

Deactivated SM-1 Nuclear Reactor Facility Decommissioning and Dismantlement

Final Environmental Assessment - Vol. I & II

April 2020



UNITED STATES ARMY GARRISON FORT BELVOIR
FAIRFAX COUNTY, VIRGINIA



**US Army Corps
of Engineers®**

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**DEPARTMENT OF DEFENSE
DEPARTMENT OF THE ARMY**

**FINDING OF NO SIGNIFICANT IMPACT
FINDING OF NO PRACTICABLE ALTERNATIVE**

**DECOMMISSIONING AND DISMANTLEMENT OF THE DEACTIVATED SM-1 NUCLEAR
REACTOR FACILITY**

**United States Army Garrison Fort Belvoir
Fairfax County, Virginia**

Pursuant to the Council on Environmental Quality regulations, 40 *Code of Federal Regulations* (CFR) Part 1500-1508, implementing procedural provisions of the National Environmental Policy Act and the provisions of 32 CFR Part 651, the United States Army Corps of Engineers (USACE) gives notice that a Final Environmental Assessment (EA), Finding of No Significant Impact (FNSI), and Finding of No Practicable Alternative (FONPA) have been prepared for the proposed decommissioning and dismantlement of the Deactivated Stationary Medium Power Model 1 (SM-1) Nuclear Reactor Facility at United States Army Garrison Fort Belvoir (Fort Belvoir) in Fairfax County, Virginia (Proposed Action). The Proposed Action has been thoroughly reviewed by USACE and it has been determined that it will have no significant adverse effects on the local environment or quality of life that would require the preparation of an Environmental Impact Statement (EIS) as defined at 32 CFR Part 651.41, *Conditions requiring an EIS*, and 32 CFR Part 651.42, *Actions normally requiring an EIS*.

Background:

SM-1 was the Army's first nuclear-powered, electricity-generating station and the first pressurized water reactor to be connected to an electrical grid in the United States. SM-1 operated from 1957 to 1973 and was deactivated between 1973 and 1974. It was placed in a safe storage (SAFSTOR) configuration in 1974. The Deactivated SM-1 Nuclear Reactor Facility is maintained under Reactor Possession Permit Number SM1-1-19 issued by the Army Reactor Office (ARO). ARO, established by the US Army Nuclear and Countering Weapons of Mass Destruction Agency (USANCA), oversees the Army Reactor Program (ARP) and designates the ARP Manager. The Deactivated SM-1 Nuclear Reactor Facility has been part of a routine monitoring program that is consistent with Army Regulation (AR) 50-7 and implemented by USACE.

Under USACE's Deactivated Nuclear Power Plant Program, decommissioning a nuclear reactor is required within 60 years of its final shutdown in order to be consistent with US Nuclear Regulatory Commission (NRC) regulations. The Deactivated Reactor Management Plan outlines a process for managing the Army's deactivated nuclear power plants, including SM-1. Decommissioning includes the full range of actions taken to bring radioactivity levels at the site down to the unrestricted release standards. This includes construction-related activities such as decontamination, removal of radioactive materials, building demolition, and site remediation. AR 50-7 requires USACE to obtain a Decommissioning Permit from the ARO prior to initiating decommissioning. Although SM-1 is located on Fort Belvoir's fee title land, AR 50-7 designates USACE as the lead Army component and single point of contact at Headquarters, Department of the Army for nuclear reactor decommissioning to ensure compliance with environmental requirements for decommissioning Army nuclear reactors.

Proposed Action:

The Proposed Action is to decommission the Deactivated SM-1 Nuclear Reactor Facility and dismantle existing structures in accordance with the ARO-approved SM-1 Decommissioning Plan (DP) to allow the site to be released for unrestricted future use. All radioactive and non-radioactive wastes (e.g., buildings, underground utility lines, contaminated soils) would be removed from the SM-1 site. Radioactive, hazardous, and non-radioactive waste would be segregated and prepared on-site for transport to an appropriate disposal or recycling facility. The decommissioning of SM-1 would reduce residual radioactivity to levels that would allow USACE to release the site for unrestricted use, as defined in 10 CFR Part 20.1402, *Radiological Criteria for License Termination*, and return the property to Fort Belvoir for future use.

The purpose of the Proposed Action is to safely remove, transport, and dispose of all materials, equipment, and structures associated with the Deactivated SM-1 Nuclear Reactor Facility and remediate environmental impacts from the facility such that residual radioactivity levels meet the applicable criteria for unrestricted use. The Proposed Action is needed to complete the decommissioning of the Deactivated SM-1 Nuclear Reactor Facility within 60 years of its final shutdown in accordance with the NRC regulations as adopted by the ARP in AR 50-7. The Proposed Action would complete the final phase of an All Hazards Assessment required under AR 50-7 to allow for permit termination. Implementing the Proposed Action would reduce costs associated with maintaining the Deactivated SM-1 Nuclear Reactor Facility, and would allow USACE to meet mission objectives to decommission SM-1 and terminate the possession permit. Upon its completion, the Proposed Action would return the property to Fort Belvoir.

Existing Conditions:

Fort Belvoir is a strategic sustaining base for the Army that provides logistical, intelligence, and administrative support to a diverse mix of tenant commands, activities, and agencies. The Deactivated SM-1 Nuclear Reactor Facility is located on Fort Belvoir's South Post within the secured 300 Area, on an approximately 3.6-acre site along the shoreline of Gunston Cove, a tidal embayment of the Potomac River. The SM-1 site contains the reactor building, an inactive wastewater lift station, a small warehouse, a water intake pier and pump house, a concrete discharge pipe, and outfall structure. The water intake pier and pump house, concrete discharge pipe, and outfall structure are located in the 100-year floodplain and tidal wetlands associated with Gunston Cove. Based on its age and exceptional historic importance, the SM-1 Reactor Facility has been determined eligible for listing in the National Register of Historic Places (NRHP). In accordance with 36 CFR Part 800.2(a)(2), the Department of the Army and Fort Belvoir have designated USACE as lead federal agency for purposes of consultation under Section 106 of the National Historic Preservation Act (NHPA).

Alternatives Analyzed:

The EA analyzes two alternatives to the Proposed Action: 1) the Proposed Action Alternative, which would execute the Deactivated SM-1 Nuclear Reactor Facility DP; and 2) the No Action Alternative, which would not implement the SM-1 DP and would allow the continued maintenance of the Deactivated SM-1 Nuclear Reactor Facility in a SAFSTOR condition and future Reactor Possession Permit extensions.

Under the Proposed Action Alternative, the Deactivated SM-1 Nuclear Reactor Facility would be decommissioned and dismantled. All radioactive and non-radioactive materials and equipment, as well as remnant structures, including the intake pier and pumphouse, concrete discharge pipe, and outfall structure, would be removed from the SM-1 site. Removal of in-water structures would require work in the 100-year floodplain and tidal wetlands associated with Gunston Cove. All radioactive and non-radioactive materials and waste associated with the site would be packaged, transported, and disposed of in accordance with applicable laws and regulations. Fort Belvoir's

existing road network would be used to access the SM-1 site, and to transport materials and waste off-post for disposal or recycling.

Following decommissioning, the site would be restored, including the placement of clean fill soils and grading to mimic the site's current elevation and topography, and released for unrestricted use. The 100-year floodplain and tidal wetlands would return to a pre-disturbance condition following the removal of the remnant in-water structures. Adherence to applicable safety plans and standard operating procedures would minimize health and safety risks. The Proposed Action Alternative would avoid, minimize, or mitigate any potential adverse environmental impacts to the maximum extent possible.

Under the No Action Alternative, USACE would continue to maintain the Deactivated SM-1 Nuclear Reactor Facility in a SAFSTOR condition under the current reactor possession permit (No. SM1-1-19). The No Action Alternative would require USACE to continue bearing the cost of maintenance and would not allow the site to be restored or returned to a natural state. Although the No Action Alternative does not meet the Proposed Action's purpose and need, it represents the status quo and serves as a comparative baseline for analysis in the EA, in accordance with 40 CFR Part 1502.14.

Environmental Effects:

The EA presents an analysis of the potential environmental impacts associated with the Proposed Action Alternative and No Action Alternative. Potential direct, indirect, and cumulative impacts were evaluated for water resources; air quality; biological resources; radiological safety and health; occupational safety and health; cultural resources; transportation and traffic; non-radiological hazardous materials and non-hazardous solid waste; and geology, topography, and soils. Neither Alternative would have significant adverse impacts on these resources.

By necessity of the location of the intake pier, pump house, and wastewater outfall pipe and the requirement to remove those structures to complete decommissioning and dismantlement of SM-1, activities to facilitate their removal must occur in tidal wetlands and the 100-year floodplain to satisfy the Proposed Action's purpose and need. USACE would comply with applicable provisions of Executive Order (EO) 11988, *Floodplain Management* and Clean Water Act (CWA) in conducting this work; therefore, adverse short-term impacts on those resources from the Proposed Action Alternative would be less than significant. Long-term impacts would be beneficial as those resources return to a pre-disturbance condition. In accordance with EO 11988, this FNSI incorporates USACE's FONPA explaining its decision to implement the Proposed Action Alternative in the 100-year floodplain associated with Gunston Cove. The detailed rationale and analysis for this finding is provided in the Final EA.

USACE has determined that the Proposed Action Alternative would have an *Adverse Effect* on the NRHP-eligible SM-1 Reactor Facility under Section 106 of the NHPA. In consultation with the Virginia Department of Historic Resources (VDHR; the Commonwealth of Virginia's State Historic Preservation Office [SHPO]), the Advisory Council on Historic Preservation (ACHP), and other participating Section 106 consulting parties, USACE has developed a Memorandum of Agreement (MOA) that stipulates measures that USACE will implement to mitigate this adverse effect on the SM-1 historic property and ensure that it remains less than significant. These measures are summarized as follows:

- A. USACE will produce Historic American Engineering Record (HAER) Level II documentation for the SM-1 Reactor Facility. The written documentation will include physical descriptions of the facility, detailed discussion of its historic significance, a discussion of how the facility was operated, and a description of the decommissioning and demolition process, supported by a complete bibliography and electronic repository, including photography, videography, historic motion picture film, and relevant documents, as appropriate. The HAER Level II documentation will also include scanned and digitally enhanced copies of

the available as-built drawings of Building 372 and 3-dimensional renderings of Building 372 using Light Detection and Ranging (LIDAR) scans.

- B. For inclusion in the HAER Level II documentation, USACE will conduct interviews with personnel closely associated with the construction, operation, and initial closure of SM-1. Interviews will be conducted, recorded, and transcribed in accordance with applicable standards.
- C. All field work, photography, and research necessary to produce HAER Level II documentation for the SM-1 Reactor Facility will be carried out by or under the direct supervision of architectural historians or historians who meet the appropriate Secretary of the Interior's *Professional Qualification Standards* (SOI Standards; 48 *Federal Register* 44738-9, Sept. 29, 1983). All work will be conducted in accordance with *Recording Historic Structures and Sites for the Historic American Engineering Record* (48 *Federal Register* 44731-34, September 29, 1983); Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation* (36 CFR Part 61); and Secretary of the Interior's *Standards for the Treatment of Historic Properties* (36 CFR Part 68).
- D. The participating Section 106 consulting parties for the MOA, including the SHPO, will be provided with an opportunity to review and comment on the HAER Level II documentation.
- E. USACE will carefully remove the commemorative plaque currently affixed to Building 372 and move it to an as-yet-undetermined facility in Virginia for restoration and display.
- F. In consultation with the participating Section 106 consulting parties, USACE will develop and erect a historical plaque/marker at the SM-1 site following site restoration activities to commemorate the SM-1 Reactor Facility and its national significance. USACE will also erect up to two additional plaques/markers at as-yet-undetermined, publicly accessible locations.
- G. Within one year of the MOA's enactment, USACE will salvage historical items from the SM-1 Reactor Facility to be placed on loan to appropriate repositories for traveling exhibits. The salvaged items may include, but are not limited to, the educational control panel, a historic scale model, and other items remaining from when Building 372 operated as a museum.
- H. The HAER Level II documentation will be completed within one year after the demobilization of decommissioning equipment and personnel from the SM-1 site

With implementation of measures specified in the MOA and other applicable best management practices and minimization measures described in the EA, the Proposed Action Alternative would have no significant adverse impacts on human health or the environment.

Finding of No Practicable Alternative:

Pursuant to Executive Order 11988, I find that there is no practicable alternative to siting elements of the Proposed Action entirely outside of floodplains. USACE will ensure that all practicable measures to minimize impacts on and within the floodplain environment are incorporated into the Proposed Action. This decision has been made after taking into account all submitted information and considering a full range of practical alternatives that meet project requirements.

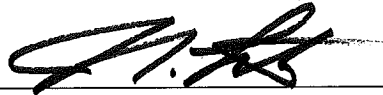
Finding of No Significant Impact:

Based on information gathered and analyzed in the EA, the Department of the Army finds that implementing the Proposed Action would not significantly impact the quality of the natural or human environment as defined at 32 CFR Part 651.41-42; therefore, preparation of an EIS is not required.

U.S. Army Corps of Engineers, Baltimore District

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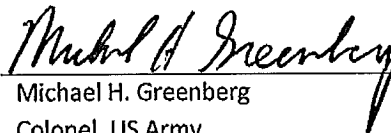


COL John T. Litz
District Engineer

U.S. Army Garrison Fort Belvoir

31 Apr 20

Date



Michael H. Greenberg
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Environmental Assessment
Decommissioning and Dismantlement of the
Deactivated SM-1 Nuclear Reactor Facility
US Army Garrison Fort Belvoir, Fairfax County, Virginia

Vol. I

April 2020



Prepared by the

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FINAL

Final Environmental Assessment

Decommissioning and Dismantlement of the Deactivated SM-1 Nuclear Reactor Facility

ABSTRACT

The United States Army Corps of Engineers (USACE) has prepared this Environmental Assessment (EA) to evaluate the potential environmental consequences of the proposed decommissioning and dismantlement of the United States (US) Army's Deactivated Stationary Medium Power Model 1 (SM-1) Nuclear Reactor Facility at US Army Garrison Fort Belvoir (Fort Belvoir) in Fairfax County, Virginia ("Proposed Action"). In accordance with Army Regulation (AR) 50-7, *Army Reactor Program*, USACE is the lead Army component and single point of contact at Headquarters, Department of the Army for nuclear reactor decommissioning, and ensures compliance with environmental requirements for decommissioning Army nuclear reactors. The Proposed Action would decommission and remove all radioactive and non-radioactive materials (e.g., buildings, underground utility lines, contaminated soil) from the SM-1 site. Radioactive, hazardous, and non-radioactive waste would be segregated and prepared on-site for transport to an appropriate disposal or recycling facility. The proposed decommissioning and dismantlement of SM-1 would reduce residual radioactivity to levels that allow USACE to release the site for unrestricted use as defined in 10 Code of Federal Regulations (CFR) Part 20.1402, *Radiological Criteria for License Termination* and return the property to Fort Belvoir for future use. In accordance with AR 50-7, implementing the Proposed Action is necessary to complete the decommissioning of SM-1 within 60 years of the reactor's deactivation.

This EA has been prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA; Title 42, United States Code [USC] Part 4321 et seq.); the NEPA-implementing regulations of the Council on Environmental Quality (CEQ) (40 CFR Parts 1500–1508); and the Army's NEPA regulations (32 CFR Part 651, *Environmental Analysis of Army Actions*). The EA considers several alternatives to implement the Proposed Action, but determined that only one alternative would satisfy the Proposed Action's purpose and need. Accordingly, this EA provides a detailed analysis of two alternatives: the Proposed Action Alternative and No Action Alternative, or status quo. Resources or resource areas evaluated in the EA include: water resources, including water-based recreation; air quality; biological resources; radiological and occupational safety and health; cultural resources; transportation and traffic; non-radiological hazardous materials and waste, and non-hazardous solid waste; and geology, topography, and soils. With implementation of best management practices (BMP) and mitigation measures, the EA concludes that adverse impacts would not meet the conditions requiring preparation of an Environmental Impact Statement (EIS) (32 CFR Part 651.41, *Conditions requiring an EIS*). The Proposed Action Alternative would have no significant adverse impacts on the natural or human environment and therefore, is not an action normally requiring preparation of an EIS (32 CFR 651.42, *Actions normally requiring an EIS*).

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Facility
US Army Garrison Fort Belvoir, Fairfax County, Virginia**

FINAL

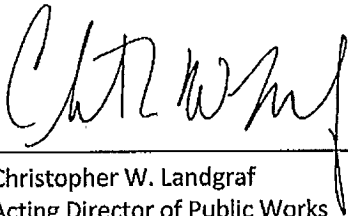
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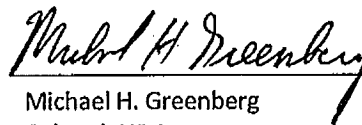


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Executive Summary

ES.1 Introduction

This Environmental Assessment (EA) evaluates the potential environmental impacts of decommissioning and dismantling the United States (US) Army's Deactivated Stationary Medium Power Model 1 (SM-1) Nuclear Reactor Facility at US Army Garrison Fort Belvoir (Fort Belvoir) in Fairfax County, Virginia ("Proposed Action"). The Deactivated SM-1 Nuclear Reactor Facility is located on Fort Belvoir's South Post along the shoreline of Gunston Cove, a tidal embayment of the Potomac River. The US Army Corps of Engineers (USACE) maintains SM-1 in accordance with USACE's current Reactor Possession Permit Number SM1-1-19 (USANCA, 2019) issued by the Army Reactor Office (ARO). ARO, established by the US Army Nuclear and Countering Weapons of Mass Destruction Agency (USANCA), oversees the Army Reactor Program (ARP) and designates the ARP Manager. Although SM-1 is on Fort Belvoir's fee title land, Army Regulation (AR) 50-7, *Army Reactor Program* designates USACE as the lead Army component and single point of contact at Headquarters, Department of the Army for nuclear reactor decommissioning to ensure compliance with environmental requirements for decommissioning Army nuclear reactors.

ES.2 Background

SM-1 was the Army's first nuclear-powered, electricity-generating station and the first pressurized water reactor to be connected to an electrical grid in the US. SM-1 operated from 1957 to 1973 and was primarily used to train military personnel in nuclear reactor operations. From 1973 to 1974, SM-1 was deactivated. Deactivation consisted of removal and disposal of the nuclear fuel, minor decontamination, shipment of necessary radioactive waste, sealing the reactor vessel, and installation of appropriate warning signs and monitoring devices in accordance with the *SM-1 Decommissioning and Conversion Plan* as approved by the Army Reactor Systems Health and Safety Review Committee (US Army, 1975). The SM-1 vapor container, which contains the reactor pressure vessel, reactor shield tank, and the primary system components, was also sealed and the facility was placed under a routine monitoring program currently implemented by USACE.

The SM-1 site is located on Fort Belvoir's South Post (i.e., the portion of Main Post to the south of Richmond Highway/US Route 1) within the secured 300 Area. It is situated on an approximately 3.6-acre fenced parcel of land adjacent to Gunston Cove. The SM-1 site contains the reactor building (Building 372), an inactive wastewater lift station (Building 7350), a small warehouse (Building 349), a water intake pier and pump house (Building 375) that extends into Gunston Cove from the shoreline, and a concrete discharge pipe and outfall structure. Building 375, the concrete discharge pipe, and outfall structure are within the 100-year floodplain and tidal wetlands associated with Gunston Cove. (Other buildings formerly associated with the operation of SM-1 outside the facility's fenced perimeter have either been demolished or repurposed for other uses. These buildings are not addressed by the Proposed Action analyzed in this EA.)

SM-1 was designed, built and operated as part of the Army Nuclear Power Program (currently the ARP) under authority granted to the Department of Defense (DOD) by Section 91(b) of the Atomic Energy Act (AEA) of 1954, as amended (42 United States Code (USC) Part 2121). Section 91(b) authorizes DOD to procure and utilize special nuclear material in the interest of national defense and to acquire utilization facilities (i.e., reactors for military purposes). Section 110(b) of the AEA excludes reactor facilities acquired by DOD from the licensing requirements of the Act. The Proposed Action falls within the authorities granted to DOD under Sections 91(b) and 110(b) of the AEA, to regulate radioactive materials associated with a "utilization facility for military purposes."

The AEA provides the authorities to the Army to establish the ARO and administer the ARP. AR 50-7 implements this authority and sets forth program policies consistent with US Nuclear Regulatory Commission (NRC) regulations including decommissioning criteria set forth in 10 Code of Federal Regulations (CFR) 20 Subpart E, *Radiological Criteria for License Termination*. Today, the ARP helps ensure that Army reactors are decommissioned in a manner that is consistent with federal regulatory standards and guidelines, including those put forth by NRC, the National Council on Radiation Protection (NCRP), and American National Standards Institute (ANSI). It is Army policy to implement project consistent with NRC guidelines as well as the recommendations of ANSI and NCRP.

ES.2.1 Decommissioning

Decommissioning includes the full range of actions taken to bring radioactivity levels at the site down to the unrestricted release standards provided in 10 CFR 20.1402. This includes construction-related activities such as facility dismantlement and removal, as well as other requirements that must be met prior to and during such activities.

AR 50-7 requires USACE to obtain a Decommissioning Permit from ARO in accordance with the Deactivated Reactor Management Plan (DRMP), which outlines a process for managing the Army's deactivated nuclear power plants, including SM-1 (US Army, 2016). As described in the DRMP, a four-phase All Hazards Assessment (AHA) is central to the licensing of these facilities. The four phases of an AHA include:

- **Phase I** consists of preparation of a historical site assessment (HSA) to quantify data quality objectives, and a conceptual site model to inform the conduct of a characterization survey. The HSA also includes an initial waste classification of large reactor components.
- **Phase II** consists of radiological and non-radiological sampling and analyses, and preparation of a Characterization Survey Report (CSR). Based on the CSR, a disposal alternatives evaluation and decommissioning and disposal cost estimate are also prepared.
- **Phase III** consists of developing detailed design plans to execute the selected hazards reduction approach, decommissioning, and disposal options.
- **Phase IV** consists of executing the Phase III plans and conducting a final status survey (FSS) for permit termination.

The planning, sampling, and analytical requirements of the AHA are integral parts of the decommissioning process that ensure proper waste classification, handling, treatment, disposal, and/or storage. The proposed decommissioning of SM-1 is currently in Phase III; Phase I and Phase II have been completed.

The ARP adopts the NRC's radiological dose criteria for releasing a facility or site for unrestricted use, as provided in 10 CFR Part 20.1402, Subpart E. This regulation states that a facility or site can be released for unrestricted use if radioactivity levels are such that the average member of a critical group would not receive a Total Effective Dose Equivalent in excess of 25 millirems per year. Regulations at 10 CFR Part 20 also stipulate that residual activity be reduced to levels that are as low as reasonably achievable (ALARA).

NRC and the US Department of Transportation (USDOT) co-regulate the transportation of radioactive materials (44 *Federal Register* 38690, July 2, 1979). USDOT regulates all aspects of transportation to include packaging, documentation, and shipment or carrier responsibilities. NRC develops safety standards for packaging certain radioactive materials (adopted by USDOT) and licenses the transport of radioactive materials for compliance with USDOT-specific regulations that fall outside their purview (NRC, 2019). ARO does not regulate the transportation of radioactive materials.

Non-radioactive wastes generated from the proposed SM-1 decommissioning would fall under the regulatory jurisdiction of the US Environmental Protection Agency and applicable state agencies. These wastes may include lead-based paints, lead used as radiation shielding, mercury regulated under the Resource Conservation and Recovery Act (RCRA), and asbestos containing materials and polychlorinated biphenyls regulated under the Toxic Substances Control Act (TSCA). RCRA defines "mixed waste" in 40 CFR 266.210 as "a waste that contains both RCRA hazardous waste and source, special nuclear, or byproduct material subject to the Atomic Energy Act of 1954 as amended." Mixed wastes generally require treatment (such as microencapsulation) prior to disposal at a radioactive waste disposal facility. Radiologically contaminated TSCA waste, while not technically "mixed waste," also requires special waste management considerations.

ES.3 Purpose and Need

Under the Army's Deactivated Nuclear Power Plant Program, decommissioning a nuclear reactor is required within 60 years of its final shutdown in order to be consistent with the NRC regulations (as adopted by the ARP in AR 50-7). The Deactivated SM-1 Nuclear Reactor Facility has been in a safe storage (SAFSTOR) condition and subject to regular inspection and monitoring for more than 46 years. Accordingly, the purpose of the Proposed Action is to safely remove, transport, and dispose of all materials and equipment (M&E) and structures associated with the Deactivated SM-1 Nuclear Reactor Facility and remediate environmental impacts from the facility such that residual radioactivity levels meet the applicable criteria for unrestricted use. The Proposed Action would accomplish this objective and terminate the ARO Decommissioning Permit for SM-1.

USACE maintenance of the Deactivated SM-1 Nuclear Reactor Facility is costly and not sustainable over the long-term. Costs to maintain and ultimately decommission SM-1, including the transport and disposal of radioactive debris, will only continue to increase over time. In its current state, the SM-1 site does not support the Army's mission on Fort Belvoir, now or in the future. Although Fort Belvoir covers 7,696 acres, approximately 57 percent (4,714 acres) is constrained to development. The SM-1 site, located in Fort Belvoir's intensively developed 300 Area, represents an ideal location to potentially support a future DoD facility or tenant¹.

Therefore, the need for the Proposed Action is to complete the decommissioning of the Deactivated SM-1 Nuclear Reactor Facility within 60 years of its final shutdown in accordance with the NRC regulations as adopted by the ARP in AR 50-7. The Proposed Action would complete Phase IV of the multi-phased AHA by implementing the detailed design and execution plans prepared as part of Phase III. Upon ARO approval of the final, site-specific Decommissioning Plan (DP) outlining the proposed decommissioning approach for SM-1, decommissioning activities for SM-1 would proceed to completion. Implementing the Proposed Action in this manner would result in a cost savings to USACE as maintenance of the site would no longer be required. Upon its completion, the Proposed Action would return the property to Fort Belvoir. Further, the Proposed Action allows USACE to meet Army mission objectives to decommission SM-1 and terminate the SM-1 possession permit.

ES.4 Alternatives

This EA evaluates the No Action and Proposed Action Alternatives. If implemented, the Proposed Action Alternative would complete the decommissioning of the Deactivated SM-1 Nuclear Reactor Facility in accordance

¹ Neither the Army nor Fort Belvoir has proposed or identified a future facility or tenant for the SM-1 site. Development of the SM-1 site to support a future DoD facility or tenant is not included in the Proposed Action and would be evaluated in NEPA documentation that would be prepared separately from this EA.

with the ARO-approved DP. The No Action Alternative would continue to maintain SM-1 in a SAFSTOR condition. None of the other evaluated alternatives satisfied the Proposed Action's purpose and need.

ES.4.1 No Action Alternative

Under the No Action Alternative, USACE would continue to maintain the Deactivated SM-1 Nuclear Reactor Facility in a SAFSTOR condition under Reactor Possession Permit Number SM1-1-19 and future permit extensions. The ARP's mission to deactivate SM-1 and return the property to Fort Belvoir would be delayed or defunct, should decommissioning not take place within 60 years of its deactivation. Under the No Action Alternative, USACE would continue to bear the cost of maintaining the Deactivated SM-1 Nuclear Reactor Facility, including regular inspection and monitoring. The site would not be restored, allowed to return to a natural state, or re-purposed to support the Army's mission on Fort Belvoir under this Alternative. While the No Action Alternative would not meet the Proposed Action's purpose and need, it is analyzed in the EA to provide a comparative baseline in accordance with 40 CFR Part 1502.14.

ES.4.2 Proposed Action Alternative

The Proposed Action Alternative would execute the ARO-approved SM-1 DP in compliance with USACE safety requirements and applicable federal and state laws and regulations. Decommissioning and dismantlement of the Deactivated SM-1 Nuclear Reactor Facility under this Alternative would include the following types of activities:

- Mobilization and site preparation
- Removal of radioactive M&E
- Decontamination
- Removal of non-radioactive M&E
- Dismantlement and debris removal
- Site remediation and restoration
- Demobilization

The Proposed Action Alternative would generally be sequenced in the order presented above; however, the final decommissioning approach would be organized and conducted based on factors such as scheduling, permitting, and the availability of personnel and specialized equipment. During the course of the Proposed Action Alternative, waste characterization and shipping, and material/facility release surveys would be conducted on a routine basis.

All radioactive waste generated from decommissioning activities would be packaged, transported, and disposed of in accordance with applicable laws and regulations. Waste transport from the SM-1 site would be distributed over the approximately 5-year decommissioning period; however, it is anticipated that 50 percent of waste shipments would occur during the middle 12 months (i.e., months 19 through 30) of the project (USACE, 2018c).

The removal of Building 375, the concrete discharge pipe, and outfall structure would require work within the 100-year floodplain and tidal wetlands associated with Gunston Cove. In accordance with Executive Order 11988, USACE has prepared a Finding of No Practicable Alternative (FONPA) explaining its decision to implement the Proposed Action Alternative in the 100-year floodplain.

Site restoration would include the placement of clean fill soils and grading to mimic the site's current elevation and topography. A loamy top soil seeded with native grasses and shrubs to promote revegetation would then be applied to the site. USACE would also comply with Fort Belvoir's Policy Memorandum #27, *Tree Removal and Protection*, by replanting trees at a 2-to-1 replacement ratio, either on-site or elsewhere on Fort Belvoir (Fort

Belvoir, 2018b). The removal of structures from the 100-year floodplain and tidal wetlands associated with Gunston Cove would enable those areas to return to a pre-disturbance condition in the long term.

Under the Proposed Action Alternative, Fort Belvoir's existing road network would be used to access the SM-1 site, and to transport materials and waste for disposal or recycling off-post. The primary routes designated for this purpose include Wilson Road and Totten Road within the 300 Area, and Theote Road and Pohick Road from the 300 Area to US Route 1 (Richmond Highway).

ES.5 Public and Agency Involvement

USACE outreach regarding the Proposed Action is ongoing and included a six-week public review and comment period for the Draft EA that began on December 20, 2019 and ended on January 31, 2020. Three public meetings were held during the six-week Draft EA public comment period. The availability of the Draft EA for public review and the dates, times, and locations of the Draft EA public meetings were announced via publication of a Notice of Availability (NOA) in local newspapers and on social media platforms maintained by USACE and Fort Belvoir. Additionally, printed copies of the Draft EA were made available for public review at the Fort Belvoir Library and the Kingstowne and Lorton branches of the Fairfax County Public Library. No comments requiring substantial revision of the EA, USACE's Proposed Action, or the impact analysis were received during the Draft EA public comment period. Comments requiring minor revisions are addressed accordingly in the Final EA. Additional information about the proposed SM-1 decommissioning is available online at <https://www.nab.usace.army.mil/Missions/Environmental/SM-1/>.

USACE consulted with numerous regulatory agencies concerning the proposed decommissioning of the Deactivated SM-1 Nuclear Reactor Facility, including the Virginia Department of Historic Resources (VDHR; the Commonwealth of Virginia's State Historic Preservation Office [SHPO]), the US Fish and Wildlife Service (USFWS), and National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NOAA Fisheries). In accordance with DOD Instruction 4710.02, *Interactions with Federally Recognized Tribes*, USACE also coordinated with recognized state and federal Indian tribes having possible ancestral ties to the region. Substantive public and agency comments received to date are addressed in the EA, as appropriate.

ES.6 Environmental Consequences

The potential environmental consequences of the No Action and Proposed Action Alternatives are summarized in **Table ES-1**. For all resources analyzed in the EA, adverse impacts would be less than significant and would not meet the conditions requiring preparation of an EIS as defined at 32 CFR Part 651.41, *Conditions requiring an EIS*. Therefore, the Army has determined that the Proposed Action is not an action normally requiring preparation of an EIS as defined at 32 CFR Part 651.42, *Actions normally requiring an EIS*.

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Table ES-1: Summary of Environmental Impacts and Management and/or Mitigation Measures

Resource Area	No Action Alternative	Proposed Action Alternative	Management and/or Mitigation Measures (Proposed Action Alternative)
Water Resources, including Water-Dependent Recreation (EA Section 3.3)	No impacts. There would be no impacts on water resources, water quality, or water-dependent recreation as no decommissioning activities would occur. Existing conditions would continue.	<p>Short-term, less-than-significant adverse impacts on groundwater, surface water, water quality, and stormwater from potential release of waste fluids and sedimentation during decommissioning and dismantlement activities.</p> <p>Short-term, less-than-significant adverse impacts on wetlands, floodplains, Resource Protection Areas (RPAs), and water-dependent recreation from decommissioning and dismantlement activities occurring in these areas.</p> <p>Long-term, beneficial impacts on groundwater, water quality, RPAs, stormwater, floodplains, and water-dependent recreation from restoration of the SM-1 site to a permeable, vegetated condition, and removal of in-water structures from the 100-year floodplain and wetlands.</p>	<ul style="list-style-type: none"> • Capture, containerize, and characterize waste fluids during dismantlement activities, transport from the site by licensed contractors, and dispose of at permitted off-post facilities. • Provide spill kits on the site in the event that containment and cleanup of accidental spills is needed. • Plan, review, and evaluate activities with the potential to release residual or waste fluids to identify best practices and procedures to contain fluids and prevent accidental releases. • Cut support piles below the mudline during removal of the intake pier/pump house structure and leave portions below the mudline in place to minimize sediment and subaqueous bottom disturbance. • Use containment booms, turbidity curtains, and/or similar measures during in-water work to prevent the downstream migration of floating debris and disturbed sediments, and ensure that disturbed sediments re-settle near their original location. • Obtain permit coverage pursuant to Sections 401/404 of the Clean Water Act (CWA) prior to wetland disturbance. • Mitigate tree removal in RPAs through the planting of two new trees for the removal of every tree four inches in diameter at breast height or greater in accordance with Fort Belvoir Policy Memorandum #27, <i>Tree Removal and Protection</i>. • Obtain coverage under the Virginia Department of Environmental Quality's (VDEQ) Construction General Permit (CGP) prior to earth disturbance. • Post signage or provide additional notification as determined necessary to ensure that boaters maintain a safe distance during removal of the intake pier/pump house. • Implement BMPs for noise control such as erection of temporary sound barriers; limiting the idling of vehicles and equipment when parked or not in use; using newer, quieter equipment to the extent possible and keeping equipment well-maintained and in good working order. • To the extent possible, conduct decommissioning activities during normal daytime working hours (i.e., approximately 8:00 a.m. to 5:00 p.m., Monday through Friday) to further minimize temporary decommissioning-related noise impacts.

