of the OU-1 site boundary, however, any stream work within the portion of the site located downstream of OU-1 should include sediment sampling for lead and PAHs in its scope of work. Should any sampled sediments exceed regulatory standards, then they must be properly disposed of. Once the limit of disturbance is established for Site 6, the FMMD Environmental Division must be consulted to ensure it does not encroach onto OU-1. No significant adverse impacts are anticipated to any other IRP site under the Proposed Action.

5.10.2 Impacts from the No Action Alternative

Under the No Action Alternative, stream channel restoration would not occur. There would be no potential disruption to the OU-1 site, no generation of excess vegetation or dredged sediment, and no potential releases of petroleum-based fluids. Therefore, there would be no impact on hazardous materials.

5.11 TRAFFIC AND ROADWAYS

A project is considered to have a significant effect on traffic and roadways if the additional traffic caused by the Proposed Action results in the Level of Service (LOS) declining from LOS D or better to LOS E or F. In addition, a project may contribute toward a substantial cumulative effect if its traffic, when taken together with traffic from past, present and reasonably foreseeable future projects, causes intersection LOS to decline from LOS D or better to LOS E or F.

5.11.1 Impacts from Construction of the Proposed Action

Construction of the stream restoration improvements would not impact any transportation infrastructure within or outside of FMMD. None of the equipment used to construct the improvements or transport materials to the stream reaches would require modifications to transportation infrastructure or traffic patterns. The number of construction workers associated with the project would add a negligible increase (less than 1% increase) in overall traffic volume within FMMD on a daily basis.

To ensure that construction vehicles do not degrade the quality of the roadways within FMMD, dirt would be physically removed (using brushes and/or water) from construction equipment before the equipment travels on FMMD roadways.

Therefore, construction activities associated with the Proposed Action would have a short-term, less-than-significant adverse impact on traffic and roadway conditions within or in the vicinity of FMMD.

5.11.2 Impacts from Operation of the Proposed Action

The Proposed Action operational phase would not require modifications to traffic or roadway conditions at FMMD. However, stream channel restoration may decrease the severity and frequency of flooding to any FMDD roadways or parking areas that have been previously subject to such conditions within FMMD.

5.11.3 Impacts from the No Action Alternative

The No Action Alternative would have no mechanism to directly impact traffic or roadway conditions at FMMD. FMMD roadway and parking areas would continue to be subject to intermittent flooding, as there would be no improvement to riparian zones or changes to stream channel elevations that would mitigate flooding conditions.

5.12 INFRASTRUCTURE AND UTILITIES

The Proposed Action would result in significant adverse impacts to infrastructure and utilities if it (1) reduces water availability or supply to existing users, (2) results in noncompliance with the existing FMMD solid waste management plan, (3) overdrafts groundwater basins or (4) exceeds safe annual yield of water or energy supply sources.

5.12.1 Impacts from Construction and Operation of Proposed Action

The Proposed Action has no mechanisms to impact infrastructure and utilities, as defined for this resource topic. The Proposed Action would not change utility demand or supply to users within FMMD or in the surrounding community.

5.12.2 Impacts from the No Action Alternative

No impacts are expected on infrastructure or utilities as a result of implementing the No Action Alternative. Existing conditions would remain unchanged for these resources.

5.13 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN

Impacts to socioeconomics, environmental justice and the protection of children would be considered significant if they were to cause substantial change to the sales volume, income, employment, or population of the surrounding ROI.

5.13.1 Impacts from Construction of the Proposed Action

Construction of the Proposed Action would take place in phases, with Severn Run proposed to be the first reach to be restored. As part of the restoration process, an engineering firm would initially be contracted to prepare construction design plans for the restoration of the selected stream reach, giving consideration to restoration activities completed for other reaches and with the goal of improving the overall watershed at FMMD. FMMD would hire a qualified engineering firm with expertise in restoration design. Following design approval, FMMD would hire a qualified firm to construct (implement) the restoration design. The design process would take approximately 6-10 months, while the construction process would take another 6-10 months, depending on the complexity of the restoration and length of the reach. The total combined design and construction costs are expected to be approximately $1.57 million for the Severn Run reach. Therefore, while the economic benefits would be beneficial to the employees of the firms selected to implement the restoration work, the overall impact on socioeconomic conditions at FMMD and within Anne

Arundel County would be negligible. Additionally, neither the design work nor construction activities would induce changes in employment, housing, or demands on education or community resources within the community because the time frame of the work is of a short duration, such that temporary or permanent relocation of families would not be reasonably anticipated to occur as a result of the Proposed Action.

Based on data presented in Section 4.14, FMMD nor Anne Arundel County do not meet the definition of having a minority or impoverished population that could be impacted disproportionately by the Proposed Action. Therefore, the Proposed Action would have no adverse impact on environmental justice communities.

While there are walking paths throughout FMMD, there are none specifically located within the areas where stream restoration work would occur. Therefore, no children reside or play in areas where the Proposed Action would be accomplished.

To ensure children are not impacted during construction activities, temporary construction fencing or signage would be installed at the boundary of the work area to prevent access to it by children and other unauthorized personnel. Therefore, the Proposed Action would have no impact on children.

5.13.1.1 Impacts from the No Action Alternative

Under the No Action Alternative, the proposed stream improvements would not be constructed. Existing conditions in Anne Arundel County would be unchanged. No impacts to socioeconomic conditions, environmental justice or the protection of children would occur.

5.14 CUMULATIVE IMPACTS

5.14.1 Definition of Cumulative Impacts

CEQ regulations stipulate that the cumulative impacts analysis within an EA should consider the potential environmental impacts resulting from "the incremental impacts of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR 1508.7). CEQ guidance in Considering Cumulative Impacts affirms this requirement, stating that the first steps in assessing cumulative impacts involve defining the scope of the other actions and their interrelationship with the proposed action. The scope must consider geographic and temporal overlaps among the proposed action and other actions. It must also evaluate the nature of interactions among these actions.

Cumulative impacts are most likely to arise when a relationship or synergism exists between a proposed action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in close proximity to the proposed action would be expected to have more potential for a relationship than those more geographically separated. Similarly, actions that coincide, even partially, in time would tend to offer a higher potential for cumulative impacts.

To identify cumulative impacts the analysis needs to address three fundamental questions:

- Does a relationship exist such that affected resource areas of the proposed action might interact with the affected resource areas of past, present or reasonably foreseeable actions?

- If one or more of the affected resource areas of the proposed action and another action could be expected to interact, would the proposed action affect or be affected by impacts of the other action?
- If such a relationship exists, then does an assessment reveal any potentially significant impacts not identified when the proposed action is considered alone?

The scope of the cumulative effects analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur. For this PEA, the geographic extent of the cumulative effects analysis is the FMMD property. Table 13 identifies projects occurring within the same general time frame at FMMD and whose effects, when added to those of the Proposed Action, may result in cumulative effects. The following subsections include a discussion of potential cumulative impacts by environmental resource area.

Table 14. Actions at FMMD Potentially Causing Cumulative Effects of Importance

JCOG (aka SOF Operations Facility)	Design, construction (FY 21-22) and operation of a new two-story, 113,296 SF operational building on 13.5 acres of available space within a controlled access setting with a 250-space surface parking lot to accommodate approximately 196 personnel from four organizations, including JCOG, SOCOM, MPO, and CYBERCOM. The proposed site located in the southeast portion of Meade .5 miles and disconnected from the nearest proposed action location.
Barracks	Design and construction of up to 9 new barracks to house 1600-1800 enlisted personnel, constructed in 3 phases at 3 sites near existing Freedom Center barracks. Phase I, currently under design, est. construction FY22/23, encompasses two 4-story buildings, approx. 168,000 SF, located south of the existing Freedom Center barracks complex .25 miles from the Midway Branch of the Proposed Action. Also included in Phase 1 is the redesign of the current stormwater infrastructure and existing stormwater management pond serving the Freedom Barracks to accommodate the additional discharges. The second project site (Phase II) is located approx. .5 miles from the Midway Branch portion of the Proposed Action. The third site (Phase III) is located west of the outdoor running track at Gaffney Fitness Center which is adjacent to the Midway portion of the Proposed Action. Phase II and III construction are est. FY 24/25 and a Phase 2b construction is est. FY31 for a third building dropped from the Phase I design, still within one of the 3 project sites.
Cooper Avenue Widening	Widening of Cooper Ave. and Rose St. from two to four lanes to increase safety, efficiency, and traffic flow and connect primary roads. Widen Reece Road where the new four lane road ends. Sidewalks will be rebuilt to regulation and design standards. New landscaping, street trees, lighting, and street furniture will be added.
Rockenbach Access Control Point (ACP)	Construction of a new access-controlled entry point located at the confluence of Rockenbach Road and Annapolis Road (MD 175) at the installation border to create traffic flow improvements along the NE side of the installation. Minor new impervious surfaces would be created. Increased run-off would be managed by existing water control systems.

5.14.2 Potential Cumulative Impacts by Environmental Resource Area

The following analysis examines the potential cumulative impacts on the natural and man-made environment that would result from the cumulative impact of the Proposed Action, in combination with the other actions described above. Based on the assessment of past, present, and reasonably foreseeable future actions at and in the vicinity of stream improvement projects at FMMD, a limited number of resource topics analyzed in this PEA would be reasonably expected to experience cumulative impacts:

- Water Resources
- Biological resources

The cumulative impacts from the proposed stream improvement projects on these resources are expected to be beneficial on a long-term basis. Impacts on all other resources will be temporary and confined to the construction phases of the projects. Thus, all other environmental resource topics were omitted from impact analysis because temporary, negligible, or no environmental impacts would occur when considered on a cumulative basis.

5.14.2.1 Water and Biological Resources

The cumulative impacts associated with water and biological resources are intrinsically related, as all benefits to water quality would also benefit biological resources.

The completion of all the stream reach restoration improvement projects would have long-term, beneficial impacts to water quality and biological resources (habitat, terrestrial and aquatic vegetation and wildlife) with their combined goals of preventing erosion, decreasing sedimentation, removal of dams, trash, and fish barriers, all of which would provide improvements both to the individual reaches and the FMMD watershed as a whole. Thus, the Proposed Action would greatly reduce the adverse impact that past actions at FMMD and in upstream communities have had on water quality and biological resources at FMMD.

However, other future development projects at FMMD could reduce these benefits, should these other projects not consider their impact on individual reaches or the watershed. Specifically, development projects at FMMD that individually or collectively increase stormwater volume beyond the capacity of the restored stream reaches would incrementally and ultimately eliminate the benefits of the stream restoration projects. This would occur due to increased streamflow, leading to stream bank instability, erosion, loss of riparian vegetation, and impairment of surface water quality. In turn, this would adversely impact aquatic wildlife within the footprints of each reach, as well as on the wildlife that forages for these species in their respective riverine habitats. It is also noted that future development projects upstream of FMMD have a substantial impact on water quality (and water volume) entering FMMD. If future projects upstream of FMMD do not consider and implement measures to improve water quality and reduce runoff volume, then the benefits of the Proposed Action within FMMD could be reduced, though not eliminated. Therefore, continued coordination between FMMD and outside stakeholders will be important to ensure the long-term benefits to the FMMD watershed are maintained.

5.14.3 No Action

The No Action Alternative would result in increasingly significant adverse cumulative environmental impacts occurring to water quality and biological resources. As development within FMMD and the surrounding community continues, there is likely to be an increase in impervious

surfaces and stormwater runoff entering the FMMD stream reaches and watersheds. Without stream reach restoration, the increased stormwater volume would continue to deteriorate the stream channels, leading to increased erosion, sedimentation, flooding, and terrestrial and aquatic habitat and wildlife. Additionally, FMMD would continue to be outside of its MS4 permit compliance requirements. As physical stream conditions worsen at FMMD, the adverse water quality conditions would continue to degrade water quality and biological resources downstream of FMMD through increased sediment loading, flow rates, and flooding.

5.15 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

As described throughout Section 5 of this PEA, the construction and operation of the Proposed Action would not generate any significant adverse impacts, while significant beneficial impacts would be achieved during operation of the Proposed Action. Therefore, an Environmental Impact Statement is not warranted.

As detailed in this PEA, construction activities associated with the Proposed Action would generate adverse impacts to natural resources, but none would be considered significant. This is because these impacts would be temporary, lasting approximately six months during the construction phase of each stream reach. The intensity of the adverse impacts would be limited to the area immediately surrounding the stream reaches. Additionally, the number of receptors would be limited to a relatively small number of staff and personnel within FMMD. These adverse impacts would end once the construction phases are completed. During operation, the long-term beneficial significant impacts would be realized because the stream reach improvements would function to improve water quality, reduce flooding and sedimentation, improve and increase riparian habit, remove trash and other debris, and improve biological quality of both the aquatic and terrestrial environment. While the stream reaches would still be under pressure from upstream development, their resiliency to withstand sediment loading and storm-related surges in runoff volume. On a cumulative basis, the stream reach restoration would improve the overall quality of the FMMD watershed. However, routine operation maintenance would be required to ensure the stream restoration goals are maintained as designed. Additionally, future development activities (such as new building construction or renovation) must give consideration to the FMMD watershed functions and values to ensure the lasting benefits of the Proposed Action across the FMMD watershed.

Table 15 includes a list of federal environmental statutes and executive orders that are applicable to the Proposed Action, as well as the status of compliance to each.