Table ES-1: Summary of Environmental Impacts and Management and/or Mitigation Measures

Resource Area	No Action Alternative	Proposed Action Alternative	Management and/or Mitigation Measures (Proposed Action Alternative)
Air Quality (EA Section 3.4)	No impacts. There would be no impacts on air quality. Existing conditions would continue.	Short-term, less-than-significant adverse impacts on air quality from emissions of Criteria pollutants, hazardous air pollutants (HAP), and greenhouse gases (GHG) by construction equipment and vehicles during decommissioning and dismantlement activities. No long-term impacts.	<ul style="list-style-type: none"> • Cover truck beds while in transit to limit fugitive emissions. • Spray water on any unpaved roads or stockpiles to limit fugitive emissions. • Use ultra-low sulfur diesel as a fuel source where appropriate to minimize oxides of sulfur emissions. • Use clean diesel in construction equipment and vehicles through the implementation of add-on control technologies (e.g., diesel particulate filters and diesel oxidation catalysts, repowers, and/or newer and cleaner equipment). Use electric-powered equipment in lieu of diesel-powered equipment when feasible. • Implement control measures for heavy construction equipment and vehicles (e.g., minimizing operating and idling time), to limit criteria pollutant emissions. • Obtain air quality permits as necessary, in compliance with federal, state, and local standards.
Biological Resources (EA Section 3.5)	No impacts. Continued maintenance of the Deactivated SM-1 Nuclear Reactor Facility would have no effects on biological resources on and in the vicinity of the site.	<p>Short-term, less-than-significant adverse impacts on vegetation and plant communities, wildlife and habitat, protected species, and Special Natural Areas from disturbance of terrestrial and aquatic environments (including osprey nesting areas) during decommissioning and dismantlement activities.</p> <p>Long-term, beneficial impacts on wildlife, protected species, and habitats from site restoration and revegetation.</p> <p>Endangered Species Act (ESA) Section 7 and Magnuson-Stevens Fishery Conservation and Management Act (MSA) determinations:</p> <p>Not likely to adversely affect the federally threatened northern long-</p>	<ul style="list-style-type: none"> • In consultation with Fort Belvoir's Directorate of Public Works (DPW), prepare and adhere to a site-specific replanting plan. • Adhere to Fort Belvoir policies and practices to prevent or minimize the introduction and spread of invasive plant species, such as cleaning equipment and vehicles before they leave the site. • Replant cleared trees on-site where deemed suitable in accordance with Fort Belvoir policy; reseed other disturbed areas with native grasses and/or shrubs to promote revegetation. • Incorporate applicable time of year restrictions into the project work plan to prevent or minimize adverse impacts on biological resources on or near the SM-1 site. • Relocate active osprey nests (e.g., on Building 372 and the intake pier) according to VDGIF's <i>Removal or Relocation of Osprey Nests in Virginia: A Guideline for Landowners</i> (VDGIF, 2010) and Fort Belvoir's Policy Memorandum #78, <i>Conservation of Migratory Birds</i>. • Cut support piles below the mudline during removal of the intake pier/pump house structure and leave portions below the mudline in place to minimize sediment and subaqueous bottom disturbance. • Use containment booms, turbidity curtains, and/or similar measures during in-water work to prevent the downstream migration of floating debris and

Table ES-1: Summary of Environmental Impacts and Management and/or Mitigation Measures

Resource Area	No Action Alternative	Proposed Action Alternative	Management and/or Mitigation Measures (Proposed Action Alternative)
		<p>eared bat (NLEB) and <i>no effect</i> on terrestrial critical habitat; <u>USFWS concurrence received</u>.</p> <p><i>May affect, but unlikely to adversely affect</i> Essential Fish Habitat (EFH); <u>NOAA Fisheries concurrence received</u>.</p> <p><i>Not likely to adversely affect</i> federally listed fish species and critical habitat; <u>NOAA Fisheries concurrence received</u>.</p>	<p>disturbed sediments, and ensure that disturbed sediments re-settle near their original location.</p> <ul style="list-style-type: none"> • Inform workers and personnel on the SM-1 site of the bald eagle's active nesting season (15 November to 15 June). Coordinate with Fort Belvoir's Environmental Division, USFWS, and VDGIF as necessary. • Prohibit vegetation clearing between 1 April and 15 July of any year to prevent or minimize impacts on migratory birds; or, conduct surveys for birds and/or active nests prior to vegetation clearing if such activities cannot be avoided during that time period. • Prohibit vegetation clearing between 15 April and 15 September to protect special status bat species. • To the extent possible, avoid in-water activities between 15 February and 30 June of any year to prevent or minimize impacts on anadromous fish. • To the extent possible, implement measures to prevent or minimize impacts on submerged aquatic vegetation (SAV) and the introduction or spread of aquatic invasive species during in-water activities associated with the Proposed Action. • Update protected species queries and re-initiate consultation with applicable regulatory agencies if it is determined that the Proposed Action would potentially affect new or additional protected species not addressed in this EA. • Mitigate dust levels with water sprays and covers over dust-creating stockpiles and truck transport (e.g., soils). • Follow time of year restrictions to minimize or avoid impacts on bald eagle habitat, as necessary, for activities within the Potomac River Eagle Concentration Area. • Monitor replanted vegetation on the site for one year following demobilization to ensure successful establishment and viability.
Radiological Safety and Health (EA Section 3.6)	<i>No impacts.</i> While there would be no radiological impacts on safety, contamination, waste, or disposal from the No Action Alternative, there would be a need for continued environmental monitoring and	<i>Short-term, less-than-significant adverse impacts</i> on radiological exposure (human health and safety), waste generation, transportation, and disposal, and potential accidental release of radioactive materials from decommissioning and	<ul style="list-style-type: none"> • Implement a Radiation Safety Program, an Environmental Monitoring and Control Program, and a Waste Management program to ensure the safe removal of activated and/or contaminated components and reduce the risk of potential release to the environment. These programs would also require routine measurement of the quantity of direct radiation and radioactive material releases. • Provide appropriate monitoring of occupational radiation exposure to staff

Table ES-1: Summary of Environmental Impacts and Management and/or Mitigation Measures

Resource Area	No Action Alternative	Proposed Action Alternative	Management and/or Mitigation Measures (Proposed Action Alternative)
	security protocols to ensure long-term environmental and public safety. Very limited quantities of solid waste would be generated at the facility from routine surveillance operations.	dismantlement activities. Long-term, beneficial impacts from removal and disposal of radioactive waste in licensed/permitted landfills.	entering and working in the restricted area in accordance with EM 385-1-1. An individual's access to radiation areas will be restricted as the individual approaches the exposure dose limit to minimize further occupational exposure and ensure regulatory limits are not exceeded. <ul style="list-style-type: none">Implement a Waste Management Plan (WMP) during the decommissioning process for safe handling and management of low-level radioactive waste (LLRW). Perform sorting, segregation, and decontamination to the extent practical to minimize the amount of radioactive waste requiring treatment and disposal. Notify all appropriate authorities and satisfy all regulatory requirements prior to off-site shipment of any radioactive material.
Occupational Safety and Health (EA Section 3.7)	Less-than-significant adverse short- and long-term direct impacts on occupational safety and health from continued maintenance of the Deactivated SM-1 Nuclear Reactor Facility. No short- or long-term indirect impacts on occupational safety and health from continued maintenance of the Deactivated SM-1 Nuclear Reactor Facility.	Short- and long-term, less-than-significant adverse impacts on occupational safety and health during decommissioning and dismantlement activities and site maintenance following restoration.	<ul style="list-style-type: none">Prepare, implement, and adhere to an accident prevention plan (APP) before performing work. Review and update the APP throughout the Proposed Action Alternative as project phases and/or conditions change. USACE would provide continuous oversight of the APP.Enter into one or more Memorandum of Agreement (MOA) with on- and off-post fire and emergency response services and/or emergency health care providers to define roles and responsibilities and establish conditions for response, oversight, and monitoring.
Cultural Resources (EA Section 3.8)	Less-than-significant adverse impacts on Buildings 372, 349, 350/7350, and 375, which would not be repurposed and would be inefficient to maintain in their present condition.	Less-than-significant adverse effect on National Register of Historic Places (NRHP)-eligible architectural resources from dismantlement of SM-1 and associated structures, with implementation of applicable mitigation and minimization measures. No effect on traditional cultural resources. National Historic Preservation Act Section 106 determination: Adverse effect on the SM-1 Reactor	<ul style="list-style-type: none">Adhere to the policies and procedures for unanticipated discoveries per 36 CFR Part 800.13, <i>Post-review Discoveries</i> and Fort Belvoir Policy Memorandum #26, <i>Unanticipated Discoveries</i> including immediately ceasing work and notifying the SHPO, Fort Belvoir Cultural Resource Manager, federally and state-recognized Indian tribes, ACHP, and other relevant parties upon discovery of materials or human remains during ground disturbance activities.Adhere to mitigation measures stipulated in a MOA between USACE, SHPO, ACHP, and other participating Section 106 consulting parties, including:<ul style="list-style-type: none">Production of Historic American Engineering Record (HAER) Level II documentation for SM-1, to include a detailed historical narrative, accompanying photography and videography, and recorded interviews with former SM-1 personnel, which will be provided to the SHPO and

Table ES-1: Summary of Environmental Impacts and Management and/or Mitigation Measures

Resource Area	No Action Alternative	Proposed Action Alternative	Management and/or Mitigation Measures (Proposed Action Alternative)
		Facility historic property; <u>SHPO concurrence received.</u>	<ul style="list-style-type: none"> participating Section 106 consulting parties for review and comment; Removal of the commemorative plaque from Building 372 and restoration and display at an as-yet-undetermined facility in Virginia; Development and installation of a historical plaque/marker at the SM-1 site and up to two publicly accessible locations following decommissioning activities; and Salvage of historical items from the SM-1 facility within one year of the MOA's enactment and loan of such items to appropriate repositories for traveling exhibits.
Transportation and Traffic (EA Section 3.9)	No impacts. There would be no impacts on the on-post and off-post transportation network.	<p>Short-term, less-than-significant adverse impacts on the on- and off-post transportation network, road conditions, and health and safety from the transport of waste, import of fill material, and workers' commuting vehicles.</p> <p>No long-term impacts.</p>	<ul style="list-style-type: none"> Implement a project-specific transportation management plan identifying approved travel routes to and from the site for decommissioning personnel and heavy trucks transporting materials, equipment, and debris. Notify on- and off-post emergency responders of the types of shipments that would be transported to support preparation for potential transportation-related accidents. Schedule decommissioning-related traffic for off-peak hours in coordination with Fort Belvoir and other affected organizations to minimize roadway congestion. Package and ship all radioactive waste and other debris generated at the SM-1 site in accordance with the WMP and consistent with NRC and USDOT regulatory requirements.
Non-Radiological Hazardous Materials and Waste, and Non-Hazardous Solid Waste (EA Section 3.10)	Less-than-significant adverse impacts from non-radioactive hazardous materials that would remain in Building 372 and on the SM-1 site. Small quantities of hazardous and non-hazardous solid waste would be generated at the facility from routine surveillance operations.	<p>Short-term, less-than-significant adverse impacts on non-radiological hazardous waste and non-hazardous solid waste generated from dismantlement of the facility.</p> <p>No long-term impacts.</p>	<ul style="list-style-type: none"> Generate, handle, manage, store, package, characterize, transport, and dispose of all waste generated during the Proposed Action Alternative in accordance with written procedures and requirements set forth in applicable management plans (e.g., the WMP and DP).
Geology, Topography, and Soils (EA Section 3.11)	Less-than-significant adverse impacts from radiologically contaminated soils that would not be removed from the site.	Short-term, less-than-significant adverse impacts on topography, soils, bathymetry, and sediments from dismantlement and excavation	<ul style="list-style-type: none"> Obtain ground disturbance permits from Fort Belvoir DPW. Obtain coverage under the CGP and adhere to the requirements of a site-specific stormwater pollution prevention plan (SWPPP), erosion and

Table ES-1: Summary of Environmental Impacts and Management and/or Mitigation Measures

Resource Area	No Action Alternative	Proposed Action Alternative	Management and/or Mitigation Measures (Proposed Action Alternative)
		<p>activities.</p> <p>No short- or long-term impacts on geology.</p> <p>No long-term adverse impacts on topography, bathymetry, or sediments. Long-term beneficial impacts on soils from the removal and disposal of soils containing low levels of residual radiological contaminants.</p>	<p>sediment control (E&SC) plan (to be included in the project civil design plan following review by Fort Belvoir DPW and approval by VDEQ), and stormwater management plan (SWMP) to minimize the erosion of exposed soils and corresponding concentrations of sediments and pollutants in stormwater generated on the project site and discharged to receiving water bodies.</p> <ul style="list-style-type: none"> • Use containment booms, sediment curtains, and other applicable measures during in-water and nearshore work to prevent the migration of disturbed sediments into the water column, minimize turbidity, and ensure disturbed sediments settle near their original location. • Prepare and adhere to a site-specific plan (to be included in the project civil design plan) for the placement of clean soils that would specify potential sources of backfill and topsoil, soil segregation requirements, necessary amendments to ensure successful establishment and viability of vegetation, and depth of topsoil. • Restore the SM-1 site to a permeable, vegetated condition to minimize or prevent continued soil erosion and corresponding sedimentation of receiving water bodies.

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Abbreviations and Acronyms

AADT	Annual Average Daily Traffic
ACHP	Advisory Council on Historic Preservation
ACM	Asbestos-Containing Materials
ACP	Access Control Point
ADP	Area Development Plan
AEA	Atomic Energy Act
AHA	All Hazards Assessment
ALARA	As Low As Reasonably Achievable
ANSI	American National Standards Institute
APE	Area of Potential Effects
APP	Accident Prevention Plan
AR	Army Regulation
ARO	Army Reactor Office
ARP	Army Reactor Program
BFE	Base Flood Elevation
BGEPA	Bald and Golden Eagle Protection Act
bgs	below ground surface
BMP	Best Management Practice
CAA	Clean Air Act
CBPA	Chesapeake Bay Preservation Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CGP	Construction General Permit
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CO _{2e}	Carbon Dioxide equivalent
CSR	Characterization Survey Report
CWA	Clean Water Act
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
DAAF	Davison Army Airfield
DA-PAM	Department of the Army Pamphlet
dba	A-weighted decibels
dbh	diameter at breast height
DDT	Dichlorodiphenyltrichloroethane
DES	Directorate of Emergency Services
DO	Dissolved Oxygen
DOD	Department of Defense
DOE	Department of Energy
DP	Decommissioning Plan
DPS	Distinct Population Segment
DPW	Directorate of Public Works

E&SC	Erosion and Sediment Control
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EM	Engineer Manual
EO	Executive Order
ESA	Endangered Species Act
FCD	Federal Consistency Determination
FNSI	Finding of No Significant Impact
FONPA	Finding of No Practicable Alternative
FR	Federal Register
FSS	Final Status Survey
FSSP	Final Status Survey Plan
FY	Fiscal Year
GEIS	Generic Environmental Impact Statement
GHG	Greenhouse Gas
HAP	Hazardous Air Pollutant
HAER	Historical American Engineering Record
HSA	Historical Site Assessment
I-95	Interstate 95
IICEP	Intergovernmental and Interagency Coordination for Environmental Planning
INRMP	Integrated Natural Resources Management Plan
IPaC	Information, Planning, and Consultation
ISW	Industrial Stormwater
JPA	Joint Permit Application
LBP	Lead-Based Paint
LIDAR	Light Detection and Ranging
LLRW	Low-level Radioactive Waste
LLW	Low-level Waste
M&E	Materials and Equipment
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MBTA	Migratory Bird Treaty Act
mg/L	milligram per liter
mg/m ³	milligram per cubic meter
MH-1A	Mobile High Power Model 1A (Nuclear Reactor Facility)
MOA	Memorandum of Agreement
MS4	Small Municipal Separate Storm Sewer Systems
mrem	millirem
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSW	Municipal Solid Waste
MWt	Megawatt Thermal
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves and Protection and Repatriation Act
NCR	National Capital Region
NCRP	National Council on Radiation Protection

NEI	National Emission Inventory
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NLEB	Northern Long-Eared Bat
NMUSA	National Museum of the US Army
NO ₂	Nitrogen Dioxide
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NO _x	Nitrogen Oxides
NRC	Nuclear Regulatory Commission
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O ₃	Ozone
OSHA	Occupational Safety and Health Administration
OSH	Occupational Safety and Health
Pb	Lead
PCB	Polychlorinated Biphenyls
PEL	Permissible Exposure Limit
PPE	Personal Protective Equipment
ppb	parts per billion
ppm	parts per million
ppt	parts per thousand
PST	Primary Shield Tank
PM	Particulate Matter
RCRA	Resource Conservation and Recovery Act
ROCs	Radionuclides of Concern
ROI	Region of Influence
RONA	Record of Non-Applicability
ROPCs	Radionuclides of Potential Concern
RPA	Resource Protection Area
RPMP	Real Property Master Plan
RPV	Reactor Pressure Vessel
SAFSTOR	Safe Storage
SARA	Superfund Amendments and Reauthorization Act
SAV	Submerged Aquatic Vegetation
sf	square feet
SHPO	State Historic Preservation Office(r)
SM-1	Stationary Medium Power Model 1 (Nuclear Reactor Facility)
SO ₂	Sulfur Dioxide
SWMP	Stormwater Management Plan
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
tpy	tons per year
TSCA	Toxic Substances Control Act

TSS	Total Suspended Solid
µg/m ³	micrograms per cubic meter
US	United States
USACE	US Army Corps of Engineers
USANCA	US Army Nuclear and Countering Weapons of Mass Destruction Agency
USC	United States Code
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VAC	Virginia Administrative Code
VC	Vapor Container
VDCR-NH	Virginia Department of Conservation and Recreation Natural Heritage Program
VDEQ	Virginia Department of Environmental Quality
VDHR	Virginia Department of Historic Resources
VDGIF	Virginia Department of Game and Inland Fisheries
VOC	Volatile Organic Compound
WCS	Waste Control Specialists
WMP	Waste Management Plan
WOUS	Waters of the United States
yd ³	cubic yards

1 Purpose and Need

1.1 Introduction

The United States Army Corps of Engineers (USACE) has prepared this environmental assessment (EA) to identify, analyze, and document the potential physical, environmental, socioeconomic, and cultural effects of decommissioning and dismantling the United States (US) Army's Deactivated Stationary Medium Power Model 1 (SM-1) Nuclear Reactor Facility at US Army Garrison Fort Belvoir (Fort Belvoir). The EA has been prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA; Title 42, United States Code [USC] Part 4321 et seq.); the NEPA-implementing regulations of the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] Parts 1500–1508); and the Army's NEPA regulations (32 CFR Part 651, *Environmental Analysis of Army Actions*). Although SM-1 is on Fort Belvoir's fee title land, Army Regulation (AR) 50-7, *Army Reactor Program* designates USACE as the lead Army component and single point of contact at Headquarters, Department of the Army for nuclear reactor decommissioning to ensure compliance with environmental requirements for decommissioning Army nuclear reactors.

USACE maintains the Deactivated SM-1 Nuclear Reactor Facility in accordance with AR 50-7 and Reactor Possession Permit No. SM1-1-19 issued by the Army Reactor Office (ARO) (USANCA, 2019). ARO, established by the US Army Nuclear and Countering Weapons of Mass Destruction Agency (USANCA), oversees the Army Reactor Program (ARP) and designates the ARP Manager. USACE proposes to complete the decommissioning of SM-1 to a standard that allows for release of the SM-1 site for unrestricted use (also referred to as the "Proposed Action").

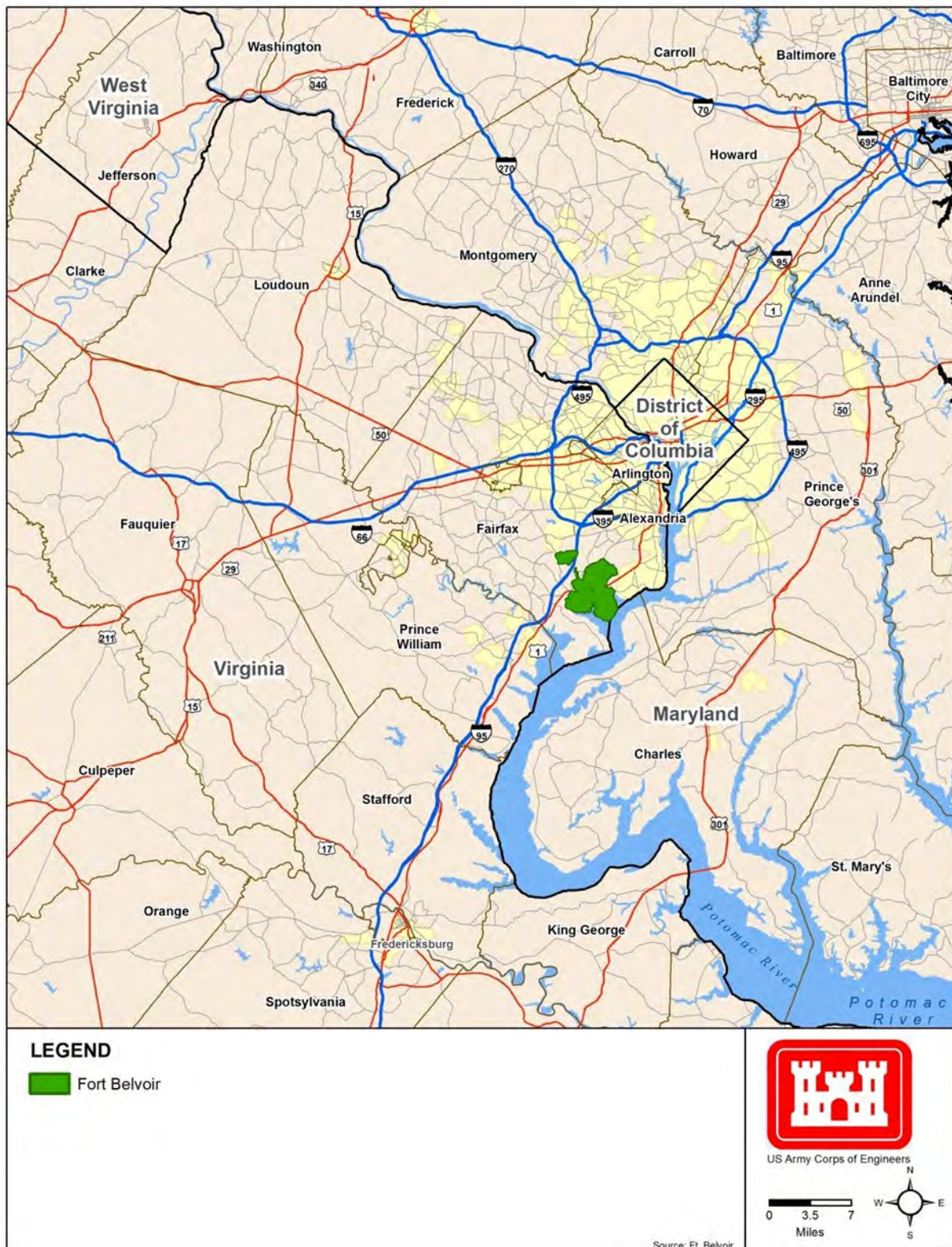
The ARP adopts the US Nuclear Regulatory Commission's (NRC) radiological dose criteria for releasing a facility or site for unrestricted use, as provided in 10 CFR Part 20.1402, *Radiological Criteria for Unrestricted Use*. This regulation states that a facility or site can be released for unrestricted use if radioactivity levels are such that the average member of a critical group would not receive a total effective dose equivalent in excess of 25 millirems (mrem) per year. Regulations at 10 CFR Part 20 also stipulate that residual activity be reduced to levels that are as low as reasonably achievable (ALARA) (radiological safety and health is discussed in **Section 3.6** of this EA).

The Proposed Action requires an ARO-approved Decommissioning Plan (DP) prior to the removal of contaminated structures, equipment, and media from the SM-1 site. Following approval of the DP, USANCA would transition the SM-1 Reactor Possession Permit Number SM1-1-19 to a Reactor Decommissioning Permit. Upon completion of the Proposed Action (see **Section 2.2**), including validation that applicable radiation dose-based cleanup standards have been met, ARO would terminate the SM-1 Decommissioning Permit. The proposed decommissioning of SM-1 would occur over an approximately 5-year time period from 2020 to 2025.

1.2 Project Location, Environmental Setting, and Description

Fort Belvoir, located in Fairfax County, Virginia is a strategic sustaining base for the Army that provides logistical, intelligence, and administrative support to a diverse mix of tenant commands, activities, and agencies. The installation is within the National Capital Region (NCR), approximately 11 miles south of Alexandria, Virginia and 17 miles southwest of Washington, D.C (**Figure 1.2-1**). Approximately 40,000 military and civilian personnel work on the post and it has a resident population of about 5,000 people (Fort Belvoir, 2014).

Figure 1.2-1: Location of Fort Belvoir



The Deactivated SM-1 Nuclear Reactor Facility is situated on Fort Belvoir's South Post (i.e., the portion of Main Post to the south of Richmond Highway/US Route 1) within a secured area known as the "300 Area". The approximately 3.6-acre site is positioned along the shoreline of Gunston Cove, a tidal embayment of the Potomac River (**Figure 1.2-2**). The SM-1 site contains the reactor building (Building 372), an inactive wastewater lift station (Building 7350), a small warehouse (Building 349), a water intake pier and pump house (Building 375) that extends approximately 100 feet into Gunston Cove from the shoreline, and a concrete discharge pipe and concrete outfall structure (**Figure 1.2-3**).

A perimeter fence surrounds the SM-1 site² and the area therein is characterized by terrain that rises from the shore of Gunston Cove to a large terraced area at an elevation of about 35 feet above mean sea level. Most of the site was graded and leveled prior to development of SM-1; to a lesser extent, trees and grassland are present along the periphery. Access to the Deactivated SM-1 Nuclear Reactor Facility is controlled by three gated entry points, two on the eastern side of the site and one on the western side.

SM-1 was a single-loop 10-megawatt thermal (MWt) pressurized water reactor, operating on highly enriched uranium fuel (US Atomic Energy Commission, 1956). The SM-1 reactor consisted of a pressurized water-cooled reactor system (primary system) and a conventional steam turbine system (secondary system). Both were closed systems to minimize the risk of contamination. High-pressure water circulated through the primary system and was used to cool and extract heat from the solid uranium-fueled reactor. The heated primary system water flowed through a steam generator where, in a non-mixing heat exchanger, secondary system water was converted to superheated steam for the operation of the turbine. River water drawn from Gunston Cove was used to cool the condensate exhaust steam from the turbine, with the condensate being returned to the steam generator. The cooling water was discharged through a 16-inch pipeline to the seal pit, located to the south of Building 372. The seal pit was used to avoid excess vacuum on the cooling water discharge line. From the seal pit, water discharged by gravity through a buried 18-inch concrete pipe back into Gunston Cove, approximately 450 feet upstream of the water intake. The seal pit also acted as a mixing chamber for routine liquid effluents that could safely be released into the river after dilution.

The primary system includes the reactor pressure vessel (RPV), primary shield tank (PST), steam generator, pressurizer, and associated piping and is totally contained within the vapor container (VC). The VC is a domed structure with a base diameter of 42 feet and height from ground surface of 46 feet. It was designed to contain all the energy released from the steam generator in an accident scenario or loss-of-coolant accident; contain all airborne radioactivity; and shield the surrounding areas from direct radiation.

1.3 History of the SM-1 Nuclear Reactor Facility

1.3.1 Army Reactor Program

The SM-1 Nuclear Reactor Facility was designed, constructed, and operated as part of the Army Nuclear Power Program (the present-day ARP). The Program was established in the 1950s to develop, construct, and operate small nuclear power reactors on select Department of Defense (DOD) lands under authority granted to the DOD by Section 91(b) of the Atomic Energy Act of 1954 (AEA), as amended (42 USC Part 2121). Section 91(b) authorizes DOD to procure and utilize special nuclear material in the interest of national defense and to acquire utilization facilities (i.e., reactors for military purposes). Section 110(b) of the Act excludes such utilization facilities acquired by DOD from any of the licensing requirements therein.

² Throughout this EA, "Deactivated SM-1 Nuclear Reactor Facility," "SM-1 site," "SM-1," and similar terminology refers to the buildings, structures, and site shown on **Figure 1.2-3**.

Figure 1.3-1: Location of the Deactivated SM-1 Nuclear Reactor Facility

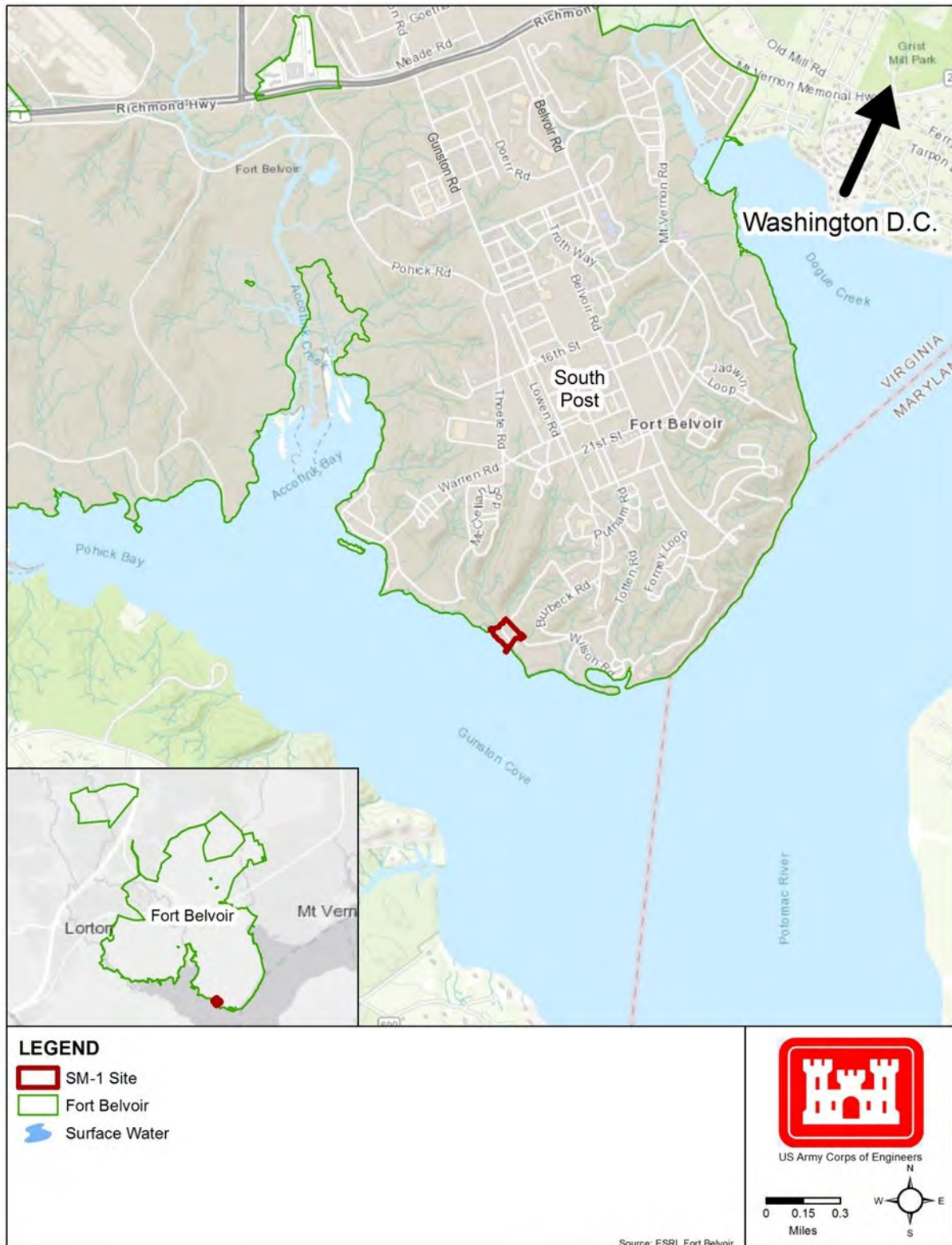


Figure 1.3-2: SM-1 Site



Pursuant to the AEA, the ARO administers this program, including the decommissioning of the Army's deactivated reactor facilities and sites. AR 50-7 sets forth Army program policies consistent with NRC regulations (10 CFR Part 20 Subpart E, and Parts 30, 50, and 51). It is Army policy to comply with the NRC regulations and industry standards such as the recommendations put forth by American National Standards Institute (ANSI) and National Council on Radiation Protection (NCRP). In accordance with AR 50-7, a decommissioning study must be performed by ARO to obtain a decommissioning permit from USANCA (US Army, 2016).

Decommissioning activities under ARO's purview are also subject to Department of the Army Pamphlet (DA-PAM) 385-24, *The Army Radiation Safety Program*, which outlines radiation safety regulations and protocols applicable to the decommissioning of Army reactor facilities.

1.3.2 Operating History

The SM-1 reactor was a single-loop 10 MWt pressurized water reactor delivering a net 1,750 kilowatts of electrical power. SM-1 was the Army's first nuclear-powered, electricity-generating station and the first pressurized water reactor to be connected to an electrical grid in the United States. Construction of the SM-1 Nuclear Reactor Facility at Fort Belvoir was completed in 1957, and it achieved its first criticality in April 1957. SM-1 was used to train hundreds of military personnel in nuclear power plant operations. The reactor last operated on 17 March 1973 and was deactivated from 1973 to 1974 (**Figure 1.3-1**).