Table 15. Compliance with Federal Environmental Statues and Executive Orders

Acts	Compliance
Clean Air Act, as amended (42 United States Code [U.S.C.] ch. 85, subch. I §7401 et seq.)	FULL
Clean Water Act, as amended (33 U.S.C. ch. 23 §1151)	FULL
Coastal Zone Management Act (16 U.S.C. ch. 33 §1451 et seq.)	FULL
Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (42 U.S.C. §9601 et seq.)	FULL
Section 438 of the Energy Independence and Security Act (42 U.S.C. ch. 152 §17001 et seq.)	FULL

Acts	Compliance
Endangered Species Act of 1973, as amended (16 U.S.C. ch. 35 §1531 et seq.)	FULL
Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e)	FULL
Migratory Bird Treaty Act (16 U.S.C §§703-712, et seq.)	FULL
National Environmental Policy Act of 1969 (42 U.S.C. §4321 et seq.)	FULL
National Historic Preservation Act of 1966, as amended (16 U.S.C. ch. 1A, subch.II §470 et seq.)	FULL
Noise Control Act of 1972, as amended (42 U.S.C. §§4901-4918, et seq.)	FULL
Resource Conservation and Recovery Act (42 U.S.C. ch. 82 §6901 et seq.)	FULL
Safe Drinking Water Act, as amended (42 U.S.C. §300f)	FULL
Toxic Substances Control Act of 1976 (15 U.S.C. ch.53, subch. I §§2601-2629)	FULL
Watershed Protection and Flood Prevention Act of 1954 (16 U.S.C. §1101, et seq.)	FULL
North American Wetlands Conservation Act (16 U.S.C. 4401-4412)	FULL
Sikes Act, as amended (16 U.S.C. 670a-670o)	FULL
Archaeological Resources Protection Act, as amended (16 U.S.C. §§470aa-470mm)	FULL
Executive Orders (EO)	
Floodplain Management (EO 11988)	FULL
Protection of Wetlands (EO 11990)	FULL
Environmental Justice in Minority Populations and Low-Income Populations (EO 12898)	FULL
Federal Compliance with Pollution Control Standards (EO 12088)	FULL
Protection of Children from Environmental Health Risks and Safety Risks (EO 13045)	FULL
Invasive Species (EO 13112)	FULL
Consultation and Coordination with Indian Tribal Governments (EO 13175)	FULL
Strengthening Federal Environmental, Energy, and Transportation Management (EO 13514)	FULL
Chesapeake Bay Protection and Restoration (EO 13508)	FULL

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7.0 ACRONYMS AND ABBREVIATIONS

ACM	Asbestos Containing Materials
AIRFA	American Indian Religious Freedom Act of 1987
ANSI	American National Standards Institute
AOC	US Architect of the Capitol
AQCR	Air Quality Control Region
ARPA	Archaeological Resource Protection Act of 1979
AWG	Air Warfare Group
BGE	Baltimore Gas and Electric
BMP	Best Management Practice
BRAC	Base Realignment and Closure
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environment Response, Compensation and Liability Act
CFD	Clean Fill Dump
CFR	Code of Federal Regulations
COMAR	Code of Maryland Regulations
CSL	Closed Sanitary Landfill
CVSM	Classification of Vegetation Communities of Maryland
CWA	Clean Water Act
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
CZMP	Comprehensive Zoning Map Process
DDM	Discarded Military Munitions
DINFOS	Defense Information School
DISA	Defense Information System Agency
DMA	Defense Media Activity
DNL	Day night level
DNR	Department of Natural Resources
DODCAF	Department of Defense Consolidated Adjudication Facility
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
EISA	Energy Independence and Security Act
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESC	Erosion and Sediment Control
ESCP	Erosion and Sediment Control Plans
ESD	Environmental Site Design
FCA	Forest Conservation Act
FEMA	Federal Emergency Management Agency
FIRMs	Flood Insurance Rate Maps
FFA	Federal Facility Agreement
FFRMS	Federal Flood Risk Management Standard
FGGM	Fort George G. Meade

FMMD	Fort George G. Meade
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FUDS	Formerly Used Defense Systems
FWS	Fish and Wildlife Service
GHG	Green House Gases
GPM	Gallons Per Minute
GWP	Global Warming Potential
HEL	Highly Erodable Lands
HTRS	Hazardous, Toxic, and Radioactive Substances
HUC	Hydrologic Unit Codes
HVAC	Heating, Ventilation, and Air Conditioning
IAE	Impervious Acreage Equivalency
IAW	In accordance with
ICRMP	Integrated Cultural Resources Management Plan
IMCOM	US Army Installation Management Command
INRMP	Integrated National Resource Management Plan
IPCC	Intergovernmental Panel on Climate Change
IPMP	Integrated Pest Management Plan
IRP	Installation Restoration Program
ISCP	Installation Spill Contingency Plan
LBP	Lead-based Paint
LID	Low Impact Development
LOS	Level of Service
MC	Munitions Constituents
MDE	Maryland Department of the Environment
MEC	Munitions and Explosives of Concern
METF	Maximum extent technically feasible
MGD	Million gallons per day
MGS	Maryland Geological Survey
MHT	Maryland Historic Trust
MMRP	Military Munitions Response Program
MOU	Memorandum of Understanding
MRA	Munitions Response Areas
MSDS	Material Safety Data Sheets
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves and Repatriation Act of 1979
NASA	National Aeronautics and Space Administration
NCA	Noise Control Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NLEB	Northern Long-eared Bat
NOX	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List

NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRL	US Naval Research Laboratory
NSA	National Security Agency
NSR	New Source Review
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Poly-chlorinated Biphenyl
PEA	Programmatic Environmental Assessment
PEM	Palustrine Emergent Wetland
PFO	Palustrine Forested Wetland
POW	Prisoner of War
PSS	Palustrine Scrub Shrub Wetland
RCRA	Resource Conservation and Recovery Act
REC	Record of Environmental Consideration
ROI	Region of Influence
RSC	Army Reserve Center
RTE	Rare, Threatened or Endangered
SARA	Superfund Amendments and Reauthorization Act
SCA	Stream Corridor Assessment
SFPF	Stream Functions Pyramid Framework
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SOP	Standard Operating Procedure
SPCCP	Spill Prevention Control and Countermeasures Plan
SWP	State Water Program
SWPPP	Stormwater Pollution Prevention Plan
TCP	Traditional Cultural Properties
TMDL	Total Maximum Daily Load
TSCA	Toxic Substances Control Act
TSS	Total Suspended Solids
USACE	United States Army Corps of Engineers
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Service
UXO	Unexploded Ordnance
VOC	Volatile Organic Compound
WWII	World War II
WWTP	Wastewater Treatment Plant

8.0 LIST OF PREPARERS

DMA-Mabbett JV (USACE Baltimore District contractor)	
A. Glucksman, BS, MS	Project Manager. Affected Environment, Environmental Consequences
K. Kittel, BS	Sr. Scientist. Affected Environment, Environmental Consequences
D. Martin, BS, MS	Geographic Information Systems Mapping

APPENDICES

APPENDIX A

Regulatory Correspondence

Request for Early Input

Programmatic Environmental Assessment
Proposed Actions and Alternatives for Stream Restorations at Fort G. Meade, Maryland

All Interested Parties: The U.S. Army Garrison, Fort George G. Meade, Maryland (FMMD) is preparing a Programmatic Environmental Assessment (PEA) pursuant to the National Environmental Policy Act of 1969 (42 United States Code Section 4321 *et seq.*), herein known as NEPA. The Council on Environmental Quality (CEQ) is responsible for issuing regulations (40 Code of Federal Regulations [CFR] 1500-1508) and implementing the provisions of NEPA. CEQ regulations, in turn, are supplemented by procedures adopted on an agency-specific basis. For the Department of the Army (DA), the pertinent regulations are contained in 32 CFR Part 651, Army Regulation (AR) 200-2, Environmental Analysis of Army Actions. AR 200-2 specifically includes in its list of Army actions that normally require an EA [32 CFR 651.33 (c)] changes to established installation land use that generate impacts on the environment. A PEA is intended to assist agency planning and decision-making. While required to assess environmental impacts and evaluate their significance, a PEA is routinely used as a planning document to evaluate environmental impacts, develop alternatives and mitigation measures, and allow for agency and public participation (32 CFR 651.20). This PEA was developed pursuant to these laws and regulations. NEPA requires all Federal agencies to give appropriate consideration to potential environmental effects of proposed and alternative major actions in the planning and decision-making processes.

The PEA is being prepared to evaluate the environmental impacts associated with the Proposed Action to improve water quality in the FMMD stream systems, stabilize stream banks, ensure future improvements to habitat and fisheries, reduce flooding conditions on and off the installation, comply with FMMD's Integrated Natural Resources Management Plan (INRMP), and enhance the overall health of the Chesapeake Bay watershed by complying with FMMD's MD Municipal Separate Storm Sewer System (MS4) Phase II Permit, Chesapeake Bay TMDL requirements for federal facilities (Permit 13-SF-5501). Restoration activities are proposed at eight degraded stream reaches in Midway Branch, Franklin Branch, Rogue Harbor, and Severn Run watersheds on FMMD. Restoration activities may include, but are not limited to, construction equipment usage, physical land improvements, debris removal, and long-term monitoring to ensure the effectiveness of these improvements. It is anticipated that the Proposed Action will provide long-term environmental benefits for FMMD and neighboring communities by improving stream water quality. Severn Run would be the first stream to be restored. Should any adverse impacts be identified during the restoration process, measures to minimize those adverse impacts would be developed and applied to this and subsequent restoration activities at the other watersheds. Under the Proposed Action, combinations of the following restoration activities would be implemented to support regenerative stormwater conveyance and natural channel design:

- **Installation of Cobble Weirs** - Designed to specific height and used to prevent flooding and erosion.
- **Installation of Stone Steps** - Designed a series of pools built with rocks that mimic staircase steps to slow down stream flow.

- **Installation of Root Wads** – Designed as a protection technique that provides immediate riverbank stabilization, protects the toe-of-slope, and provides excellent fish habitat, especially for juveniles. Root Wads also provide toe support for bank revegetation techniques and collect sediment and debris that will enhance bank structure over time.
- **Wetland Enhancement and Creation** – Designed to rehabilitate or reestablish a degraded wetland, and/or the modification of an existing wetland to favor specific wetland functions such as flooding from an adjacent stream.
- **Constructed Riffles and Rock Cross Vanes** - Designed as channel-spanning structures that provide grade control, dissipate energy, deflect stream flow to the center of the channel, and create pools. A grade control structure stabilizes the stream channel by preventing changes in bed elevation at that point. It can also protect a streambank from undesirable erosion or migration when the erosion is caused by flows impacting the bank face. These alternatives are evaluated in this PEA.

The PEA will also consider a **No-Action alternative**, which would retain stream conditions as they currently exist for the foreseeable future. While the No Action alternative would not meet the purpose of restoration, CEQ requires the analysis of the No Action alternative; it also provides a benchmark for enabling decision-makers to compare the magnitude of environmental effects of the Proposed Action.

In accordance with 40 CFR 1500-1508, the Army invites you to provide early input on the Proposed Action that should be considered in our analysis of each alternative in the forthcoming PEA. Due to the COVID-19 quarantine, this early agency correspondence notice is being provided via email instead of a mailed letter. This notice is also being distributed to other organizations known to have an interest in natural resource conditions at FMMD.

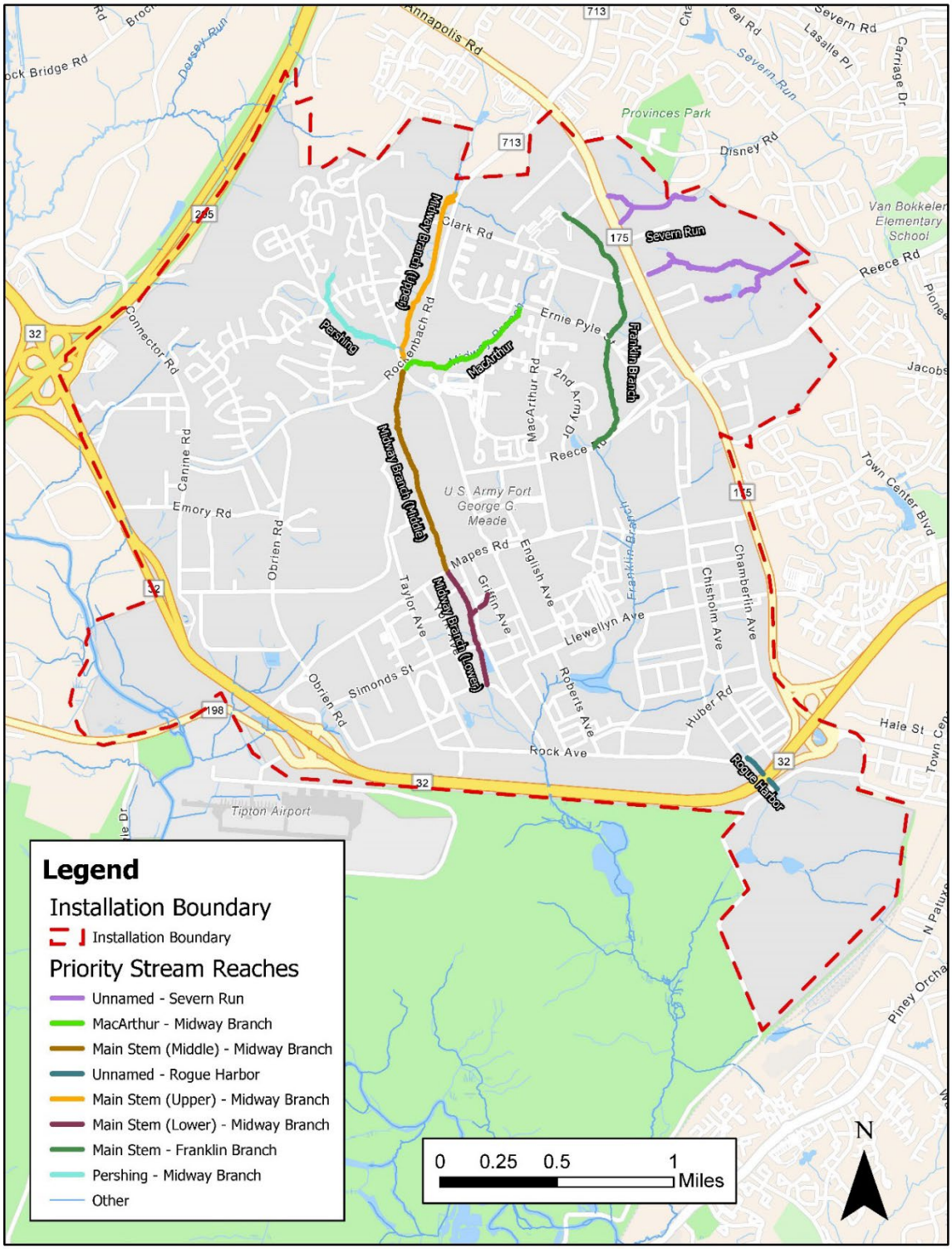
Additionally, once the draft PEA is completed, your organization and the public will have an opportunity to review and provide comment during a 30-day public review period, which will be announced in a notice published in local newspapers and on the FMMD website. Printed copies of the draft PEA typically provided to local libraries will not be available due to the COVID-19 quarantine. All materials will be provided online on the FMMD website under Environmental Public Notices at the following link https://home.army.mil/meade/index.php/my-fort/all-services/environmental

We appreciate your attention to this matter and request your review and written comment within 30 days of receipt of this letter. Should you require any additional information or have any questions, please contact the US Army Corps of Engineers, Baltimore District Project Manager, Ms. Heather Cisar at Heather.R.Cisar@usace.army.mil. Thank you for your patience and understanding during this unprecedented time.