1.3.3 Deactivation and Remediation

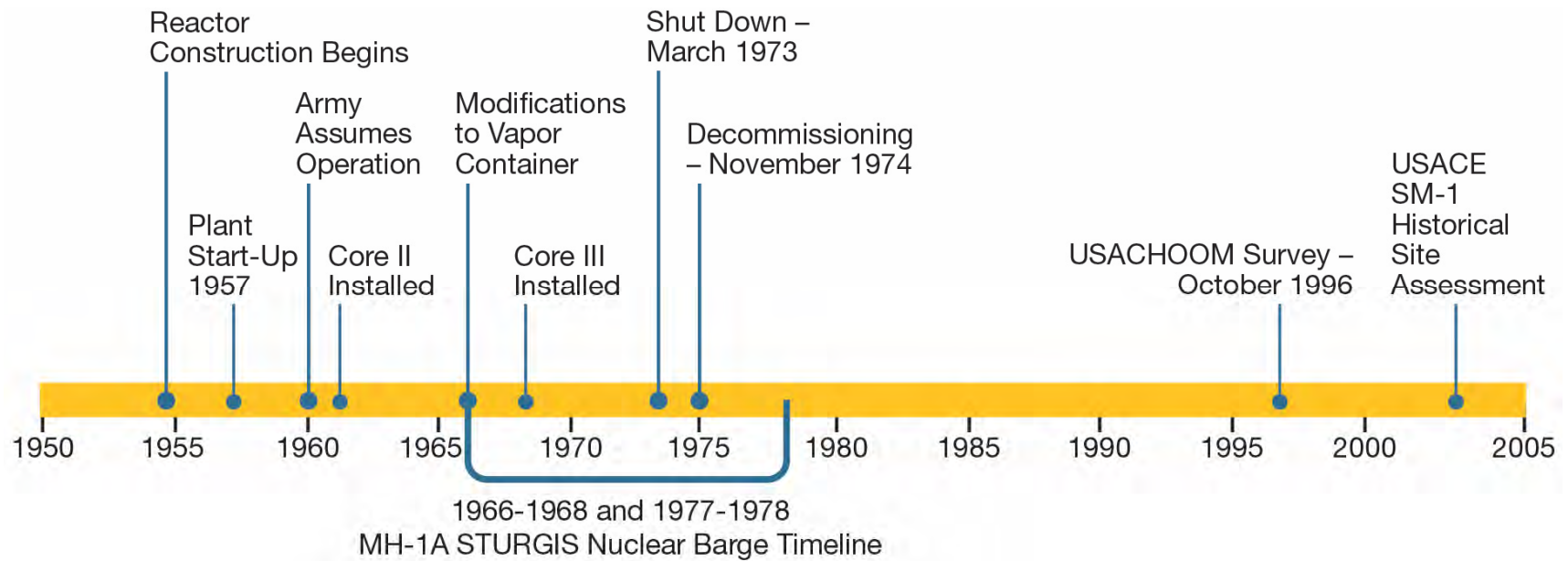
The initial deactivation process for the SM-1 Nuclear Reactor Facility began upon its deactivation and placement in a safe storage (SAFSTOR) configuration in November 1974 (**Figure 1.3-1**). Nuclear facilities in SAFSTOR are maintained and monitored in a condition that allows radioactivity to decay; afterward, the plant is dismantled, and the property is decontaminated (NRC, 1988). Since its placement in SAFSTOR, the Deactivated SM-1 Nuclear Reactor Facility has been subject to regular inspection and monitoring by USACE in accordance with AR 50-7 and the SM-1 Reactor Possession Permit Number SM1-1-19.

Deactivation consisted of removal of the nuclear fuel and control rods, minor decontamination, shipment of necessary radioactive waste, sealing the RPV, and installing appropriate warning signs and monitoring devices. The SM-1 VC, which contains the RPV and primary system components, was also sealed and the facility was placed under a routine monitoring program currently implemented by USACE. Additionally, the guard shack (Building 373), diesel generator area (Building 384), flammable storage area (Building 376), waste retention and processing facilities, and waste tanks were demolished and/or removed from the SM-1 site (USACE 2005).

In 1996, the US Army Center for Health Promotion and Preventive Medicine conducted radiological surveys around the Deactivated SM-1 Nuclear Reactor Facility to determine what changes had taken place over more than 20 years since shutdown. The surveys indicated that there was radioactive contamination inside the restricted areas in Building 372 and in soil at the facility (US Army, 1996). After the 1996 survey was completed, about 30 drums of soil were removed from the land area near the seal pit (USACE, 2013).

In the early 2000s, USACE began developing a management plan for conducting an All Hazards Assessment (AHA) for the Deactivated SM-1 Nuclear Reactor Facility. From 2009 to 2010, following completion of a Historical Site Assessment (HSA) in 2004, characterization surveys were conducted at the SM-1 site. The survey results were documented in a 2013 Characterization Survey Report (CSR). Field surveys were again performed from 2016 to 2017 to validate the CSR findings and address data gaps identified therein. Currently, the decommissioning of SM-1 is in Phase III of the four-phase AHA process. Phase III consists of developing detailed design plans to execute the selected hazards reduction approach, decommissioning, and disposal options.

Figure 1.3-3: SM-1 Operating History and Decommissioning Timeline



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1.3.4 SM-1 Permit History

USACE maintains the Deactivated SM-1 Nuclear Reactor Facility in accordance with Reactor Possession Permit SM1-1-19, initially issued by USANCA to the USACE Environmental Community of Practice in 2009 and renewed in October 2019. The current permit incorporates a 2018 amendment (Amendment 1-18) to allow for storage on the SM-1 site of five shipping containers of tools and equipment (some contaminated with low levels of radiation) that were used during the recent (2015-2018) decommissioning of the Army's Mobile High Power Model 1A (MH-1A) reactor onboard the *STURGIS* in Galveston, Texas. *STURGIS* was a barge-mounted nuclear reactor that underwent initial testing (1967) and was later deactivated (1977-1978) at Fort Belvoir (**Figure 1.3-1**) (USACE, 2014a). USACE intends to use the stored tools and equipment transferred from *STURGIS* to implement the Proposed Action analyzed in this EA.

The SM-1 possession permit covers the following materials:

1. Byproduct produced as a result of SM-1 operations.
2. Byproduct present on-site at locations where facility equipment or materials were utilized.
3. Byproduct produced as a result of MH-1A operations in the form of residual contamination on or internal to related equipment being stored on-site.

Prior to the effective date on the current possession permit (2019), the authorizing documents for the radioactivity remaining at the Deactivated SM-1 Nuclear Reactor Facility included Department of the Army Radioactive Materials Authorization Number A 45-63-02 and several other Reactor Possession Permits.

1.4 Purpose and Need

Under the Army's Deactivated Nuclear Power Plant Program, decommissioning a nuclear reactor is required within 60 years of its final shutdown to be consistent with the NRC regulations (as adopted by the ARP in AR 50-7). The Deactivated SM-1 Nuclear Reactor Facility has been in a SAFSTOR condition and subject to regular inspection and monitoring for more than 46 years. Accordingly, the purpose of the Proposed Action is to safely remove, transport, and dispose of all materials and equipment (M&E) and structures associated with the Deactivated SM-1 Nuclear Reactor Facility such that residual radioactivity levels meet the applicable criteria for unrestricted use. The Proposed Action would accomplish this objective and terminate the ARO Decommissioning Permit for SM-1.

USACE maintenance of the Deactivated SM-1 Nuclear Reactor Facility is costly and not sustainable over the long-term. Costs to maintain and ultimately decommission SM-1, including the transport and disposal of radioactive debris, will only continue to increase over time. In its current state, the SM-1 site does not support the Army's mission on Fort Belvoir, now or in the future. Although Fort Belvoir covers 7,696 acres, approximately 57 percent (4,714 acres) is constrained to development. The SM-1 site, located in Fort Belvoir's intensively developed 300 Area, represents an ideal location to potentially support a future DoD facility or tenant³.

Therefore, the need for the Proposed Action is to complete the decommissioning of the Deactivated SM-1 Nuclear Reactor Facility within 60 years of its final shutdown in accordance with the NRC regulations as adopted by the ARP in AR 50-7. The Proposed Action would complete Phase IV of the multi-phased AHA by implementing the detailed design and execution plans prepared as part of Phase III. Upon ARO approval of the final, site-specific DP outlining

³ Neither the Army nor Fort Belvoir has proposed or identified a future facility or tenant for the SM-1 site. Development of the SM-1 site to support a future DoD facility or tenant is not included in the Proposed Action and would be evaluated in NEPA documentation that would be prepared separately from this EA.

the proposed decommissioning approach for SM-1, decommissioning activities for SM-1 would proceed to completion. Implementing the Proposed Action in this manner would result in a cost savings to USACE as maintenance of the site would no longer be required. Upon its completion, the Proposed Action would return the property to Fort Belvoir. Further, the Proposed Action allows USACE to meet Army mission objectives to decommission SM-1 and terminate the SM-1 possession permit.

1.5 Scope and Analysis

This EA analyzes the potential direct, indirect, and cumulative physical, environmental, socioeconomic, and cultural effects of the No Action and Proposed Action Alternatives, as follows:

- **No Action Alternative.** Continue to maintain the Deactivated SM-1 Nuclear Reactor Facility in a SAFSTOR condition with regular inspections and monitoring.
- **Proposed Action Alternative.** Complete the decommissioning and dismantlement of SM-1 to a standard that allows for release of the site for unrestricted use and termination of the ARO Reactor Decommissioning Permit.

Three buildings (358, 371, and 380) historically associated with SM-1 operations are located north to northeast of the Deactivated SM-1 Nuclear Reactor Facility within the 300 Area (**Figure 3.8-1**). These were administrative support and training facilities for SM-1 that have since been renovated and are currently occupied by other tenants not associated with SM-1. Studies concluded that none of the buildings, or sites on which they are situated, require any further remediation with respect to radioactive materials associated with former SM-1 reactor operations (USACE 2019a). As such, the scope of this EA does not include these (or any other) buildings located outside the SM-1 site, as shown on **Figure 1.2-3**.

Resources or resource areas subject to detailed analysis in this EA include: radiological and occupational safety and health; transportation and traffic; non-radiological hazardous materials and waste, and non-hazardous solid waste; cultural resources; geology, topography, and soils; water resources, including recreation; biological resources; and air quality.

1.6 Decision to be Made

The intent of this EA is to inform decision-makers and the public of the potential environmental effects of the Proposed Action and its considered alternatives prior to making a federal decision to move forward with any alternative. In doing so, USACE can make a fully informed decision, aware of the potential environmental effects of its Proposed Action. This decision-making process also includes identifying the actions that USACE will commit to undertake to minimize environmental effects, as required by NEPA, CEQ regulations, and Army NEPA regulations.

The decision to be made is whether USACE should implement the Proposed Action and, if necessary, carry out mitigation measures to reduce effects on resources.

1.7 Public Agency Involvement

USACE invites public participation in its decision-making process in accordance with NEPA. Agencies, organizations, and members of the public having a potential interest in the Proposed Action are urged to participate. The following sections summarize public and agency involvement with respect to the Proposed Action.

1.7.1 Public Involvement

USACE outreach regarding the proposed decommissioning of SM-1 is ongoing and included a six-week public review and comment period for the Draft EA that began on December 20, 2019 and ended on January 31, 2020. Three public meetings were held during the six-week Draft EA public comment period (**Table 1.7-1**). The availability

of the Draft EA for public review and the dates, times, and locations of the Draft EA public meetings were announced via publication of a Notice of Availability (NOA) in local newspapers and an online news platform, and on social media platforms maintained by USACE and Fort Belvoir. Additionally, printed copies of the Draft EA were made available for public review at the Fort Belvoir Library and Fairfax County Public Library's Kingstowne and Lorton branches. All substantive comments received during the public review period are addressed in the Final EA. Additional information regarding the Draft EA public meetings and comments received during the public review period is provided in **Section 7** of the EA.

Information about the proposed decommissioning of the Deactivated SM-1 Nuclear Reactor Facility is available online at <https://www.nab.usace.army.mil/Missions/Environmental/SM-1/>.

USACE outreach conducted to date for the Proposed Action, including general project information meetings and the Draft EA public meetings, is summarized in **Table 1.7-1**. The events and venues were selected to provide the public with multiple opportunities on- and off-post to obtain information about the proposed decommissioning of SM-1. Participants at each event were also encouraged to ask questions and to make known their concerns or issues regarding the Proposed Action, if any. Copies of presentation materials used at these meetings are included in **Appendix A**.

Table 1.7-1: Public Outreach for the Proposed Action

Event	Date	Location
Public Meeting	28 January 2019	Humphreys Hall (Building 247), Fort Belvoir
Public Meeting	12 March 2019	Fairfax South County Center
Mason Neck Town Hall	2 April 2019	Lorton, Virginia
12th AV BN Safety Day	23 May 2019	Davison Army Airfield, Fort Belvoir
Garrison Safety Day	12 June 2019	Specker Field House (Building 1182), Fort Belvoir
Draft EA Public Meeting	8 January 2020	Fairfax South County Center
Draft EA Public Meetings	9 January 2020 ^{1, 2}	Wood Theater (Building 2120), Fort Belvoir

Notes:

1. Two public meetings for the Draft EA were held on 9 January 2020. The first meeting was held in the afternoon from 1 p.m. to 3 p.m. The second was held in the evening from 6:30 to 8:30 p.m.
2. The 9 January 2020 meetings were rescheduled from meetings that were originally planned for 7 January 2020 at Humphreys Hall (Building 247) but postponed due to inclement weather.

1.7.2 Agency Coordination

Intergovernmental and Interagency Coordination for Environmental Planning (IICEP) is a federally mandated process for informing and coordinating with other governmental agencies regarding a federal proposed action. USACE coordinated and consulted with the following agencies during the IICEP process for this EA:

- Advisory Council on Historic Preservation (ACHP)
- US Fish and Wildlife Service (USFWS)
- US Environmental Protection Agency (USEPA)

- National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NOAA Fisheries)
- National Capital Planning Commission
- Virginia Department of Game and Inland Fisheries (VDGIF)
- Virginia Department of Conservation and Recreation Natural Heritage Program (VDCR-NH)
- Virginia Department of Environmental Quality (VDEQ)
- Fairfax County Planning Commission
- Virginia Department of Historic Resources (VDHR; the Commonwealth of Virginia's State Historic Preservation Office [SHPO])

Copies of relevant agency correspondence are included in **Appendix B**.

1.7.3 National Historic Preservation Act

The National Historic Preservation Act of 1966 (NHPA), as amended, outlines federal policy to protect historic properties and promote historic preservation in cooperation with other nations, tribal governments, states, and local governments. Section 106 of the NHPA and its implementing regulations (36 CFR 800, *Protection of Historic Properties*) requires federal agencies to consider the potential effects of their proposed actions on historic properties listed or eligible for listing in the National Register of Historic Places (NRHP). Section 106 is a separate process from, but often conducted in parallel with, NEPA. In accordance with 36 CFR Part 800.2(a)(2), the Army and Fort Belvoir have designated USACE as the lead federal agency for purposes of Section 106 consultation regarding the Proposed Action.

The SM-1 Nuclear Reactor Facility has been determined to be eligible for listing in the NRHP based on its historical significance. USACE has determined that the Proposed Action would have an *Adverse Effect* on the SM-1 Nuclear Reactor Facility under Section 106. The SHPO concurred with USACE's finding of adverse effect in a letter dated 30 January 2020. USACE, in consultation with the SHPO, ACHP, and other participating Section 106 consulting parties, has developed a Memorandum of Agreement (MOA) stipulating measures that USACE will implement to mitigate this adverse effect and ensure it remains less than significant. SM-1's historical significance, Section 106 consultation conducted to date, and MOA requirements are further discussed in **Section 3.8**. Copies of the MOA and relevant Section 106 correspondence are provided in **Appendix B**.

1.7.4 Tribal Consultation

DOD Instruction 4710.02, *Interactions with Federally Recognized Tribes*, implements the DOD *American Indian and Alaska Native Policy* (updated January 2012); AR 200-1, *Environmental Protection and Enhancement*; NEPA; NHPA; and Native American Graves and Protection and Repatriation Act (NAGPRA).

By letter dated 25 January 2019, USACE invited the following state and federally recognized Indian tribes with historic and cultural ties to Virginia and/or the Fort Belvoir area to participate as consulting parties in the Section 106 process for the Proposed Action:

- Eastern Band of Cherokee Indians
- Tuscarora Nation of New York
- United Keetoowah Band of Cherokee Indians in Oklahoma
- Catawba Indian Nation
- Pamunkey Indian Tribe
- Chickahominy Indian Tribe – Eastern Division
- Upper Mattaponi Tribe
- Rappahannock Tribe
- Monacan Indian Nation
- Nansemond Indian Nation
- Chickahominy Indian Tribe

Copies of relevant correspondence are included in **Appendix B**. To date, no tribal responses have been received.

The state and federally recognized tribes listed above were notified of the availability of the Draft EA for review during the six-week public comment period. No tribal comments on the Draft EA were received.

1.8 Related Environmental and Other Documents

1.8.1 Programmatic NEPA Review

Pursuant to NEPA, NRC has studied the potential physical, environmental, cultural, and socioeconomic effects of decommissioning a nuclear reactor facility. NRC has completed three program-level NEPA studies that are relevant to the Proposed Action evaluated in this EA:

- **Generic Environmental Impact Statement (GEIS) on Decommissioning of Nuclear Facilities, Supplement 1 (NUREG-0586)** (NRC, 2002). This GEIS analyzes decommissioning activities performed to remove radioactive and non-radioactive (e.g. intake structures and cooling towers) materials from structures, systems, and components from license certification to termination. The GEIS determined that most potential environmental impacts from the decommissioning of nuclear facilities are small.
- **GEIS in Support of Rulemaking on Radiological Criteria for License Termination of NRC-Licensed Nuclear Facilities (NUREG-1496)** (NRC, 1997). This GEIS analyzes regulatory alternatives for establishing radiological criteria for decommissioning licensed nuclear facilities. The GEIS concludes that decommissioning alternatives should consider the future use of the site, provisions for public participation, the minimization of radioactive waste volumes and overall public risk, and other factors.
- **Final Environmental Impact Statement (EIS) on the Transportation of Radioactive Material by Air and Other Modes (NUREG-0170)** (NRC, 1977). This EIS analyzes impacts on human health and safety from the transport of radioactive material under normal and accident conditions. The EIS determined that risks to workers and the general public from exposure to radioactive material during transport are low.

As applicable, the findings of these studies are incorporated by reference to supplement the analysis presented in this EA.

1.8.2 Decommissioning Planning Documents and Studies

This EA reflects and incorporates information from the following SM-1 decommissioning planning documents and studies:

- **Decommissioning Environmental Assessment** (US Army, 1972)
- **Historical Site Assessment** (USACE, 2005)
- **Characterization Survey Report** (USACE, 2013)

- **Phase 1 Archaeological Survey** (USACE, 2018b)
- **Decommissioning Plan** (USACE, 2019b)
- **Waste Management Plan** (USACE, 2018a)
- **Transportation Assessment Technical Memorandum** (USACE, 2018c)

1.8.3 Other Relevant Documents

Data relevant to the Proposed Action analyzed in this EA were obtained from multiple sources. These data are summarized or cited throughout the document, as appropriate. A complete list of references is provided in **Section 6**.

1.9 Regulatory Framework

This EA has been prepared under the provisions of, and in accordance with, NEPA, CEQ regulations, and Army NEPA regulations. Other laws and regulations applicable to the Proposed Action include, but are not limited to, the following:

- Clean Water Act (CWA; 33 USC Part 1251 *et seq.*)
- Resource Conservation and Recovery Act (RCRA; 42 USC Part 6901 *et seq.*)
- Section 438 of the Energy Independence and Security Act (Public Law 110-140)
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (42 USC Part 9601 *et seq.*)
- Federal Clean Air Act (CAA) of 1990 (42 USC Part 7401 *et seq.*, as amended)
- Endangered Species Act (ESA; 16 USC Part 1531 *et seq.*)
- Migratory Bird Treaty Act (MBTA; 16 USC Part 703 *et seq.*)
- NHPA (54 USC Part 300101 *et seq.*)
- NAGPRA (25 USC Part 3001 *et seq.*)
- DOD Instruction 4710.02, *Interactions with Federally Recognized Tribes*
- Toxic Substances Control Act (TSCA; 15 USC Part 2601 *et seq.*)
- EO 11990, *Protection of Wetlands* (1977)
- EO 11988, *Floodplain Management* (1977)
- EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (1994)
- EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (21 April 1997), as amended by EO 13296 (2003)
- EO 13834, *Efficient Federal Operations* (2018)

2 Proposed Action and Alternatives

2.1 Introduction

In accordance with AR 50-7, ARO requires a DP that is consistent with applicable NRC guidelines to proceed with the decommissioning and dismantlement of the Deactivated SM-1 Nuclear Reactor Facility. Upon ARO acceptance of the final DP, ARO will issue a Decommissioning Permit. Successful implementation of the DP in accordance with the permit would result in termination of the permit. Accordingly, the Proposed Action evaluated in this EA is to complete the decommissioning and dismantlement of SM-1 to a standard that allows for release of the site for unrestricted future use (**Section 1.1**).

This section of the EA includes a general description of the proposed decommissioning and dismantlement approach for SM-1. A probable sequence of decommissioning and dismantlement activities is presented in **Section 2.2** (some variability in the sequence of these activities is anticipated). Alternatives considered and evaluated in this EA are discussed in **Section 2.3**.

2.2 Description of the Proposed Action

The Proposed Action would execute the ARO-approved SM-1 DP in a manner that conforms to USACE safety requirements and complies with applicable state and federal laws and regulations. Decommissioning and dismantlement of a facility such as SM-1 generally consists of the following activities:

- Mobilization and site preparation
- Removal of non-radioactive hazards
- Removal of radioactive M&E
- Decontamination
- Removal of non-radioactive M&E
- Dismantlement and debris removal
- Site remediation and restoration
- Demobilization

The Proposed Action would generally be sequenced in the order presented above; however, the final decommissioning and dismantlement approach would organize and conduct these activities based on factors such as scheduling, permitting, and the availability of personnel and specialized equipment. During the course of the Proposed Action, waste characterization and shipping, and material/facility release surveys, would be conducted on a routine basis.

All radioactive and non-radioactive dismantlement debris, including building materials and soils, would be transported from the site by truck and, in some instances, trans-loaded to rail for shipment to a disposal facility. Waste generation, handling, and disposal are discussed further in **Section 2.2.8**.

If implemented, the Proposed Action would commence in 2020 with ARO approval of the DP and the findings of this EA. It would culminate with termination of the SM-1 Decommissioning Permit. The Proposed Action is further described in **Section 2.2.1** through **Section 2.2.8** as common steps associated with the decommissioning and dismantlement process.

2.2.1 Site Preparation

Site preparation is the first step in the decommissioning and dismantlement approach for SM-1. Preparatory activities associated with the Proposed Action would include vegetation management; establishing radiological and security controls; establishing temporary or modified facilities and work support areas; improving infrastructure; and personnel and equipment mobilization. The decommissioning contractor would obtain an excavation permit issued by Fort Belvoir's Directorate of Public Works (DPW) prior to beginning ground-disturbing activities on the SM-1 site.

Vegetation removal would be necessary to provide personnel and equipment with access to work areas. These measures would ensure safe ingress and egress to portions of the site where decommissioning and dismantlement activities would occur. Tree removal under the Proposed Action would generally occur in the upper and lower portions of the SM-1 site as required by activities such as underground utility removal and soil remediation.

The Proposed Action would include site improvements necessary to support decommissioning and dismantlement activities. Site improvements would include the construction of a concrete waste storage pad, installation of new temporary electrical power connections, and upgrades to roads around Building 372. As necessary, improvements may also include upgrading or reconfiguring the site's perimeter security fence and access control points. Additionally, routine repair and maintenance work conducted by Fort Belvoir may also support preparatory activities for the Proposed Action. For example, Fort Belvoir DPW regularly inspects and repairs rill and gully erosion occurring around and under Totten Road. USACE would coordinate specific maintenance requests with DPW in advance and in accordance with DPW's established procedures.

The Proposed Action would require heavy equipment such as cranes, skid loaders, forklifts, boom lifts, excavators, and similar platforms to support dismantlement and earthwork. As space is limited at the SM-1 site, heavy equipment would not be mobilized until needed to support proposed decommissioning activities.

2.2.2 Removal / Disposal of Non-Radiological Hazards

Following site preparation activities, the Proposed Action would address the removal and disposal of non-radiological hazards at SM-1. For example, the disposition of Building 372 would start with asbestos abatement in all accessible areas to include known sources of asbestos-containing materials (ACM) such as insulation and floor, ceiling, and roof materials. In other instances, ACM surveys may be required during decommissioning to ascertain whether abatement is necessary. Survey and abatement activities for other non-radiological hazards would be conducted in a similar manner. These hazards would include:

- microbial contamination (mold)
- lead-based paint (LBP)
- mercury in thermostats and laboratory drains
- polychlorinated biphenyls (PCBs) in paint, dielectric fluid, caulk, and gaskets
- exterior interferences associated with Building 372 such as a distilled water tank, service water tank, and an electrical substation

Additionally, non-radiological hazards are known or suspected in soils present on the SM-1 site. For example, lead was detected in soil samples taken in proximity to Building 372. Contaminated soils under the Proposed Action would either be addressed in relation to dismantlement and removal activities, or once all materials and waste have been segregated and/or prepared for transport and disposal.

2.2.3 Removal of Radioactive M&E

Individual radioactive system components (contaminated and/or activated) would be removed from Building 372 prior to its dismantlement. Employing this approach, the Proposed Action would remove and dispose of M&E from the Building 372 Restricted Area (including the VC) (**Figure 3.6-1**) and the Unrestricted Area (**Figure 3.6-2**).

Radiological surveys would be performed on all M&E prior to removal to determine proper waste classification for disposition. With the exception of the RPV, primary system components would likely be classified as Class A low-level radioactive waste (LLRW); the RPV would be managed as Class B LLRW (see **Section 3.6**).

The RPV is the most radioactive element of the deactivated and defueled SM-1 reactor and the most substantial in terms of weight when considering the additional shielding that would be necessary for shipping. The use of a large crane would be required to lift the RPV from the primary shield tank for placement into a US Department of Transportation (USDOT) and NRC-compliant shipping cask for disposition. The total weight of the packaged RPV is anticipated to be in the range of 60,000 to 80,000 pounds.

2.2.3.1 Decontamination

Some areas of Building 372 contain surface contamination above the release criteria described in the DP (USACE, 2019b). Accordingly, the Proposed Action would include decontamination of some surfaces to meet the release criteria prior to dismantlement. Power washing, scabbling, and other methods would be employed to remove contamination from the metal and concrete surfaces. All residual solid and liquid wastes would be captured, containerized, characterized, and, as necessary, treated and disposed of at an appropriate permitted facility. The Proposed Action may also include decontamination to reduce potential worker exposures, even if the release criteria cannot be met as a result.

2.2.4 Removal of Non-Radioactive M&E

When practicable, the Proposed Action would also remove non-radioactive M&E prior to dismantlement. However, most non-radioactive M&E (and some that may have low levels of internal radioactivity) would remain in place during dismantlement. Following dismantlement, this waste would be segregated from other dismantlement debris for proper disposal or recycling.

2.2.5 Dismantlement and Debris Removal

The Proposed Action would dismantle and/or remove the remaining structures on the SM-1 site. These include the storage warehouse (Building 349); water intake pier and pump house (Building 375); an inactive wastewater lift station (Building 7350); all underground utilities and features (**Figure 2.2-1**)⁴; and other minor infrastructure components. Prior to dismantlement or removal activities, material or facility release surveys and additional confirmatory surveys would be conducted in accordance with the DP to verify that applicable release criteria provided in the DP have been met.

⁴ With the exception of the electrical connection to Building 372, utility lines within the SM-1 site shown on **Figure 2.2-1** have been abandoned in place and are no longer active. Utility systems formerly serving the SM-1 Reactor Facility have been capped and/or rerouted as necessary to serve other occupied facilities at Fort Belvoir. Also see **Section 3.2.6** for additional discussion of utilities at the SM-1 site.

Figure 2.2-1: Existing Utilities and Infrastructure on the SM-1 Site



Dismantlement would also include the removal of subsurface components such as foundations and footings, some of which extend to 18 feet below ground surface (bgs). As appropriate, dewatering of excavations would occur to maintain the excavation and water control measures would be employed to capture, monitor, and discharge water in accordance with a written plan that ensures compliance with applicable permit requirements. This phase of the Proposed Action would not dismantle or remove other structures previously associated with SM-1 located outside of the SM-1 site fence (i.e., Buildings 358, 371, and 380).

Removal of the water intake pump house and pier, which extends approximately 100 feet from the shoreline into Gunston Cove, would likely require the use of a barge-mounted crane and other vessels to give the dismantlement crew and equipment access to the structure. Superstructures would be removed first, followed by the piles. The piles would be cut below the mudline and the portions below the cut would be left in place (NOAA, 2019b).

Additional information about dismantlement and debris removal is provided in **Section 3**, as related to a specific resource or resource area analyzed in this EA.

2.2.6 Site Remediation and Restoration

The Proposed Action would remove and dispose of contaminated environmental media from the site in accordance with release criteria provided in the DP. There are known and suspected areas around and beneath Building 372 and near the seal pit where radionuclide contamination levels exceed or may exceed the release criteria. For example, the Proposed Action would presume that soils around underground tanks and piping are radiologically contaminated.

In total, the Proposed Action would excavate an estimated 5,500 cubic yards (yd³) of soils, including overburden and waste soils; approximately 5,000 yd³ would be disposed of as radioactive waste. These soils would be segregated at the point of excavation. Clean soils would be stockpiled on-site and/or transported off-site for disposal at a permitted off-post facility. Contaminated soils would be packaged for transport off-post for disposal.

During this phase of the Proposed Action, and prior to commencing any site restoration activities, Final Status Surveys (FSS) would be conducted to ensure all exposed areas of the site comply with the 25 mrem per year unrestricted release criteria (**Section 1.1**). Prior to conducting each FSS, an FSS Plan (FSSP) consistent with the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) and subject to USACE approval would be prepared. Site restoration activities under the Proposed Action would commence once the release criteria are confirmed to be met.

The Proposed Action would restore the SM-1 site via placement of clean fill soils to backfill excavated areas and achieve positive drainage. Grading and earthwork would also be conducted to mimic current topography, to the extent practicable. The amount of clean fill soils that would be imported or transported to the site would be based on a final, agreed upon site profile. USACE and its decommissioning contractor would prepare and adhere to a site-specific plan for the placement of clean soils (to be included in the project civil design plan). This plan would specify potential sources of backfill and topsoil, soil segregation requirements, necessary amendments to ensure successful establishment and viability of vegetation, and depth of topsoil.

Upon satisfying the site profile criteria, a loamy topsoil seeded with native grasses and shrubs would be applied across the site to promote revegetation in accordance with a replanting plan that would be prepared by USACE and its decommissioning contractor in consultation with Fort Belvoir. Restoration under the Proposed Action would also comply with Fort Belvoir's Policy Memorandum #27, *Tree Removal and Protection*, by replanting trees at 2-to-1 replacement ratio, either on-site or elsewhere on post. Following the demobilization of decommissioning personnel and equipment, USACE and Fort Belvoir would monitor vegetation on the site for a period of one year to

ensure successful establishment. In the long term, vegetation on the site would be maintained in accordance with Fort Belvoir's established vegetation management practices and policies.

2.2.7 Demobilization

Temporary structures or infrastructure components used to support the prior phases of the Proposed Action would be dismantled and removed from the site during demobilization. Additionally, historical markers or displays may be placed as part of the demobilization. Under the Proposed Action, there would be no remnants of the Deactivated SM-1 Nuclear Reactor Facility left on-site. This phase of the Proposed Action would also include road inspection and repair of any damages incurred during decommissioning and dismantlement, and monitoring of replanted vegetation to ensure successful establishment and viability (**Section 2.2.6**).

2.2.8 Waste Transport and Disposal

The Proposed Action would generate approximately 11,500 yd³ of radioactive and clean (non-radioactive) dismantlement debris and waste (USACE, 2019d). Approximately 64 percent (7,424 yd³) of this volume would consist of radiological waste, with the remainder (36 percent, or 4,103 yd³) consisting of clean waste suitable for disposal at permitted, off-post municipal landfills and clean building materials (primarily concrete and steel) that may be suitable for recycling. This estimate is conservative and allows for opportunities to dispose of decontaminated materials as clean waste. To further minimize volumes of clean waste diverted to landfills, opportunities to recycle clean waste would be continuously reviewed and identified throughout the project. Disposal of radioactive and clean waste is further discussed in **Sections 3.6** and **3.10** of this EA, respectively.

Over the course of the Proposed Action, debris and waste generated from decommissioning and dismantlement would be segregated and packaged (i.e., containerized) in accordance with NRC and USDOT standards prior to transport. An estimated 648 25-yd³ containers would be required to transport the anticipated volume of debris and waste, with each container roughly equivalent to one truck load. Over the approximately 5-year decommissioning period, this would equate to an average of two to three containers of debris being transported from the site per week for disposal or recycling. This would increase to an average of six to seven waste containers transported from the site per week during the middle 12 months (i.e., months 19 through 30) of the project, when approximately 50 percent of the anticipated waste would be generated (USACE, 2018c). Waste packaging and transport is further discussed in **Section 3.9** of this EA.

2.3 Alternatives Screening Criteria

As part of early project planning, USACE identified seven screening criteria to guide the review, evaluation, and selection of decommissioning and dismantlement options for the Deactivated SM-1 Nuclear Reactor Facility. The alternatives considered were limited to those that would allow for termination of the SM-1 Decommissioning Permit and release of the site for unrestricted use in accordance with criteria defined in 10 CFR Part 20.1402 (**Section 1.1**). That is, satisfaction of the screening criteria would select and implement an alternative that would meet the Proposed Action's purpose and need. These criteria are briefly described, as follows:

- **Safety.** Protect public and worker safety, to the maximum extent possible, by reducing the probability of accident or injury in all phases of the decommissioning process.
- **Health.** Reduce risk to public and worker health, to the maximum extent possible, including compliance with the radiological criteria for release of the site for unrestricted use and demonstration of the ALARA objective.
- **Time.** Select and implement a decommissioning and dismantlement approach that results in termination of the Decommissioning Permit prior to expiration of the 60-year post-deactivation threshold in

accordance with Army regulations (that implement the NRC requirements) and the program requirements of the Army's Deactivated Nuclear Power Plant Program.