Enclosure 1: Figure 1
Enclosure 2: Contact List

Enclosure 1

Figure 1: Location Map of the Proposed Watershed Areas



Enclosure 2 - Contact List

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June 12, 2020

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STATE CLEARINGHOUSE RECOMMENDATION

State Application Identifier: MD20200507-0347
Applicant: Mabbett & Associates, Inc. **and** US Army Corps of Engineers, Baltimore District
Project Description: Programmatic Environmental Assessment (PEA): Proposed Stream Restoration to Improve Water Quality in the Fort George G. Meade, Maryland (FMMD) Stream Systems, Stabilize Stream Banks, Ensure Future Improvements to Habitat and Fisheries, and Reduce Flooding Conditions; Includes a No-Action Alternative
Project Address: 8 Stream Reaches in Midway Branch, Franklin Branch, Rogue Harbor, and Severn Run Watersheds, Fort Meade, MD 20755
Project Location: Anne Arundel County
Recommendation: Consistent with Qualifying Comments

Dear Mr. Glucksman and Ms. Cisar:

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

Review comments were requested from the Maryland Departments of General Services, Natural Resources, Transportation, and the Environment; the Maryland Military Department; Anne Arundel County; and the Maryland Department of Planning, including the Maryland Historical Trust. Anne Arundel County did not have comments.

The Maryland Departments of General Services, Natural Resources, and Transportation; the Maryland Military Department; and the Maryland Department of Planning, including the Maryland Historical Trust found this project to be consistent with their plans, programs, and objectives.

The Maryland Historical Trust has determined that the project will have "no effect" on historic properties and that the federal and/or State historic preservation requirements have been met.

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

1. "Any solid waste including construction, demolition and land clearing debris, generated from the subject project, must be properly disposed of at a permitted solid waste acceptance facility, or recycled if possible. Contact the Solid Waste Program at (410) 537-3315 for additional information regarding solid waste activities and contact the Resource Management Program at (410) 537-3314 for additional information regarding recycling activities.

2. The Resource Management Program should be contacted directly at (410) 537-3314 by those facilities which generate or propose to generate or handle hazardous wastes to ensure these activities are being conducted in compliance with applicable State and federal laws and regulations. The Program should also be contacted prior to construction activities to ensure that the treatment, storage or disposal of hazardous wastes and low-level radioactive wastes at the facility will be conducted in compliance with applicable State and federal laws and regulations.

3. The proposed project may involve rehabilitation, redevelopment, revitalization, or property acquisition of commercial, industrial property. Accordingly, MDE's Brownfields Site Assessment and Voluntary Cleanup Programs (VCP) may provide valuable assistance to you in this project. These programs involve environmental site assessment in accordance with accepted industry and financial institution standards for property transfer. For specific information about these programs and eligibility, please Land Restoration Program at (410) 537-3437.

4. Borrow areas used to provide clean earth back fill material may require a surface mine permit. Disposal of excess cut material at a surface mine may require site approval. Contact the Mining Program at (410) 537-3557 for further details.

5. During the duration of the project, soil excavation/grading/site work will be performed; there is a potential for encountering soil contamination. If soil contamination is present, a permit for soil remediation is required from MDE's Air and Radiation Management Administration. Please contact the New Source Permits Division, Air and Radiation Management Administration at (410) 537-3230 to learn about the State's requirements for these permits.

6. Construction, renovation and/or demolition of buildings and roadways must be performed in conformance with State regulations pertaining to 'Particulate Matter from Materials Handling and Construction' (COMAR 26.11.06.03D), requiring that during any construction and/or demolition work, reasonable precaution must be taken to prevent particulate matter, such as fugitive dust, from becoming airborne."

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

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

Thank you for your cooperation with the MIRC process.

Sincerely,

Myra Barnes, Lead Clearinghouse Coordinator

MB:SM
cc:

Tony Redman - DNR	Ian Beam - MDOT	Kirk Yaukey - MILT	Joseph Griffiths - MDPL
Amanda Redmiles - MDE	Tanja Rucci - DGS	Samantha Harris - ANAR	Beth Cole - MHT

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May 8, 2020

Mr. Andrew Glucksman, Director, Natural Resources Group
Mabbett & Associates, Inc.
40 Old Louisquisset Pike
Suite 200, Box 13
North Smithfield, RI 02896

Ms. Heather Cisar, Project Manager, Installation Support Branch
US Army Corps of Engineers, Baltimore District
2 Hopkins Plaza
Baltimore, MD 21201

STATE CLEARINGHOUSE REVIEW PROCESS

State Application Identifier: **MD20200507-0347**
Reviewer Comments Due By: June 9, 2020
Project Description: Programmatic Environmental Assessment (PEA): Proposed Stream Restoration to Improve Water Quality in the Fort George G. Meade, Maryland (FMMD) Stream Systems, Stabilize Stream Banks, Ensure Future Improvements to Habitat and Fisheries, and Reduce Flooding Conditions; Includes a No-Action Alternative
Project Address: 8 Stream Reaches in Midway Branch, Franklin Branch, Rogue Harbor, and Severn Run Watersheds, Fort Meade, MD 20755
Project Location: Anne Arundel County
Clearinghouse Contact: Sylvia Mosser

Dear Mr. Glucksman and Ms. Cisar:

Thank you for submitting your project for intergovernmental review. Participation in the Maryland Intergovernmental Review and Coordination (MIRC) process helps ensure project consistency with plans, programs, and objectives of State agencies and local governments. MIRC enhances opportunities for approval and/or funding and minimizes delays by resolving issues before project implementation.

Maryland Gubernatorial Executive Order 01.01.1998.04, Smart Growth and Neighborhood Conservation Policy, encourages federal agencies to adopt flexible standards that support "Smart Growth." In addition, Federal Executive Order 12072, Federal Space Management, directs federal agencies to locate facilities in urban areas. Consideration of these two Orders should be taken prior to making final site selections. A copy of Maryland

Gubernatorial Executive Order 01.01.1998.04, Smart Growth and Neighborhood Conservation Policy is available upon request.

We have forwarded your project to the following agencies and/or jurisdictions for their review and comments: the Maryland Departments of Natural Resources, the Environment, Transportation, and General Services; the Maryland Military Department; Anne Arundel County; and the Maryland Department of Planning, including the Maryland Historical Trust. A composite review and recommendation letter will be sent to you by the reply due date. Your project has been assigned a unique State Application Identifier that you should use on all documents and correspondence. Please be assured that we will expeditiously process your project.

If you need assistance or have questions, contact the State Clearinghouse staff noted above at 410-767-4490 or through e-mail at sylvia.mosser@maryland.gov. Thank you for your cooperation with the MIRC process.

Sincerely,

Jason Dubow, Manager
Resource Conservation and Management

JD:SM

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20200387 2 F Army

Maryland

Beth Cole -MDP- <beth.cole@maryland.gov>

DLI7

Early Input FGGM Stream Restoration

1 message

Glodek, Jerald W CIV USARMY USAG (USA) <jerald.w.glodek.civ@mail.mil> Wed, Aug 26, 2020 at 2:22 PM
To: Beth Cole - MHT <beth.cole@maryland.gov>
Cc: Dixie Henry -MDP- <dixie.henry@maryland.gov>, "Kopich, Suzanne M CIV USARMY ID-SUSTAINMENT (USA)" <suzanne.m.kopich.civ@mail.mil>

Good afternoon Beth,

AUG 26 2020 AN Co.

We are preparing a Programmatic Environmental Assessment (PEA) for the proposed stream restoration activities at Fort Meade, Maryland. The attached letter includes a brief description of the proposed action and instructions on how to provide your early input, which will be considered as we prepare the Public Draft PEA. Due to the COVD-19 restrictions, a hardcopy of this letter will not be mailed. Your organization will have an additional opportunity to comment on the proposed action once the Public Draft PEA is completed and published for a 30-day review period.

BY:

Thank you,

Jerry Glodek
Cultural Resource Manager
Fort George G. Meade, MD 20755
(443) 962-3784

Stakeholders letter Stream Restoration FGGM.PDF
489K

The Maryland Historical Trust has determined that this undertaking will have no adverse effect on historic properties.

Dixie Henry Date 9/10/2020

Archeology
9/10/20

From: Tango, Peter J
To: French, John B; Glucksman Andrew
Cc: O"Connell, Thomas J; Adams, Tarik
Subject: Re: [EXTERNAL] Fort Meade Stream Restoration - NEPA EA - USFWS Patuxent RR - Request for Early Input
Date: Friday, May 08, 2020 6:38:01 AM
Attachments: image002.png

Thank you John and Andrew!
I have been waiting to hear this for almost 10 years. I visited the Fort Meade site at a time when the idea was being considered by staff to look at a monitoring network to track change in water quality through time in response to management actions. There will be tremendous value to the science and management communities in a well documented and monitored stream restoration on Fort Meade. I know that I am looking forward to hearing more about the planned project in the days ahead.

Be safe, stay in touch, have a great day!
Cheers,
Peter Tango, Acting Deputy Director at Patuxent Campus for USGS

From: French, John B <jbfrench@usgs.gov>
Sent: Thursday, May 7, 2020 5:34 PM
To: Glucksman Andrew <glucksman@mabbett.com>
Cc: O'Connell, Thomas J <toconnell@usgs.gov>; Tango, Peter J <pjtango@usgs.gov>; Adams, Tarik <tarik_adams@fws.gov>
Subject: FW: [EXTERNAL] Fort Meade Stream Restoration - NEPA EA - USFWS Patuxent RR - Request for Early Input

Andrew, thanks for your letter and the opportunity for input.
I am no longer Center Director at Patuxent wildlife Research Center; the center has merged with another USGS lab, the Leetown Science Center and Tom O'Connell is the director of the new center. This may prove beneficial to you as Leetown focusses on aquatic habitats. Tom is copied on this email.
I also copied Tarik Adams, acting USFWS Refuge Manager for the Patuxent Research Refuge, in case you do not have his contact information.

Regards, John

.....

***John B. French, Jr.**, Ph.D*
USGS Patuxent Wildlife Research Center
cell: (301) 452-0497 . office: (301) 497-5502
email: jbfrench@usgs.gov https://www.usgs.gov/centers/pwrc

From: Glucksman Andrew <glucksman@mabbett.com>
Sent: Thursday, May 7, 2020 5:10 PM
To: French, John B <jbfrench@usgs.gov>
Cc: Kopich, Suzanne M CIV USARMY ID-SUSTAINMENT (USA) <suzanne.m.kopich.civ@mail.mil>;

Cisar, Heather R CIV CENAB CENAD (USA) <Heather.R.Cisar@usace.army.mil>
Subject: [EXTERNAL] Fort Meade Stream Restoration - NEPA EA - USFWS Patuxent RR - Request for Early Input

Good afternoon Mr. French,

We have been contracted by the U.S. Army Corps of Engineers Baltimore District and Fort Meade to prepare a Programmatic Environmental Assessment (PEA) for the proposed stream restoration activities at Fort Meade, Maryland. The attached letter includes a brief description of the proposed action and instructions on how to provide your early input, which will be considered as we prepare the Public Draft PEA. Due to the COVD-19 restrictions, a hardcopy of this letter will not be mailed. Your organization will have an additional opportunity to comment on the proposed action once the Public Draft PEA is completed and published for a 30-day review period.

Thank you,

Andrew

Andrew Glucksman, LEED AP
Director, Natural Resources Group

Mabbett & Associates, Inc.
Scientists | Engineers | Program Managers
40 Old Louisquisset Pike, Suite 200, Box 13
North Smithfield, Rhode Island 02896
Tel: (781) 275-6050, ext. 401
glucksman@mabbett.com
www.mabbett.com

CVE Verified Service-Disabled Veteran-Owned Small Business

Please consider the environment before printing this email.

The U.S. Army Garrison, Fort George G. Meade, Maryland (FMMD) is preparing a Programmatic Environmental Assessment (PEA or Study) to evaluate the environmental impacts associated with stream restoration activities. FMMD solicited early input from other federal and state regulatory agencies to inform the development of the PEA. In response to this request, the U.S. Environmental Protection Agency (USEPA), Region 3, on 03 June 2020 provided comments on the Proposed Action. FMMD appreciates the input from USEPA and has prepared the following responses to document how USEPA comments will be considered in the PEA. The USEPA comments are provided in italics, while FMMD responses are provided in standard font.

I. Background, Purpose and Need

Comment 1. *We recommend that the EA explain the background and need for the project, including the existing conditions, proposed conditions, and how the proposed action will meet the goals, including improving water quality watershed health, meeting regulatory requirements and complying with FMMD's Integrated Natural Resources Management Plan (INRMP).*

We recommend that the Study explain the specific requirements for the INRMP as well as the Municipal Separate Storm Sewer System (MS4) Phase II Permit and Chesapeake Bay TMDL requirements.

Response to Comment 1. The PEA includes the requested information in the description of the proposed action and alternatives. Additionally, the analyses identify how the proposed action is integrated with the FMMD INRMP; the permits necessary to construct and operate the restoration activities; and the specific MS4 TMDL permit requirements that will be met over time, as well as the TMDL credit objectives. The USACE conducted stream assessment studies **in 2008 (?)** and 2012 on Midway and tributaries to Midway with the purpose to document Indicators of biological Integrity, instream habitat capacity and water quality.

Comment 2. *The Request for Early Input states that the PEA will evaluate the environmental impacts associated with ensuring future improvements to habitat and fisheries. We suggest the PEA clarify what is meant by "ensure future improvements."*

Response to Comment 2. It is noted that the objective of the proposed restoration is to improve the overall quality of the FMMD watershed, which will provide incremental benefits to downstream habitat and fisheries.