- **Space.** Select and implement a decommissioning and dismantlement option that provides adequate space to safely and efficiently perform all associated work activities.
- **Cost.** The programmatic, technical, and administrative elements of decommissioning the site should be completed at a fair and reasonable cost, within program funding.
- **Land Use.** Result in land use that supports the Army's mission, now or in the future, and is consistent with Fort Belvoir's Real Property Master Plan (RPMP) for South Post (Fort Belvoir, 2015).
- **Environmental.** Avoid or minimize adverse effects on protected, beneficial, or valued environmental resources as required by law and to the maximum extent possible, consistent with Fort Belvoir's *Integrated Natural Resources Management Plan* (INRMP; 2018a) and other relevant guidance.

NEPA, CEQ regulations, and Army NEPA regulations require a range of reasonable alternatives to be explored and evaluated objectively. USACE considered several alternatives to the Proposed Action to evaluate against the screening criteria. This evaluation determined that only one action alternative, the Proposed Action Alternative, would meet the Proposed Action's purpose and need. **Section 2.3.1** describes the Proposed Action Alternative and No Action Alternative in more detail. **Section 2.3.2** describes the alternatives considered and eliminated from detailed analysis, including a brief discussion of the reasons for their elimination.

2.3.1 Alternatives Selected for Detailed Analysis

2.3.1.1 No Action Alternative

Under the No Action Alternative, USACE would continue to maintain the Deactivated SM-1 Nuclear Reactor Facility in a SAFSTOR condition under Reactor Possession Permit Number SM1-1-19. The ARP's mission to decommission SM-1 and return the property to Fort Belvoir would be delayed or defunct, should decommissioning not take place within 60 years of its deactivation. Under the No Action Alternative, USACE would continue to bear the cost of maintaining SM-1, including regular inspection and monitoring. The site would not be restored or allowed to return to a natural state under this Alternative. While the No Action Alternative would not meet the Proposed Action's purpose and need, it is analyzed in the EA to provide a comparative baseline in accordance with 40 CFR Part 1502.14.

2.3.1.2 Proposed Action Alternative

The Proposed Action Alternative would execute the Deactivated SM-1 Nuclear Reactor Facility DP and terminate the Decommissioning Permit as described in **Section 2.2**. Under the Proposed Action Alternative, all radioactive and non-radioactive materials and waste associated with the SM-1 site would be removed for transport to an appropriate disposal or recycling facility. To the extent practicable, hazardous materials and radioactive M&E would be selectively dismantled and removed intact for disposition prior to dismantlement of site structures. Conversely, M&E verified as uncontaminated would likely be left in place for dismantlement and segregated on-site for disposal or recycling thereafter. Employing a similar approach, the Proposed Action Alternative would also excavate and remove subsurface infrastructure and any contaminated media from the SM-1 site (e.g., soils). The resultant materials and waste would also be segregated on-site for transport and disposal in compliance with applicable laws and regulations.

Under the Proposed Action Alternative, Fort Belvoir's existing road network would be used to access the SM-1 site (e.g. personnel and equipment), as well as to transport materials and waste for disposal or recycling off-post. As shown on **Figure 2.3-1**, the primary routes designated for this purpose include Wilson Road, Totten Road, and Grindley Road within and exiting the 300 Area. Gunston Road, 21st Street, Theote Road and Pohick Road would be used for movement between the 300 Area and US Highway 1/Richmond Highway (off post). From the intersection of Pohick Road and US Highway 1, Interstate 95 (I-95) is accessible via Fairfax County Parkway approximately 3.5 miles to the west-southwest.

Other installation roadways may also support the Proposed Action Alternative. These include an unpaved perimeter security patrol road as a potential inbound route for full or empty dump trucks hauling fill materials during site restoration activities. The truck gate also provides an alternate means for inbound and outbound access to the SM-1 site. The truck gate (accessible from Putnam Road) would support limited movements of oversized equipment such as large cranes and other oversize shipments.

Under the Proposed Action Alternative, the latter stages of decommissioning and dismantlement of SM-1 would include site remediation, as necessary to comply with the unrestricted use criteria. Such a finding would be validated by the FSS process in accordance with AR 50-7 prior to site restoration activities. Demobilization and termination of the Decommissioning Permit would conclude the Proposed Action Alternative and return the property to Fort Belvoir in a natural state for future use.

Adherence to the DP under the Proposed Action Alternative would reduce safety and health risks, to the maximum extent possible, through careful planning and executing work tasks to minimize hazardous work conditions. Waste transport under the Proposed Action Alternative would generally avoid areas on post where residents, staff, or visitors are often present. Trucks transporting waste would exit the 300 Area via Gridley Road through the 300 Area gate or via Putnam Road through an optional truck gate located to the west of the 300 Area gate. The use of these primary routes under the Proposed Action Alternative would reduce potential interactions with other vehicles or pedestrians to the maximum extent possible.

Completion of the implementation of the Proposed Action Alternative by approximately 2025 would result in permit termination within 60 years of SM-1's initial deactivation as required by the Army's Deactivated Nuclear Power Plant Program. Accordingly, the Proposed Action Alternative would accomplish the Army's mission to implement the Deactivated Nuclear Power Plant Program. Adequate space is available to conduct the Proposed Action Alternative safely and efficiently, and work sequencing would further minimize the space required to decommission and dismantle SM-1. The Proposed Action Alternative would also provide operational flexibility for more efficient access to and from the SM-1 site. For example, on the one-way Totten Road, traffic could be reversed as necessary to accommodate either southbound or northbound trucks during peak periods of waste shipments.

The Proposed Action Alternative could be implemented at a fair and reasonable cost to USACE, returning the SM-1 site to Fort Belvoir for future use. Whether maintained for conservation or re-purposed for another use, as an additional, vacant parcel of land, the site would directly support the Army's mission on post. It would also retain consistency with Fort Belvoir's future land use plans for this area of the post, as designated in the RPMP (see **Section 3.2.1**).

Figure 2.3-1: Transportation Route Options on Fort Belvoir



As described in this EA, the Proposed Action Alternative would avoid, minimize, or mitigate for any potential adverse environmental impacts of decommissioning SM-1 to the maximum extent possible. The Proposed Action Alternative would also result in the removal of all structures (above and below ground) from the SM-1 site, including their associated radioactive or hazardous materials and wastes. That is, site cleanup and restoration under the Proposed Action Alternative would produce a net environmental benefit.

Therefore, the Proposed Action Alternative is carried forward for detailed analysis in this EA.

2.3.2 Alternatives Considered and Dismissed

USACE considered several alternatives for implementing the Proposed Action. These alternatives were evaluated against screening criteria (see **Section 2.3**) for consistency with the Proposed Action's purpose and need. These alternatives failed to meet the screening criteria and were dismissed from further analysis. This section provides a brief discussion on the rationale for their dismissal.

2.3.2.1 Decommission and Leave-In-Place

The decommission and leave-in-place alternative would allow portions of the Deactivated SM-1 Nuclear Reactor Facility to remain intact in the long term, but still meet the standard of unrestricted release per 10 CFR 20.1402 and allow termination of the reactor permit within 60 years of SM-1's deactivation. This option would require removal of radioactive material and equipment, including the primary reactor system components inside the VC. Equipment with low levels of interior or exterior contamination could be decontaminated to preserve the equipment for historical purposes. With an intent to leave the building and VC in place, special care would be taken to minimize damage to the structures while removing radioactive materials. Building surfaces would be decontaminated to levels that would meet pre-determined criteria based on the potential dose to future site occupants. Additionally, residual soil contamination would be remediated to meet dose-based release criteria. Following decontamination of remaining building components, the facility and site would be suitable for unrestricted use in accordance with criteria defined in 10 CFR Part 20.1402; additional monitoring and/or land use controls would not be required.

Relative to the Proposed Action Alternative (**Section 2.3.1.2**), work under this alternative to extract key components of the reactor, while leaving Building 372 largely intact and decontaminating remaining reactor and building components, would require extensive engineering to temporarily stabilize the building and structure. Factors impacting the complexity of this alternative could include:

- Removing large components from the VC while attempting to preserve the structure.
- Decontaminating the interior of contaminated equipment and verifying that criteria have been met.
- Demonstrating that administrative areas, operational areas, and VC meet the unrestricted release criteria.

Correspondingly, the alternative would also increase the potential for accidents (e.g., entrapment, crushing, collapse, laceration/puncture/severing injuries, exposure to residual radioactivity), thereby posing a substantially higher risk to worker safety and health and failing to meet USACE's **Safety** and **Health** screening criteria (**Section 2.3**). The additional engineering and safety measures that would be required under this alternative, would also contribute to substantially greater costs incurred by USACE to decommission the Deactivated SM-1 Nuclear Reactor Facility relative to the Proposed Action Alternative, thereby failing to meet the **Cost** screening criterion.

Building 372 has been vacant for more than 30 years and has experienced substantial interior and exterior deterioration during that time. Its current condition, combined with modifications to remove key reactor and components as part of this alternative, would necessitate extensive retrofitting and modernization to meet current building codes and make Building 372 suitable for future human occupancy. Removal of existing ACM, LBP, and other non-radiological hazards would also be required. Improvements would likely include, but would not be limited to, new doors, windows, electrical and data wiring, plumbing, drywall, interior and exterior paint, and roofing materials.



Existing interior space condition in Building 372.

Modernization of the facility would also be required to meet the requirements of the Americans with Disabilities Act (42 USC 126 Parts 12101 et seq.; 28 CFR Parts 35 and 36). These upgrades would further contribute to a substantially greater cost for this alternative relative to the Proposed Action Alternative; thus, the alternative would fail to meet the **Cost** screening criterion.

The potentially adverse perception by future tenants of occupying a former nuclear reactor facility could result in their unwillingness to occupy the building, thereby failing to use the site in a manner that supports the current and future Army mission. Leaving any decontaminated reactor systems in place (e.g., for historic preservation) would also fail to directly support the Army's mission at Fort Belvoir, and would result in a land use that is inconsistent with Fort Belvoir's future land use plans as designated in the RPMP (see **Section 3.2.1**). These factors would contribute to this alternative's failure to satisfy the **Land Use** criterion.

The decommission and leave-in-place alternative would meet the **Time**, **Space**, and **Environmental** screening criteria for the following reasons, respectively:

- Despite the longer implementation period that would be required relative to the Proposed Action Alternative to conduct the additional engineering and facility modernization discussed above, decommissioning of the Deactivated SM-1 Nuclear Reactor Facility would still be completed within the 60-year post-deactivation timeframe in accordance with Army regulations (that implement the NRC requirements) and the program requirements of the Army's Deactivated Nuclear Power Plant Program.
- While space on the SM-1 site would be more constrained under this alternative relative to the need to preserve the structure of Building 372, sufficient space would still be available on the site to safely and efficiently implement the alternative. However, additional safety precautions would likely be needed relative to the Proposed Action Alternative to ensure the safety and health of workers during decommissioning and building modernization activities.
- The alternative would result in somewhat less environmental disturbance relative to the Proposed Action Alternative because Building 372 would largely remain intact. Much of the surrounding site would be disturbed to remove contaminated soils, resulting in vegetation clearing and the temporary displacement of wildlife, followed by the application of clean fill soils and re-planting of vegetation during site restoration. However, the extent of such disturbance on the site relative to the Proposed Action would be less. The modernization and reuse of Building 372 would have a long-term beneficial impact on this NHRP-eligible resource.

However, as discussed above, the decommission and leave-in-place alternative would fail to meet four (**Safety, Health, Cost, and Land Use**) of the seven screening criteria developed by USACE. Therefore, the alternative would fail to meet the Proposed Action's purpose and need and was eliminated from detailed analysis in this EA.

2.3.2.2 Alternate Transportation Routes (Fort Belvoir)

Multiple alternate transport routes within Fort Belvoir were considered to provide access to and from the SM-1 site to conduct decommissioning and dismantlement activities (**Figure 2.3-1**). Factors evaluated for this purpose included public safety, traffic, roadway grades and truck turning radii, and posted speed limits (USACE, 2018c). The alternate routes were considered inferior to the proposed route to meet the varied requirements necessary to support the Proposed Action. Therefore, alternate transport routes on Fort Belvoir were eliminated from detailed analysis in this EA.

2.3.2.3 Barge Transport Option

The barge transport option for waste shipments would utilize a loading area in Ponton Basin, a lagoon approximately 0.3 mile east of the SM-1 site, for staging and eventual transport of materials and waste via barge. Under this option, waste containers would be trucked east on Wilson Road to a staging/transfer point along the existing seawall on the north side of Ponton Basin. A land- or barge-based crane would then load the containers onto a moored barge for transport via the Potomac River and Chesapeake Bay to a transfer facility in Norfolk, Virginia.

Although a viable option logistically, the selection of the barge transport option would require dredging in Ponton Basin and portions of Gunston Cove. A minimum channel depth of nine feet at low tide would be required to accommodate tugboat delivery and retrieval of barges. This equates to an average dredge depth of five feet across a lagoon of approximately 28,000 square feet, not including its entry channel. As such, the barge transport option would likely require the removal of more than 10,000 yd³ of dredge spoils. Due to these environmental factors, this option would substantially increase the time, cost, and impact of decommissioning and dismantling the Deactivated SM-1 Nuclear Reactor Facility. Therefore, the barge transport option was eliminated from detailed analysis in this EA.

2.3.2.4 Decommissioning and Dismantlement of Upland Site Components, and Leaving-in-Place Pier and other Infrastructure in the Floodplain

An alternative that removes only the portion of the Deactivated SM-1 Nuclear Reactor Facility in uplands, but does not include removal of the pier or any other infrastructure in the floodplain, was considered but was not carried through for detailed study. Work in the 100-year floodplain and tidal wetlands (**Sections 3.3.3.3.3 and 3.3.3.3.5**, respectively), which includes removal of the cooling water intake pier, pump house, concrete discharge pipe, and outfall structures is integral to the Proposed Action.

Alternatives that would leave items associated with the operation of the SM-1 Nuclear Reactor Facility, including the cooling water intake pier, and wastewater discharge infrastructure in place were not further considered by USACE because they would not meet the Proposed Action's Purpose and Need (**Sections 1.4**) to remove all materials and equipment (M&E) and structures allowing for unrestricted future use of the site. An alternative that proposes to leave structures associated with the reactor operations, and underground lines in place that may have acted as a conduit for radioactive materials transport or previously contained radioactive materials, cannot achieve complete decommissioning; the underground lines cannot be surveyed in place to demonstrate that the release limits for the remaining features meet the criteria presented in the Decommissioning Plan (DP). To meet the Proposed Action's Purpose and Need, all materials will require removal to make them accessible for radiological

release surveys. The Finding of No Practicable Alternative (FONPA) (**Appendix C**) further explains USACE’s decision to implement the Proposed Action in the 100-year floodplain, in accordance with EO 11988.

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3 Affected Environment and Environmental Consequences

3.1 Introduction

Section 3 describes the existing physical, environmental, and cultural conditions on and around the Deactivated SM-1 Nuclear Reactor Facility (i.e., the affected environment), and the Proposed Action's potential direct and indirect impacts on those resources (i.e., environmental consequences). The potentially affected environment for this EA is defined at the individual resource level. That is, depending on the resource considered, potential adverse effects may accrue to the site, its immediate surroundings, or all or parts of Fort Belvoir, Fairfax County, and the Washington, D.C. area. Information on resources analyzed in this EA was obtained through the review of existing environmental documents, including those provided by USACE and Fort Belvoir. Additional information was obtained from other credible sources, such as regulatory agencies and the scientific community.

Resources dismissed from detailed analysis in this EA in accordance with 40 CFR Part 1500 are discussed in **Section 3.2**. The discussions of resources potentially affected by the No Action and Proposed Action Alternatives are subsequently organized in **Section 3** as follows:

- **Section 3.3**, Water Resources, including Water-Dependent Recreation
- **Section 3.4**, Air Quality
- **Section 3.5**, Biological Resources
- **Section 3.6**, Radiological Safety and Health
- **Section 3.7**, Occupational Safety and Health
- **Section 3.8**, Cultural Resources
- **Section 3.9**, Transportation and Traffic
- **Section 3.10**, Non-Radiological Hazardous Materials and Waste, and Non-Hazardous Solid Waste
- **Section 3.11**, Geology, Topography, and Soils

Thresholds for determining the significance of an adverse impact are provided in the corresponding Environmental Consequences section for each resource listed above (the terms “impact” and “effect” are used synonymously throughout this EA). Generally, adverse impacts that are determined to be less than significant do not meet the conditions requiring preparation of an EIS as defined at 32 CFR Part 651.41. Actions not having a significant impact on the environment do not normally require the preparation of an EIS, as defined at 32 CFR Part 651.42.

For all resources evaluated in this EA, a beneficial impact would occur if the Alternative results in the improvement of the resource's condition in, adjacent to, or near the SM-1 site.

The potential cumulative impacts on these resources are described in **Section 4**.

3.2 Resources Dismissed from Further Analysis

In compliance with NEPA, CEQ regulations, and Army NEPA regulations, the description of the affected environment focuses on those resources and conditions potentially subject to effects. Those resources that are dismissed from detailed analysis are discussed briefly, providing additional detail as to why the resource was not subjected to further analysis (40 CFR Part 1500.1[b] and Part 1500.4[b]).

3.2.1 Land Use

The Deactivated SM-1 Nuclear Reactor Facility is situated within an area of Fort Belvoir designated as a professional/institutional land use zone. This land use designation generally includes non-tactical administrative functions, as well as some areas on post where research and development activities are concentrated (Fort Belvoir, 2015). The Proposed Action would decontaminate, dismantle, and remove all facilities and infrastructure from the SM-1 site; contaminated soils would also be excavated and removed. The site would then be restored to a natural state under the Proposed Action. The resultant land use would be consistent with Fort Belvoir's professional/institutional zone and no change to the site's current land use designation would be required. Therefore, land use was dismissed from further analysis in this EA.

3.2.2 Aesthetics and Visual Resources

The Deactivated SM-1 Nuclear Reactor Facility is visible from areas on Fort Belvoir's South Post, within Gunston Cove itself, and the shoreline opposite the site (e.g., Pohick Bay Regional Park is approximately 1 mile west-southwest across Gunston Cove).

Decommissioning and dismantlement activities under the Proposed Action would be similar in nature to a construction site. Construction activity on Fort Belvoir and within the NCR occurs regularly, and is a common component of viewsheds therein. As such, no significant adverse effects are anticipated to result from the Proposed Action, which would occur on an intermittent and temporary basis. In the long term, a minor, beneficial impact on local aesthetics and visual resources would be likely to result from the Proposed Action as the site is returned to a natural state. Therefore, aesthetics and visual resources were dismissed from further analysis in this EA.



SM-1 Site View from Gunston Cove (USACE, 2019c)

Section 3.8, *Cultural Resources* addresses the aesthetic or visual appeal of SM-1 as a historic property.

3.2.3 Noise

On Fort Belvoir, the existing noise environment is characterized by local road traffic, aircraft overflights, construction and maintenance activities, and sounds typical of any mixed-use urban environment. Most noise generated on post is intermittent with effects dependent on factors such as weather, time of day, and the location of sensitive receptors. Whether a noise is considered a nuisance often depends on the type of noise and how it is perceived by a receptor.

The use of heavy equipment during certain phases of the Proposed Action would generate short-term, intermittent, temporary noise. Noise levels would depend on equipment usage and whether such activities take place individually or concurrently. Vehicles and trucks used to move personnel, M&E, and waste to and from the SM-1 site would also generate noise along segments of local and regional roads. Noise under the Proposed Action would be comparable to that of a typical construction or building demolition site. No residential land use is found

within 0.5-mile of the SM-1 site and many areas in between are forested. The implementation of standard best management practices (BMPs) would further reduce noise levels associated with decommissioning activities. Additionally, work activities would generally be limited to weekdays and primarily take place during normal business hours.

Short-term noise associated with the Proposed Action would not substantially alter the noise environment from the *status quo*. In the long-term, background noise would be comparable to other open space areas or transport routes on and in the vicinity of Fort Belvoir. Therefore, noise impacts on residential land use were dismissed from further analysis in this EA.

Section 3.3.2.6 evaluates potential noise impacts on community land use in the context of water-dependent recreation. **Section 3.7** evaluates noise exposure risk for on-site workers directly involved in decommissioning SM-1.

3.2.4 Socioeconomics, Including Protection of Children

The Proposed Action would not increase the number of personnel stationed on Fort Belvoir now or in the future. A short-term, temporary increase in the civilian working population on post would result from decommissioning and dismantlement activities. This change would be negligible in the context of current and planned development activities on Fort Belvoir. Overall, changes to population, demographics, income, community services and facilities, or housing are anticipated to be minimal.

The decommissioning and dismantlement of SM-1 would create local jobs and induced effects such as local expenditures from workers. These jobs would be temporary and hired workers would not be likely to change their place of residence. In the context of the regional economy, the Proposed Action would have a minor, short-term, beneficial effect as economic stimulus. These effects would generally coincide with the duration of the Proposed Action. As analyzed in this EA, potential adverse impacts on socioeconomics from noise, air, or water pollution associated with the Proposed Action would be minimal. Therefore, socioeconomics was dismissed from detailed analysis in this EA.

Since children may suffer disproportionately from environmental health risks and safety risks, the intent of EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, is to ensure that federal agencies prioritize and address this concern. Although children are present on Fort Belvoir both as residents and visitors, the Proposed Action would occur within a secured area of South Post bounded to the south by Gunston Cove. Children are not authorized to access this area of the post and access to the SM-1 site would be strictly controlled due to the nature of the Proposed Action. Further, secondary effects associated with the Proposed Action (e.g., noise, air quality, and traffic) would not be anticipated to disproportionately affect children's health or safety. Therefore, protection of children was dismissed from detailed analysis in this EA.

3.2.5 Environmental Justice

The purpose of EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, is to avoid the disproportionate placement of adverse environmental, economic, social, or health effects from federal proposed actions and policies on minority and low-income populations. Due to the location of the Deactivated SM-1 Nuclear Reactor Facility, the Proposed Action would not result in disproportionate adverse human health or environmental effects on minority or low-income communities, either on- or off-post. A minor, short-term beneficial effect on disadvantaged, minority communities within the NCR would likely result from the hiring of temporary workers to support decommissioning activities. Therefore, environmental justice was dismissed from detailed analysis in this EA.

3.2.6 Utility Systems

The SM-1 site contains various underground utility lines (**Figure 2.2-1**), all of which are inactive except for Building 372's electrical connection to the on-post grid. The Proposed Action would deactivate and remove the current electrical lines that service the reactor facility. All other legacy utility systems and infrastructure on the site would also be removed as part of decommissioning. The decommissioning contractor would obtain excavation permits from Fort Belvoir DPW and verify the locations of buried infrastructure prior to beginning ground-disturbing activities on the SM-1 site.

The Proposed Action would install and operate temporary utilities for power and water necessary to support decommissioning activities; however, this demand would be accommodated under existing private sector contracts held by Fort Belvoir. Additionally, increases in demand would fluctuate and occur intermittently over the duration of the Proposed Action. No local service disruptions are anticipated to result from the Proposed Action. Additionally, there is sufficient regional disposal capacity for municipal solid waste (MSW) generated by the Proposed Action. The quantity of MSW would also be reduced by the segregation of waste and debris at the site prior to disposition, including recyclable materials. Therefore, utilities were dismissed from further analysis in this EA.

3.3 Water Resources, including Water-Dependent Recreation

This section describes water resources that could be affected by the Proposed Action. Water resources consist of surface water and groundwater, as follows:

- Surface water includes rivers and creeks, streams, lakes, bays and estuaries, stormwater runoff, wetlands, and floodplains.
- Groundwater is water contained under the earth's surface in soil or in pores and crevices in rock.

Water quality describes the chemical and physical composition of surface and groundwater resources. The region of influence (ROI) for water resources and water quality includes the SM-1 site and downstream receiving water bodies.

Water-based recreation is a frequent activity in the vicinity of Fort Belvoir and the SM-1 site. These activities include fishing, boating, waterskiing, swimming, kayaking, rafting, canoeing, sailing, and waterfowl hunting. The ROI for water-based recreation is Gunston Cove and upstream surface water bodies.

3.3.1 Regulatory Setting

Table 3.3-1 summarizes federal and state regulations and Army and Fort Belvoir policies that are applicable to water resources in the vicinity of the Deactivated SM-1 Nuclear Reactor Facility and Fort Belvoir.

Table 3.3-1: Water Resources – Applicable Regulations and Guidance

Regulation	Description
Federal	
Clean Water Act, as amended (33 USC Part 1251 <i>et seq.</i>)	Authorizes the USEPA to regulate activities resulting in a discharge to navigable waters, including dredged and fill materials and stormwater runoff. Section 404 of the CWA requires that a permit be obtained from USACE before discharging dredge or fill material into waters of the US (WOUS), their tributaries, and associated wetlands. Section 303 requires states to identify waters where current pollution control technologies alone cannot meet the established water quality standards. It further requires development of total maximum daily loads (TMDLs) for pollutants in waters identified as “impaired” for their designated uses.
Coastal Zone Management Act (16 USC Part 1451 <i>et seq.</i>)	Establishes a national coastal management program that comprehensively manages and balances competing uses of and impacts on coastal areas and resources. The Coastal Zone Management Act (CZMA) includes a consistency determination requirement that federal activities potentially affecting a state’s coastal resources must be consistent to the maximum extent practicable with that state’s federally approved coastal management program.
EO 11990, <i>Protection of Wetlands</i>	Requires federal agencies to take actions to minimize or avoid the destruction, loss, or degradation of wetlands and to preserve and enhance their natural and beneficial values. Federal agencies are to avoid new construction in wetlands. If it is determined that there is no practicable alternative to building in a wetland, the proposed construction must incorporate all possible measures to limit harm to the wetland.
EO 11988, <i>Floodplain Management</i>	Requires federal agencies to avoid, to the extent possible, adverse impacts associated with the occupation and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.
State	
Chesapeake Bay Preservation Act (Code of Virginia Part 62.1-44.2)	Protects lands designated as Chesapeake Bay Preservation Areas. Projects that occur on lands that are protected under the Act must be consistent with the Act and may be subject to the performance criteria to reduce for preservation areas. Under the Chesapeake Bay Preservation Act (CBPA), Fairfax County adopted an Ordinance that designates resource protection areas (RPAs) and management areas within the county.
Virginia Water Control Law (Code of Virginia Part 62.1-44.2)	Mandates the protection of existing high-quality state waters and the restoration of all other state waters to such quality as to permit reasonable public uses and to support aquatic life.
Virginia Water Protection Permit Program (9 Virginia Administrative Code [VAC] 25-210-10 <i>et seq.</i>)	Serves as Virginia’s Section 401 Water Quality Certification Program to regulate discharges of dredged material into waterways or wetlands, or for other instream activities under the federal Section 404 permit program.
Code of Virginia Part 28.2-1200 through Part 28.2-1420	Authorizes the Virginia Marine Resources Commission to regulate activities affecting subaqueous bottomlands, marine fisheries, and coastal resources (e.g., tidal wetlands, coastal sand dunes/beaches).

3.3.2 Affected Environment

3.3.2.1 Groundwater

Fort Belvoir is underlain by two aquifer systems associated with the Lower (hereafter, the “lower Potomac aquifer”) and Middle Potomac (hereafter, the “middle Potomac aquifer”) Formations. The lower Potomac aquifer is situated within the bottom portion of the Potomac Formation approximately 500 to 600 feet bgs. Groundwater in this aquifer flows to the southeast; recharge occurs via precipitation along the western portion of Fort Belvoir and areas farther north and west of the post (Fort Belvoir, 2018a). The lower Potomac aquifer provides drinking water for some private wells in off-post areas of northern Virginia.

The middle Potomac aquifer, situated above the lower Potomac aquifer, is an unconfined system or perched (water table) aquifer. Groundwater in this aquifer system is locally influenced by topography and drains towards nearby surface water features. Aquifer recharge occurs directly and indirectly via precipitation as either surface discharge or percolation through soil media (Fort Belvoir, 2018a).

Depth to the water table across Fort Belvoir is seasonally and geographically variable, ranging from approximately 10 to 35 feet bgs in most areas on post. In proximity to streams and other surface water features, however, the water table may occur at or near the surface as part of the unconfined aquifer system. In such areas, depth to water is typically less than 10 feet bgs. There are no active potable water wells on the installation; all abandoned wells have been filled and received regulatory closure (Fort Belvoir, 2015).

Depth to groundwater on the SM-1 site is approximately 30 feet bgs, and 10 to 15 feet bgs in areas downslope of Building 372 (USACE, 2019b). It is likely that groundwater underlying the SM-1 site flows generally toward Gunston Cove (USACE, 2013).

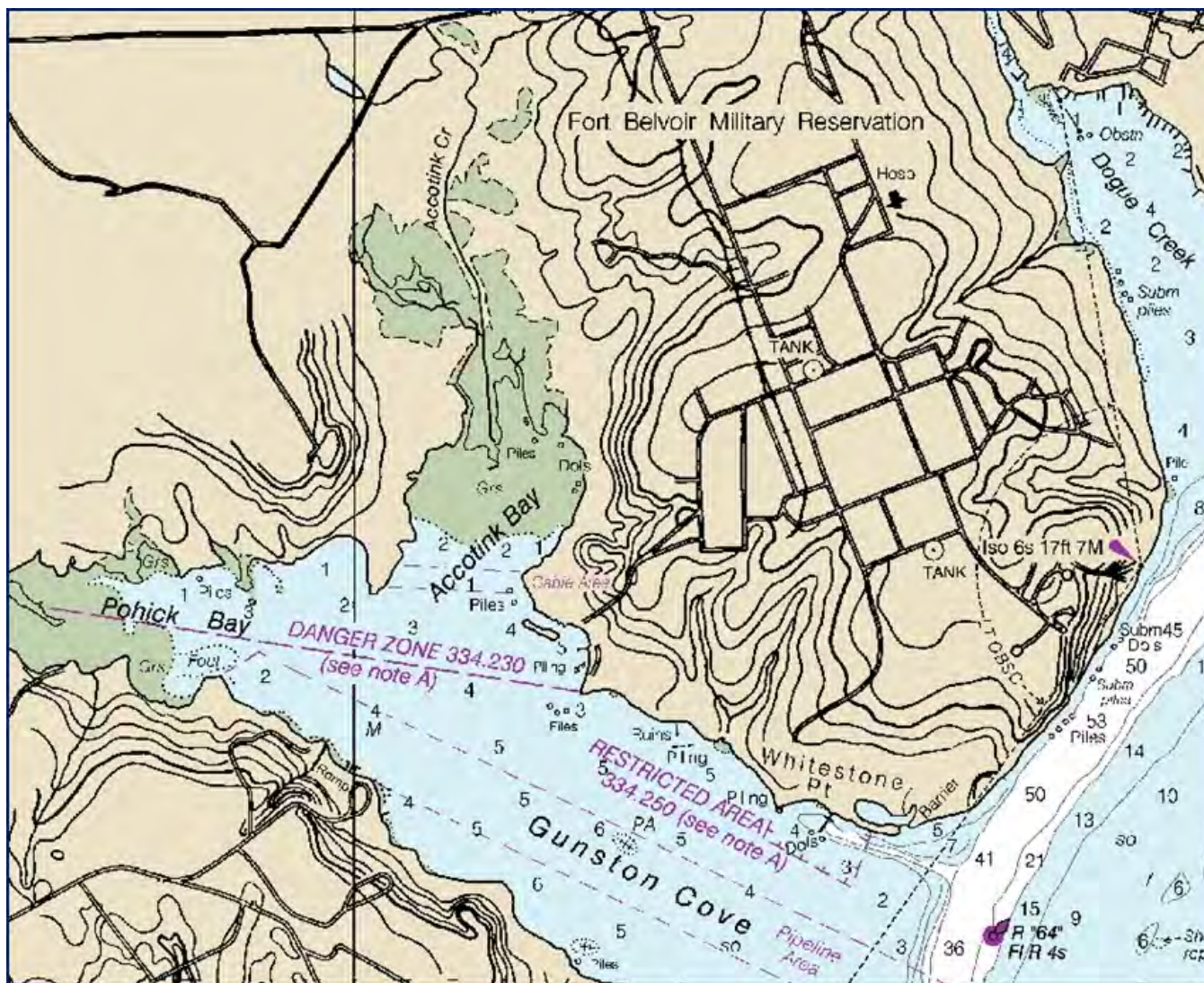
3.3.2.2 Surface Water and Water Quality

There are no naturally occurring or human-made bodies of surface water within the perimeter of the SM-1 site. Surface water bodies near the SM-1 site include three unnamed streams: a perennial (i.e., having year-round flow) stream fed by an intermittent (i.e., seasonally influenced flow) stream to the northwest-west, and an intermittent stream to the east-northeast of the site. Other nearby surface water bodies include Gunston Cove, Pohick Creek and Bay, Accotink Creek and Bay, and the Potomac River.

The SM-1 site is adjacent to Gunston Cove, a tidal embayment of the Potomac River (**Figure 1.3-1**). Gunston Cove converges with the Potomac River less than one mile downstream (southeast) of the SM-1 site. The Potomac River discharges to the Chesapeake Bay approximately 64 miles (in a straight line) downstream from Fort Belvoir and is one of the Bay’s major tributaries.

Water depths in Gunston Cove vary from approximately 3.3 feet in the northern portion to approximately 7.4 feet in the center (**Figure 3.3-1**). The mean tidal range is approximately 2.1 feet (Tide Forecast, 2019). Streams in the vicinity of the SM-1 site discharge to Gunston Cove.