Comment 3*. To improve water quality and reduce flooding conditions on and downstream of FMMD, we recommend that any stream restoration activities be taken in conjunction with a comprehensive plan to address sources of stormwater from or into the installation. The addition of an array of green infrastructure may be a cost-effective way to help reduce flooding and degradation from stormwater while ensuring stability of stream restoration activities that are undertaken. Likewise, there may be opportunities in the watersheds to improve riparian buffers, replace inadequate crossings, and add stormwater best management practices (BMPs) to help meet the goals of the project.*

Response to Comment 3. The proposed stream restoration will occur within the FMMD property boundary, where FMMD has ownership. FMMD does not have jurisdiction or authority to implement similar stream improvements outside of the FMMD property. The proposed stream restoration is designed to account for the impaired water quality from upgradient off-site locations that ultimately

enters FMMD. Accordingly, many of the proposed stream restoration elements include improvements to riparian buffers, culverts, and utilization of BMPs to reduce erosion and sediment loading.

***Comment 4**. As part of this effort, we recommend that existing and proposed stormwater BMPs in upland areas be inventoried and their efficacy assessed. This evaluation would include whether they are they functioning as designed and whether retrofits or upgrades may be helpful. We suggest considering opportunities to incorporate green infrastructure throughout the installation to reduce runoff volume and improve water quality. Such measures include removing unused impervious areas, adding rain gardens, depressed parking islands, pervious pavement/trails, vegetated swales, rainwater harvesting from roof areas and other BMPs.*

Response to Comment 4. The design for the proposed stream restoration accounts for existing BMPs. However, the PEA will not itself include an inventory or analysis of existing BMPs for the reader. Further, incorporation of green infrastructure is a longer-term goal at FMMD and is part of an integrated approach to managing stormwater to meet MS4 TMDL permit requirements.

***Comment 5**. We also recommend evaluating the contribution of undersized or inadequate crossings to stream degradation and flooding issues in the watersheds. Where possible, removal or replacement of structures may improve in-stream conditions. We also recommend consideration of collaboration with adjacent landowners to address inadequate crossings and stormwater runoff in the area to improve the watershed. For example, working with the MD State Highway Administration to address stormwater issues along MD 175 may improve stream conditions.*

Response to Comment 5. The design for the proposed stream restoration accounts for various factors that have resulted in stream degradation and flooding issues in the watershed. To that end, the restoration elements include improved riparian buffers, improved stream back elevations, and an improvement to stormwater outfalls and culverts. FMMD has a long collaborative relationship will all abutting landowners and organizations that generate stormwater that ultimately flows into FMMD. Whenever possible, FMMD has requested that these organizations also work to improve stormwater quality so that restoration activities are more likely to achieve permit requirements. FMMD and MD SHA worked jointly on the widening of MD 175 which also included collaborating on stormwater BMPs.

***Comment 6**. The goals of both the overall projects and the individual restoration projects should be clear. We recommend specific targeted goals for each stream reach to be restored (e.g. fish habitat improvement, stream temperature decreases, etc.)*

Response to Comment 6. The PEA will identify general restoration goals targeted for individual stream reaches and for the overall watershed.

II. Environmental Impacts

***Comment 7**. Restoration activities are proposed at "eight degraded stream reaches in Midway Branch, Franklin Branch, Rogue Harbor, and Severn Run watersheds on FMMD". The nature of the degradation in each of the stream reaches should be discussed, including biota and in-stream habitat, existing riparian vegetation/buffers and management, constrictions or obstructions, and the location/extent of sources of degradation on and off-site.*

Response to Comment 7. The PEA will describe the existing conditions in each stream reach, and the on-site and off-site factors contributing to impairments.

III. Specific comments regarding Severn Run from our Laboratory and Applied Sciences Division follow:

Comment 8A*. * Severn Run is a nine-mile-long headwater stream of the Severn River, and is generally a relatively healthy stream compared to many in the region. With shade provided by a largely intact lowland forest of red maple, river birch, sycamore and ash, it is a recreational trout stream and is stocked with brook trout by the MD Department of Natural Resources (DNR).*
https://www.aacounty.org/boards-and-commissions/severn-river-commission/severn-watershed/severn-run-and-jabez-branch/ <https://www.aacounty.org/boards-and-commissions/severn-river-commission/severn-watershed/severn-run-and-jabez-branch> <https://www.aacounty.org/boards-and-commissions/severn-river-commission/severn-watershed/severn-run-and-jabez-branch/>
Comment 8B ** We recommend that the requirements of trout and potential species of special concern be considered in any restoration plan for Severn Run. Requirements for brook trout would include good water quality, cool stream temperatures, deep pools, gravel stream beds, and dense forested buffers. For example, we generally recommend management actions that would minimize tree removal and disturbance and impacts for haul roads.*
Comment 8C ** For Severn Run or other relatively intact streams, we generally recommend focusing on reducing or treating runoff from impervious areas, preserving and enhancing functioning riparian stream buffers, and evaluating a surgical approach for minor enhancements to avoid significant disturbance or potential impacts.*

Response to Comments 8A, B, and C. The proposed stream restoration elements will improve water quality and seek to achieve compliance with FMMD's MS4 TMDL requirements. Restoration elements include improving riparian buffers, stream bank elevations, and reducing sedimentation. These restoration activities both directly and indirectly improve habitat for a variety of aquatic species, including but not limited to trout and other sensitive species. Segments of Severn Run where the most predominant populations of these fish are located downstream of FMMD. Therefore, while the proposed stream restoration activities are designed to improve water quality within FMMD, there will be indirect improvements to downstream water quality that will continue to benefit aquatic species and their habitat.

IV. Stream Restoration

Comment 9*. We recommend a discussion of the use of regenerative stormwater conveyance and natural channel design principles and techniques, including an analysis of ecosystem trade-offs and potential unintended consequences.*

As previously noted, we recommend that stream restoration be evaluated along with other measures such as aquatic resource and buffer protection, restoration of buffers, replacement of inadequate crossings, and stormwater management. In some cases, limited direct intervention (e.g. protection with vegetation buffer enhancement) may be the most environmentally effective and cost-effective option.

In addition to evaluating existing conditions, we recommend assessing other recent restoration projects in the watersheds and scientific studies to help target appropriate stream reaches and activities for restoration.

Response to Comment 9: FMMD is currently in the design phase for stream restoration elements for Severn Run, the first reach planned for restoration. As applicable, the above-mentioned recommendations will be given consideration such that the most appropriate and effective restoration techniques are implemented within FMMD.

***Comment 10**. Several specific activities were described "to support regenerative stormwater conveyance and natural channel design." While most of these activities are typically used in stream restoration, the use of "installation of stone steps", does raise some potential concerns, particularly for aquatic life passage. We recommend the evaluation of a similar, but nature-based design of step-pool construction in high-gradient reaches, with irregular spacing that mimics natural conditions in high-gradient streams.*

Response to Comment 10. As noted in the response to comment 9, FMMD is currently in the design phase for stream restoration elements for Severn Run, the first reach planned for restoration. As applicable, the above-mentioned recommendations will be given consideration such that the most appropriate and effective restoration techniques are implemented within FMMD.

***Comment 11.** We suggest that indirect and secondary impacts be carefully evaluated. For instance, while increasing flooding events into a floodplain may increase sediment and nutrient retention, saturation of the floodplain could cause die-off of trees and change wetlands from a forested to emergent. Care must also be taken during construction of instream structures including steps or step-pools, cobble weirs, constructed riffles, and rock cross vanes so that passage of aquatic organisms is not blocked at low-flow conditions.*

Response to Comment 11. As noted in the response to comments 9 and 10, FMMD is currently in the design phase for stream restoration elements for Severn Run, the first reach planned for restoration. Both the design and the construction of the design are designed to minimize the maximum extent practicable any direct or indirect (secondary) adverse impacts to aquatic organisms. The stream reaches identified for restoration currently have limited aquatic species or habitat due to their being substantially impaired. Thus, any unavoidable short-term adverse impacts would be off-set by long-term benefits that will help to restore the stream reaches and the overall watershed quality, making it more suitable to support aquatic species and their habitat.

V. Wetlands

***Comment 12**. The Request indicates that wetland enhancement and creation are activities that will be used and states that these are "designed to rehabilitate or reestablish a degraded wetland, and/or the modification of an existing wetland to favor specific wetland functions such as flooding from an adjacent stream." This is confusing as it states "wetland creation" but seems to be describing restoration and/or rehabilitation activities. For clarity, it would be helpful to describe the proposed activities consistent with the definitions used by the Chesapeake Bay Program (CBP). As defined by CBP, wetland creation is "the manipulation of the physical, chemical, or biological characteristics present to develop a wetland that did not previously exist at a site." Wetland restoration is "the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former wetland" while wetland rehabilitation is "the manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded wetland."*

While the definition of wetland enhancement is similar to that stated ["the manipulation of the physical, chemical, or biological characteristics of a wetland to heighten, intensify, or improve a specific function(s)"] we note that enhancement can be problematic and may raise concerns. By attempting to improve a particular function in an already functioning wetland, there may be trade-offs and losses of other functions. Generally, we recommend holistic restoration or rehabilitation of degraded wetlands to return them to a fully functional, resilient system. If wetland enhancement is considered, we strongly recommend that potential enhancement areas be carefully assessed and closely monitored.

We recommend that the EA include a discussion of wetlands onsite and characterization of degradation along with the causes, if known. Identifying locations for creation of wetlands for stormwater treatment or flooding would also be helpful. We also recommend that creation areas be sited to avoid adverse impacts to other resources such as forest or habitat of species of special concern.

Response to Comment 12. FMMD is currently developing the design for the Severn Run restoration. Both wetland creation and wetland enhancement may be included as elements of restoration where applicable, and use of these elements would be evaluated on a case-by-case basis. The PEA will include language that is consistent with the CBP to more clearly define these different elements.

VI. Monitoring

Comment 13*. The Request for Early Input states: "Should any adverse impacts be identified during the restoration process, measures to minimize those adverse impacts would be developed and applied to this and subsequent restoration activities at the other watersheds." To identify such adverse impacts, maintenance issues, less than optimal results, we recommend a robust monitoring and adaptive management plan, including pre-construction assessment and long-term monitoring.*

Response to Comment 13. Comment noted. As part of the design process, FMMD and USACE completed a stream assessment survey to identify existing pre-construction conditions that warrant restoration. The PEA will identify and describe the long-term monitoring that would be performed to ensure the constructed restoration elements function as designed.

The USFWS recently prepared a Rapid Assessment Method Report. After construction and permit expiration, FMMD will follow the monitoring guidance outlined in a report titled, "Recommended Methods to Verify Stream Restoration Practices Built for Pollutant Crediting in the Chesapeake Bay Watershed". The Verification Protocol suggests:

- MS4 BMP inspection
- Most BMPs have to be inspected once every three years to maintain credit.

With this in mind, FMMD expects to verify the projects performance (applying the expert panel verification protocols) every three years after construction. A monitoring plan will be developed after the engineering design is completed.

VII. Wildlife

***Comment 14**. We recommend that direct and indirect effects on aquatic biota and other fauna be assessed, including any potential shifts in available aquatic or upland habitat, aquatic life passage, temporary impacts from construction impacts, etc.*

As part of the analysis, we recommend that the impact of any project that may attract waterfowl such as flooded or impounded areas be considered in light of wildlife management plans for any nearby airports or airfields including Tipton Airfield. Coordination with the FAA may be needed to expand or create wetland or open water areas.

Response to Comment 14. The PEA will include an evaluation of direct and indirect impacts to terrestrial and aquatic flora and fauna, both during construction and operation. Coordination with FAA is not an anticipated need as the scope of work will not include the expansion of open water areas.

VIII. Invasive Species

***Comment 15**. Disturbance during construction may introduce or spread invasive species. The EA would benefit from an evaluation of invasive species that may be present onsite or in the area and the Project's potential for dispersal of invasive species during construction, BMPs that may be employed to reduce potential spread of these species, and any monitoring or treatment planned.*

Response to Comment 15. The proposed restoration would remove invasive vegetation and replace it with native, non-invasive vegetation within each stream reach to the maximum extent practicable. The PEA will identify measures to manage and reduce the potential spread of invasive species, as specified in FMMD's Invasive Management Plan (May 2012).

IX. Air Quality

***Comment 16**. Under the general conformity rule, reasonably foreseeable emissions associated with all operational and construction activities, both direct and indirect, must be quantified and compared to the annual de minimis levels for those pollutants in nonattainment for that area. A general conformity rule analysis should be conducted according to the guidance provided by the EPA in Determining Conformity of General Federal Actions to State or Federal Implementation Plans.*

Response to Comment 16. The PEA will include an analysis of emissions associated with construction and operational maintenance activities to assess whether a General Conformity Determination is required.

Subject: FW: Fort Meade Stream Restoration - NEPA EA - USEPA - Request for Early Input

-----Original Message-----
From: Traver, Carrie [mailto:Traver.Carrie@epa.gov]
Sent: Friday, June 5, 2020 2:37 PM
To: Glucksman Andrew <glucksman@mabbett.com>
Cc: Kopich, Suzanne M CIV USARMY ID-SUSTAINMENT (USA) <suzanne.m.kopich.civ@mail.mil>; Cisar, Heather R CIV CENAB CENAD (USA) <Heather.R.Cisar@usace.army.mil>; Rudnick, Barbara <Rudnick.Barbara@epa.gov>
Subject: [Non-DoD Source] RE: Fort Meade Stream Restoration - NEPA EA - USEPA - Request for Early Input

Good afternoon,

Thank you for providing the notice that the U.S. Army Garrison, Fort George G. Meade, Maryland (FMMD) is preparing a Programmatic Environmental Assessment (PEA or Study) to evaluate the environmental impacts associated with stream restoration activities. In response, the U.S. Environmental Protection Agency (EPA) is providing recommendations for your consideration in the development of the EA in compliance with the National Environmental Policy Act (NEPA) of 1969, the CEQ regulations implementing NEPA (40 CFR 1500-1508), and Section 309 of the Clean Air Act.

Background, Purpose and Need

We recommend that the EA explain the background and need for the project, including the existing conditions, proposed conditions, and how the proposed action will meet the goals, including improving water quality watershed health, meeting regulatory requirements and complying with FMMD's Integrated Natural Resources Management Plan (INRMP).