Figure 3.3-1: Gunston Cove Depth Sounding Chart



Source: (NOAA, 2019a)

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It is likely that water quality in Gunston Cove is primarily influenced by discharges from Accotink Creek and Pohick Creek, its two primary drainages. Accotink and Pohick Creeks discharge to their respective bays, which subsequently converge with Gunston Cove approximately one mile upstream of the SM-1 site. Both creeks are listed as “impaired” by the Commonwealth of Virginia in accordance with Section 303(d) of the CWA due to degraded water quality that does not fully support designated uses, as established by state water quality standards. Degraded water quality conditions are primarily due to pollutants and sediment conveyed in stormwater generated by impervious surfaces (e.g., buildings, concrete) within the creeks’ intensively developed watersheds. Total Maximum Daily Loads (TMDLs) have been implemented to address pollutants such as fecal coliform, *Escherichia coli* (*E. coli*), chlorides, sediments, and PCBs in Accotink and Pohick Creeks.

Urban development and agriculture within the watersheds of the Potomac River and Chesapeake Bay have impacted these water bodies in a similar manner. As such, TMDLs developed jointly between Maryland, Washington, D.C., and Virginia have been implemented to improve water quality in the vicinity of Fort Belvoir to address PCBs in fish tissue and nitrogen and phosphorus (as part of the 2010 Chesapeake Bay TMDL) (MDE, 2019). USEPA implemented the Chesapeake Bay TMDL in 2010 to regulate annual discharges of nitrogen, phosphorus, and sediment from major sources within the Bay’s approximately 64,000-square-mile watershed.

The six states within the Bay’s watershed and Washington, D.C. are required to adopt watershed implementation plans in accordance with the Chesapeake Bay TMDL to meet annual thresholds for discharges of these pollutants within their boundaries.

The sediments in Gunston Cove were classified as radiological due to the known discharges of diluted liquid wastes from SM-1, as well as the potential for sediment to be impacted from deactivation activities of the MH-1A on the *STURGIS* (USACE, 2005). However, radiological characterization efforts did not identify any radionuclides of potential concern (ROPC) that exceeded the screening levels (USACE, 2013). The sediments in shoreline/cove work areas would require additional sampling at the completion of the activities described in the Proposed Action (see **Section 2.2.6**).

3.3.2.3 Wetlands and Resource Protection Areas

3.3.2.3.1 Wetlands

There are no jurisdictional wetlands or streams within the landward perimeter of the SM-1 site (AECOM-Tidewater, 2016). A query of the USFWS National Wetlands Inventory mapper revealed several unnamed streams and a palustrine forested wetland in the vicinity of the site (**Figure 3.3-2**). The unnamed streams to the west-northwest are identified as perennial and intermittent streams; another unnamed intermittent stream is present to the east-northeast of the SM-1 site (USFWS, 2019b).

3.3.2.3.2 Resource Protection Areas

The Chesapeake Bay Preservation Act (CBPA), enacted by the Virginia General Assembly in 1988, sets limits on development within Chesapeake Bay Resource Protection Areas (RPAs). An RPA is defined in the CBPA as a vegetated buffer no less than 100 feet wide located adjacent to and landward of all tidal shores, tidal wetlands, and non-tidal wetlands connected by surface flow, and contiguous to tidal wetlands along water bodies with perennial flow. The purpose of an RPA is to maintain or restore a vegetated buffer between development and tributaries to the Chesapeake Bay, with the assumption that such a buffer traps pollutants in runoff before they reach the Bay. Development in RPAs is restricted to water dependent activities, maintenance of public facilities, passive recreation, water wells, and historic preservation; redevelopment of existing uses is also allowed in RPAs.

Figure 3.3-2: Water Resources at the SM-1 Site



Fort Belvoir recognizes Chesapeake Bay RPAs on the post. In addition to the 100-foot vegetated buffers, as described above, RPAs on Fort Belvoir also include 100-year floodplains. That is, RPA boundaries extend landward from the tidal shore for 100 feet or to the 100-year floodplain boundary, whichever is greater (**Section 3.3.2.5**). Approximately 2,700 acres of Chesapeake Bay RPAs have been identified on Fort Belvoir based on planning-level assessments of perennial streams and their contiguous floodplains and wetlands. Site-specific RPA delineations (or the perennial flow determinations and wetland delineations that support an RPA delineation) have not been conducted on Fort Belvoir, except for mature projects in an advanced stage of site planning or permitting (Fort Belvoir, 2016). In accordance with Policy Memorandum #27, *Tree Removal and Protection*, Fort Belvoir requires the planting of two new trees between 1.5 and 2.5 inches diameter at breast height (dbh) for every tree or sapling 4 inches dbh or greater removed from RPAs during project-related activities. At minimum, the number of trees replanted in the RPA must equal those removed from the RPA during the project; additional trees may be planted outside the RPA to meet this replanting requirement (Fort Belvoir, 2018b). Additionally, trees and shrubs less than 4 inches dbh that are removed from the RPA during the project must be replaced one-for-one within the RPA in accordance with VDCR's *Riparian Buffers Modification and Mitigation Guidance Manual* (VDCR, 2003).

RPAs on the SM-1 site are associated with the Gunston Cove shoreline, 100-year floodplain, and the unnamed perennial and intermittent streams to the northwest and southeast, respectively (**Figure 3.3-2**). Due to the proximity of these surface water features, RPAs cover approximately 45 percent (2.2 acres) of the SM-1 site (Fairfax County, 2019).

3.3.2.4 Stormwater

Stormwater generated on Fort Belvoir is collected and conveyed through a network of inlets, management basins, ditches, culverts, and underground pipes. Fort Belvoir discharges stormwater to receiving water bodies in accordance with a Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4) (Permit No. VAR040093). Fort Belvoir's MS4 permit is issued by VDEQ under the Virginia Pollutant Discharge Elimination System program. Portions of Fort Belvoir are also covered by an Industrial Stormwater (ISW) Permit (VA0097221) issued by VDEQ. Monitoring, sampling, and reporting of discharges from outfalls on post is periodically conducted to ensure stormwater meets water quality regulatory criteria set forth in these permits. Although SM-1 is not within areas covered by the ISW Permit, portions of the waste transportation route options drain to ISW Outfalls 007 (west of the 300 Area truck gate); 019, 020, and 021 (along Totten Road); 022 (west of Ponton Basin); and 015 (west of Theote Road between Pohick Road and 16th Street).

Under Fort Belvoir's MS4 permit, projects disturbing 2,500 square feet or more of land must prepare and adhere to an erosion and sediment control (E&SC) plan in accordance with the Virginia Erosion and Sediment Control regulations (9 Virginia Administrative Code [VAC] 25-840-40); a stormwater management plan (SWMP) in accordance with the Virginia Stormwater Management Program regulations (9 VAC 25-870-55) is also required. E&SC plans are reviewed by Fort Belvoir DPW prior to submission to VDEQ for approval; approved E&SC plans are included in the project civil design plan. For projects that disturb one acre or more of land, coverage under Virginia's General Permit for Discharges of Stormwater from Construction Activities (Construction General Permit [CGP]) must be obtained. The CGP codifies a requirement to prepare and implement a more detailed, site-specific stormwater pollution prevention plan (SWPPP) for projects that exceed this disturbance threshold.

Stormwater collection and conveyance infrastructure on the SM-1 site is limited. It is likely that stormwater flows by gravity following existing topography away from buildings and structures. Stormwater that does not infiltrate through the soil media may initially drain towards the unnamed streams west or east of the site. Ultimately, stormwater drains to Gunston Cove and, further downstream, the Potomac River.

3.3.2.5 Floodplains

Floodplains are low-lying areas adjacent to streams, rivers, and other water bodies that are subject to periodic inundation by flood waters. The 100-year flood, or base flood, is the flood that has a one percent or greater chance of being equaled or exceeded in any given year. The Base Flood Elevation (BFE) is the water-surface elevation of the base flood.

Approximately 0.5-acre of the SM-1 site is situated within the 100-year floodplain associated with Gunston Cove and the unnamed streams to the west and east, respectively (**Figure 3.3-2**). The intake pier/pump house, concrete discharge pipe, and outfall structure associated with SM-1 are located within the 100-year floodplain. The 100-year floodplain in the vicinity of the SM-1 site is designated as *Zone AE*. The BFE in this area is 10 feet (FEMA, 2019). The majority of the SM-1 site, including Building 372, is located outside the 100-year floodplain.



SM-1 Intake Pier and Pump House (USACE, 2019c)

3.3.2.6 Water-Dependent Recreation

Surface waters in the vicinity of the SM-1 site support a number of water-dependent private and public recreational activities and facilities. Within Gunston Cove, Fort Belvoir's Family, Morale, Welfare, and Recreation office operates and maintains docks at the Outdoor Recreation Center and Travel Camp approximately 0.6-mile and 0.2-mile, respectively, upstream from the SM-1 site. Small boats suitable for use in nearshore waters can be rented at the Outdoor Recreation Center. A duck-hunting blind, accessible only by boat, is located just offshore from and to the west of the SM-1 site (Google Earth, 2019).

Approximately one mile across Gunston Cove, a public boat launch, small boat rentals, and guided boat tours of nearshore waters are offered at Pohick Bay Regional Park, operated by the Northern Virginia Regional Park Authority. Multiple private docks extend from private properties along the Gunston Cove shoreline south of Pohick Bay Regional Park.

Recreational fishermen, waterfowl hunters, boaters, and other water recreation enthusiasts are often observed in Gunston Cove and adjacent waters. It is likely that Gunston Cove is frequently accessed by users via the facilities noted above. Recreational boaters observed in Gunston Cove may also originate from the Fort Belvoir Marina along Dogue Creek, approximately two miles (in a straight line) northeast of the SM-1 site; private docks along the Potomac River shoreline east of Fort Belvoir; or marinas, docks, and public boat launches in Maryland across the Potomac River from Fort Belvoir (Google Earth, 2019).

3.3.2.7 Coastal Zone Management

The Coastal Zone Management Act (CZMA) of 1972 (16 USC Part 1451, *et seq.*, as amended) provides assistance to the states, in cooperation with federal and local agencies, for developing land and water use programs in coastal zones. Section 307(c)(1) of the Coastal Zone Management Act Reauthorization Amendment stipulates that federal projects that affect land uses, water uses, or coastal resources of a state's coastal zone must be consistent, to the maximum extent practicable, with the enforceable policies of that state's federally approved coastal zone management plan.

The Commonwealth of Virginia has developed and implemented a federally approved Coastal Zone Management (CZM) Program. The Virginia CZM Program is administered by VDEQ and consists of a network of state agencies and local governments that regulate Virginia's coastal zone lands and resources. Virginia's CZM Program encompasses nine enforceable policies for the coastal area pertaining to:

- Fisheries management
- Subaqueous lands management
- Wetlands management
- Dunes management
- Non-point source pollution control
- Point source pollution control
- Shoreline sanitation
- Air pollution control
- Coastal lands management

Virginia's coastal zone includes all of Fairfax County. As a federally owned military installation, Fort Belvoir is statutorily excluded from the state's coastal zone. However, federal actions occurring at Fort Belvoir that have the potential to affect coastal zone resources must be consistent, to the maximum extent practicable, with the state's enforceable policies. Therefore, the Army is required to determine the consistency of proposed activities potentially affecting Virginia's coastal zone resources with the enforceable policies of the Virginia CZM program.

3.3.3 Evaluation of Environmental Consequences

3.3.3.1 Approach to the Analysis

Impacts on water use and water quality from the decommissioning of nuclear facilities are neither detectable nor destabilizing (NRC, 2002). However, this section addresses site-specific water resources that could be affected by the Proposed Action. This section discusses short-term (decommissioning) and long-term (post-decommissioning) impacts on water resources and water-dependent recreation potentially resulting from the No Action and Proposed Action Alternatives. Significance thresholds for adverse impacts on water resources and water-dependent recreation are presented in **Table 3.3-2**.

Table 3.3-2: Water Resources Impact Significance Thresholds

Impact Significance Threshold	Type of Impact	Impact Significance Threshold Definition
Less than Significant Adverse Effect	Direct Impacts	The Alternative ¹ would have temporary or permanent impacts on water resources or water-dependent recreation; however, such impacts could be avoided, compensated for, or minimized through adherence to applicable BMPs, minimization or protection measures, or permitting requirements.
	Indirect Impacts	The Alternative would create or contribute to the creation of conditions independent of the Proposed Action that result in temporary or permanent impacts on water resources or water-dependent recreation; however, such impacts could be avoided, compensated for, or minimized through adherence to applicable BMPs, minimization or protection measures, or permitting requirements.
Potentially Significant Adverse Effect	Direct Impacts	The Alternative would have permanent impacts on water resources that could not be avoided, compensated for or minimized through adherence to applicable BMPs, minimization or protection measures, or permitting requirements; and/or would permanently prohibit recreational user access to all or portions of water bodies in the vicinity of the SM-1 site.
	Indirect Impacts	The Alternative would create conditions independent of the Proposed Action that would have permanent impacts on water resources that could not be avoided, compensated for, or minimized through adherence to applicable BMPs, minimization or protection measures, or permitting requirements; and/or would permanently prohibit recreational user access to all or portions of water bodies in the vicinity of the SM-1 site.

Note:

- As used in each of the Impact Significance Threshold tables presented in **Section 3** (i.e., **Tables 3.3-2, 3.4-3, 3.5-2, 3.6-4, 3.7-3, 3.8-1, 3.9-2, 3.10-2, and 3.11-2**), “Alternative” refers to the alternatives analyzed in this EA; that is, the No Action Alternative and the Proposed Action Alternative.

3.3.3.2 No Action Alternative

Under the No Action Alternative, USACE would continue to maintain the Deactivated SM-1 Nuclear Reactor Facility in its current SAFSTOR condition. This would have no impacts on water resources, water quality, or water-based recreation.

3.3.3.3 Proposed Action Alternative

3.3.3.3.1 Groundwater

The Proposed Action Alternative would not require temporary or permanent withdrawals of groundwater (with the possible exception of dewatering during decommissioning-related excavations on the SM-1 site), nor would it include the temporary or permanent installation of wastewater injection wells. Liquid wastes would be captured, containerized, characterized, transported from the site by licensed contractors, and disposed of at permitted off-post facilities. Spill kits would be provided in conspicuous locations on the site throughout the proposed decommissioning process in the event that containment and cleanup of accidental spills is needed.

All existing aboveground and sub-grade impervious surfaces, including building foundations, utilities, and other components would be removed from the site during the proposed decommissioning. No new or additional

impervious surface would be created on the site by the Proposed Action Alternative and restoration activities would result in a permeable, vegetated site.

Therefore, the Proposed Action Alternative would have short- and long-term, less than significant impacts on groundwater. Beneficial impacts on groundwater would be likely in the long term.

3.3.3.3.2 Surface Water and Water Quality

Sediments and pollutants conveyed in stormwater discharged from the SM-1 site during decommissioning and dismantlement activities would have the potential to degrade water quality in receiving water bodies. Adherence to applicable plan or permitting requirements would manage the quality and quantity of stormwater discharged from the site, thereby preventing or minimizing adverse impacts on water quality. Soil disturbance would be distributed throughout the proposed decommissioning and would vary in intensity and extent. This would minimize the quantity of soils that would be exposed at any given time and corresponding concentrations of sediment in stormwater discharged from the site to receiving water bodies.

Containment booms and sediment curtains would be used during in-water and nearshore work associated with removal of the intake pier/pump house, concrete discharge pipe, and outfall structure to contain debris that could inadvertently enter the water column, prevent the migration of disturbed sediment into the water column, minimize turbidity, and ensure disturbed sediments settle near their original location. Disturbance of subaqueous bottomlands during in-water activities would also be minimized to the extent practicable. Spill kits would be kept nearby during all in-water and nearshore work to prevent or reduce risk from the migration of hazardous substances into receiving water bodies in the event that an accidental spill occurs.

Following the completion of restoration activities, the site would be a permeable, vegetated site. Maintenance of the site in a permeable, vegetated condition would facilitate localized infiltration of precipitation into underlying soils and aquifers and aid in minimizing the quantity and improving the quality of stormwater runoff from the site. For these reasons, the Proposed Action Alternative would have short- and long-term, less than significant impacts on surface water and water quality. Beneficial impacts on surface water and water quality would be likely in the long term.

3.3.3.3.3 Wetlands and Resource Protection Areas

Wetlands

It is anticipated that removal of the intake pier/pump house, concrete discharge pipe, and outfall structure would disturb approximately 1.4 acres of tidal wetlands in Gunston Cove, and 0.6 acre of freshwater wetlands immediately inland of Gunston Cove. Prior to conducting in-water work associated with the Proposed Action Alternative, the decommissioning contractor would obtain authorization from applicable federal and state regulatory agencies to temporarily impact wetlands. As necessary, the decommissioning contractor would delineate wetlands that would be potentially disturbed, obtain a jurisdictional determination from USACE, and submit a joint permit application (JPA) identifying avoidance, minimization, and/or compensatory mitigation measures to receive applicable permit coverage.

Adherence to applicable permitting requirements would minimize temporary impacts on wetlands to the extent practicable. Through the permitting process, the decommissioning contractor would evaluate and consider additional measures to avoid or minimize adverse impacts on wetlands. These may include BMPs implemented before or during removal of the in-water structures, or restoration and monitoring post-removal (**Section 3.3.3.4**). Following the completion of the proposed decommissioning activities, wetlands in the vicinity of the site would be allowed to return to a pre-disturbance condition. No new activities or conditions would be established by the Proposed Action Alternative that would involve ongoing or permanent disturbance of wetlands. Thus, impacts on

wetlands resulting from the Proposed Action Alternative would be temporary and less than significant. Beneficial impacts on wetlands would be likely in the long term.

Resource Protection Areas

Vegetation clearing and/or soil disturbance to facilitate the removal of existing structures and abandoned utility lines, provide maneuvering and operational space for decommissioning vehicles and equipment, and storage and staging space for materials and containerized waste would disturb an estimated 2.1 acres of RPAs within the SM-1 site. While this would be an adverse effect, it would be temporary and would be mitigated through the planting of two new trees for the removal of every tree four inches dbh or greater in accordance with Fort Belvoir Policy Memorandum #27, *Tree Removal and Protection*. Vegetation replacement in the RPA would also adhere to the requirements of VDCR's *Riparian Buffers Modification and Mitigation Guidance Manual* (VDCR 2003). No ongoing or permanent activities with potential to disturb RPAs would be established by the Proposed Action Alternative. Following the completion of restoration activities, the site would be maintained in a vegetated condition by Fort Belvoir and would be integrated into the RPA associated with Gunston Cove.

Therefore, the Proposed Action Alternative would have short-term, less than significant impacts on RPAs. Beneficial impacts on RPAs would be likely in the long term.

3.3.3.3.4 Stormwater

Because the Proposed Action Alternative involves more than one acre of land disturbance, the decommissioning contractor would obtain coverage under the CGP, including preparation and implementation of a site-specific SWPPP. Adherence to the requirements of the CGP during land-disturbing activities would ensure that short-term impacts on surface water quality from stormwater discharged from the SM-1 site remain minimal. Soil disturbance would be distributed throughout implementation of the Proposed Action Alternative and would vary in intensity and extent, thereby minimizing the quantity of soils that would be exposed at any given time and corresponding concentrations of sediment in stormwater discharged from the site to receiving water bodies. Dismantlement waste temporarily staged on and transported from the SM-1 site would be packaged in accordance with applicable NRC and USDOT requirements to prevent inadvertent releases of radioactive and non-radioactive wastes to Fort Belvoir's stormwater management system.

In the long term, no new permanent point sources of stormwater discharge would be established by the Proposed Action Alternative. Following restoration activities, the site would be maintained by Fort Belvoir in a vegetated, permeable condition. This would facilitate the infiltration of precipitation while minimizing the quantity and improving the quality of stormwater runoff from the site.

For these reasons, the Proposed Action Alternative would have short-term, less-than-significant impacts on stormwater. Beneficial impacts on stormwater would be likely in the long term.

3.3.3.3.5 Floodplains

By necessity of their location, removal of the intake pier/pump house, concrete discharge pipe, and outfall structure would involve work in the 100-year floodplain. The removal of all structures and equipment associated with the reactor's operation, including those in the 100-year floodplain, is necessary to decommission the Deactivated SM-1 Nuclear Reactor Facility.

The area that would be occupied by the equipment needed to remove structures in the floodplain would be an exceedingly small fraction of the 100-year floodplain associated with downstream stretches of Gunston Cove and the Potomac River. Therefore, activities in the Proposed Action Alternative occurring in the 100-year floodplain would not noticeably impair the floodplain's capacity to absorb or convey floodwaters, nor would they noticeably

displace floodwaters further downstream. Because there would be no noticeable displacement of floodwaters, the proposed activities would have no potential in the short term to threaten human life or property downstream of the SM-1 site.

Thus, the Proposed Action Alternative would have short-term, less than significant impacts on the 100-year floodplain. In the long term, removal of the pier/pump house, concrete discharge pipe, and outfall structure would have beneficial impacts on the 100-year floodplain and associated functions and values by promoting the return of the Gunston Cove shoreline and subaqueous bottom to conditions resembling those that existed prior to the development of SM-1.

The FONPA (**Appendix C**) addresses USACE's decision to implement the Proposed Action in the 100-year floodplain, in accordance with EO 11988.

3.3.3.3.6 Water-Dependent Recreation

In the short term, work associated with the removal of the intake pier/pump house, concrete discharge pipe, and outfall structure could represent a safety risk to public recreation in Gunston Cove. However, access to offshore areas in the vicinity of the SM-1 site would continue to be strictly controlled by the military (**Figure 3.3-1**). If deemed necessary, signage would be posted conspicuously around these work areas (on- and offshore) to inform boaters and ensure they maintain a safe distance. Additional notification could also be provided through the posting of notices at local marinas and boat launch facilities and/or publication in local newspapers. With such measures in place, public safety risks from the in-water removal of structures would be negligible. In the long term, the removal of terrestrial and in-water SM-1 components would enhance the aesthetic value of Gunston Cove and remove a hazard from the waterway.

Noise generated from the decommissioning and dismantlement of SM-1 could be perceived as a public nuisance by recreational users of Gunston Cove, particularly in relation to the Outdoor Recreation Center and Travel Camp located upstream. Noise from proposed decommissioning activities would likely be audible in the offshore waters associated with these facilities. Therefore, noise generated under the Proposed Action Alternative would result in minor, short-term, intermittent adverse impacts on water-dependent recreation in Gunston Cove. To minimize these potential impacts, the decommissioning contractor would implement standard construction-related BMPs for noise control (**Section 3.3.3.4**). The geographic orientation of the SM-1 site in relation to the Outdoor Recreation Center and Travel Camp would also be likely to reduce noise levels from source to potential receptors upstream. It is anticipated that the majority of the proposed decommissioning activities would occur during normal working hours (i.e., approximately 8:00 a.m. to 5:00 p.m. Monday through Friday), further minimizing temporary decommissioning-related noise impacts.

As such, the Proposed Action Alternative would have short-term, less than significant impacts on water-dependent recreation in Gunston Cove. Beneficial impacts on water-dependent recreation in Gunston Cove would result in the long term (i.e., improved aesthetics and hazard reduction).

3.3.3.3.7 Coastal Zone Management

USACE has determined that the Proposed Action Alternative would be consistent, to the maximum extent practicable, with the enforceable policies of Virginia's CZM Program. A Federal Consistency Determination (FCD) analyzing the effects of the Proposed Action on Virginia's coastal zone resources was submitted to VDEQ for review concurrently with the Draft EA public review period. VDEQ concurred with USACE's determination in a letter dated 13 February 2020. Copies of the FCD and VDEQ concurrence letter are provided in **Appendix D**.

3.3.3.4 Management and/or Mitigation Measures

USACE would implement the measures listed below to ensure that potential impacts on water resources remain less-than-significant under the Proposed Action Alternative. Additional details regarding these measures are provided in the DP (USACE, 2019b).

- Waste fluids generated during dismantlement activities (e.g., washing or saw cutting byproducts) would be captured, containerized, characterized, transported from the site by licensed contractors, and disposed of at permitted off-post facilities.
- Spill kits would be provided in conspicuous locations on the site throughout the proposed decommissioning process in the event that containment and cleanup of accidental spills is needed.
- Activities with the potential to release residual or waste fluids would be planned, reviewed, and evaluated by decommissioning personnel prior to execution to identify best practices and procedures to contain the fluids and prevent accidental releases.
- During removal of the intake pier/pump house structure in Gunston Cove, support piles would be cut below the mudline and the portions below the mudline would be left in place to minimize sediment and subaqueous bottom disturbance.
- Containment booms, turbidity curtains, and/or similar measures would be used during in-water work as applicable to prevent the downstream migration of floating debris and disturbed sediments, and ensure that disturbed sediments re-settle near their original location.
- As necessary, the decommissioning contractor would delineate wetlands, obtain a jurisdictional determination from USACE, and submit a JPA identifying avoidance, minimization, and/or compensatory mitigation measures to receive permit coverage pursuant to Sections 401/404 of the CWA.
 - BMPs to avoid or minimize impacts on wetlands during removal of the in-water structure may include: (1) perform activities from portions of the dock/pier or from a floating platform; (2) do not use fill to provide footing for equipment; (3) stage equipment and materials away from the project area when not in use; (4) provide landward access to the project area in a manner that avoids shoreline buffer vegetation; (5) install appropriate erosion and sedimentation controls outside impact areas to minimize secondary effects; (6) dewater and dispose of dredged material in upland sites away from the shoreline, as applicable; and, (7) execute work in a timely manner to limit the quantity and duration of increased turbidity.
 - Wetland restoration activities post-removal of the in-water structures may include replanting wetland vegetation, removal of invasive species, or re-contouring portions of the site to direct stormwater away from the littoral zone.
- Tree removal in the RPA would be mitigated through the planting of two new trees for the removal of every tree four inches dbh or greater in accordance with Fort Belvoir Policy Memorandum #27, *Tree Removal and Protection*.
- The decommissioning contractor would obtain coverage under the CGP, including preparation and implementation of a site-specific SWPPP.
- Signage would be posted conspicuously in the vicinity of the intake pier/pump house, concrete discharge pipe, and outfall structure, and equipment associated with their removal (on- and offshore) to inform boaters and ensure they maintain a safe distance. Additional notification may be provided as determined

necessary through the posting of notices at local marinas and boat launch facilities and/or publication in local newspapers.

- The decommissioning contractor would implement standard construction-related BMPs to minimize temporary noise impacts on water-dependent recreational users, which could include some or all of the following: erection of temporary sound barriers; limiting the idling of vehicles and equipment when parked or not in use; using newer, quieter equipment to the extent possible and keeping equipment well-maintained and in good working order.
- To the extent possible, the majority of decommissioning activities during normal daytime working hours (i.e., approximately 8:00 a.m. to 5:00 p.m., Monday through Friday) to further minimize temporary decommissioning-related noise impacts on water-dependent recreational users.

3.4 Air Quality

The CAA of 1970, as amended, requires the USEPA to establish National Ambient Air Quality Standards (NAAQS) for ambient air pollutants considered harmful to public health and the environment. These pollutants, known as “criteria pollutants,” include: ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), lead (Pb), and two types of particulate matter: particulate matter that is 10 micrometers or less in diameter (PM₁₀) and particulate matter that is 2.5 micrometers or less in diameter (PM_{2.5}). Ground-level O₃ is a strong photochemical oxidant that results from a chemical reaction of volatile organic compounds (air toxics), nitrogen oxides (NO_x), and oxygen in the presence of sunlight (USEPA, 2018b). O₃ is considered a secondary pollutant because it is not directly emitted from pollution sources but is formed in the ambient air. Therefore, the emissions of the precursors (NO_x and volatile organic compounds [VOCs]) are used to estimate the amount of O₃ emissions.

The CAA established two types of NAAQS: primary standards to protect public health (physical effects, such as difficulty breathing or disease, including on sensitive asthmatics, children, and elderly) and secondary standards to protect public welfare (non-physical effects, such as visibility impairment and damage to food sources) (40 CFR Part 50). The NAAQS are expressed as concentration of a criteria pollutant in air and the duration of exposure. Exposure duration can be further defined as either short-term (e.g., 1-hour, 8-hour, 24-hour) or long-term (e.g., annual average).

USEPA uses regional, contiguous areas to determine an area’s NAAQS compliance. These areas may be a county or a group of neighboring counties, a city or a group of regionally connected cities, or other neighboring or regionally connected areas. An area with air pollutants that meet or are below the NAAQS is an attainment area; an area that exceeds one or more NAAQS is a non-attainment area for the exceeded pollutant(s). An area that was historically in non-attainment, but later achieved consistent attainment, is designated as a maintenance area (USEPA, 2019b).

USEPA and local governments also regulate toxic and hazardous air pollutants (HAPs), such as benzene, asbestos, naphthalene, toluene, and xylenes. HAPs are usually present in minimal quantities in the ambient air; however, their high toxicity may pose a threat to public health even at low concentrations (USEPA, 2018a). Pursuant to CAA Section 112, radionuclides such as radon, cesium-137, plutonium, and uranium are categorized as HAPs (USEPA, 2017d). Existing radiological conditions are discussed in **Section 3.6** and are not further discussed in this section.

Greenhouse gas (GHG)-emitting human activities alter the chemical composition of the Earth’s atmosphere and cause shifts in the global climate (i.e., global warming and climate change). GHGs include carbon dioxide (CO₂), methane, nitrous oxide, and fluorinated gases (hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride). CO₂ and other GHGs are emitted from fuel-burning stationary sources (e.g., boilers, generators, plants, and factories), fuel-burning mobile sources (e.g., cars, buses, airplanes, trains, and construction equipment), and certain manufacturing industries and activities (USEPA, 2017c).

3.4.1 Regulatory Setting

Table 3.4-1 outlines other federal regulations that are applicable to air quality and relevant to the Proposed Action.

Table 3.4-1: Air Quality – Applicable Regulations and Guidance

Guidance	Description/Applicability
Clean Air Act (CAA) of 1970, as amended	Established National Ambient Air Quality Standards (NAAQS) for six air pollutants known as criteria pollutants (40 CFR 50): carbon monoxide (CO), nitrogen dioxide (NO ₂), ozone (O ₃), particulate matter (PM ₁₀ [particulate matter with a diameter ≤ 10 micrometers], and PM _{2.5} [particulate matter with a diameter ≤ 2.5 micrometers]), lead (Pb), and sulfur dioxide (SO ₂).
Clean Air Act Amendments (CAAA) of 1990	Expands the scope and content of the act's conformity provisions in terms of their relationship to a State Implementation Plan (SIP). Under Section 176(c) of CAAA, a project is in "conformity" if it corresponds to a SIP's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving their expeditious attainment.
State Implementation Plans (42 USC Subpart 7407)	Requires that each state submit a SIP to USEPA that demonstrates how the NAAQS will be attained (i.e., air pollution at or below NAAQS levels), maintained, and enforced; includes regulations, permitting guidance, emission inventories, and other related documentation or enforceable requirements, as well as air quality standards that can be stricter than Federal standards; authorized under Section 107 of the CAA. USEPA reviews and approves all SIPs, and the SIP is enforced by the state. Virginia's SIP was first submitted to and approved by USEPA in 1972. The state has submitted multiple revisions to USEPA since then for approval and incorporation into the SIP Invalid source specified..
The General Conformity Rule (40 CFR Parts 51 and 93)	Requires federal actions or federally funded actions planned to occur in a non-attainment or maintenance area to be reviewed prior to their implementation to ensure that the actions would not interfere with a State's plans to meet or maintain the NAAQS; considers the total direct and indirect emissions of a proposed action under a General Conformity Analysis; requires a General Conformity Determination if the total air emissions are not exempt or below <i>de minimis</i> levels (i.e., minimum thresholds for criteria pollutants in non-attainment and maintenance areas) specified in 40 CFR Part 93.153.
Ozone Transport Region (42 USC Part 7511c)	Designates the region from Northern Virginia to Maine as an ozone transport region, whereby there may be stricter ozone standards; 40 CFR Part 93.153 of the General Conformity Rule establishes <i>de minimis</i> levels for ozone precursors (i.e., VOCs and NO _x) that may be more restrictive.
List of Hazardous Air Pollutants (42 USC Part 7412)	Lists 187 HAPs regulated by the USEPA (USEPA, 2018a); authorized under Section 112 of the CAA.
New Source Performance Standards (40 CFR Part 60)	Establishes standards to minimize emissions of criteria pollutants and HAPs from specific types of man-made, stationary emission sources; applies to sources that are new, reconstructed, or modified; authorized under Section 111 of the CAA.

Table 3.4-1: Air Quality – Applicable Regulations and Guidance

Guidance	Description/Applicability
National Emission Standards for Hazardous Air Pollutants (40 CFR Part 61)	Establishes standards for various HAPs and source categories; includes a National Emissions Standard for Hazardous Air Pollutants (NESHAP) for asbestos demolition and renovation (40 CFR Part 61.145) and for radionuclide emissions from federal facilities that are not NRC Licensees or Department of Energy facilities (such as Fort Belvoir) (40 CFR Part 61, Subpart I); authorized under Section 112 of the CAA.
Title V Permit Program (40 CFR Part 71)	Requires major sources (i.e., stationary sources, or groups of stationary sources, with the potential to emit more than 100 tons per year [tpy] of any criteria pollutant, 10 tpy of any HAP, or 25 tpy of any combination of HAPs) to obtain a federal Title V operating permit (as specified in Title V of the CAA and in VDEQ's Title V Facility Permit regulations at 9 VAC5-80); includes requirements for reporting GHGs emitted from major sources (area sources are not considered to be major) (USEPA, 2017a); authorized under Section 112 of the CAA.
Mobile Emission Standards (42 USC Subpart 7521-7590)	Establishes USEPA emission standards for manufacturers and operators of mobile sources; includes engine and fuel requirements to reduce mobile source pollution; includes limits on GHGs emitted from mobile sources (USEPA, 2017b); authorized under Section 202 of the CAA.

3.4.2 Affected Environment

Fairfax County was previously designated a moderate non-attainment area for the 1997 8-hour O₃ NAAQS and the 1997 PM_{2.5} NAAQS. In November 2014, Fairfax County was designated as a maintenance area for the 1997 PM_{2.5} NAAQS. However, the NAAQS for the 1997 8-hour O₃ and the 1997 PM_{2.5} were revoked in April 2015 and October 2016, respectively (80 *Federal Register* [FR] 12264, 81 FR 58010). While revoked standards are no longer in effect, anti-backsliding rules may still apply. Such rules ensure that areas previously designated as non-attainment do not reverse air quality improvement progress by removing certain emission controls and standards in place, even after a non-attainment status or NAAQS standard is revoked (80 FR 12264, 81 FR 58010).