We recommend that the Study explain the specific requirements for the INRMP as well as the Municipal Separate Storm Sewer System (MS4) Phase II Permit and Chesapeake Bay TMDL requirements.

The Request for Early Input states that the PEA will evaluate the environmental impacts associated with ensuring future improvements to habitat and fisheries. We suggest the PEA clarify what is meant by "ensure future improvements."

Proposed Action

To improve water quality and reduce flooding conditions on and downstream of FMMD, we recommend that any stream restoration activities be taken in conjunction with a comprehensive plan to address sources of stormwater from or into the installation. The addition of an array of green infrastructure may be a cost-effective way to help reduce flooding and degradation from stormwater while ensuring stability of stream restoration activities that are undertaken. Likewise, there may be opportunities in the watersheds to improve riparian buffers, replace inadequate crossings, and add stormwater best management practices (BMPs) to help meet the goals of the project.

As part of this effort, we recommend that existing and proposed stormwater BMPs in upland areas be inventoried and their efficacy assessed. This evaluation would include whether they are they functioning as designed and whether retrofits or upgrades may be helpful. We suggest considering opportunities to incorporate green infrastructure throughout the installation to reduce runoff volume and improve water quality. Such measures include removing unused impervious areas, adding rain gardens, depressed parking islands, pervious pavement/trails, vegetated swales, rainwater harvesting from roof areas and other BMPs.

We also recommend evaluating the contribution of undersized or inadequate crossings to stream degradation and flooding issues in the watersheds. Where possible, removal or replacement of structures may improve in-stream conditions. We also recommend consideration of collaboration with adjacent landowners to address inadequate crossings and stormwater runoff in the area to improve the watershed. For example, working with the MD State Highway Administration to address stormwater issues along MD 175 may improve stream conditions.

The goals of both the overall projects and the individual restoration projects should be clear. We recommend specific targeted goals for each stream reach to be restored (e.g. fish habitat improvement, stream temperature decreases, etc.)

Environmental Impacts

Restoration activities are proposed at "eight degraded stream reaches in Midway Branch, Franklin Branch, Rogue Harbor, and Severn Run watersheds on FMMD". The nature of the degradation in each of the stream reaches should be discussed, including biota and in-stream habitat, existing riparian vegetation/buffers and management, constrictions or obstructions, and the location/extent of sources of degradation on and off-site.

Specific comments regarding Severn Run from our Laboratory and Applied Sciences Division follow:

* Severn Run is a nine-mile-long headwater stream of the Severn River, and is generally a relatively healthy stream compared to many in the region. With shade provided by a largely intact lowland forest of red maple, river birch, sycamore and ash, it is a recreational trout stream and is stocked with brook trout by the MD Department of Natural Resources (DNR). Blockedhttps://www.aacounty.org/boards-and-commissions/severn-river-commission/severn-watershed/severn-run-and-jabez-branch/ <Blockedhttps://www.aacounty.org/boards-and-commissions/severn-river-commission/severn-watershed/severn-run-and-jabez-branch/>
* We recommend that the requirements of trout and potential species of special concern be considered in any restoration plan for Severn Run. Requirements for brook trout would include good water quality, cool stream temperatures, deep pools, gravel stream beds, and dense forested buffers. For example, we generally recommend management actions that would minimize tree removal and disturbance and impacts for haul roads.
* For Severn Run or other relatively intact streams, we generally recommend focusing on reducing or treating runoff from impervious areas, preserving and enhancing functioning riparian stream buffers, and evaluating a surgical approach for minor enhancements to avoid significant disturbance or potential impacts.

Stream Restoration

We recommend a discussion of the use of regenerative stormwater conveyance and natural channel design principles and techniques, including an analysis of ecosystem trade-offs and potential unintended consequences.

As previously noted, we recommend that stream restoration be evaluated along with other measures such as aquatic resource and buffer protection, restoration of buffers, replacement of inadequate crossings, and stormwater management. In some cases, limited direct intervention (e.g. protection with vegetation buffer enhancement) may be the most environmentally effective and cost-effective option.

In addition to evaluating existing conditions, we recommend assessing other recent restoration projects in the watersheds and scientific studies to help target appropriate stream reaches and activities for restoration.

Several specific activities were described "to support regenerative stormwater conveyance and natural channel design." While most of these activities are typically used in stream restoration, the use of "installation of stone steps", does raise some potential concerns, particularly for aquatic life passage. We recommend the evaluation of a similar, but nature-based design of step-pool construction in high-gradient reaches, with irregular spacing that mimics natural conditions in

high-gradient streams.

We suggest that indirect and secondary impacts be carefully evaluated. For instance, while increasing flooding events into a floodplain may increase sediment and nutrient retention, saturation of the floodplain could cause die-off of trees and change wetlands from a forested to emergent. Care must also be taken during construction of instream structures including steps or step-pools, cobble weirs, constructed riffles, and rock cross vanes so that passage of aquatic organisms is not blocked at low-flow conditions.

Wetlands

The Request indicates that wetland enhancement and creation are activities that will be used and states that these are "designed to rehabilitate or reestablish a degraded wetland, and/or the modification of an existing wetland to favor specific wetland functions such as flooding from an adjacent stream." This is confusing as it states "wetland creation" but seems to be describing restoration and/or rehabilitation activities. For clarity, it would be helpful to describe the proposed activities consistent with the definitions used by the Chesapeake Bay Program (CBP). As defined by CBP, wetland creation is "the manipulation of the physical, chemical, or biological characteristics present to develop a wetland that did not previously exist at a site." Wetland restoration is "the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former wetland" while wetland rehabilitation is "the manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded wetland."

While the definition of wetland enhancement is similar to that stated ["the manipulation of the physical, chemical, or biological characteristics of a wetland to heighten, intensify, or improve a specific function(s)"] we note that enhancement can be problematic and may raise concerns. By attempting to improve a particular function in an already functioning wetland, there may be trade-offs and losses of other functions. Generally, we recommend holistic restoration or rehabilitation of degraded wetlands to return them to a fully functional, resilient system. If wetland enhancement is considered, we strongly recommend that potential enhancement areas be carefully assessed and closely monitored.

We recommend that the EA include a discussion of wetlands onsite and characterization of degradation along with the causes, if known. Identifying locations for creation of wetlands for stormwater treatment or flooding would also be helpful. We also recommend that creation areas be sited to avoid adverse impacts to other resources such as forest or habitat of species of special concern.

Monitoring

The Request for Early Input states: "Should any adverse impacts be identified during the restoration process, measures to minimize those adverse impacts would be developed and applied to this and subsequent restoration activities at the other watersheds." To identify such adverse impacts, maintenance issues, less than optimal results, we recommend a robust monitoring and adaptive management plan, including pre-construction assessment and long-term monitoring.

Wildlife

We recommend that direct and indirect effects on aquatic biota and other fauna be assessed, including any potential shifts in available aquatic or upland habitat, aquatic life passage, temporary impacts from construction impacts, etc.

As part of the analysis, we recommend that the impact of any project that may attract waterfowl such as flooded or impounded areas be considered in light of wildlife management plans for any nearby airports or airfields including Tipton Airfield. Coordination with the FAA may be needed to expand or create wetland or open water areas.

Invasive Species

Disturbance during construction may introduce or spread invasive species. The EA would benefit from an evaluation of invasive species that may be present onsite or in the area and the Project's potential for dispersal of invasive species during construction, BMPs that may be employed to reduce potential spread of these species, and any monitoring or treatment planned.

Air Quality

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

Again, thank you for providing us with notice to provide comments for your consideration in the development of the Study. We request that you share the draft PEA with EPA and we would also be happy to provide technical assistance for studies that may be needed in support of the PEA. Please feel free to contact me at traver.carrie@epa.gov <mailto:traver.carrie@epa.gov> or 215-814-2772.

Thank you,

Carrie

Carrie Traver

Life Scientist

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From: Glucksman Andrew <glucksman@mabbett.com>
Sent: Thursday, May 07, 2020 5:05 PM
To: Traver, Carrie <Traver.Carrie@epa.gov>
Cc: Kopich, Suzanne M CIV USARMY ID-SUSTAINMENT (USA) <suzanne.m.kopich.civ@mail.mil>; Cisar, Heather R CIV CENAB CENAD (USA) <Heather.R.Cisar@usace.army.mil>
Subject: Fort Meade Stream Restoration - NEPA EA - USEPA - Request for Early Input

Good afternoon Ms. Traver,

We have been contracted by the U.S. Army Corps of Engineers Baltimore District and Fort Meade to prepare a Programmatic Environmental Assessment (PEA) for the proposed stream restoration activities at Fort Meade, Maryland. The attached letter includes a brief description of the proposed action and instructions on how to provide your early input, which will be considered as we prepare the Public Draft PEA. Due to the COVD-19 restrictions, a hardcopy of this letter will not be mailed. Your organization will have an additional opportunity to comment on the proposed action once the Public Draft PEA is completed and published for a 30-day review period.

Thank you,

Andrew

Andrew Glucksman, LEED AP

Director, Natural Resources Group

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APPENDIX B

Coastal Zone Consistency Determination

Coastal Zone Management Act Consistency Certification
Proposed Stream Restoration Program at U.S. Army Garrison Fort George G. Meade, Maryland

October 2020

Proposed Stream Restoration Program at U.S. Army Garrison Fort George G. Meade, Maryland

Coastal Zone Management Act (CZMA) Consistency Certification

Determination of Consistency with Maryland's Coastal Zone Management Program (CZMP)

ln accordance with the Federal Coastal Zone Management Act (CZMA) of 1972, as amended, Section 307(c)(3)(A) and 15 Code of Federal Regulations (CFR) Part 930, subpart D, and the CZMA Memorandum of Understanding (MOU) between the State of Maryland and the U.S. Department of Defense, this document serves as a Federal Consistency Determination for the proposed U.S Army Garrison (USAG) Fort George G. Meade (FMMD) onsite stream restoration program (Proposed Action).

Maryland's Coastal Zone Management Plan (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.

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

The Army is required to determine the consistency for its proposed activities associated with activities at FMMD affecting Maryland's coastal resources or coastal uses with the CZMP, which is administered by the Maryland Department of Natural Resources (MDNR) Chesapeake and Coastal Service (CCS). The Army determined that implementation of the Proposed Action would ultimately have a negligible adverse effect and a significant positive effect on the land, water, or natural resources of the Maryland's Coastal Zone. This document represents an analysis of Maryland's CZMP Enforceable Coastal Policies (MDNR, 2011), and reflects the commitment of the Army to comply with the Maryland CZMP.

This document represents an analysis of project activities in context with established CCS Enforceable Programs. Furthermore, submission of this consistency determination reflects the commitment of FMMD to comply with those Enforceable Programs. FMMD has determined that the Proposed Activity would have a negligible impact on any land and water uses or natural resources of Maryland's coastal zone.

1. ENCLOSURE 1: Proposed Project Description

a. Project Location

FMMD encompasses approximately 5,139 acres and is located in the northwest corner of Anne Arundel County, Maryland. FMMD is located approximately 17 miles southwest of downtown Baltimore, Maryland, and approximately 24 miles northeast of Washington, D.C. The state capitol city of Annapolis is approximately 14 miles southeast.

b. Project Description

FMMD is proposing to implement the proposed restoration activities at eight impaired stream reaches in Midway Branch, Franklin Branch, Rogue Harbor, and Severn Run watersheds on FMMD (Figure 1). These reaches fall into one of two different 12-digit Hydrologic Unit Codes (HUC) identified as 021311050949 (Franklin, Midway, and Rogue Harbor) and 021310021002 (Severn Run). Restoring stream systems in these watersheds will improve water quality, reduce flooding, enhance fish habitat, prevent further stream degradation, and provide numerous co-benefits for FMMD and neighboring communities, while also helping FMMD maintain compliance with federal and state water quality requirements.

As part of FMMD's comprehensive stream assessment and restoration efforts, FMMD is working with the U.S. Fish & Wildlife Service (USFWS) on the proposed restoration actions. The first stream restoration project would be located in the Severn Run watershed. Midway, Franklin, and Rogue Harbor watersheds would follow, implementing the same types of practices proposed at the Severn Run stream should they prove to be beneficial.

Two major stream systems, Midway Branch and Franklin Branch, and the headwaters of another system, Severn Run, are located on FMMD. Both Midway and Franklin Branches flow from north to south through the center of FMMD. The headwaters of Severn Run are located on the northeastern corner of FMMD, and flow east for approximately 5,000 feet before exiting FMMD and ultimately discharging into the Severn River. Figure 2 shows the FMMD Future Development Plan map of the installation identifying an overall plan to restore watershed areas of interest. Further details of these proposed stream reaches are identified in Table 1.

The headwaters of Midway Branch are located north of FMMD in an urbanized, developed area. Midway Branch flows through the central portion of FMMD and exits the property where it flows through a culvert under Maryland Route 32 (MD 32). The headwaters of Franklin Branch begin just downstream of 29th Street, flow through a culvert under the MacArthur High School area, and eventually drain into Burba Lake within the installation (approximately 100-year-old lake). Water drains from Burba Lake through a weir and joins Midway Branch upstream of Rock Avenue.

The Rogue Harbor reach would extend approximately 650-linear-feet from 1st Street downstream to the MD 32 culvert, including a failed culvert system at the old Rock Road crossing, which is allowing head cutting back to 1st Street.

The Proposed Action restoration activities that support regenerative stormwater conveyance and natural channel design include, but are not limited to:

- **Installation of Cobble Weirs** - Designed to specific height and used to prevent flooding and erosion.
- **Installation of Stone Steps** - Designed as a series of pools built with rocks that mimic staircase steps to slow down stream flow.

- **Installation of Root Wads** – Designed as a protection technique that provides immediate riverbank stabilization, protects the toe-of-slope and provides excellent fish habitat, especially for juveniles. Root Wads also provide toe support for bank revegetation techniques and collect sediment and debris that will enhance bank structure over time.
- **Wetland Enhancement and Creation** –Designed to rehabilitate or reestablish a degraded wetland, and/or the modification of an existing wetland to favor specific wetland functions such as flooding from an adjacent stream.
- **Constructed Riffles and Rock Cross Vanes**- Designed as channel-spanning structures that provide grade control, dissipate energy, deflect stream flow to the center of the channel, and create pools. A grade control structure stabilizes the stream channel by preventing changes in bed elevation at that point. It can also protect a streambank from undesirable erosion or migration when the erosion is caused by flows impacting the bank face.