Fairfax County, including Fort Belvoir and the SM-1 site, is designated by the USEPA as a marginal non-attainment area for the 2008 8-hour O₃ NAAQS and is located in the ozone transport region where *de minimis* levels of VOC and NO_x are 50 and 100 tpy, respectively (40 CFR Part 93.153). Fairfax County is currently in attainment for all other criteria pollutants (i.e., CO, SO₂, PM_{2.5}, PM₁₀, NO₂, and Pb) (USEPA, 2019b).

Under the CAAA, a project is in “conformity” if it corresponds to a SIP’s purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving their expeditious attainment. In accordance with the General Conformity Rule (40 CFR Parts 51 and 93), federal actions planned to occur in a non-attainment or maintenance area must be reviewed prior to their implementation to ensure that emissions from these actions would not:

- Cause or contribute to any new violations of any standards in any area.
- Increase the frequency or severity of any existing violation of any standards in any area.
- Delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

The Proposed Action would occur in Fairfax County, a marginal non-attainment area for the 2008 8-hour O₃ NAAQS. Therefore, analysis of potential emissions from the Proposed Action is required in accordance with the General Conformity Rule to determine if such emissions would contribute to the further degradation of air quality in Fairfax County and delay or prevent the attainment of the applicable SIP's objectives.

In accordance with 40 CFR Part 71, Fort Belvoir is classified as a "major source" of air emissions (i.e., it has the potential to emit more than 100 tpy of any criteria pollutant, 10 tpy of any HAP, or 25 tpy of any combination of HAPs). As such, the installation maintains a Title V operating permit (Number NVRO70550). This permit regulates stationary source emissions for the installation as a whole and includes requirements for emission monitoring, testing, recordkeeping, reporting, and inventorying on an annual basis. HAPs at Fort Belvoir are primarily associated with permanent, stationary sources (e.g., fueling stations, fuel storage tanks, and paint booths). As a major source, Fort Belvoir also reports annual installation-wide GHG emissions as part of the USEPA's Greenhouse Gas Reporting Program (USEPA, 2019a). None of the buildings on the SM-1 site (i.e., Buildings 372, 7350, 349, and 375) contain stationary sources that are regulated by Fort Belvoir's Title V permit.

3.4.3 Evaluation of Environmental Consequences

3.4.3.1 Approach to the Analysis

Impacts on air quality from the decommissioning of nuclear facilities are neither detectable nor destabilizing (NRC, 2002). However, this section addresses potential site-specific effects from the No Action and Proposed Action Alternatives, and the methodologies to determine those impacts. **Table 3.4-2** identifies the adverse impact significance thresholds for air quality. Direct impacts would occur on the SM-1 site and would result from the proposed activities under either Alternative. Indirect impacts would have the potential to migrate off the SM-1 site, such as an increase in off-site emissions or off-site visibility impacts from fugitive dust.

Table 3.4-2: Air Quality Impact Thresholds

Impact Significance Threshold	Type of Impact	Impact Significance Threshold Definition
Less than Significant Adverse Effect	Direct Impacts	<ul style="list-style-type: none"> The Alternative would result in negligible emissions of criteria pollutants within an attainment area and/or negligible emissions of HAPs. The Alternative would not violate the conditions of the Title V permit. The Alternative would result in minimal amounts of fugitive dust emissions and emissions of GHGs that are not noticeable on a regional level.
	Indirect Impacts	<ul style="list-style-type: none"> The Alternative would induce emissions outside of the site that would not exceed <i>de minimis</i> levels or change the attainment status. The Alternative would induce emissions of HAPs outside of the site that would not exceed major source thresholds.
Potentially Significant Adverse Effect	Direct Impacts	<ul style="list-style-type: none"> The Alternative would result in criteria pollutant emission levels exceeding <i>de minimis</i> levels and/or HAP emissions exceeding major source thresholds. Emissions would change attainment status. The Alternative would result in the violation of Title V permit conditions. The Alternative would generate fugitive dust emissions that would cause visibility issues and GHG emissions that would be noticeable on a regional or global level.

Table 3.4-2: Air Quality Impact Thresholds

Impact Significance Threshold	Type of Impact	Impact Significance Threshold Definition
	Indirect Impacts	<ul style="list-style-type: none"> The Alternative would induce emissions outside of the site that would exceed NAAQS or <i>de minimis</i> levels or change the attainment status. The Alternative would induce emissions of HAPs outside of the site that would exceed major source thresholds.

Appropriate minimization measures that could be implemented to reduce the severity of an impact are included in **Section 3.4.3.4**. The detailed calculations and methodologies for estimating the Proposed Action's air emissions are provided in **Appendix E**. The calculations include:

- Calculation of criteria pollutant emissions to determine the applicability of the General Conformity regulations (based on the attainment status designation for Fairfax County)
- Calculation of GHG emissions in carbon dioxide equivalent (CO₂e) units and comparison to the annual state-wide and Fort Belvoir GHG emissions to determine the Proposed Action's level of contribution to regional GHG emissions.

The calculation of HAP emissions from permanent, stationary sources was not necessary for this analysis as all emissions from the Proposed Action would be mobile and temporary.

3.4.3.2 No Action Alternative

Under the No Action Alternative, there would be no dismantlement of buildings or structures at the SM-1 site and existing conditions would continue for the foreseeable future. Therefore, implementation of the No Action Alternative would not result in any changes to existing air quality. Fort Belvoir's contribution to regional air quality would not change. Ambient air quality trends and regional emissions would continue as described in **Section 3.4.2**.

3.4.3.3 Proposed Action Alternative

Temporary activities under the Proposed Action Alternative that would generate pollutant emissions include, but are not limited to:

- Handling and transport of excavated and imported materials (i.e., soil and concrete) during construction;
- Operations of heavy-duty, diesel-powered trucks and equipment at the site during dismantlement;
- Operations of heavy-duty, diesel-powered trucks traveling to and from the site to dispose of or deliver materials during dismantlement;
- Operation of workers' commuter vehicles, commuting to and from the SM-1 site;
- Storage of excavated and imported materials in stockpiles;
- Use of unpaved areas/roads; and
- Site preparation activities (e.g., clearing, grubbing, tree removal).

3.4.3.3.1 Criteria Pollutants

The Proposed Action Alternative would generate criteria pollutant emissions. All emissions generated would be temporary (i.e., only occurring during construction) and there would be no emission sources at the SM-1 site after completion of the Proposed Action Alternative. Further details on the emission sources, such as the types and sizes of construction equipment, are provided in **Appendix E**.

Table 3.4-3 shows the criteria pollutant emissions estimates for each year of the Proposed Action Alternative and compares them to applicable *de minimis* levels or major source thresholds. The PM₁₀ and PM_{2.5} values in **Table 3.4-3** include calculated fugitive emission values. Because criteria pollutant calculations only include the temporary, mobile sources associated with the Proposed Action Alternative, a comparison to Fort Belvoir's installation-wide permanent, stationary source emissions is not necessary.

As shown in **Table 3.4-3**, temporary construction emissions would not exceed the annual *de minimis* levels or major source thresholds for any criteria pollutants. Therefore, a General Conformity Determination is not required. Detailed methodologies for estimating air emissions and a Record of Non-Applicability (RONA) are provided in **Appendix E**.

Emission limits and conditions in the Title V permit are primarily relevant to stationary sources at the installation; no limit exceedances or noncompliance with Fort Belvoir's Title V permit would occur under the Proposed Action Alternative. Based on the temporary nature of the emissions and the non-effect on Fort Belvoir's Title V permit, the Proposed Action Alternative would have a temporary, less than significant impact on air quality.

3.4.3.3.2 HAP Emissions

Most HAPs emitted in Virginia and at Fort Belvoir are primarily associated with permanent, stationary sources and are typically measured at very low concentrations. Temporary HAP emissions associated with the Proposed Action Alternative could occur, but would be negligible when compared to Fort Belvoir and regional HAP emissions and would not meet or exceed major source thresholds (10 tpy of any HAP or 25 tpy of any combination of HAPs). Therefore, HAP emissions from the Proposed Action Alternative would have a temporary, less than significant impact on air quality.

3.4.3.3.3 GHG Emissions

Potential GHG emissions were calculated for each year of the Proposed Action Alternative. **Table 3.4-4** shows the estimated GHG emissions for each year of the Proposed Action Alternative and compares them to the 2017 Fort Belvoir installation-wide GHG emissions and the Virginia 2015 state-wide GHG emissions. The relative annual contribution of GHG emissions from the Proposed Action Alternative would be negligible on a regional level. Therefore, GHG emissions from the Proposed Action Alternative would have a temporary, less-than-significant impact on air quality.

Table 3.4-3: Proposed Action Alternative Criteria Pollutant Emissions Compared to Fort Belvoir Emissions, *De Minimis* Levels, and Major Source Thresholds

Pollutant	2021 Proposed Action Alternative Emissions (tpy)	2022 Proposed Action Alternative Emissions (tpy)	2023 Proposed Action Alternative Emissions (tpy)	2024 Proposed Action Alternative Emissions (tpy)	2025 Proposed Action Alternative Emissions (tpy)	2017 Fort Belvoir Annual Emissions (tpy) ¹	<i>De minimis</i> Level (tpy) ²	Major Source Threshold (tpy) ³
VOCs	0.24	0.43	0.50	0.67	0.27	1.95	50	--
NO _x	2.39	6.48	6.73	7.69	1.74	31.85	100	--
SO ₂	0.17	0.48	0.50	0.58	0.12	0.12	--	100
CO	1.24	2.22	2.48	3.31	1.11	14.86	--	100
PM ₁₀	1.18	0.37	0.44	0.59	0.23	1.37	--	100
PM _{2.5}	1.18	0.36	0.40	0.53	0.18	1.35	--	100

Notes:

1. Source: (VDEQ, 2013)
2. *De minimis* levels for an O₃ non-attainment area in the ozone transport region.
3. Major source threshold for criteria pollutants.

Table 3.4-4: Proposed Action Alternative GHG Emissions Compared to Fort Belvoir and State-wide GHG Emissions

GHG	2021 Proposed Action Alternative Emissions (metric tpy)	2022 Proposed Action Alternative Emissions (metric tpy)	2023 Proposed Action Alternative Emissions (metric tpy)	2024 Proposed Action Alternative Emissions (metric tpy)	2025 Proposed Action Alternative Emissions (metric tpy)	2017 Fort Belvoir Annual Emissions (metric tpy) ¹	2015 State-wide Emissions (metric tpy) ²
CO ₂ e	231.34	632.41	651.93	757.36	158.40	24,585	103,000,000
<i>Percentage (%) of Fort Belvoir Emissions</i>	<i>0.94</i>	<i>2.57</i>	<i>2.65</i>	<i>3.08</i>	<i>0.64</i>	--	--
<i>Percentage (%) of State-wide Emissions</i>	<i>0.0002</i>	<i>0.0006</i>	<i>0.0006</i>	<i>0.0007</i>	<i>0.0002</i>	--	--

Notes:

1. Source: (USEPA, 2019a)
2. Source: (EIA, 2019)

3.4.3.4 Management and/or Mitigation Measures

No potentially significant adverse effects on air quality were identified by analysis; therefore, no mitigation measures would be required. The following management measures and/or BMPs would be implemented to further reduce the anticipated less-than-significant, adverse effects:

- Truck beds would be covered while in transit to limit fugitive dust emissions.
- Water would be sprayed on any unpaved roads or stockpiles to limit fugitive dust emissions.
- Ultra-low sulfur diesel would be used as a fuel source where appropriate to minimize oxides of sulfur emissions.
- Clean diesel would be used in construction equipment and vehicles through the implementation of add-on control technologies such as diesel particulate filters and diesel oxidation catalysts, repowers, and/or newer and cleaner equipment. When feasible, electric-powered equipment would be used in lieu of diesel-powered equipment.
- Control measures for heavy construction equipment and vehicles, such as minimizing operating and idling time, would be implemented to limit criteria pollutant emissions.
- Air quality permits would be obtained for the Proposed Action Alternative, as necessary, in compliance with federal, state, and local standards.

3.5 Biological Resources

Biological resources include native or naturalized plants (flora) and animals (fauna); their habitats; and the larger ecosystems in which they occur. This section discusses vegetation and plant communities, wildlife (including protected species), and the habitats in which they are found, and designated Special Natural Areas.

The ROI generally includes Fort Belvoir and Gunston Cove, as well as any adjacent areas that provide important habitat connectivity for special status species. For the purpose of analysis, the SM-1 site and its immediate vicinity are used to determine the relevance of this broader ROI for individual species, if any. Biological resources present on and around the SM-1 site are discussed in this section, including special status species with federal, state, or local protection.

3.5.1 Regulatory Setting

Table 3.5-1 outlines federal and state regulations and Fort Belvoir policies that are applicable to biological resources present on and in the vicinity of the SM-1 site.

Table 3.5-1: Biological Resources – Applicable Regulations and Guidance

Guidance	Description/Applicability
Endangered Species Act of 1973 (16 USC Subpart 1531 et. seq.)	Provides conservation of threatened and endangered species and the habitats in which they are found. Under Section 7, agencies that may affect an endangered or threatened species must consult with USFWS and/or National Marine Fisheries Service so that federal actions will not jeopardize a listed species or result in destruction or adverse modification of its habitat.

Table 3.5-1: Biological Resources – Applicable Regulations and Guidance

Guidance	Description/Applicability
Anadromous Fish Conservation Act (16 USC 757a-757g)	Authorizes the Secretaries of the Interior and Commerce to enter into cooperative agreements with the states and other non-federal interests for conservation, development, and enhancement of anadromous fish.
Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 USC Part 1801 et seq.)	Provides conservation and management of fisheries, including the identification and protection of Essential Fish Habitat (EFH).
Migratory Bird Treaty Act of 1918 (16 USC Section 703 et. seq.)	Establishes protections for bird species that migrate between the US and other countries. Makes it unlawful to pursue, hunt, take, capture, wound, or kill a migratory bird by any means including any part, egg, or nest unless otherwise authorized, such as within legal hunting seasons. Administered by USFWS.
Bald and Golden Eagle Protection Act of 1940 (BGEPA) (16 USC 668)	Prohibits the taking of bald eagles (<i>Haliaeetus leucocephalus</i>) and golden eagles (<i>Aquila chrysaetos</i>) or their nests and eggs. Taking is defined as: “to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.”
Executive Order 13186, <i>Responsibilities of Federal Agencies to Protect Migratory Birds</i>	Establishes a Memorandum of Understanding (<i>Promote the Conservation of Migratory Birds</i>) between DOD and USFWS to identify activities where cooperation between DOD and USFWS will contribute substantially to the conservation of migratory birds and their habitats.
DOD Instruction 4715.03, <i>Natural Resources Conservation Program</i>	Authorizes installations to designate Special Natural Areas that have ecological, scenic, recreational, and educational value warranting of special conservation efforts and habitat management, consistent with the military mission.
Virginia Department of Game and Inland Fisheries <i>Removal or Relocation of Osprey Nests in Virginia: A Guideline for Landowners</i> (VDGIF, 2010).	Provides landowner guidance for the relocation of osprey (<i>Pandion haliaetus</i>) nests.
VDGIF <i>Management of Bald Eagle Nests, Concentration Areas, and Communal Roosts in Virginia: A Guide for Landowners</i> (VDGIF, 2012)	Provides landowner guidance on the management of transient and nesting bald eagles.
Fort Belvoir <i>Integrated Natural Resources Management Plan</i> (INRMP) (Fort Belvoir, 2018a)	Establishes that Fort Belvoir actions must be implemented in accordance with policies and procedures that promote overall biological diversity while also supporting Fort Belvoir’s mission. Fort Belvoir has established an ecosystem-based natural resources management program that focuses on the retention of large intact areas of natural habitat, maintenance and improvement of ecological connectivity between habitat areas, and the reduction or correction of habitat degradation.

Table 3.5-1: Biological Resources – Applicable Regulations and Guidance

Guidance	Description/Applicability
Fort Belvoir <i>Bald Eagle Management Plan</i>	Emphasizes conservation of all bald eagle habitats, which includes such requirements or restrictions as a 750-foot buffer around active nests, prohibition of clear-cutting or construction 750 feet inland of a shoreline, a prohibitory flight-zone 500 feet above nest sites during nesting season, and the protection of nest sites for up to five years of inactivity.
Fort Belvoir <i>Memorandum of Instruction – Northern Long-eared Bat Protection on Fort Belvoir</i>	Outlines an installation-wide time of year restriction on tree clearing between 15 April and 15 September to minimize impacts on northern long-eared bat (<i>Myotis septentrionalis</i>) habitat. Provides guidelines to protect and conserve the tricolored bat (<i>Perimyotis subflavus</i>) and little brown bat (<i>Myotis lucifugus</i>).
Fort Belvoir Policy Memorandum #27, <i>Tree Removal and Protection</i>	Requires trees greater than 4 inches in diameter at dbh lost to land disturbance at Fort Belvoir to be replaced at a 2:1 ratio elsewhere on Fort Belvoir property. Allows the implementation of alternative mitigation methods, such as stream or riparian area restoration, when a 2:1 ratio replacement is not achievable.
Fort Belvoir Policy Memorandum #78, <i>Conservation of Migratory Birds</i>	Provides guidance on activities that may impact the nesting season of migratory birds, such as tree removals, chimney maintenance, demolition, and mowing. Some of the restrictions and requirements include, but are not limited to: avoidance of tree clearing between 1 April – 15 July, avoidance of osprey nest removal between 16 April – 15 September (or written consent from VDGIF must be obtained), and coordination of activities within 750 feet of a bald eagle nests with Fort Belvoir’s Environmental Division.

3.5.2 Affected Environment

3.5.2.1 Vegetation and Plant Communities

3.5.2.1.1 Terrestrial

Fort Belvoir’s Integrated Natural Resources Management Plan (INRMP) identifies 16 plant community types on Fort Belvoir’s Main Post. The dominant plant community type at Fort Belvoir is “Urban,” which primarily consists of impervious surfaces, maintained lawns, and landscaped areas (Fort Belvoir, 2018a). The SM-1 site is included within the Urban plant community type.

Vegetation on the site includes maintained lawn, landscape trees and shrubs, and mature pine and hardwood trees. Vegetation is denser on the southeastern and northeastern sides of the site and along the Gunston Cove shoreline. The SM-1 site is bounded to the north by land within the Oak Submesic-Ericad Forest plant community, which is dominated by chestnut oak (*Quercus prinus*), with a mixture of northern red oak (*Quercus rubra*) and scarlet oak (*Quercus coccinea*) (Fort Belvoir, 2018a).

No invasive plant species with significant occurrence have been identified on the SM-1 site (Fort Belvoir, 2018b).

3.5.2.1.1 Aquatic

Gunston Cove borders the SM-1 site. This cove contains shallow water with various types of submerged aquatic vegetation (SAV). SAV contributes to the health of estuary systems by providing habitat for many fish and shellfish species, food for waterfowl, erosion control, and excess nutrient absorption. Mapped SAV species in Gunston Cove include hydrilla (*Hydrilla verticillata*) and common reed (*Phragmites australis*), which are both invasive species, water stargrass (*Heteranthera dubia*), spiny naiad (*Najas marina*), coontail (*Ceratophyllum demersum*), wild celery (*Vallisneria americana*), and southern naiad (*Najas guadalupensis*) (MDNR, 2018; VIMS, 2019; Fort Belvoir, 2018a). The presence and extent of SAV adjacent to and near in-water structures associated with SM-1 is not known.

3.5.2.2 Wildlife and Habitat

3.5.2.2.1 Terrestrial

Birds

Two hundred seventy-eight (278) bird species have been documented at Fort Belvoir. Vegetation on the SM-1 site could provide habitat for any number of Fort Belvoir's resident and migrant bird species, particularly those that prefer forested and wooded areas, such as the resident red-bellied woodpecker (*Melanerpes carolinus*) and migratory American redstart (*Setophaga ruticilla*), or riparian/shoreline areas, such as the resident great blue heron (*Ardea herodias*) and migratory spotted sandpiper (*Actitis macularius*). Additionally, active osprey (*Pandion haliaetus*) nests exist on Building 372, on the intake pier, and in other areas of the SM-1 site (Fort Belvoir, 2018a). Ospreys typically mate for life and return to the same nesting area each year (USFWS, n.d.). The picture below shows osprey nests on the Building 372 stack and on the intake pier adjacent to the pump house.



Osprey Nests at the Deactivated SM-1 Nuclear Reactor Facility (USACE, 2019c)

Mammals

Forty-three (43) mammal species have been documented at Fort Belvoir. Vegetation on the SM-1 site could provide habitat for any number of Fort Belvoir's mammal species, particularly those that prefer forested and edge habitats, such as the eastern gray squirrel (*Sciurus carolinensis*) and eastern cottontail rabbit (*Sylvilagus floridanus*), or those that are malleable in their habitat preferences and can successfully inhabit urban areas, such as the white tail deer (*Odocoileus virginiana*) and raccoon (*Procyon lotor*) (Fort Belvoir, 2018a).

Reptiles, Amphibians, and Invertebrates

Fort Belvoir has identified 34 species of reptiles and 27 species of amphibians within its boundaries. The majority of the reptiles and amphibian species at Fort Belvoir live in or near water, or spend at least part of their lifecycle in water. This includes the northern water snake (*Nerodia sipedon*), snapping turtle (*Chelydra serpentina*), bullfrog (*Rana catesbeiana*), and spotted salamander (*Ambystoma maculatum*) (Fort Belvoir, 2001; Fort Belvoir, 2018a). Vegetation on the SM-1 site could provide habitat for any number of Fort Belvoir's amphibian, reptile, or terrestrial invertebrate species, including those that live in association with water, since the SM-1 site includes a portion of Gunston Cove and is bordered by tributaries and a wetland area.

3.5.2.2.2 Aquatic

Macroinvertebrates

Aquatic habitats at Fort Belvoir generally consist of warm water, low baseline flow, silty/sandy substrate, and in-stream organic debris. Erosion and runoff from developed watersheds may impact the water quality of aquatic habitats. Some 197 species of aquatic benthic macroinvertebrates have been identified in Fort Belvoir waterways. Dominant benthic macroinvertebrates are pollutant-tolerant aquatic midges (*Chironomidae*) and worms (*Oligochaete*) (Fort Belvoir, 2001; Fort Belvoir, 2018a).

Fish

Sixty-five (65) resident fish species have been identified at Fort Belvoir, which predominantly includes freshwater minnow (*Cyprinidae*) and sunfish (*Centrarchidae*) species (Fort Belvoir, 2018a). The dominant fish species in Gunston Cove is the white perch (*Morone americana*). Anadromous species from Gunston Cove that may be found in the cove's tributaries during spawning season include the alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), and gizzard shad (*Dorosoma cepedianum*) (Fort Belvoir, 2018a). VDEQ recommends a time of year restriction on in-water activities between 15 February and 30 June of any year to minimize effects on anadromous fish.

Time of year restrictions applicable to terrestrial and aquatic species potentially occurring on or near the SM-1 site are summarized in **Table 3.5-2**.

Essential Fish Habitat

Essential fish habitat (EFH) is defined in the Magnuson-Stevens Fishery Conservation and Management Act (MSA) as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." EFH is regulated by NOAA Fisheries. EFH is present in Gunston Cove for at least one life stage for the little skate (*Leucoraja erinacea*), Atlantic herring (*Clupea harengus*), red hake (*Urophycis chuss*), winter skate (*Leucoraja ocellata*), clearnose skate (*Raja eglanteria*), and windowpane flounder (*Scophthalmus aquosus*) (NOAA Fisheries, 2019).

Given the low salinity of the Potomac River near the SM-1 site, adult and juvenile EFH species are not expected to occur, or would occur in low densities, as these species prefer high salinity zones (greater than 10 parts per thousand [ppt]) of the Chesapeake Bay and low water temperatures (below 10 °C) (New England Fishery Management Council & NMFS, 2017). Water temperatures and salinity levels in Gunston Cove are also anticipated to be outside of ideal conditions for spawning and larval stages (below 10 °C and above 0.5 ppt).

USACE has consulted with NOAA Fisheries regarding the Proposed Action's potential effects on EFH in accordance with the MSA. Copies of correspondence supporting this consultation are included in **Appendix B**.

3.5.2.3 Protected Species and Habitat

3.5.2.3.1 Terrestrial

A query of USFWS's Information, Planning, and Consultation (IPaC) database identified one federally listed species with potential to occur at or near the SM-1 site: the northern long-eared bat (*Myotis septentrionalis*) (NLEB). No other federally listed species or critical habitat was identified in the IPaC query (USFWS, 2019a). However, Fort Belvoir has either documented, or manages for the potential presence of, eight federally listed or state-listed threatened and endangered species based on available habitat. Fort Belvoir has also documented, or manages for the potential presence of, four "species of concern" that are not federally or state-listed: the spotted turtle (*Clemmys guttata*), Northern Virginia well amphipod (*Stygobromus phreaticus*), Tidewater amphipod (*Stygobromus indentatus*), and the monarch butterfly (*Danaus plexippus*) (Fort Belvoir, 2018a).

USACE has consulted with USFWS in accordance with Section 7 of the ESA regarding federally listed species under its jurisdiction that would be potentially affected by the Proposed Action. Copies of correspondence supporting this consultation are included in **Appendix B**.

Vegetation

The federally and state-threatened small whorled pogonia (*Isotria medeoloides*) is a flowering plant that prefers forested understory habitat (USFWS, 2018f). Identification of the species and determination of its presence in a particular area is difficult due to its unusual life cycle, which includes dormancy periods of up to five years (Fort Belvoir, 2018a). Suitable habitat for the small whorled pogonia was identified on the installation during field surveys conducted in 2011 and 2012; however, the species' presence has not been documented on Fort Belvoir and it is not expected to occur on the SM-1 site (Fort Belvoir, 2015).

Birds

The bald eagle (*Haliaeetus leucocephalus*) is a bird-of-prey that prefers habitats near water. After a significant population recovery due to the banning of dichlorodiphenyltrichloroethane (DDT) and implemented ESA protections, the bald eagle was federally delisted from the threatened and endangered species list in 2007 and delisted by the State of Virginia in 2013. However, bald eagles continue to be protected under the MBTA and the BGEPA (USFWS, 2017). The installation provides roosting, foraging, and nesting habitat for both resident and migratory bald eagles. As of 2018, there were eight active bald eagle nests at Fort Belvoir (Fort Belvoir, 2018a). None of the eight active bald eagle nests at Fort Belvoir are located within 750 feet of the SM-1 site (The Center for Conservation Biology, 2018).

The American peregrine falcon (*Falco peregrinus anatum*) is a bird-of-prey that can utilize a number of habitats, including urban areas. The peregrine falcon is a state-listed threatened species (USFWS, 2018a). Fort Belvoir does not consider the peregrine falcon to be a resident species; it does not breed or nest on the installation and typically only occurs along the Accotink Creek/Accotink Bay stream corridor and the Jackson Miles Abbott Wetland Refuge during its fall migration (Fort Belvoir, 2001). Based on peregrine falcon habitat preferences and transient occurrences, it is unlikely that the peregrine falcon would be encountered at the SM-1 site (Fort Belvoir, 2001).

Table 3.5-2: Time of Year Restrictions Applicable to the SM-1 Site

Species or Resource		Restricted Date Range ³	Month and Date ¹																								
Common Name	Scientific Name		January		February		March		April		May		June		July		August		September		October		November		December		
			1-15	16-31	1-15	16-28	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-30	1-15	16-31	
Anadromous Fish ²																											
Alewife	<i>Alosa pseudoharengus</i>	15 February – 30 June																									
Atlantic Sturgeon	<i>Acipenser oxyrinchus oxyrinchus</i>																										
Blueback Herring	<i>Alosa aestivalis</i>																										
Gizzard Shad	<i>Dorosoma cepedianum</i>																										
Mammals																											
Little Brown Bat	<i>Myotis lucifugus</i>	15 April – 15 September																									
Northern Long-eared Bat	<i>Myotis septentrionalis</i>																										
Tri-Colored Bat	<i>Perimyotis subflavus</i>																										
Birds																											
Migratory Birds (vegetation clearing)		1 April – 15 July																									
Bald Eagle (Occasional Use Forage Area)	<i>Haliaeetus leucocephalus</i>	15 May – 31 August 15 Dec. – 15 March																									
Bald Eagle (Active Nesting Season)	<i>Haliaeetus leucocephalus</i>	15 Nov. – 15 June																									
Osprey (Active Nesting Season)	<i>Pandion haliaetus</i>	16 April – 15 Sept. ⁴																									

- Notes:
- 1. Shaded cells indicate times of year when activities potentially disturbing the respective species or resource are potentially prohibited or limited; additional coordination with Fort Belvoir DPW and/or federal and state regulatory agencies may be required.
 - 2. Representative anadromous fish species potentially occurring in waters adjacent to or near the SM-1 site are listed.
 - 3. Date ranges shown are applicable to any year.
 - 4. Permission may be requested from VDGIF if disturbance cannot be avoided during this time.

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USFWS Birds of Conservation Concern species with the potential to occur at the SM-1 site include the following (USFWS, 2019a):

- Bald eagle
- Bobolink (*Dolichonyx oryzivorus*)
- Canada warbler (*Cardellina canadensis*)
- Dunlin (*Calidris alpina*)
- Kentucky warbler (*Oporornis formosus*)
- King rail (*Rallus elegans*)
- Lesser yellowlegs (*Tringa flavipes*)
- Prairie warbler (*Dendroica discolor*)
- Prothonotary warbler (*Protonotaria citrea*)
- Red-headed woodpecker (*Melanerpes erythrocephalus*)
- Rusty blackbird (*Euphagus carolinus*)
- Semipalmated sandpiper (*Calidris pusilla*)
- Short-billed dowitcher (*Limnodromus griseus*)
- Wood thrush (*Hylocichla mustelina*)

Mammals

Three protected bat species occur at Fort Belvoir: NLEB, tricolored bat (*Perimyotis subflavus*), and little brown bat (*Myotis lucifugus*). White nose syndrome, a fast-spreading fungal disease, is the main threat to these species and the principal reason for their listings (USFWS, 2018c; Hamlin, 2004; Havens, 2006). The NLEB is federally listed as threatened. During the winter, this species hibernates in caves or mines with stable temperatures, high humidity, and no air currents. During the summer, the NLEB primarily roosts individually or in colonies underneath tree bark, or in the cavities or crevices of live trees or snags. The NLEB typically forages in the understory of forested areas or over water (USFWS, 2018c).

The tricolored bat is a state-listed endangered species. As with the NLEB, the tricolored bat hibernates in caves or mines with stable temperatures and high humidity. Summer roosting habitat includes rock crevices, caves, tree foliage, and structures such as barns. They forage in riparian areas, open woods, forest edges, and over open water (NYNHP, 2014b).

The little brown bat is a state-listed endangered species. During the winter, the little brown bat hibernates in caves or mines. Summer roosting habitat includes human and natural structures, such as tree crevices, under rocks, wood piles, and in barns. The species' preferred foraging habitat is over wetlands and open water (NYNHP, 2014a).

VDGIF restricts construction near hibernacula and maternity roosts of protected bat species. According to the VDGIF online mapper of these buffer areas, there are no documented hibernacula or roost trees on Fort Belvoir property (VDGIF, 2018b; VDGIF, 2018a). Thus, there are no documented hibernacula on or within 0.25 mile of the SM-1 site and no documented roosts on or within 150 feet of the site. Fort Belvoir conducts regular surveys to monitor bat presence at the installation. Tree clearing on Fort Belvoir is restricted between 15 April and 15 September of any year to prevent or minimize impacts on protected bat species potentially occurring on the installation (**Table 3.5-2**).

Reptiles, Amphibians, and Invertebrates

The wood turtle (*Glyptemys insculpta*) is a state-listed threatened aquatic turtle that primarily lives in and along permanent freshwater streams and respective terrestrial buffers (NatureServe, 2016; Fort Belvoir, 2018a). Historically, the wood turtle was found on Fort Belvoir at the Jackson Miles Abbott Wetland Refuge, Dogue Creek, Accotink Creek, and the Accotink Bay Wildlife Refuge. No wood turtles have been found at Fort Belvoir since their last sighting in 1999 (Fort Belvoir, 2001). The species is not expected to occur at the SM-1 site.

The rusty patched bumble bee (*Bombus affinis*) was federally listed as endangered in 2017 (USFWS, 2018d). Fort Belvoir has not yet conducted surveys specifically for the rusty patched bumble bee; however, based on a review of the bumble bees' range and potential zones of presence, Fort Belvoir is located in the species' historic range (Fort Belvoir, 2018a; USFWS, 2018e). The species has not been recently observed or collected on Fort Belvoir and is not likely to be present at the SM-1 site.

3.5.2.3.2 Aquatic

Two federally and state-listed endangered fish species, the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and the shortnose sturgeon (*Acipenser brevirostrum*), have been identified as potentially occurring in the surrounding regional waterways of Fort Belvoir. Critical habitat for the Atlantic sturgeon has also been designated in the Potomac River adjacent to Fort Belvoir. These species and critical habitat are discussed below.

USACE has consulted with NOAA Fisheries regarding the Proposed Action's potential effects on federally listed species and critical habitat under its jurisdiction. Copies of correspondence supporting this consultation is provided in **Appendix B**.

Atlantic Sturgeon and Atlantic Sturgeon Critical Habitat

The Atlantic sturgeon is an anadromous fish that is federally and state-listed as endangered. The Chesapeake Bay Distinct Population Segment (DPS) spawn in the rivers of the Chesapeake Bay during the late summer and fall (NOAA Fisheries, 2018). Atlantic sturgeon of the Chesapeake Bay DPS could potentially be present in the Potomac River during spawning, anywhere from the mouth up to Little Falls Dam (upriver from Fort Belvoir). Current spawning populations have not been discovered. Water quality is considered less than ideal, due to low dissolved oxygen (DO) during the summer and poor sediment quality (NOAA Fisheries, 2018b). Clean, hard substrate necessary for the attachment of demersal adhesive eggs is also limited within this system (NOAA Fisheries, 2007).

In 2017, NOAA Fisheries issued a final rule designating critical habitat for the Atlantic sturgeon (82 FR 39160). Critical habitat for the Chesapeake Bay DPS of Atlantic sturgeon consists of approximately 480 miles of non-marine aquatic habitat in Maryland, Virginia, and the District of Columbia, including the main stem of the Potomac River. Some of the bays and tributaries branching from the Potomac River, including Gunston Cove, are within the critical habitat boundary (50 CFR 226.225). However, Atlantic sturgeon has not been observed in the Potomac River in recent decades and there is no existing evidence of current spawning in Gunston Cove.

Due to the absence of ideal habitat and a lack of confirmed and documented current spawning populations within Gunston Cove, the occurrence potential of Atlantic sturgeon adjacent to the SM-1 site is low.

Shortnose Sturgeon

The shortnose sturgeon is a federally and state-listed endangered fish that occurs in rivers and coastal waters from Canada to Florida. Twelve shortnose sturgeon were captured in the Potomac River between 1996 and 2008, between the river mouth and Indian Head (downriver from Fort Belvoir) (NOAA Fisheries, 2010). In 2005, one shortnose sturgeon was captured three kilometers downstream of Gunston Cove at Indian Head. These captures and observations confirm a historical spawning population of shortnose sturgeon in the Potomac River; however, current spawning populations have not been discovered. No shortnose sturgeon have been sighted or captured within Gunston Cove (NOAA Fisheries, 2010; Fort Belvoir, 2018a).

Due to the absence of ideal habitat and a lack of confirmed and documented current spawning populations within Gunston Cove, the potential occurrence of shortnose sturgeon adjacent to the SM-1 site is low.

Other Protected Aquatic Species

None of the fish identified within Fort Belvoir waterways are federally or state-listed as threatened or endangered. Rare fish species at Fort Belvoir that are on the VDCR-NH Watchlist include the least brook lamprey (*Lampetra aepyptera*) and bridle shiner (*Notropis bifrenatus*). The bridle shiner, which has been identified on the installation in Accotink and Dogue Creeks, is also a state species of conservation concern (Fort Belvoir, 2001; Fort Belvoir, 2018a).

The Northern Virginia well amphipod is a Federal Species of Concern and is listed by the State of Virginia as extremely rare. This species is a tiny, unpigmented, eyeless crustacean, in the group commonly known as shrimp, scuds, or sideswimmers (72 FR 51766). The T-17 Refuge borders the SM-1 site to the north and west; however, groundwater at the SM-1 site does not provide the Northern Virginia well amphipod's preferred habitat conditions (MACTEC, 2003; Denton & Scott, 2013). Therefore, the species' presence at the SM-1 site is unlikely.

During consultation in accordance with ESA Section 7, USFWS identified the Northern Virginia well amphipod as a "species of concern." Although not federally protected, USFWS expressed concern about this species relative to excavation associated with the Proposed Action. That is, since the Northern Virginia well amphipod occurs in groundwater-related habitat adjacent to the SM-1 site, excavation down to the groundwater aquifer could potentially affect this species (**Appendix B**).

3.5.2.3.3 Special Natural Areas

Fort Belvoir has established five Special Natural Areas throughout the installation in accordance with DOD Instruction 4715.03. Fort Belvoir established these areas because of the presence of listed or rare species, exemplary biodiversity or natural communities, or other notable ecological or valuable use, such as educational, recreational, or scientific purposes. One of these areas is the ravine seep at the T-17 training area; it has been designated as a wildlife refuge and a Special Natural Area in order to protect the Northern Virginia well amphipod (Fort Belvoir, 2018a). The T-17 Refuge borders the SM-1 site to the north and west.

Although not designated as a Special Natural Area, a portion of the Fort Belvoir shoreline is in USFWS's Potomac River Eagle Concentration Area (previously known as the Mason Neck Bald Eagle Concentration Area). It is one of only three such designated eagle concentration areas in Virginia (Fort Belvoir, 2018b; USFWS, 2018f; Fort Belvoir, 2015). The Gunston Cove shoreline, including the SM-1 site, is part of the Potomac River Eagle Concentration Area and is classified as an "Occasional Use Forage Area" for bald eagles. Time of year restrictions apply to the area from 15 May to 31 August and 15 December to 15 March to minimize impacts from human activity on eagles, particularly during sensitive life stages (**Table 3.5-2**) (Fort Belvoir, 2018a; USFWS, 2018b; Fort Belvoir, 2015).

3.5.3 Evaluation of Environmental Consequences

3.5.3.1 Approach to the Analysis

Potential effects on biological resources from the Proposed Action would be associated with dismantlement and site restoration activities on the SM-1 site, and in-water work associated with the removal of structures in Gunston Cove. **Table 3.5-3** identifies the adverse impact thresholds for biological resources. Impacts on aquatic and terrestrial resources from the decommissioning of nuclear facilities are neither detectable nor destabilizing (NRC, 2002). Activities within operational areas, including the removal of shoreline or in-water structures, have minimal impact on aquatic resources provided all applicable BMPs are employed and required permits are obtained (NRC, 2002). Impacts on threatened and endangered species are not a generic issue and should receive a site-specific evaluation (NRC, 2002).

Table 3.5-3: Biological Resources Impact Significance Thresholds

Impact Significance Threshold	Type of Impact	Impact Significance Threshold Definition
Less than significant Adverse Effect	Direct Impacts	<ul style="list-style-type: none"> The Alternative would result in minor or temporary vegetation removal and loss of vegetation communities; minor loss of native plant or animal species or community diversity; or minor loss or short-term disruption to a major wildlife or migratory movement corridor. The Alternative would result in minor, short-term impediments to flow or aquatic organism movements in waterways; minor or temporary alterations to terrestrial or aquatic habitats; or minor displacement or degradation of aquatic resources, including EFH or benthic communities. The Alternative would have no adverse effects on protected species and their habitats. Any loss in habitat would be less than 5 percent of undisturbed habitats within a biogeographic region, such as that found in a single valley, mountain range, or coastline
	Indirect Impacts	<ul style="list-style-type: none"> The Alternative would result in the limited proliferation of invasive species that would be managed by existing plans and procedures. The Alternative would result in minimal downstream impacts in waterways and minimal impacts on off-site Special Natural Areas. Any impacts would result only in minimal changes to biological resources
Potentially Significant Adverse Effect	Direct Impacts	<ul style="list-style-type: none"> The Alternative would result in the substantial, irreplaceable loss of vegetation and natural vegetation communities; or the substantial loss or long-term disruption to a major wildlife or migratory movement corridor. The Alternative would result in substantial alterations to terrestrial or aquatic habitats, including any fill or alteration of wetland or WOUS; substantial, long-term impediments to flow or aquatic organism movements in waterways; or substantial displacement or degradation of aquatic resources, including EFH or benthic communities. The Alternative would result in the substantial, permanent loss of native plant or animal species or community diversity, individuals, populations, or habitat of a protected species, including any loss of critical habitat and/or declining wildlife habitat that is sensitive or rare. The Alternative would result in the substantial loss of populations or habitat of a protected species that could jeopardize the continued existence of that species. A loss of at least 5 percent of undisturbed habitats within a biogeographic region is considered to be substantial.
	Indirect Impacts	The Alternative would result in the substantial introduction or proliferation of invasive species; notable downstream impacts in waterways; a substantial increase in dust, noise, and vibration in off-site Special Natural Areas; or further changes that would result in moderate to substantial changes to biological resources.

3.5.3.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented. As such, biological resources on and in the vicinity of the SM-1 site would not be affected by the proposed decommissioning activities, including dismantlement and restoration, associated with the Proposed Action. There would be no impacts on plant communities, terrestrial habitats and wildlife, aquatic habitats and wildlife, protected species and their habitats, or Special Natural Areas.

3.5.3.3 Proposed Action Alternative

3.5.3.3.1 Vegetation and Plant Communities

Terrestrial

Activities included in the Proposed Action Alternative, including site preparation, dismantlement, and remediation, would have the potential to disturb and/or remove vegetation on the SM-1 site. Tree clearing would be limited to those areas necessitating clearing. The decommissioning contractor would adhere to established Fort Belvoir policies and practices throughout the Proposed Action to prevent or minimize the introduction and spread of invasive plant species, such as cleaning equipment and vehicles before they leave the site.

During the site restoration, trees would be replanted on the SM-1 site to comply with Fort Belvoir Policy Memorandum #27, *Tree Removal and Protection*, (i.e., two to one replacement of trees larger than four inches dbh) where determined suitable. Other disturbed areas would be reseeded with native grasses and/or shrubs to promote revegetation of the site. Adherence to a site-specific soil placement plan that would specify necessary amendments (**Section 2.2.6**), and a site-specific replanting plan that would be prepared by USACE and its decommissioning contractor and included in the project civil design plan, would promote the successful establishment and viability of vegetation on the site. Following the demobilization of decommissioning personnel and equipment, USACE and Fort Belvoir would monitor vegetation on the site for a period of one year to ensure successful establishment. In the long term, vegetation on the site would be maintained in accordance with Fort Belvoir's established vegetation management policies and practices.

Therefore, impacts on terrestrial vegetation and plant communities would be short-term and less than significant. Restoration of the site following dismantlement of the Deactivated SM-1 Nuclear Reactor Facility would likely have beneficial impacts on these communities in the long term.

Aquatic

Removal of the water intake pier/pump house, which extends from the shoreline to approximately 100 feet into Gunston Cove, would likely require the use of a small barge-mounted crane and other vessels to give the dismantlement crew and equipment access to those structures. Navigating and docking the barge mounted cranes and other heavy equipment could disturb areas of aquatic vegetative communities in Gunston Cove. SAV adjacent to the concrete discharge pipe, outfall structure, and pier/pump house, if present, could be damaged or destroyed during the proposed in-water activities. As project planning continues, USACE would evaluate measures to prevent or minimize impacts on SAV and the introduction or spread of aquatic invasive species, and implement such measures to the extent possible during in-water activities associated with the Proposed Action.

Following in-water activities, the impacted area would be allowed to recover naturally. Recovered habitat would expand into locations formerly occupied by the concrete discharge pipe, outfall, and pier/pump house structures. With adherence to applicable protections under Fort Belvoir's INRMP, impacts on aquatic vegetation and plant communities would be short-term and less than significant. Beneficial impacts on these communities would be likely in the long term.

3.5.3.3.2 Wildlife and Habitat

Terrestrial

The Proposed Action Alternative would alter existing wildlife habitat at the SM-1 site from proposed site preparation, dismantlement, and restoration activities. Wildlife at and near the SM-1 site would likely be disturbed by construction related noise. Wildlife species that occupy the SM-1 site are those generally tolerant of human activities and presence (i.e., common urban and suburban species). These species would be expected to avoid the SM-1 site during decommissioning activities and relocate to undisturbed habitat areas in the vicinity.

To prevent or minimize impacts on migratory birds known or having potential to occur on or near the SM-1 site, vegetation clearing would be prohibited between 1 April and 15 July of any year in accordance with Fort Belvoir Policy Memorandum #78, *Conservation of Migratory Birds* (Table 3.5-2). The decommissioning contractor would incorporate this time of year restriction into the project work plan, as applicable. Surveys for birds and/or active nests would be conducted prior to vegetation clearing if such activities cannot be avoided during that time period.

During site restoration, disturbed areas on the SM-1 site would be restored to their existing or similar condition. In addition, the entire site would be vegetated, including the footprint of the removed structures, potentially creating new habitat for terrestrial species. Terrestrial wildlife would be expected to recolonize the area shortly following the completion of the Proposed Action Alternative.

Active osprey nests (e.g., on Building 372 and the intake pier) would be relocated according to VDGIF's *Removal or Relocation of Osprey Nests in Virginia: A Guideline for Landowners* (VDGIF, 2010). In accordance with Fort Belvoir's Policy Memorandum #78, *Conservation of Migratory Birds*, the relocation of osprey nests would not be conducted between 16 April and 15 September of any year (Table 3.5-2). This time of year restriction would be incorporated into the project work plan by the decommissioning contractor, as applicable. Relocation of these nests could cause potentially adverse impacts on an active osprey breeding pair. However, coordination with appropriate agencies and implementation of management or protection measures would minimize adverse impacts and ensure they remain less-than-significant.

The Proposed Action Alternative would result in temporary, less than significant adverse effects on terrestrial wildlife and habitat. While disturbance would occur, disrupting and displacing flora and fauna, this would be temporary. USACE would consult with Fort Belvoir DPW and applicable regulatory agencies throughout the Proposed Action to ensure temporary adverse impacts on wildlife are prevented or minimized to the extent possible. In the long-term, beneficial impacts would be expected from the creation of new habitat.

Aquatic

Infaunal and epifaunal invertebrates (e.g., mollusks and crustaceans) and their habitats would be disturbed during the proposed removal of the in-water structures. Mobile invertebrate organisms, such as crabs and shrimp, would be temporarily displaced during the in-water removal/dismantlement activities. Injury or inadvertent destruction of sessile or slow-moving invertebrate organisms, such as benthic macroinvertebrates and bivalves, could occur during the Proposed Action Alternative. Pollutant-tolerant benthic macroinvertebrates that are not injured would be expected to survive disturbed, turbid conditions during the Proposed Action Alternative.

The physical movement of in-water equipment and materials and the noise generated during dismantlement and removal activities could cause behavioral and physical impairment in Gunston Cove fish. The removal of piles and other in-water structures would create a localized sediment plume. Localized turbidity increases and sediment plumes could disrupt fish foraging and movement. However, the resulting sediment plume would be expected to settle out of the water column within a few hours and the Total Suspended Solid (TSS) levels expected for pile removal (5.0 to 10.0 milligram/liter [mg/L]) are below those shown to have adverse effects on fish (580.0 mg/L for

the most sensitive species) (NOAA Fisheries, 2017). As sediment plumes are expected to rapidly disperse, turbidity effects would be temporary and any resulting indirect impacts on baseline DO and water temperature would be ephemeral. To the extent possible, USACE would not conduct in-water work between 15 February and 30 June to prevent or minimize impacts on anadromous fish that may be present in Gunston Cove (**Table 3.5-2**). The decommissioning contractor would incorporate this time of year restriction into the project work plan, as applicable. Indirect impacts from construction equipment leaks or accidental fuel spill and runoff from upland areas could also potentially impact water quality and aquatic habitats as well. Such impacts would be prevented or minimized through the use of applicable BMPs.

Aquatic invertebrate species and the fish community would be expected to recolonize the area in the months following the completion of the Proposed Action Alternative; therefore, impacts on aquatic wildlife and habitat would be short-term and less-than-significant.

In accordance with the MSA, USACE has determined that the Proposed Action Alternative *may affect, but is unlikely to adversely affect* EFH, particularly with the implementation of BMPs during in-water activities. NOAA Fisheries concurred with this determination in a letter dated April 19, 2019. In the same letter, NOAA Fisheries also recommended that piles be cut below the mudline during removal of the water intake pier, and requested that consultation be re-initiated if other pile removal methods become necessary. Copies of this correspondence are included in **Appendix B**.

3.5.3.3.3 Protected Species and Habitat

Terrestrial

None of the eight active bald eagle nests at Fort Belvoir are located within 750 feet of the SM-1 site; the buffer around active nests is not applicable to the Proposed Action Alternative. However, construction of the Proposed Action Alternative, including tree clearing, would occur within 750 feet of the shoreline and within the Potomac River Eagle Concentration Area. Impacts on bald eagles could be potentially adverse. Adherence to applicable protections under the BGEPA, VDGIF's *Bald Eagle Management Plan*, and Fort Belvoir's *Bald Eagle Management Plan*, would minimize adverse impacts on bald eagles and ensure that they remain less than significant. Implementation of measures such as replacing cleared trees would further minimize or avoid adverse impacts.

The NLEB, tricolored bat, and little brown bat could be present in the area during the summer. These bat species could be indirectly impacted by noise, vibration, dust, and disturbances associated with proposed decommissioning activities. The proposed tree clearing could also impact summer roosting habitat. Consistent with Fort Belvoir's *Memorandum of Instruction – Northern Long-eared Bat Protection on Fort Belvoir*, the clearing of trees larger than three inches dbh would not be conducted between 15 April and 15 September of any year (**Table 3.5-2**) to prevent or minimize adverse impacts on bat species potentially present on or near the SM-1 site. The decommissioning contractor would incorporate this time of year restriction into the project work plan, as applicable. Impacts on bats and their habitat could be adverse due to the potential habitat disturbances and tree clearing; however, impacts would be minimized through the implementation of management or protection measures and adherence to applicable regulations, ensuring they remain less than significant.

Similarly, proposed decommissioning and dismantlement activities would be conducted in a manner to avoid adverse effects on migratory birds to the extent practicable. Any construction disturbance would be short-term. In addition, birds are expected to move to more favorable areas during dismantlement activities; therefore, impacts on migratory birds and their habitat would be less than significant. Following restoration activities, the site would be maintained by Fort Belvoir in a vegetated, permeable condition, potentially creating new habitat for protected species. Migratory birds would be expected to utilize the area shortly following the completion of the Proposed Action Alternative. In the long term, beneficial impacts would be expected from the creation of new habitat.

Other protected terrestrial species (i.e., small whorled pogonia, peregrine falcon, wood turtle, and rusty patched bumble bee) are not anticipated to occur on or near the SM-1 site due to a lack of suitable habitat. As such, the Proposed Action Alternative would have no or negligible impacts on these species and their habitats. As noted above, USACE would coordinate with Fort Belvoir DPW and applicable regulatory agencies throughout the Proposed Action to ensure that any temporary adverse effects on protected species and habitat are prevented or minimized to the extent possible.

In accordance with ESA Section 7, USACE has determined that the Proposed Action Alternative is *not likely to adversely affect* the federally threatened NLEB and would have *no effect* on critical habitat for any species. Accordingly, USACE submitted a self-certification letter to USFWS on 20 August 2019. A copy of the self-certification package is included in **Appendix B**.

Aquatic

As previously described, sediment plumes associated with in-water work during the Proposed Action Alternative would be small and expected to settle out of the water column within a few hours. The TSS levels expected for pile removal are below those shown to have adverse effects on the most sensitive species of fish. These small sediment plumes would be unlikely to affect Atlantic and shortnose sturgeon, should they be present in Gunston Cove or the vicinity of SM-1, as they would rapidly disperse. Turbidity resulting from the proposed in-water work would also not be expected to reach the water depths required for Atlantic sturgeon's critical habitat; therefore, direct and indirect turbidity effects on Atlantic sturgeon critical habitat would be temporary and ephemeral. In addition, vessel traffic increases above baseline levels would not cause a measurable or detectable increase in the risk of vessel strikes.

Due to the absence of ideal habitat and the lack of confirmed and documented current spawning populations within Gunston Cove, the potential occurrence of Atlantic and shortnose sturgeon adjacent to the SM-1 site is low. For the reasons above, impacts on Atlantic and shortnose sturgeon and applicable critical habitat would be short-term and less-than-significant.

As other protected aquatic species (e.g., brook lamprey, bridle shiner, and the Northern Virginia well amphipod) are not likely to occur in Gunston Cove and on or near the SM-1 site, the Proposed Action Alternative would have no or negligible impacts on these species and their habitats.

In accordance with ESA Section 7, USACE has determined that the Proposed Action Alternative *is not likely to adversely affect* ESA-listed fish species or critical habitat. NOAA Fisheries provided concurrence via email dated 4 March 2020. Copies of correspondence relevant to this consultation are included in **Appendix B**.

3.5.3.4 Management and/or Mitigation Measures

The Proposed Action Alternative would adhere to applicable protections in Fort Belvoir's INRMP to minimize adverse impacts on biological resources. No potentially significant adverse effects on biological resources have been identified. However, the following management measures or BMPs would be implemented to minimize potential adverse effects:

- In accordance with Fort Belvoir policy and an approved, site-specific replanting plan, cleared trees would be replanted on-site where deemed suitable; other disturbed areas would be reseeded with native grasses and/or shrubs to promote revegetation.
- The decommissioning contractor would adhere to Fort Belvoir policies and practices to prevent or minimize the introduction and spread of invasive plant species, such as cleaning equipment and vehicles before they leave the site.

- Active osprey nests (e.g., on Building 372 and the intake pier) would be relocated according to VDGIF's *Removal or Relocation of Osprey Nests in Virginia: A Guideline for Landowners* (VDGIF, 2010) and Fort Belvoir's Policy Memorandum #78, *Conservation of Migratory Birds*.
- The decommissioning contractor would incorporate applicable time of year restrictions into the project work plan to prevent or minimize adverse impacts on biological resources on or near the SM-1 site.
- During removal of the intake pier/pump house structure in Gunston Cove, support piles would be cut below the mudline and the portions below the mudline would be left in place to minimize sediment and subaqueous bottom disturbance.
- Containment booms, turbidity curtains, and/or similar measures would be used during in-water work as applicable to prevent the downstream migration of floating debris and disturbed sediments, and ensure that disturbed sediments re-settle near their original location.
- Workers and personnel on the SM-1 site would be informed and aware of the bald eagle's active nesting season (15 November to 15 June). Adherence to these time of year restrictions would minimize or avoid impacts on bald eagle habitat. Additional coordination with Fort Belvoir's Environmental Division, USFWS, and/or VDGIF would be conducted as necessary.
- No tree clearing would occur between 15 April and 15 September to protect special status bat species.
- To the extent possible, USACE would adhere to a time of year restriction between 15 February and 30 June to prevent or minimize impacts on anadromous fish that may be present in Gunston Cove.
- Measures to prevent or minimize impacts on submerged aquatic vegetation (SAV) and the introduction or spread of aquatic invasive species would be implemented to the extent possible during in-water activities associated with the Proposed Action.
- Prior to implementing decommissioning activities, USACE and/or the decommissioning contractor would update protected species queries and re-initiate consultation with applicable regulatory agencies if it is determined that the Proposed Action would potentially affect new or additional protected species not addressed in this EA.
- Dust levels would be mitigated with water sprays and covers over dust-creating stockpiles and truck transports (e.g., soils).
- USACE and Fort Belvoir would monitor replanted vegetation on the site for one year following demobilization to ensure successful establishment and viability.

3.6 Radiological Safety and Health

This section describes the radiological conditions within the Deactivated SM-1 Nuclear Reactor Facility, including existing contamination, potential sources of radioactive waste, and the potential for accidental release of radioactive materials from the SM-1 site.

The ROI for radiological safety, contamination, waste, and disposal is the SM-1 site and adjacent or nearby areas that could be subject to radiation exposure via one or more environmental pathways (i.e., air, water, or land). As possible, the ROI is further defined to account for the distance at which a reasonable likelihood of exposure could result from decommissioning activities or accidents.

3.6.1 Regulatory Setting

The Proposed Action is within the authorities granted to the DOD by the AEA, specifically Sections 91(b) and 110(b) which gives DOD the authority to regulate radioactive materials at the Deactivated SM-1 Nuclear Reactor Facility. The Army's policy set forth in AR 50-7 is to follow NRC guidelines, as well as the recommendations of the NCRP and ANSI. Policies and requirements set forth in DA-PAM 385-24 and Engineering Manual (EM) 385-1-80 are applicable to personnel and visitors at USACE work sites where radioactive material may be present. The Army does not regulate the transportation of radioactive materials or the disposal of radioactive materials. Transportation is regulated jointly by the USDOT and the NRC. Disposal of licensed radioactive materials is regulated by the NRC. Under the RCRA, the USEPA regulates the disposal of some wastes containing low levels of radioactivity that is exempt from NRC regulation. Relevant federal laws and requirements relating to radiological materials are summarized in **Table 3.6-1**.

Table 3.6-1: Radiological Safety and Health – Applicable Regulations and Guidance

Guidance	Description/Applicability
<i>Atomic Energy Act of 1954 (42 USC Part 2011 et seq.)</i>	Fundamental federal law regulating civilian and military uses of nuclear materials. Sections 91(b) and 110(b) give DOD the authority to regulate radioactive materials, consistent with relevant guidance identified in 10 CFR 20.1402, <i>Radiological Criteria for Unrestricted Use</i> .
<i>Army Regulation 50-7, Army Reactor Program</i>	Establishes policies, responsibilities, and procedures for implementing the ARP to ensure that Army reactors are operated in a safe, secure, and reliable manner.
<i>Department of the Army Pamphlet 385-24, The Army Radiation Safety Program</i>	Establishes Army safety procedures for the use, licensing, transportation, disposal, dosimetry, accident reporting, safety design, accountability of, and radiation exposure standards for ionizing and non-ionizing radiation sources.
<i>USACE Engineering Manual 385-1-80, Radiation Protection</i>	Describes policies and procedures for the use and/or handling of radioactive material and radiation generating devices at all USACE sites.
<i>10 CFR 20, Standards for Protection Against Radiation</i>	Establishes protection standards resulting from activities conducted under NRC-issued licenses. Also establishes the allowance for accepting wastes containing low levels of radioactivity for disposal at non-NRC licensed facilities
<i>10 CFR 37, Physical Protection of Category 1 and 2 Quantities of Radioactive Material</i>	Provides requirements for the physical protection and security of Category 1 or 2 materials.
<i>10 CFR 61, Licensing Requirements for Land Disposal of Radioactive Waste</i>	Establishes the procedures, criteria, and terms and conditions upon which the NRC issues licenses for the disposal of radioactive wastes.
<i>49 CFR 172.310, Class 7 (Radioactive) Materials</i>	Specifies requirements for marking radioactive materials for transportation.
<i>42 USC Part 6901 et seq., RCRA</i>	Establishes criteria for disposal of NRC-exempt wastes containing low levels of radioactivity.

3.6.2 Affected Environment

3.6.2.1 Current Radiological Conditions

Operation of the SM-1 reactor impacted materials and structures from either direct activation or by contamination from activation and fission products within cooling water and liquid waste. The majority of radioactive material inventory at the Deactivated SM-1 Nuclear Reactor Facility (estimated from activation analysis) is found in the VC. The remaining residual contamination is contained in various secondary and waste system components and outside soils. Internal contamination in secondary system components was verified through in situ gamma spectroscopy and material sampling. Surface contamination was identified on building surfaces through direct and removable contamination surveys. Soil contamination has been verified through radiation surveys and soil sampling and analysis. The current radiological status of the Deactivated SM-1 Nuclear Reactor Facility is provided in the DP (USACE, 2019b).

Radionuclides of concern (ROCs) at the Deactivated SM-1 Nuclear Reactor Facility are summarized in **Table 3.6-2**.

Table 3.6-2: Deactivated SM-1 Nuclear Reactor Facility ROCs

ROC	Half-life	Source	Location(s)
Tritium	12.3 years	Fission	Soil Structure - Inside VC Structure - Outside VC
Cobalt-60	5.3 years	Activation	Structure - Inside VC Structure - Outside VC
Nickel-63	93 years	Activation	Structure - Inside VC Structure - Outside VC
Strontium-90	28.6 years	Fission	Soil Structure - Inside VC Structure - Outside VC
Technetium-99	2.1 E+5 years	Fission	Soil ¹ Structure - Inside VC Structure - Outside VC
Cesium-137	30 years	Fission	Soil Structure - Inside VC Structure - Outside VC
Europium-152	13.6 years	Activation	Structure - Inside VC
Europium-154	8.8 years	Activation	Structure - Inside VC
Uranium-234	2.44E+5 years	Fuel	Structure - Inside VC
Uranium-235	7.04E+8 years	Fuel	Structure - Inside VC
Plutonium-238	87.7 years	Fuel	Structure - Inside VC
Plutonium-239/240	2.4 E+4 years/ 6,500 years	Fuel	Structure - Inside VC
Plutonium-241	14.4 years	Fuel	Structure - Inside VC

Note:

1. Not detected at significant levels in soil outside the footprint of Building 372; may be present below the building and VC slabs.

Figures 3.6-1 and 3.6-2 depict the MARSSIM classifications for the ground floor and upper floor of Building 372, respectively, as described following previous site characterization efforts. MARSSIM defines three classes from most to least contaminated, as follows:

- **Class 1** – areas that have or had, prior to remediation, potential or known radioactive contamination above the applicable screening levels;
- **Class 2** – areas that have, or had prior to remediation, a potential for radioactive contamination or known contamination, but are not expected to exceed the screening levels; and,
- **Class 3** – areas that are not expected to contain any residual radioactivity or only levels at a small fraction of the screening levels.

The ground floor elevation of Building 372 is 33 feet with the VC floor at 24.25 feet. The elevation of the upper floor in Building 372 is 45 feet.

Figure 3.6-3 depicts the MARSSIM classifications applicable to exterior areas of the Deactivated SM-1 Nuclear Reactor Facility and shows locations of soil samples that exceed screening levels of soil ROCs (Strontium-90 and Cesium-137).

3.6.2.2 Radioactive Waste

The highly radioactive spent nuclear fuel was removed from SM-1 during initial deactivation activities conducted from 1973 to 1974. As such, radioactive waste that would be generated from the Proposed Action would be classified as LLRW or low-level waste (LLW). LLRW is radioactive waste not classified as high-level, spent fuel, transuranic or byproduct material such as uranium mill tailings regulated by the NRC under 10 CFR 61. US Department of Energy (DOE) disposal facilities use the term LLW for waste regulated under DOE Order 435.1. For discussions in this EA, LLRW is assumed synonymous to LLW.

LLRW is classified as Class A, B, C, or Greater than Class C waste according to the requirements of 10 CFR Part 20, Subpart K, Waste Disposal, and 10 CFR 61.55 and 10 CFR 61.56. Class A LLRW contains the lowest levels of radioactivity for those radionuclides that drive waste classification. Class A LLRW generated during proposed decommissioning and dismantlement activities would include elements of the VC, such as the pressurizer, primary coolant pumps, and steam generator (parts of the primary system); contaminated materials such as pipes and structural concrete; and soil. The RPV would be removed as a single component and, as a whole, qualifies as Class B LLRW. The higher waste class is driven by the total Nickel-63 activity in the activated metals. It is expected that no Class C or Greater Than Class C LLRW would be generated by the proposed decommissioning.

For certain licensed or permitted LLRW containing very low levels of radioactivity, disposition at alternative non-LLRW disposal facilities may be authorized by the licensing or permitting authority. For SM-1, the authorizing agency would be the ARO. An application to the ARO consistent with the requirements of 10 CFR 20.2002, Methods for Obtaining Approval of Proposed Disposal Procedures, would be required for such authorization and disposal at a RCRA disposal facility.

Mixed waste (i.e., waste containing both RCRA hazardous and radioactive constituents) generated as part of the Proposed Action may include radiologically contaminated elemental lead formerly used for shielding, as well as LBP. Other hazardous materials regulated under TSCA, such as ACM and PCB-contaminated materials and paint, may also be radiologically contaminated and require special waste management considerations.