Under the No Action Alternative, restoration of degraded streams would not occur on FMMD. The No Action Alternative is not feasible because it would allow for the continuation of the following conditions: 1) excessive erosion; 2) excessive flooding; 3) non-compliance with MD Phase II MS4 permit, Chesapeake Bay TMDL, 4) non-compliance with the FMMD Integrated Natural Resources Management Plan (INRMP).

The restoration activities would be chosen as the Proposed Action based on the evaluated environmental, cultural, and socioeconomic impacts, as well as compliance with regulatory and mission requirements.

Required permits to implement the Proposed Action may 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 MDE-approved Erosion and Sediment Control (ESC) plans. Prior to the start of construction, any required construction-related permits or approvals would be obtained by FMMD as needed.

c. Public Participation

Public participation would take place as a part of the PEA, which is currently being prepared for the Proposed Action. The PEA serves as the primary document to facilitate environmental review of the Proposed Action by federal, state, Native American Tribes, local agencies, and the public. State agency consultation will include review through the Maryland State Clearinghouse. Public participation opportunities with respect to the PEA and decision making on the Proposed Action are guided by 32 Code of Federal Regulations (CFR) Part 651. A draft PEA and, if warranted, a draft Finding of No Significant Impact (FNSI), will be released to the public for a 30-day review and comment period. Any comments or responses will be addressed prior to publication of the final PEA. FMMD would sign a FNSI if there are no significant impacts, and then proceed with implementation of the Proposed Action. If there are significant and unmitigated adverse impacts associated with the Proposed Action, the Army would publish a Notice of Intent to prepare an Environmental Impact Statement.

d. Other Consultations

Through the NEPA process, FMMD initiated consultation with U.S. Fish and Wildlife Service, NOAA Fisheries Service, NOAA National Marine Fisheries Service, Maryland Department of Natural Resources, and Maryland Historic Trust State Historic Preservation Office. Copies of these correspondences are provided in the draft PEA. Additionally, FMMD will submit the draft PEA to the Maryland State Clearinghouse for review.

2. Enclosure 2: Site Location

a. Site Location Map

A site locus map and a site detail plan are provided below as Figures 1 and 2, respectively. Additional figures are provided in the PEA.

b. Photographs

Photographs of stream impairments are included in the PEA.

Figure 1. Site Location Map

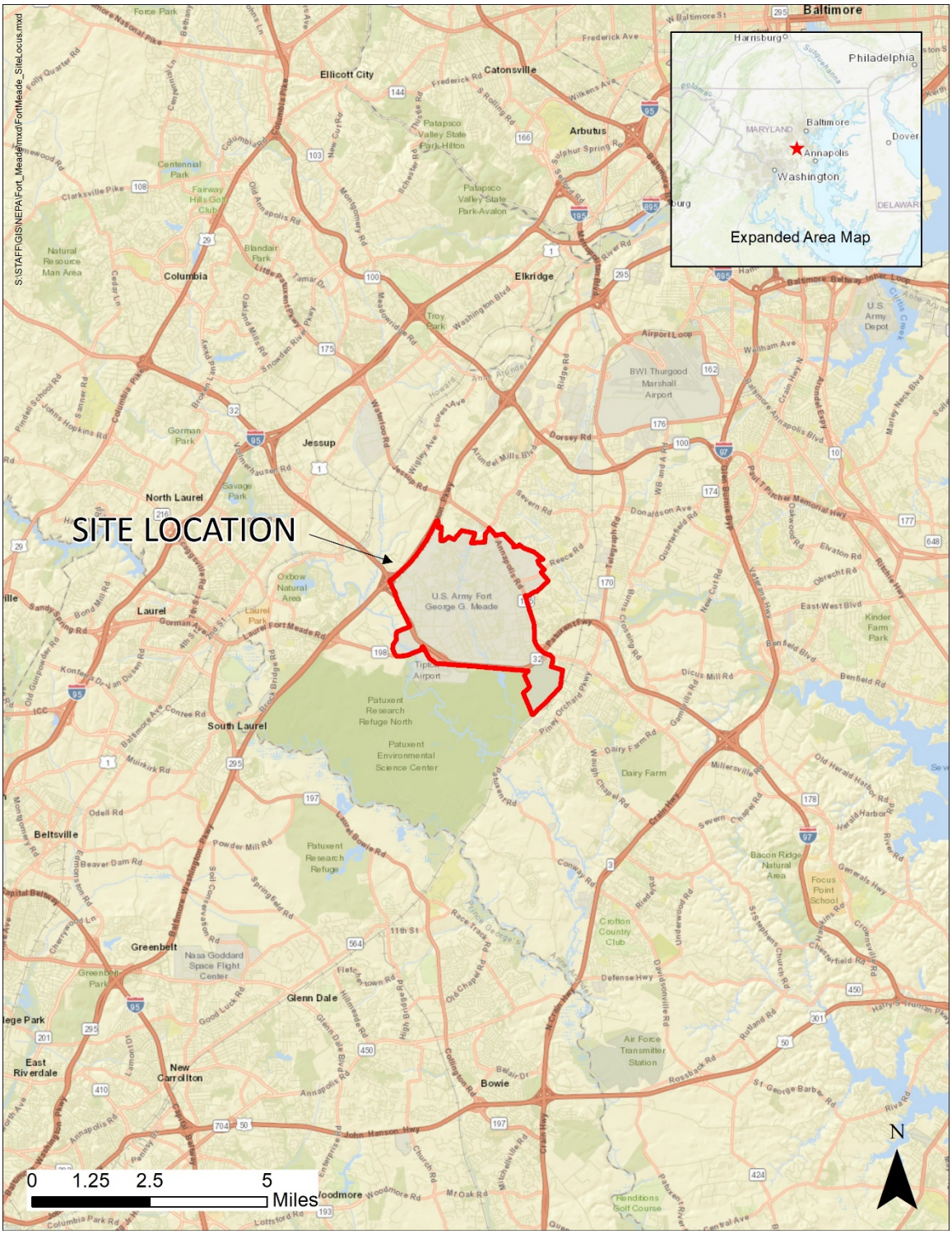
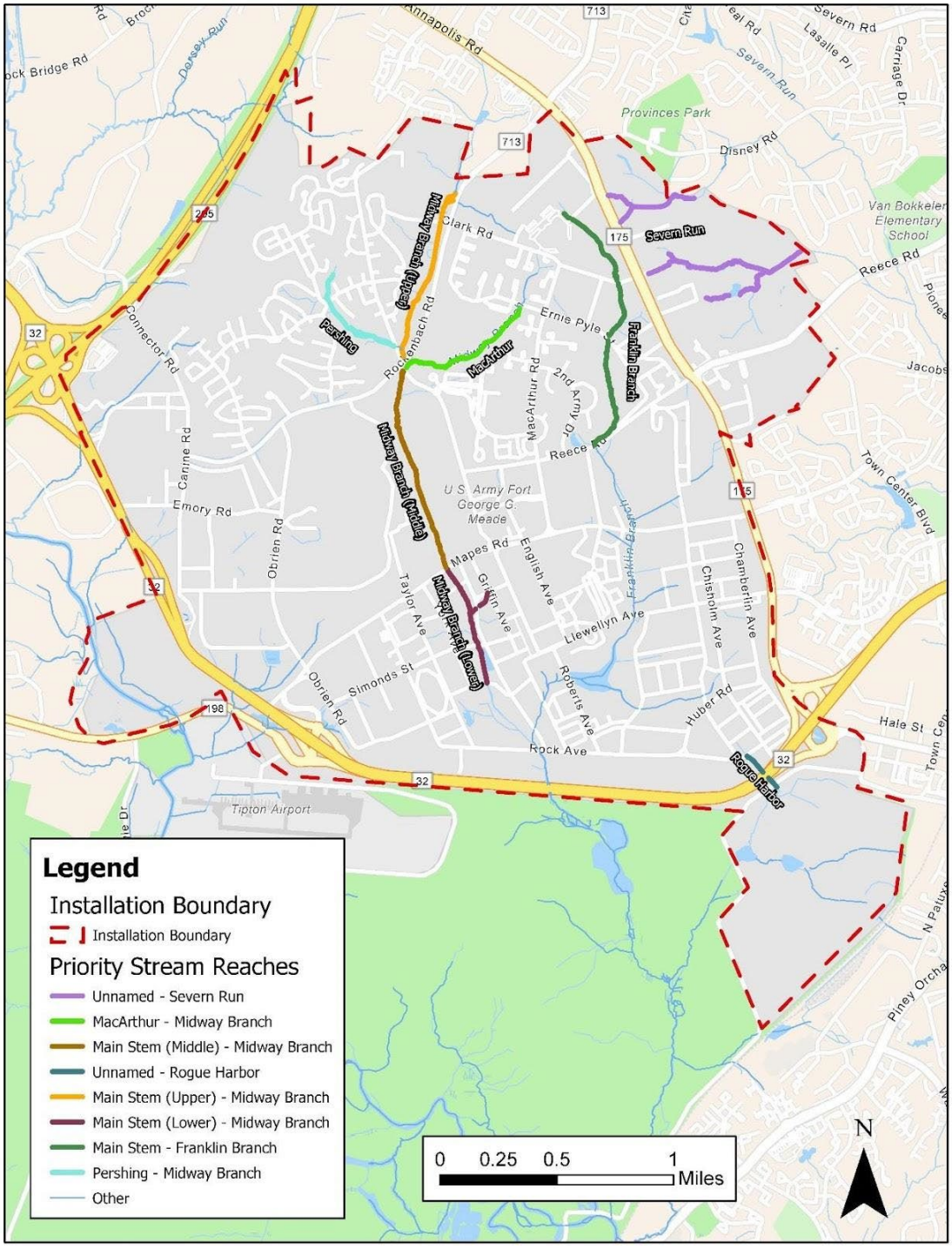


Figure 2. Site Detail Map



3. Basis for Determination

FMMD evaluated the proposed action based on its foreseeable effect on the following General Policies.

a. General Policies

i. Core Policies

Relevant core policies are described below. The core policies which are not relevant or applicable to the Proposed Action are: 1 (Air), 2 (Noise), 3 (State wild lands), 4 (State parks, forests, etc.), 5 (Water appropriation), 8 (Permanent dune structures), 9 (Assateague Island), 12 (Controlled hazardous substances), 13 (Port of Baltimore), and 14 (Outer Continental Shelf).

Policy 6. Character and Scenic Value of Waterways

None of the streams to be improved are considered wild and scenic. The proposed stream restoration project elements would temporarily impair the natural character and scenic value of the streams while under repair, but the restoration actions are intended to permanently provide significant improvements the character of the waterways over the long term.

Policy 7. Natural Water Flow

Named and unnamed streams and tributary streams are present at FMMD. However, any impediments to natural flow will nevertheless be temporary as improved stream flow is one of the objectives for undertaking these stream restorations.

Policy 10. Public Hearing for Non-Tidal Waters

In the event that implementation of any of the stream restoration activities require impacts to non-tidal waters that dredge, fill, bulkhead, or change the shoreline, a public hearing would be provided. In addition, a joint Federal/State application for the alteration of any non-tidal wetland in Maryland would be required from the USACE and MDE prior to the start of construction activities. This permit would specify how the affected waters are to be protected and any required mitigation, which could include compensatory action to protect or create wetlands elsewhere. The proposed project would comply with all permit requirements.

Policy 11. Soil Erosion

Some of the stream restoration work would necessarily disturb both the stream beds and riparian corridors. Until new vegetation is established, these activities would temporarily increase the potential for soil erosion and impacts to surface waters. An ESC plan would be developed prior to construction and submitted for approval to MDE. A Stormwater Management Plan would be prepared in accordance with Maryland Stormwater Management Act permit regulations and implemented to minimize impacts to surface water bodies. Erosion and sediment controls that could be implemented during construction include installing silt fencing and sediment traps, revegetating disturbed areas immediately after construction activities are completed, and meeting performance standards established by MDE. These measures would be designed and implemented to minimize soil erosion and impede the input of chemical nutrients and sediments to the stream reaches included in the Proposed Action.

ii. Water Quality

Relevant water quality policies are described below. Water Quality Policies that are not relevant to the Proposed Action include: 1 (Pollutants), 3 (Toxic pollutants discharge), 5 (Additional treatment for

discharges), 6 (Thermal discharges), 7 (Pesticide storage), 8 (Non-structural stormwater management for developments), 9 (Used oil), 10 (Toxic dumping material), or 11 (Public meetings).

Policy 2. Protecting State waters for recreation, fish, aquatic life, and wildlife.

The goals of the Proposed Action include removal of trash and other debris present in the reaches, water quality improvements, and specific enhancements for fish and wildlife. These improvements will also serve to enhance recreational opportunities in fulfillment of this policy. One such goal is the removal of existing fish barriers including obstructions in the stream channel that interfere with the upstream and/or downstream movement of fish and isolate stream sections, endangering trapped fish and reducing biological diversity. The planned restoration of unobstructed stream channels is important for both migratory and resident fish that travel upstream and downstream during different stages of their life cycle.

Policy 4. Stormwater Discharge Permit for discharge into State waters.

The Proposed Action would not involve discharging or introducing any substance into any state waters. Construction activities may temporarily expose soils and increase turbidity during stream bed and riparian corridor improvements. To avoid erosion of exposed soils, the construction contractor would install and maintain ESC BMPs to minimize sedimentation of run-off into waterways. Any polluting substances needed for stream reparation equipment 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 FMMD Spill Prevention, Controls and Countermeasures Plan. All activities would comply and demonstrate consistency with the relevant laws, policies and regulations.

Due to the distance from FMMD to the Chesapeake Bay, any impacts to finfish resources from non-point source pollution in the form of sedimentation caused by stream restoration construction are not reasonably anticipated to enter the Chesapeake Bay or its tributaries.

As previously described, a Stormwater Management Plan and ESC Plan would be prepared in accordance with Maryland Stormwater Management Act permit regulations and implemented to prevent impacts to other surface water bodies.

iii. **Flood Hazards**

The Proposed Action is not located in a coastal tidal floodplain, but stream restoration would necessarily occur in a non-tidal floodplain. As such, the stream restorations are designed, in part, to improve the existing conditions and would reduce flooding and improve water quality. There would be no impact on Flood Hazard policy 3 (Downstream discharge for named watersheds), but any impact on Flood Hazard policies 1 or 2 would be permanent and beneficial.

Implementing stream improvements would reduce the amount of flooding and the continued expansion of floodplains otherwise caused by stream channelization and riparian zone deterioration. Under the No Action Alternative, stream improvement projects would not be implemented. Flooding would continue to occur and likely increase over time as the stream reaches deteriorate due to the aforementioned factors (e.g. channelization, debris dams). Therefore, the No Action Alternative would have a long-term, significant adverse impact on flood conditions at FMMD.

a. Coastal Resources

i. Chesapeake and Atlantic Coastal Bays Critical Area

FMMD is not located in the Critical Area as designated and administered through the Maryland's Critical Area Program.

i. Tidal Wetlands

There are no tidal wetlands, marshes, or tidal waters at FMMD.

ii. Non-tidal Wetlands

Policy 1. Modifying character of non-tidal wetlands

FMMD has approximately 217 acres of wetlands, most of which occur along the Little Patuxent River floodplain in the southwestern portion of FMMD and along Midway Branch, Franklin Branch, and their tributaries. Most of the wetlands on FMMD are palustrine forested (PFO) along the Little Patuxent River and in the northwestern portion of FMMD. Smaller areas of wetlands within FMMD include palustrine emergent (PEM) and palustrine scrub shrub (PSS). Wetlands are present within portions of the stream reaches where restoration is planned.

The Proposed Action would have significant, beneficial, long-term impacts to wetlands by restoring the riparian and watershed health to each of the improved stream reaches.

Although the Proposed Action would improve wetlands for the long term, the construction phase would temporarily adversely impact wetlands above the threshold of 5,000 square feet in a Maryland "Use Class I-P" (*Water Contact Recreation, Protection of Aquatic Life, and Public Water Supply*) Watershed designation, which requires mitigation, and it would also impact the 25-foot wetland buffer. Thus, prior to construction, a USACE permit pursuant to Section 404 of the CWA and an MDE Wetlands and Waterways permit would be obtained by FMMD through the Joint Permit Application.

FMMD would comply with all USACE Regulatory and MDE Wetland and Waterways mitigation requirements. A final determination regarding mitigation to Waters of the US and wetlands rests with USACE and MDE, and compensatory mitigation for impacts would be resolved during the permitting phase of the Proposed Action.

ii. Forests

Relevant forest policies are described below. Forest Policies that are not relevant to the Proposed Action include: 3 (Commercial timber harvesting), 4 (Highway construction projects), and 5 (Roadside tree cutting).

Policy 1. Forest Conversation Act

It is the intent of FMMD to conserve forested areas to the maximum extent practical in accordance with the Maryland Forest Conservation Act (FCA) while continuing to sustain and support current and future missions. This includes managing the FMMD forest conservation program in accordance with the 2013 MOU between the State of Maryland and the DoD concerning federal consistency requirements of the Coastal Zone Management Act.

Limited removal and disturbance of trees may be temporarily required to reach portions of the stream channel undergoing improvements, and to install improvement measures such as root wads and stone. Thus,

temporary construction impacts to vegetative habitat would be limited to the immediate project areas and would be minor, particularly when compared to the overall significant benefits from the improvements. Where best stream restoration practices can benefit by working instream with flow diversion, this will be considered the preferred method to avoid unnecessary impacts to trees in the riparian zone. Staging of temporary material stockpiles and equipment will be limited to areas outside of the floodplain.

Where tree removal is required, the impact would be mitigated onsite by replanting at a ratio of 1:1 or higher, consistent with the FMMD FCA and Tree Management Policy (FMMD, 2009) through forest conservation, reforestation, or silvicultural improvement projects. Tree planting and landscaping would be composed of native, non-invasive plant species.

Policy 6. Non-tidal wetland compliance

The Proposed Action entails conducting a forestry activity in non-tidal wetlands and will therefore require implementation of an ESC plan to minimize sedimentation and erosion associated with construction activities. Construction activities would remove vegetative cover, disturb the soil surface, and compact the soil where heavy machinery is used. Exposed soils would be more susceptible to erosion by stream flow, wind, and surface runoff, leading to a temporary increase in sedimentation of the portion of the stream reach undergoing restoration.

Adverse impacts to soils from construction activities would be minimized by proper construction management and planning, and the use of appropriate ESC BMPs for controlling run-off, erosion, and sedimentation during construction activities. Appropriate erosion and sediment controls, such as synthetic hay bales and silt fencing, would be installed during construction. The construction would be phased such that areas that are disturbed are stabilized before moving to the next construction area.

Additionally, because the proposed construction would disturb more than one acre of ground surface, FMMD (via the selected contractor) would apply to MDE for either a General or Individual Permit for Stormwater Associated with Construction Activity. Areas disturbed within the equipment staging area would be reseeded, replanted, and/or re-sodded following construction activities, which would decrease the overall erosion potential of the site and improve soil productivity.

iii. Historic and Archaeological Sites

Policies 1, 2 and 3.

No historic properties have been identified within the stream reaches proposed for restoration. However, there is the potential for adverse impacts to previously unidentified cultural resources that could be inadvertently discovered during construction work that requires vegetation removal or causes subsurface disturbance.

To ensure adverse impacts to historical and archaeological sites are avoided, FMMD initiated Section 106 consultation with the Maryland State Historic Preservation Officer (SHPO) and selected Native American Tribes to ascertain potential impacts of the Proposed Action to historical and archaeological sites prior to implementing the Proposed Action.

Additionally, to minimize the potential adverse impact to previously unknown cultural resources during subsurface work, FMMD would implement an "Accidental Discovery" plan to comply with the NHPA, Archaeological Resources Protection Act of 1979, Native American Graves Protection and Repatriation Act (NAGPRA), American Indian Religious Freedom Act, 36 CFR Part 79, and Executive Order 13007: Indian Sacred Sites. Under this plan, if prehistoric or historic artifacts that could be associated with Native

American, early European, or American settlement are encountered at any time during construction or operation of the expansion areas, FMMD would cease all activities involving subsurface disturbance in the vicinity of the discovery. Should human remains or other cultural items, as defined by NAGPRA, be discovered during project construction, construction work would immediately cease until the FMMD Cultural Resources Manager, Maryland SHPO, and selected Native American Tribes are contacted to properly identify and appropriately treat discovered items in accordance with applicable state and federal law(s). Implementation of these measures would ensure that the Proposed Action would have "No Adverse Effect" on historic properties or cultural resources.

No additional impacts are anticipated from operation and maintenance of the stream restoration improvements.

iv. Living Aquatic Resources

Relevant living aquatic resources policies are described below. Living aquatic policies that are not relevant to the Proposed Action include: 2 (Sustainable fisheries harvesting), 3 (State land or water resource acquisitions), 6 (Riparian buffers for self-sustaining trout populations), 8 (Impacts on Submerged Aquatic Vegetation), 9 (Oyster bars), 10 (Oyster harvest), 11 (Genetically altered organisms), 12 (Vectors for introducing nonnative organisms), 13 (Snakehead introduction), and 14 (Nonnative oyster introduction).

Policy 1. Taking of a State Listed Species without an Incidental Take Permit

The state-listed faunal species that have been identified on FMMD include the glassy darter (*Etheostoma vitreum,* American brook lamprey (*Lethenteron appendix*), coastal plain swamp sparrow (*Melospiza georgiana nigrescens*) and Northern waterthrush (*Parkesia noveboracensis*). Three state-listed floral species have also been observed on FMMD. These include blunt-lobe grapefern (*Sceptridium oneidense*), Torrey's rush (*Juncus torreyi*), and partridge pea (*Chamaecrista fasciculate var. macrosperma*), and one state-wide extirpated species spotted Joe-pye-weed (*Eutrochium maculatum*). Any impacts to Rare, Threatened or Endangered (RTE) species during construction are expected to be short term, direct, minor, and adverse. Impacts to RTE species during operation are expected to be long-term, direct, significant, and beneficial due to improved habitat and a healthier watershed, due to improved stream bank stabilization and water quality, reduced erosion, restoration of healthy buffer zones, and the removal of trash, fish barriers, and debris dams. FMMD would perform routine maintenance of restoration measures to ensure they continue to function as designed.

An unpermitted "take" of an RTE species is not anticipated to occur under the Proposed Action. If a protected species should be found in a proposed construction area, FMMD would consult with the USFWS and/or the applicable state agency and appropriate steps would be taken to ensure the species was not harmed.

Policy 4. Passage of finfish

The proposed actions are intended to improve fish passage for finfish and all others.

Policy 5. In-stream construction windows

All in-stream construction in nontidal waters is prohibited from October through April, inclusive, for natural trout waters and from March through May, inclusive, for recreational trout waters. In addition, the construction of proposed projects, which may adversely affect anadromous fish spawning areas, shall be prohibited in non-tidal waters from March 15 through June 15, as set forth by MDE.

Policy 7. Aquatic and terrestrial habitat impacts in non-tidal waters

For aquatic and terrestrial habitat, minor, short-term, direct, adverse impacts could result from disruption of the stream and riparian corridors during construction activities, particularly any work in the streams and along the banks. Construction would require direct disturbance to these components of the stream channels while restoration improvements are made. These impacts would be temporary, lasting approximately six months for Severn Run. The construction phase would vary for other stream reaches based on their length and extent of restoration required.

As previously described, short-term adverse impacts would be minimized by installing erosion and sediment controls to reduce bank erosion and sedimentation of water flowing downstream. Specifically, controls may include silt fencing, synthetic hay bales, and in-water sedimentation traps and pools, which would contain sediment-laden water to only a short segment of stream where restoration is actively under construction. Mitigation for unavoidable impacts will be completed as part of any USACE and MDE permit program.

In general, significant, long-term beneficial impacts are anticipated for aquatic and terrestrial habitat during operation of the proposed stream restoration by stabilizing the stream banks, improving water quality through reduced erosion and sedimentation, restoring healthy buffer zones, and removing trash, fish barriers, and debris dams.

b. COASTAL USES

1. Mineral Extraction: Not Relevant

2. Electrical Generation and Transmission: Not Relevant

3. Tidal Shore Erosion Control: Not Relevant

4. Oil and Natural Gas Facilities: Not Relevant

5. Dredging and Disposal of Dredged Material: Not Relevant

6. Navigation: Not Relevant

7. Transportation: Not Relevant

8. Agriculture: Not Relevant

9. Development: Not Relevant

10. Sewage Treatment: Not Relevant

Summary of Findings

Based on the above analysis, FMMD personnel would 1) comply with all MD coastal policies; 2) ensure all federal consistency requirements are met; 3) follow all MDE regulations and Army INRMP requirements, and; 4) implement measures to mitigate any potential environmental impacts.

FMMD has conducted a Coastal Zone Management Federal Consistency review of the Proposed Action and has determined that the Proposed Action is consistent, to the maximum extent practicable, with the policies of Maryland's federally approved Coastal Zone Management Program.

APPENDIX C

Record of Non-Applicability

Air Emissions Calculations and Record of Non-Applicability
for the
Programmatic Environmental Assessment
Proposed Stream Restoration Program
U.S. Army Garrison
Fort George G. Meade, Maryland

Table of Contents for the Supporting Documentation and Emissions Estimates

List of Tables

1 Emissions Estimations and Methodology

Fort George G. Meade (FMMD) has considered all foreseeable direct and indirect sources of air emissions associated with the Proposed Action. *Direct emissions* are emissions that are caused or initiated by a federal action and occur at the same time and place as the action. *Indirect emissions* are reasonably foreseeable emissions that are caused by the action but might occur later in time and/or be farther removed in distance from the action itself, and that the federal agency can practicably control. There are no indirect emissions anticipated. More specifically, project-related direct emissions would result from the following:

- **Construction Emissions.** Emissions from this activity would be primarily generated during construction from fugitive dust particles from surface disturbances, and a combination of off-road construction equipment associated with limited vegetation clearing, grading of stream beds and banks, and installation of physical restoration measures, such as step pools and root wads. The equipment may include generator sets, tractors/loaders/backhoes, graders, and water trucks (for dust control). On-road construction vehicles that would be active during the construction phase (6 months) include material delivery trucks, tractor trailers used for transporting off-road heavy equipment, and workers commuting daily to and from the job site in their personal vehicles.
- **Operational Emissions.** Operational sources of air emissions would include infrequent use of small-engine equipment (chainsaws) used for vegetation control to ensure that vegetation overgrowth does not occur or disturb the designed vegetation improvements along the stream banks. This chainsaw would make a *de minimis* contribution to overall emissions. Therefore, operation of the Proposed Action would result in a negligible increase in annual emissions at FMMD.

The following sections describe the equations, calculations, and assumptions made to derive the total construction emissions presented in Table 1. As shown in Table 1, the total project emissions are below the conformity threshold values.

Table 1. Summary of Annual Emissions from the Proposed Action

Maximum Annual Emissions	**Proposed Action Emissions - tons per year (tpy)**				
	CO	**NOx**	**PM(1)**	**SO_2**	**VOC**
Surface Disturbance	--	--	0.09	--	--
Off-Road Heavy Construction Equipment	0.76	0.65	0.028	0.002	0.097
On-Road Construction Support and Worker's Vehicles	0.19017	0.01569	0.03533	0.00120	0.00113
Operational Annual Emissions from the Proposed Action	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Maximum Total Direct Emissions from the Proposed Action (typ)	**0.95027**	**0.66579**	**0.15343**	**0.0033**	**0.09823**
Conformity Threshold Value (tpy)	100	100	100	100	50

Notes:
1 - PM10 and PM2.5 combined

2 Surface Disturbance

The quantity of dust emissions from construction operations is proportional to the area of land being worked and the type of construction activity. The following assumptions were used in the calculations for fugitive dust emissions during construction, which is assumed to take six months.

Construction of the Severn Run stream reach restoration would last approximately six months. The construction period for restoration of subsequent stream reaches will vary, depending on the length and elements of the restoration required. For this analysis, air emissions were estimated for a six-month construction period and associated with vegetation clearing, grading, and placement of materials (e.g. root wads, stone, fill). The Severn Run stream reach proposed for improvement is approximately 7,500 feet in length, with improvements estimated to occur approximately 50 feet on either side of the stream channel, for a total area of disturbance of approximately nine acres.

Particulates are the main air pollutant of concern from construction projects. Construction activities would generate both coarse and fine particulate emissions. The amount of particulate emissions can be estimated from the amount of ground surface exposed, the type and intensity of activity, soil type and conditions, wind speed, and dust control measures used. To limit these emissions, construction BMPs, generally including water- or chemical-based dust suppression, would be implemented to reduce fugitive dust generation and further prevent it from becoming airborne.

Total suspended particulates were calculated using the emission factor for heavy construction activity operations from "AP-42, Compilation for Air Pollutant Emission Factors" (USEPA, 1995), to provide a conservative estimate of PM emissions. Estimates are shown in Table 2.

Table 2. Total Suspended Particulate Emissions during Construction of the Proposed Action

Total Area (acres)	Exposed Area (acres)	Construction Duration (months)	Emission Factor (tons/acre/month)[1]	Control Efficiency (%)	PM (tons/year)
9	9	6	80	50	0.09

Notes:
1 - Emission factor for "Heavy Construction Operations" (USEPA, 1995)

3 Off-Road Heavy Construction Equipment

Non-road construction vehicles (backhoes, loaders) would emit criteria pollutants during construction. Criteria pollution emissions from construction equipment were calculated assuming the use of two backhoe loaders and smaller support equipment, operating for approximately eight hours per day for a total of 130 weekdays (approximately 6 months). Emissions were estimated using "Off-Road – Model Mobile Source Emission Factors" from the California South Coast Air Quality Management District (SCAQMD, 2020) because the state of Maryland has not published their own emission factors. Emission factors for year 2022 were used in these calculations, though it is understood that construction activities for other stream reaches would occur farther into the future; emission factors typically decrease over time as new and more efficient equipment is brought to market. Therefore, using year 2022 factors represents a conservative estimate of potential emissions.

To determine the heavy construction equipment emissions in tons per year, the following formula was used, with information provided from Tables 3 and 4:

$$\mathbf{TPY_p = (T_h \times E_{fp} \times N \times D)/C}$$

Where: TPY_p = Tons Per Year of Pollutant

T_h = Time (hours per day of operation)

E_{fp} = Emissions Factor for the given pollutant (information from *South Coast Air Basin, 2020*)

N = Number of pieces of equipment

D = Days of use of equipment

C = Conversion from lbs to tons

A sample calculation for construction equipment for CO from the use of a grader is depicted as follows:

$$TPY_{CO} = (T_h \times E_{CO} \times N \times D)/C$$

$$TPY_{CO} = (8 \times 0.5747 \times 1 \times 30)/2000$$

$$TPY_{CO} = (137.9)/2000$$

$$TPY_{CO} = 0.06896$$

The annual heavy construction equipment emissions are presented in Table 5 for each pollutant during each phase of construction.

Table 3. Schedule of Construction Equipment Use

Equipment Type	Number of Units	Hours Used /Day	Total Days	Total Hours
Generator sets	2	8	130	2080
Tractors/Loaders/Backhoes	2	8	130	2080
Graders	1	8	130	1040

Table 4. Emission Factors for Off-Road Heavy Construction Equipment

2022 Equipment/Emission Factor [1]	CO (lbs/hr)	NOx (lbs/hr)	PM [2] (lbs/hr)	SO_2 (lbs/hr)	VOC [3] (lbs/hr)
Generator sets	0.2694	0.2783	0.0117	0.0007	0.0340
Tractors/loaders/backhoes	0.3599	0.2302	0.0095	0.0008	0.0384
Graders	0.5732	0.4657	0.0218	0.0015	0.0807

Notes:
1 – South Coast Air Basin (SCAB), emission factor year 2022. Composite emission factors used.
2 - PM emissions represent combined PM_{10} and $PM_{2.5}$ estimates.
3 - VOCs are considered equivalent to ROGs for calculating non-road construction equipment emissions.

Table 5. Annual Off-Road Construction Equipment Emissions

Criteria Pollutant[1]	**CO**	**NOx**	**PM[2]**	**SO_2**	**VOCs[3]**
Generator sets	0.280176	0.289432	0.012168	0.000728	0.03536
Tractors	0.374296	0.239408	0.00988	0.000832	0.039936
Graders	0.298064	0.242164	0.011336	0.00078	0.041964
Total Off-Road Heavy Construction Equipment Emissions (tons per year [tpy])4	**0.952536**	**0.771004**	**0.033384**	**0.00234**	**0.11726**

Notes:
1 - PM emissions from non-road construction vehicles are included in the general construction emissions factor applied in the estimates in 4, and therefore non-road emissions of PM are not included in this table.
2 – PM emissions represent combined PM_{10} and $PM_{2.5}$ estimates.
3 - VOCs are considered equivalent to Reactive Organic Gases (ROG) for calculating non-road construction equipment emissions.
4 - Calculated using "Off-road Mobile Source Emission Factors (Scenario Year 2022) (SCAQMD, 2020).

4 On-Road Heavy and Light Duty Trucks and Construction Worker Vehicle Emissions

Emissions from on-road heavy and light duty diesel-fueled trucks associated with the delivery and distribution of construction materials and general on-site construction support, as well as those from construction workers' passenger vehicles, were included in this analysis. Emission factors specific to Maryland for emission year 2022 (published by the US Air Force) were used for on-road heavy and light duty diesel-fueled trucks, and for gasoline-fueled passenger vehicles (USAF, 2018). Assumptions of travel distance incorporated in the calculations for the different vehicle categories were as follows:

- For on-road heavy duty diesel-fueled trucks, it was assumed there would be 10 trucks operating, each operating for 30 days (not necessarily contiguous), and each traveling 20 miles per day. This is equivalent to a total of 6,000-miles traveled per year (10 trucks * 30 days * 20 miles).
- For on-road light duty diesel-fueled trucks, it was assumed there would be 10 trucks operating, each operating for 30 days (not necessarily contiguous), and each traveling 20 miles per trip. This is equivalent to a total of 6,000-miles traveled per year (10 trucks * 30 days * 20 miles).
- For construction workers' gasoline-fueled passenger vehicles, it was assumed there would be 10 vehicles operating, each traveling a total of 40 miles per day, for 130 days (6 months, weekdays), at an average speed of 30 miles per hour. This is equivalent to a total of 52,000 -miles traveled per year (10 vehicles * 130 days * 40 miles).

Table **6** details the emission factors used in this analysis.

Table 6. On-Road Heavy and Light Duty Trucks and Construction Workers' Vehicle Emission Factors

On-Road Vehicle Category	2022 Emissions Factors, lbs/mile					
	CO	**NOx**	**PM10**	**PM2.5**	**SO_2**	**VOC**
Heavy-Duty Diesel-Fueled Truck (8,501 + lbs)	0.0029299	0.0006658	0.0080755	0.0000265	0.0002712	0.0002491
Light-Duty Diesel-Fueled Truck (0-8,500 lbs)	0.0084900	0.0004365	0.0006680	0.0000066	0.0000154	0.0000132
Light-Duty Gasoline-Fueled Vehicles (passenger cars)	0.0059966	0.0004762	0.0003417	0.0000044	0.0000132	0.0000132

On-road heavy duty and light duty diesel-fueled truck emissions were calculated using the following equation:

$$\mathbf{TPY_P = (ME \times EF_P)/C}$$

Where: TPY_P = Tons Per Year of Pollutant

ME = Total Miles per Vehicle/Year

EF_P = Emission Factor for the given pollutant (lbs/mile)

C = Conversion from lbs to tons

Construction workers gas vehicle emissions were determined using the following equation:

$$\mathbf{TPY_P = (ME \times EF_P \times W)/C}$$

Where: TPY_P = Tons Per Year of Pollutant

ME = Miles per Vehicle: number of trips x miles/trip x days

Number of trips = 2; Miles/trip = 20; Total Days = 130

W = Number of Workers

Short-term Workers = 10

EF_P = Emission Factor for the given pollutant (lbs/mile)

C = Conversion from lbs to tons

A sample calculation for CO emissions from construction workers' vehicles is provided below:

$$\mathbf{TPY_{CO} = (ME \times EF_{CO} \times W)/C}$$

$$TPY_{CO} = (5{,}200 \times 0.006217 \times 10)/2{,}000$$

$$TPY_{CO} = 323.28/2{,}000$$

$$TPY_{CO} = 0.161$$

Table 7 summarizes the annual on-road construction support vehicle emissions.

Table 7. Estimated Annual Vehicle Emissions from On-Road Heavy and Light Duty Trucks and Construction Workers' Vehicles

	Construction Emissions (tpy)					
On-Road Vehicle Category	**CO**	**NOx**	**PM10**	**PM2.5**	**SO_2**	**VOC**
Heavy Duty Diesel Truck Construction Equipment Emissions	0.00879	0.00200	0.02423	0.00008	0.00081	0.00075
Light Duty Diesel Trucks Construction	0.02547	0.00131	0.00200	0.00002	0.00005	0.00004
Construction Worker Vehicle Emissions	0.15591	0.01238	0.00888	0.00011	0.00034	0.00034
On-Road Construction Support and Worker's Vehicles Emissions (tpy)	0.19017	0.01569	0.03512	0.00021	0.00120	0.00113

5 References

USEPA, 1995 Compilation of Air Pollutant Emission Factors, AP-42, 5th edition, Vol. I: Stationary Point and Area Sources. January 1995.

USAF, 2018 Emission Estimation Method for Hauling Excavation Materials and Construction Supplies: United States Air Force (USAF) Institute for Environment, Safety and Occupational Health Risk Analysis (IERA) Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (Revised August 2018). Emissions Factor for the Maryland, Year 2022 (Table 5-25).

SCAQMD, 2020 Off-Road – Model Mobile Source Emission Factors, Year 2022.

Record of Non-Applicability

In Accordance with the Clean Air Act – General Conformity Rule for the
STREAM RESTORATION PROGRAM
FORT GEORGE G. MEADE, MARYLAND

The United States Army Garrison (USAG) Fort George G. Meade (FMMD) proposes restoration activities on eight impaired stream reaches in Midway Branch, Franklin Branch, Rogue Harbor, and Severn Run watersheds on (FMMD), MD. Restoring stream systems in these watersheds will improve water quality, reduce flooding, enhance fish habitat, prevent further stream degradation, and provide numerous co-benefits for FMMD and neighboring communities, while also helping FMMD maintain compliance with federal and state water quality requirements.

The Proposed Action is described in detail in the accompanying Programmatic Environmental Assessment (PEA). The air quality impacts associated with constructing and operating the Proposed Action, including the estimated emissions calculations, are presented in Section 5.6 of the PEA. As described therein, General Conformity under the Clean Air Act, Section 176 has been evaluated according to the requirements of Title 40 of the Code of Federal Regulations Part 93, Subpart B. The requirements of this rule are not applicable to the action because:

> The maximum total annual direct and indirect emissions from the Proposed Action have been estimated at 0.95 tons per year (tpy) of carbon monoxide (CO), 0.67 tpy of nitrogen oxides (NOx), 0.15 tpy of particulate matter ($PM_{2.5+10}$), 0.003 tpy of sulfur dioxide (SO_2), and 0.098 tpy of volatile organic compounds (VOCs; ozone precursor). These levels are below the 50 tpy conformity threshold value for VOCs and 100 tpy conformity threshold value each for NOx, PM_{10}, CO, and SO_2 established by 40 CFR 93.153(b) for the Metropolitan Baltimore Intrastate Air Quality Control Region.

Supporting documentation and emission estimates:

[X] Are Attached

[X] Appear in the National Environmental Policy Act Documentation

[ ] Other

_____ _____

Colonel, U.S. Army Date
Garrison Commander

APPENDIX D

Public Involvement Documentation

NOTICE OF AVAILABILITY

Draft Programmatic Environmental Assessment
for the Proposed Stream Restoration Program
U.S. Army Garrison Fort George G. Meade, Maryland

Interested parties are hereby notified that Fort George G. Meade (FMMD) has prepared a Draft Final Programmatic Environmental Assessment (PEA) in accordance with the National Environmental Policy Act (NEPA) of 1969, and regulations implementing the procedural provisions of the NEPA, 40 Code of Federal Regulations (CFR) 1500-1508, and Environmental Analysis of Army Actions, 32 CFR 651. The Draft PEA evaluates the potential environmental, cultural, and socioeconomic effects associated with restoration activities at eight impaired stream reaches in Midway Branch, Franklin Branch, Rogue Harbor, and Severn Run watersheds on FMMD. Under the proposed action, FMMD would restore stream systems in these watersheds to improve water quality, reduce flooding, enhance fish habitat, prevent further stream degradation, and provide numerous co-benefits for FMMD and neighboring communities, while also helping FMMD maintain compliance with federal and state water quality requirements. As part of FMMD's comprehensive stream assessment and restoration efforts, FMMD is working with the U.S. Fish & Wildlife Service on the proposed restoration actions, the first of which is located in the Severn Run watershed. Midway, Franklin, and Rogue Harbor watersheds will follow, implementing beneficial practices proposed at the Severn Run stream.

Based on the draft PEA, the Army has determined that implementation of the Proposed Action would have no significant adverse direct, indirect, or cumulative effects on the quality of the human or natural environment. Therefore, at the conclusion of the public comment period, it is anticipated that a Finding of No Significant Impact (FNSI) would be appropriate and would be signed for the Fort Meade Stream Restoration Program. An Environmental Impact Statement, therefore, is not deemed necessary to implement the Proposed Action.

The Draft PEA is available for review and comment for 30 days from publication of this notice. Copies may be found online at https://home.army.mil/meade/index.php/my-fort/all-services/environmental. The documents can also be found at the following locations: Medal of Honor Memorial Library on Fort Meade and Odenton Regional Library, 1325 Annapolis Road, Odenton, MD. Additionally, copies of the Draft PEA may be obtained by writing to the address below. Please submit all comments on the Draft PEA in writing within 30 days from the publication of this notice to: ATTN - Fort Meade Programmatic Stream Restoration Programmatic Environmental Assessment, US Army Corps of Engineers, Baltimore District Planning Division, 2 Hopkins Plaza, 10th Floor, Baltimore, MD 21201; or via email to FtMeadePEA@usace.army.mil and Ms. Suzanne Kopich, US Army Garrison Fort George G. Meade DPW, Environmental Division at suzanne.m.kopich.civ@mail.mil.