Figure 3.6-1 Categorization of Spaces in Building 372-Ground Floor

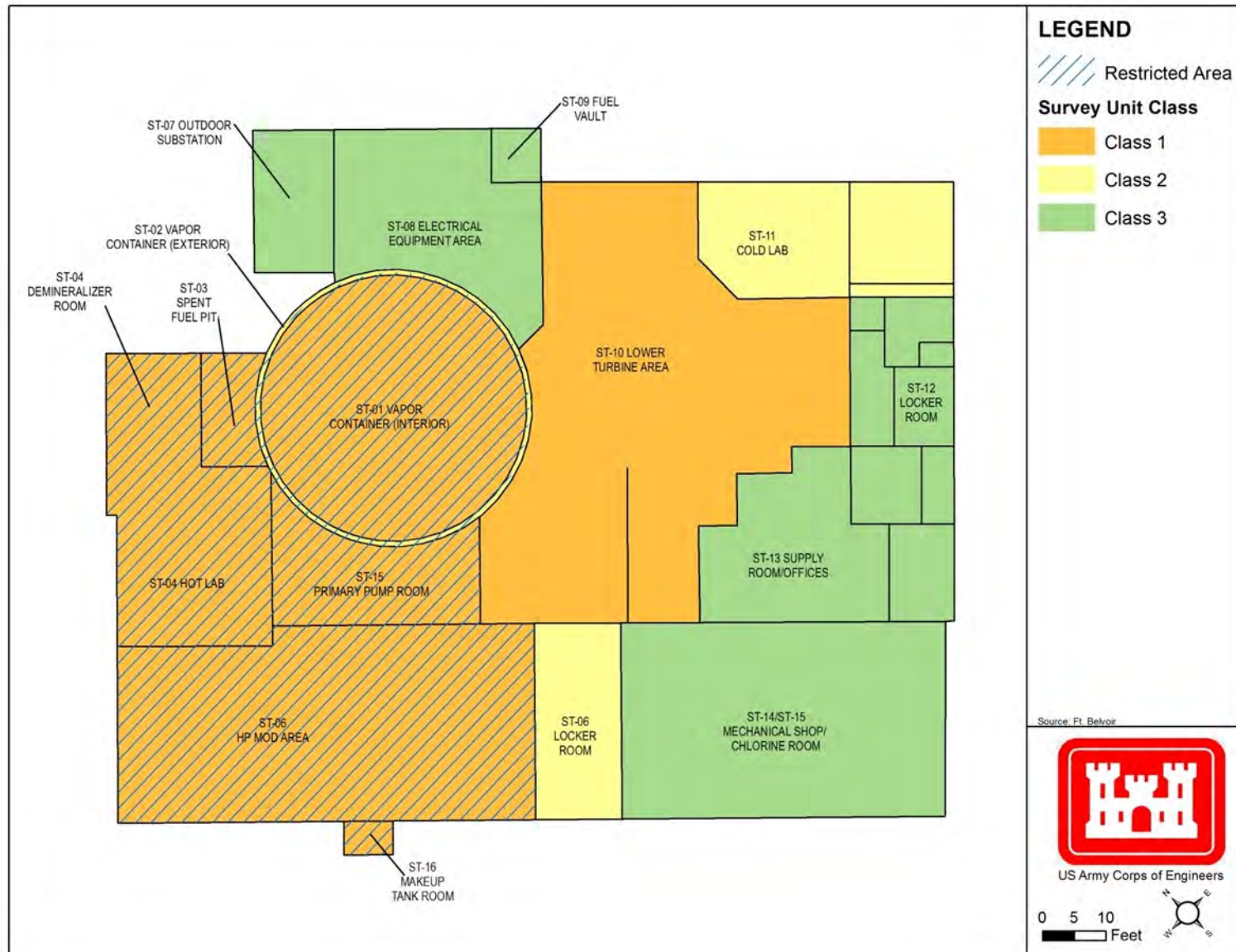


Figure 3.6-2 Categorization of Spaces in Building 372 - Upper Floor

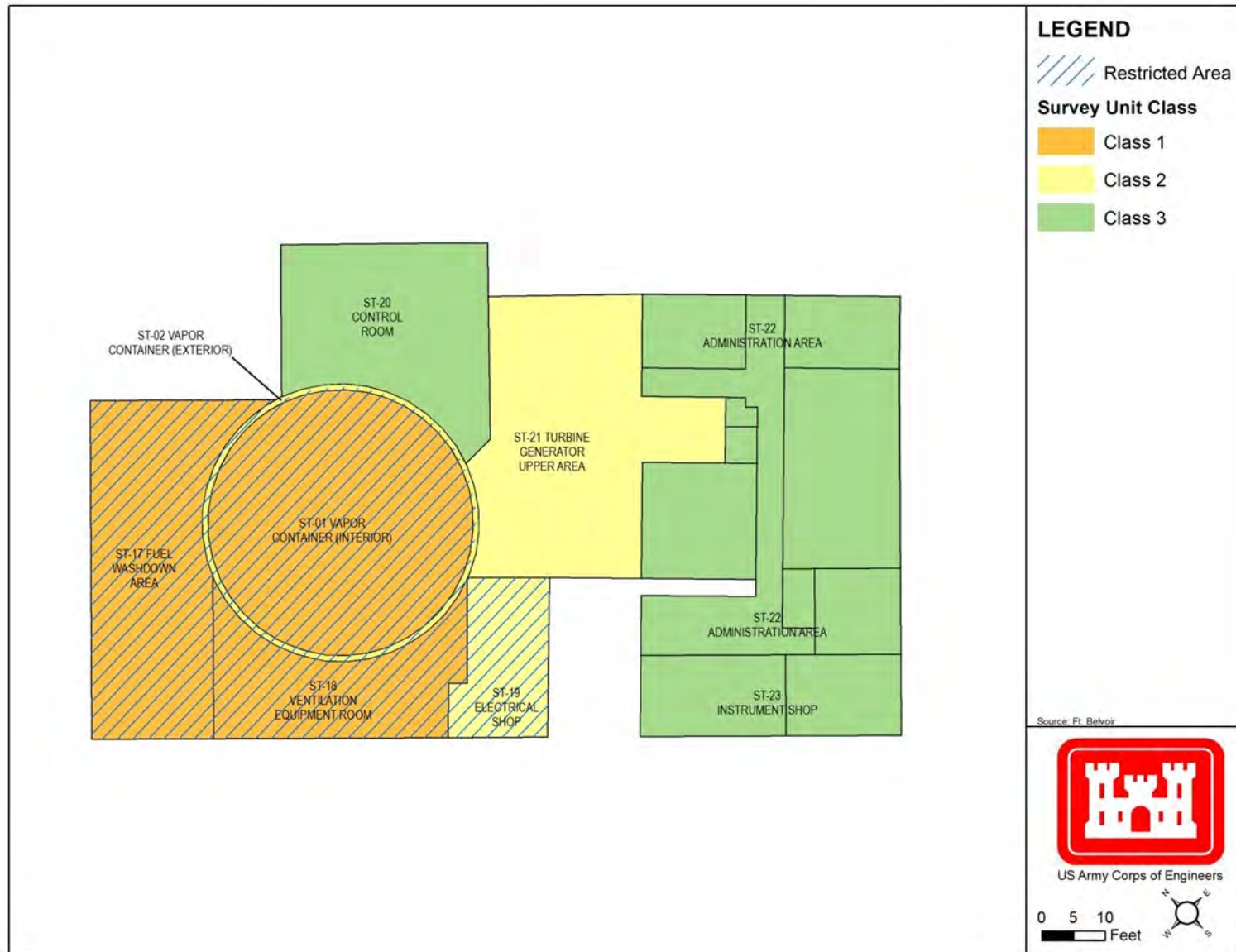


Figure 3.6-3: Contaminated Areas of Concern on SM-1 Site



Table 3.6-3 presents estimates of the total volume of contaminated building debris, concrete debris, soil, and M&E anticipated for disposal as either exempt radioactive waste or LLRW that would be generated by the Proposed Action. The LLRW volumes in **Table 3.6-3** include a small percentage of mixed hazardous and radioactive waste.

Table 3.6-3: LLRW Volume Estimates

Waste Type	Building / Site Area	Type / Material	Estimated LLRW Volume (yd ³)
Building Debris	Unrestricted Area	Walls, Floors, and Roof	Limited ¹
	Restricted Area	Walls, Floors, and Roof	452
	Lower Site	Structures / Debris	590
Sub-total - Building Debris			1,042
Concrete Debris	Unrestricted Area	Slabs and Foundation	10
	Restricted Area	Slab and foundation	875
	VC	Walls and Slab	
Sub-total - Concrete Debris			885
Waste Soil	Upper Site around Building 372	Soil	4,835
	Lower Site	Soil and Pipes	209
	Building 372 – sub-slab	Soil and Pipes	10
Sub-total - Waste Soil			5,054
M&E Waste	Unrestricted Area Municipal Waste	M&E	84
	Restricted Area	M&E	183
	VC	M&E and RPV	176
Sub-total - M&E Waste			443
Total Estimated LLRW Volume			7,424

Note:

1. Small volumes generated from targeted decontamination efforts.

Source: USACE 2019c

Estimated volumes of non-radioactive waste that would be generated during the Proposed Action are presented in **Section 3.10**.

Radioactive waste generated during the Proposed Action would likely be disposed of at one or more of the facilities listed below:

1. Waste Control Specialists (WCS), LLC (Class A, B, and exempt waste)
9998 West State Hwy 176
Andrews, Texas 79714
2. US Ecology Idaho (Exempt waste only)
P.O. Box 400
20400 Lemley Road
Grand View, Idaho 83624
3. Energy Solutions (Class A waste only)
Interstate 80, Exit 49
Grantsville, UT 84029
4. US Department of Energy Nevada National Security Site (LLW)
Nevada Field Office
National Nuclear Security Administration
P.O. Box 98518
Las Vegas, NV 89193-8518

3.6.2.3 Potential for Accidental Releases

An accidental release of radiological material that impacts public health (i.e., one that exceeds applicable regulatory thresholds) is considerably more likely to occur at an operating reactor rather than one that has permanently ceased operations, such as SM-1. Accidents that are likely to exceed applicable radiological regulatory thresholds can be categorized into 1) fuel-related accidents that generally involve the maintenance, storage, or movement of fuel, and 2) radioactive material-related (non-fuel) accidents, such as the management of high-activity waste such as water treatment/demineralizer resins (NRC, 2002). All nuclear fuel and demineralizer resins were removed from SM-1 during initial deactivation activities completed in 1974.

Accidental releases that could occur during the proposed decommissioning and dismantlement activities include the release of contaminated liquids currently contained in the hot waste tank, VC sump, or laboratory waste tanks, as well as the release of airborne dust, particulates, or other small debris generated during decontamination or dismantlement. The primary ROC inside and outside Building 372, and the most likely to be released in an accident scenario, is Cesium-137. Accidental releases of contaminated water or airborne substances could potentially result in incidental inhalation, ingestion, short-term dermal contact, and/or external exposures.

The DP analyzed several radiological accidents that could occur during execution of the Proposed Action (USACE, 2019b). These included a release of contaminated liquid, a release of airborne contamination, unexpected exposures to “hot particles,” and transportation accidents.

3.6.3 Evaluation of Environmental Consequences

3.6.3.1 Approach to the Analysis

The analysis of radiological impacts focuses on the potential for the Proposed Action to cause detectable radiological effects outside of regulatory limits. “Detectable” effects include those causing exposure above regulatory thresholds (e.g., 10 mrem to a member of the public from airborne releases, 100 mrem to a member of the public from all exposure pathways; 5,000 mrem for occupational exposures), increasing radioactivity levels above ALARA levels, increasing the probability of a severe radiological accident, and requiring disposal of radioactive waste outside of standard regulatory procedures. **Table 3.6-4** identifies the adverse impact significance thresholds for radiological contamination or exposure.

Table 3.6-4: Radiological Safety and Health Impact Significance Thresholds

Impact Significance Threshold	Type of Impact	Impact Significance Threshold Definition
Less than Significant Adverse Effect	Direct Impacts	<ul style="list-style-type: none"> The Alternative would result in occupational and public exposure levels below regulatory thresholds. The Alternative would increase the probability of an accidental radiological release on- or off-site; however, any resulting exposure would remain at undetectable levels and would be minimized through safe work procedures and emergency plans. The Alternative would increase the amount of radioactive materials and waste requiring disposal, but the total amount would remain manageable under existing permits and procedures.
	Indirect Impacts	<ul style="list-style-type: none"> The Alternative would result in negligible human or environmental health risks that could be further minimized or avoided through safe work procedures and monitoring.
Potentially Significant Adverse Effect	Direct Impacts	<ul style="list-style-type: none"> The Alternative would result in occupational and public exposure levels above regulatory thresholds. The Alternative would increase the probability of a radiological accident that could result in detectable levels of on- or off-site release. The Alternative would increase the amount of radioactive materials and waste requiring disposal and the total amount would exceed current or future facility capacity.
	Indirect Impacts	The Alternative would create substantial human or environmental health risks.

3.6.3.2 No Action Alternative

Under the No Action Alternative, the Deactivated SM-1 Nuclear Reactor Facility would not be decommissioned and would remain in a SAFSTOR condition for the foreseeable future. Radioactive materials and waste would not reach a level low enough for the release of the facility and termination of the permit under natural decay conditions within the allotted 60-year regulatory threshold, as required by 10 CFR 50.82(a)(3). In the short term, there would be no impacts on occupational and public exposure or potential for decommissioning accidents; environmental monitoring and security protocols would remain in effect in accordance with the *status quo*. However, the risk of an exposure or accident occurrence in the future would remain possible under the No Action Alternative.

3.6.3.3 Proposed Action Alternative

3.6.3.3.1 Radiological Contamination

The probability of a radiological accident that would involve the release of contamination is minimized by the fact that only minimal quantities of loose (removable) radioactive contamination exist within the Deactivated SM-1 Nuclear Reactor Facility, therefore all but eliminating a dispersion concern. Additionally, the vast majority of radiological activity that remains within the reactor components is contained within the matrix of building construction materials (i.e., activated components), and in this non-dispersible form is unable to result in a severe environmental impact.

Controls would be required in the Decommissioning Permit to prevent the spread of contamination beyond the radiological exclusion zone. Therefore, no significant release of airborne or liquid contamination is anticipated during decommissioning and dismantlement activities. The Decommissioning Permit would also require environmental monitoring to ensure controls are adequate to protect human health and the environment. Worker radiation exposures would be limited in accordance with the USACE *Safety and Health Requirements Manual*, EM 385-1-1.

Exposure to occupational workers for decommissioning work completed by trained workers is considered minor (NRC, 2002). Public exposure to radiation would be significantly less than that of workers and meet requirements identified in the Decommissioning Permit. The NRC's decommissioning GEIS also indicates that the radiological impacts of decommissioning would remain within regulatory limits for worker and public exposures and that the radiological impacts of decommissioning much larger facilities would be small (NRC, 2002). Therefore, direct and indirect radiological impacts on occupational exposure to workers under the Proposed Action Alternative would be less than significant.

3.6.3.3.2 Radiological Waste and Disposal

Waste material generated during the Proposed Action Alternative would be managed to minimize disposal volumes and to maintain proper containment of hazardous materials. The decommissioning and dismantlement work would be completed by trained workers who would ensure that all waste is contained to prevent release to the off-site environment. Characterization of waste for radiological and non-radiological hazardous constituents would assure waste is acceptable for off-site disposal. All wastes generated would be disposed of according to federal regulations at approved regulated/permitted facilities.

The Proposed Action Alternative would result in the generation of LLRW from decommissioning and dismantlement activities. Such waste would include contaminated concrete, steel, tile, utility pipes, plastic, M&E, soils, and mixed waste. A total of approximately 7,424 yd³ of radioactive waste would be generated under the Proposed Action Alternative (**Table 3.6-3**). This amount would represent less than 1 percent of WCS's licensed disposal capacity of 2.1 million yd³ of LLRW and less than 1 percent of Energy Solutions' disposal capacity of 5 million yd³ (Energy Solutions, 2008; WCS, 2015). Therefore, the amount of generated waste would not have a noticeable effect on the disposal capacity at available disposal sites. Further, these estimates are conservative and allow for opportunities to dispose of additional materials as clean waste.

In the short term, the Proposed Action Alternative would have less than significant adverse impacts from the generation of radiological waste. In the long term, the removal and disposal of LLRW would have beneficial impacts by allowing unrestricted future use of the SM-1 site. The disposal of LLRW at a licensed off-post facility would safeguard the public as the radioactivity decays in a carefully monitored and licensed facility, resulting in additional beneficial impacts.

3.6.3.3.3 Accidental Releases

The Proposed Action Alternative has the potential to increase the probability of radiological accidents involving the release of contaminated liquids and airborne contamination as well as increased vulnerability to external events (e.g., natural disasters). With mitigation procedures in place, the impacts of non-spent fuel-related radiological accidents are neither detectable nor destabilizing (NRC, 2002). Further, adherence to safe work procedures and emergency plans would minimize the likelihood of a radiological accident and resulting consequences; therefore, the Proposed Action Alternative would result in less-than-significant adverse impacts on the likelihood of radiological accidents. Following restoration activities, the site would be maintained by Fort Belvoir in a vegetated, permeable condition; therefore, no potential for accidental release under the Proposed Action Alternative would occur in the long term.

3.6.3.3.4 Management Measures

USACE is committed to ensuring that potential radiological risks to the health and safety of the public, workers, and Garrison personnel and residents are eliminated or minimized to the greatest extent practicable throughout the duration of the Proposed Action Alternative. Therefore, decommissioning would occur in a controlled manner to minimize both public and occupational radiation exposure. In support of the project, the decommissioning contractor would implement a Radiation Safety Program, an Environmental Monitoring and Control Program, and a Waste Management Program to ensure the safe removal of activated and/or contaminated components in an effort to reduce the risk of potential release to the environment. The requirements of these programs would include routine measurement of the quantity of direct radiation and radioactive material releases.

The contractor would also provide appropriate monitoring of occupational radiation exposure to staff entering and working in the restricted area. USACE follows guidance limits in EM 385-1-1, *Safety and Health Requirements* to provide assurance that individuals do not exceed the federal limits specified in 10 CFR 20. These guidance limits are 10 percent of the 10 CFR 20 limits (USACE, 2014b). EM 385-1-1 also provides ALARA dose limits less than the federal threshold. As an individual approaches the exposure dose limit, the individual's access to radiation areas would be restricted to minimize further occupational exposure and to ensure regulatory limits are not exceeded.

For safe handling and management of LLRW, the Proposed Action Alternative would implement a Waste Management Plan (WMP) during the decommissioning process. The WMP establishes the framework for programmatic strategies for managing generated waste, including pollution prevention, segregation, and waste minimization methods; staging and storage requirements; treatment and disposal requirements; and required safety training. Sorting, segregation, and decontamination would be performed to the extent practical to minimize the amount of radioactive waste requiring treatment and disposal. All appropriate authorities would be notified, and all regulatory requirements satisfied prior to off-site shipment of any radioactive material.

3.7 Occupational Safety and Health

USACE is committed to creating a safe working environment to ensure that potential risks to the health and safety of the public, workers, and Garrison personnel and residents are eliminated or minimized to the greatest extent practicable throughout the duration of the Proposed Action. A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury or illness, or property damage. Occupational Safety and Health (OSH) programs address the health and safety of people at work. These programs impose regulatory requirements for the benefit of employees and the public, including implementation of engineering and administrative practices that aim to reduce risks of illness, injury, death, and property damage.

This section discusses occupational safety and health applicable to the Proposed Action. The ROI for the safety and health discussion presented in this EA encompasses the SM-1 site and adjacent or nearby areas that would be used for the staging or storage of materials and equipment.

3.7.1 Regulatory Setting

The Occupational Safety and Health Administration (OSHA) is the primary regulatory agency overseeing worker safety, protection, and health. OSHA establishes worker protection standards that must be followed to prevent and minimize potential safety and health risks. In Virginia, the OSH Safety Compliance Division enforces state and federal laws and regulations pertaining to worker health and safety (Virginia Department of Labor and Industry, 2016). OSH regulations cover potential exposure to a wide range of chemical, physical, and biological hazards and ergonomic stressors. The regulations are designed to control these hazards by eliminating exposure via administrative or engineering controls, substitution, or use of personal protective equipment (PPE).

On a USACE project, EM 385-1-1 (US Army, 2014) is the governing document for site safety. EM 385-1-1 references the applicable regulations summarized in **Table 3.7-1**.

Table 3.7-1: Occupational Safety and Health – Applicable Regulations and Guidance

Guidance / Regulation	Description
Occupational Safety and Health Act (29 USC Part 651 et seq.)	The Act is the primary federal statute for regulating the safety and health of workers in the US.
29 CFR 1910, <i>Occupational Safety and Health Standards for General Industry</i>	Primary federal regulation that governs day-to-day workplace, or “general industry,” safety and applies to the extent that specific standards of the agricultural, construction, and maritime industries do not apply.
29 CFR 1926, <i>Occupational Safety and Health Standards for Construction</i>	Primary federal regulation that governs workplace safety for the construction industry.
29 CFR 1960, <i>Basic Program Elements for Federal Employees, OSHA</i>	Contains special provisions to assure safe and healthful working conditions for federal employees.
EO 12196, <i>Occupational Safety and Health Programs for Federal Employees, 26 Feb, 1980</i>	Contains additional provisions to assure safe and healthful working conditions for federal employees.
Department of Defense Instruction 6055.1, <i>DOD Safety and Occupational Health Program, 14 Oct 2014</i>	Encompasses all DOD personnel and operations worldwide during peacetime and military deployments. Does not apply to DOD contractor personnel or contractor operations.
AR 385-10, Army Safety Program	Prescribes Department of the Army policy, responsibilities, and procedures to safeguard and preserve Army resources worldwide.

3.7.2 Affected Environment

Health and safety hazards can often be identified and reduced or eliminated before an activity begins. Hazards at the SM-1 site could potentially occur from earthwork (e.g., excavation, filling, grading), decontamination, dismantlement, staging and loading, and confined space activities, as well as the creation of a noisy environment or fire hazards on or near the site. Any facility or human-use area with a potential explosive or rapid oxidation process would create unsafe environments for nearby populations. Noisy environments could also mask verbal or mechanical warning signals such as sirens, bells, or horns. The operation, maintenance, and repair of vehicles and equipment also present additional safety implications.

Physical, chemical, ergonomic, and biological hazards pose potential safety risks to workers involved in nuclear facility decommissioning activities. Examples of these hazards are discussed below. Based on current conditions at the SM-1 site as described in this EA and to varying degrees, all of these occupational hazards would be present or have potential to occur during the Proposed Action.

Unless otherwise noted, information in the following sub-sections is drawn from the NRC’s decommissioning GEIS (NRC, 2002).

3.7.2.1 Physical Hazards

Slips, trips, and falls are some of the most common types of physical occupational hazards. Such incidents can occur when walking surfaces are slippery or uneven, when climbing or working on stairs and ladders, or when a

worker's vision is obstructed due to dim lighting. Additional physical hazards could result from accidents involving vehicles and equipment; accidental ignition of flammable or combustible materials; excessive noise conditions; adverse reactions to temperature (heat or cold); and/or exposure to electricity (e.g., burns, electrocution).

Worker exposure to noise is regulated by a legally enforceable permissible exposure limit (PEL) of 90 A-weighted decibels (dBA) over the course of an 8-hour day. This PEL is a time-weighted average, meaning that the average noise exposure experienced by a worker calculated over an 8-hour day cannot exceed 90 dBA. For comparison, a conversational human speaking voice is approximately 60 dBA heard from three feet away (CDC, 2018; US Department of Labor, 2019).

Table 3.7-2 presents noise ranges for common types of construction/demolition vehicles and equipment that would potentially be used at the SM-1 site during the proposed decommissioning.

Table 3.7-2: Predicted Noise Ranges from Selected Types of Construction/Demolition Equipment

Equipment	Typical Noise Level (dBA) 50 Feet from Source
Air Compressor	81
Backhoe	80
Mobile Crane	83
Bulldozer	85
Grader	85
Jackhammer	88
Front-end Loader	85
Pneumatic Tool	85
Rail Saw	90
Saw	76
Truck	88

Source: (Federal Highway Administration, 2017)

3.7.2.2 Chemical Hazards

Chemicals and hazardous substances in Building 372 and on the SM-1 site would pose a potential hazard to workers through incidental or accidental inhalation, dermal contact, or ingestion. Solvents and particulates would also pose a risk to worker health. Chemicals and substances in and around Building 372 could include ACM, PCBs and mercury. In reactor facilities, these commonly occur in building materials, paints, light bulbs, light fixtures, switches, electrical components, and high-voltage cables. Other chemical hazards could include low levels of potassium, sodium chromate, and nickel, as well as quartz and cristobalite silica generated during concrete demolition. Fumes containing lead and arsenic, and smoke from flame cutting and welding are also sources of chemical exposure during decommissioning.

3.7.2.3 Ergonomic Hazards

Ergonomic hazards can result from the physiological and psychological demands of decommissioning work. Common indicators of ergonomic stress include discomfort and fatigue. These conditions can result in decreased

performance, decreased safety, and increased chance of injury. Sources of ergonomic stress during decommissioning activities could include mechanical vibrations, lifting, and static work.

3.7.2.4 Biological Hazards

Biological hazards include any virus, bacteria, fungus, parasite, or living organism that can cause a disease in human beings. Such hazards on the SM-1 site could include mold, vermin and their droppings, mosquitoes, ticks carrying Lyme disease, and/or poison ivy. There would potentially be an increased risk of exposure to mosquitoes, ticks, and poison ivy in areas of dense vegetation that would require clearing.

3.7.2.5 Fire and Emergency Services

Fire, emergency, and health services are available on- and off-post. Fort Belvoir's Directorate of Emergency Services (DES) provides continuous law enforcement, access control, and fire and emergency services to the installation. DES operates four fire stations on Fort Belvoir: one each on Fort Belvoir North Area, Davison Army Airfield, North Post, and South Post. Fire Station 465 on South Post is at 9701 Gunston Road, approximately 1.6 miles north of the SM-1 site. The Fort Belvoir Fire Department maintains capabilities to address a range of emergency situations on the installation, including fires, confined space incidents, and hazardous material response. The Fire Department also issues permits for confined space entry and provides associated stand-by emergency response services.

Fort Belvoir and the Fairfax County Fire and Rescue Department have entered into a MOA to provide mutual emergency response aid when requested for incidents occurring on- or off-post. Fort Belvoir is bounded by areas of Fairfax County served by Fire and Rescue Battalions 405 and 406, which serve a combined population of approximately 288,000 people covering 93 square miles. In fiscal year (FY) 2018, the battalions responded to more than 22,000 emergency medical service calls and 4,700 fire incidents with average response times of 5 and 6 minutes, respectively (Fairfax County Fire and Rescue, 2018)

The Fort Belvoir Community Hospital is located at 9300 DeWitt Loop on South Post approximately 2.8 miles north of the SM-1 site. Encompassing 1.2 million square feet, the hospital has 120 inpatient rooms and an intensive care unit, operating rooms, and emergency medical services. The hospital's emergency department is open 24 hours a day.

Off-post, the Inova Mount Vernon Hospital is located approximately 7.8 miles northeast of the SM-1 site and is the nearest off-post hospital to South Post that includes a 24-hour emergency room. The Inova Trauma Center, located approximately 15 road miles north of Fort Belvoir, is the only Level 1 trauma center in the Northern Virginia area. Level 1 trauma centers are capable of providing total care for every aspect of human injury and are staffed 24 hours a day by general surgeons. They also provide prompt availability of care in specialties such as orthopedic surgery, neurosurgery, anesthesiology, emergency medicine, radiology, internal medicine, and critical care.

3.7.3 Evaluation of Environmental Consequences

3.7.3.1 Approach to the Analysis

This section discusses short-term (decommissioning) and long-term (post-decommissioning) impacts on occupational health and safety and fire and emergency services potentially resulting from the No Action and Proposed Action Alternatives. Impact significance thresholds for these resources are presented in **Table 3.7-3**.

Table 3.7-3: Occupational Safety and Health Impact Significance Thresholds

Impact Significance Threshold	Type of Impact	Impact Significance Threshold Definition
Less than Significant Adverse Effect	Direct Impacts	<ul style="list-style-type: none"> The Alternative would result in a lost-time injury or an injury requiring prescribed medicine (i.e., a reportable injury), but the injured person would fully recover in time. The Alternative would result in an accident or emergency requiring response or treatment from on- or off-post fire and emergency services or emergency health care providers but is within their capacity to address.
	Indirect Impacts	<ul style="list-style-type: none"> The Alternative would create conditions that increase the risk of non-fatal injuries to workers on or near the SM-1 site. The Alternative would create conditions that increase demand for on- or off-post fire and emergency services and/or emergency health care services, but such demand would not exceed those services' capabilities.
Potentially Significant Adverse Effect	Direct Impacts	<ul style="list-style-type: none"> The Alternative would result in a fatal human injury or permanent disability. The Alternative would result in an accident or emergency requiring response or treatment from on- or off-post fire and emergency services or emergency health care providers that would exceed their existing or future capabilities.
	Indirect Impacts	<ul style="list-style-type: none"> The Alternative would create conditions that would cause a worker on or near the SM-1 site to experience a fatal injury or develop a permanent disability or terminal illness. The Alternative would create conditions that would increase the demand for on- or off-post fire and emergency services that would exceed the capabilities of those services.

3.7.3.2 No Action Alternative

Under the No Action Alternative, the SM-1 site would continue to be maintained in a SAFSTOR condition. Access to the facility would be restricted to authorized personnel. Workers performing periodic maintenance and upkeep tasks at the facility and site would risk exposure to physical, chemical, ergonomic, and biological hazards present on the site; however, any such work would be conducted in accordance with applicable OSH plans and regulatory requirements. Any accident potentially resulting from such work would likely be small in scale and within the capacity of Fort Belvoir DES and/or hospital to address.

Prior to conducting particularly hazardous activities, such as confined space entry, additional planning would be conducted between contractors and fire and emergency services providers. As needed, fire and emergency service providers would be present on the SM-1 site during such activities to provide oversight and immediate response if needed.

For these reasons, adverse impacts on occupational safety and health and fire and emergency services resulting from the No Action Alternative would be less than significant.

3.7.3.3 Proposed Action Alternative

3.7.3.3.1 Occupational Safety and Health

In addition to radiological hazards (**Section 3.6**) and to varying degrees, conditions in Building 372 and on the SM-1 site would pose an increased risk of worker exposure to physical, chemical, ergonomic, and biological hazards during decommissioning and dismantlement activities. Such risks would be minimized through the decommissioning contractor's implementation and adherence to an OSH program and an Accident Prevention Plan (APP) to protect the health and safety of personnel working at the site. It is important to note that historic injury and fatality rates reported at nuclear reactor facilities are lower than the average US industrial rates at non-nuclear reactor sites (NRC, 2002).

At minimum, the APP would require the use of applicable and appropriate PPE to protect workers from occupational hazards on the site; direct workers to identify and isolate hazards before beginning work; emphasize the importance for workers to maintain awareness of their surroundings and consider the implications of their actions prior to executing tasks; designate appropriate areas for worker breaks and smoking; establish procedures for preventing or minimizing exposure to hazardous materials, substances, and conditions; and provide contact information for fire and emergency services responders. All workers on the site would be required to review the APP before performing work, and periodic briefings would be conducted to inform workers of potential hazards and safety procedures.

The APP would be periodically reviewed and updated as the project progresses and/or as conditions on the SM-1 site change. Each subcontractor would be responsible for adhering to the overall APP and would prepare and adhere to trade-specific OSH plans as applicable. As appropriate, work would be conducted throughout the decommissioning process in accordance with trade-specific best practices.

For these reasons, the Proposed Action Alternative would have less than significant adverse short- and long-term direct impacts, and no short- or long-term indirect impacts, on occupational safety and health.

3.7.3.3.2 Fire and Emergency Services

Adherence to applicable OSH plans and procedures as well as trade-specific best practices would, at minimum, minimize the scale or severity of any potential occupational accidents occurring on the site and the proportionate response required by fire and emergency services or emergency health care provided at on- or off-post medical facilities. Prior to particularly hazardous tasks, such as confined space entry, additional coordination would be conducted between the contractor, on-post and/or off-post fire and emergency services, and other relevant organizations to identify potential risks and develop specific work and emergency response procedures. As needed, fire and emergency services would be present on the SM-1 site during particularly hazardous activities (e.g., confined space entry, heavy crane lifts) to provide oversight and immediate response if required. Adherence to OSH plans and procedures and prior planning and coordination between the contractor and emergency services providers would ensure that incidents potentially occurring during the Proposed Action Alternative remain within the capabilities of available emergency service providers.

Following the completion of decommissioning activities, the SM-1 site would be maintained in a vegetated or otherwise undeveloped condition for the foreseeable future as the site is not included in Fort Belvoir future land use plans. While occupational hazards could occur during long-term maintenance of the site, adherence to OSH plans and procedures would ensure that any incidents are minimized and/or avoided to the extent practicable.

For these reasons, the Proposed Action Alternative would have less than significant adverse short- and long-term direct impacts, and no short- or long-term indirect impacts, on fire and emergency services.

3.7.3.4 Management and/or Mitigation Measures

The contractor would prepare, implement, and adhere to an APP in accordance with applicable regulatory requirements. All workers on the site would be required to review the APP before performing work. The APP would be reviewed and updated throughout the Proposed Action Alternative as project phases and/or conditions change, and would be subject to continuous USACE oversight.

USACE would also enter into one or more MOAs with on- and off-post fire and emergency response services and/or emergency health care providers to define roles and responsibilities and establish conditions for response, oversight, and monitoring.

3.8 Cultural Resources

Cultural resources are defined as prehistoric or historic sites, buildings, structures, objects, or other physical evidence of human activity that are considered important to a culture or community for scientific, traditional, or religious reasons.

3.8.1 Regulatory Setting

The NHPA of 1966, as amended, outlines federal policy to protect historic properties and promote historic preservation in cooperation with other nations, tribal governments, states, and local governments. Section 106 of the NHPA requires federal agencies to consider the effects of their proposed actions on historic properties before undertaking a project, and allows the ACHP an opportunity to comment on such undertakings. Under Section 106, federal agencies are responsible for delineating the Area of Potential Effects (APE) within which impacts from a proposed action may occur; identifying historic properties present within the APE; assessing the potential effects of the undertaking on those historic properties; and considering ways to avoid, minimize, and mitigate any adverse effects. Federal agencies are further required to initiate consultation with the SHPO for actions that may impact historic properties. VDHR serves as the SHPO in Virginia.

Sections 106 and 110 of the NHPA require federal agencies to identify, evaluate, inventory, and protect historic properties (i.e., those that are listed or eligible for listing in the NRHP) that are under their jurisdiction and control. The NHPA imposes no absolute preservation requirements; however, federal agencies must follow and document mandated procedures for any federal decision regarding undertakings that may affect cultural resources. In accordance with 36 CFR Part 800.2(a)(2), the Army and Fort Belvoir have designated USACE as the lead federal agency for purposes of Section 106 consultation regarding the Proposed Action.

The ROI for cultural resources corresponds to the APEs, as defined below for above-ground (architectural) and archaeological resources, respectively.

3.8.2 Affected Environment

The Proposed Action includes the dismantlement and removal of buildings and infrastructure, the removal of contaminated soils, and site restoration; therefore, it has the potential to affect historic properties. In accordance with Section 106, USACE initiated consultation with the SHPO by letter dated October 29, 2015 in which USACE defined the federal undertaking (i.e., the Proposed Action) and the APE for above-ground (architectural) and archaeological resources (**Appendix B**). For above-ground resources, the APE is coterminous with the 10.76-acre area surrounding the SM-1 site and Buildings 371 and 380 (Building 358, formerly used as a training/administrative facility for SM-1, was excluded from the APE due to its relative distance from the Deactivated SM-1 Nuclear Reactor Facility). The archaeological APE is coterminous with the boundaries of ground disturbance related to dismantlement, site cleanup, and staging activities (**Figure 3.8-1**).

Figure 3.8-1: APE for the Proposed Action



Historical documents related to SM-1 are maintained and stored at the Humphreys Engineering Center in Alexandria, Virginia, and the USACE Baltimore and Philadelphia District offices. Historical documents include blueprints, plans, photographs, surveys, design documents and drawings, as well as operational manuals. USACE initiated archiving efforts to digitize the SM-1 historical documents and to create a historical document repository.

3.8.2.1 Archaeological Resources

One archaeological site, 44FX1331, was identified within the SM-1 APE in 1987 during a pedestrian survey of the area by former Fairfax County Archaeologist Michael Johnson. In February 2018, AECOM-Tidewater Joint Venture conducted a Phase I archaeological survey at the SM-1 site and its 4.54-acre (1.84-hectare) archaeological APE to determine if other potentially significant archaeological resources were present. The survey determined that extensive ground disturbance associated with construction of SM-1 severely impacted the landform and may have destroyed much of the site's subsurface integrity. As a result, the site was determined not eligible for listing in the NRHP and no further archaeological study of the SM-1 site was recommended. The results of the survey were reported in *Phase I Archaeological Survey of the SM-1 Reactor Facility, US Army Garrison Fort Belvoir, Fairfax County, VA* (USACE, 2018b), submitted to the SHPO in February 2018. By letter dated March 21, 2018, the SHPO concurred with the findings and recommendations of the Phase I archaeological survey that no further archaeology work at the SM-1 site was required (VDHR File No. 2015-1247) (**Appendix B**).

3.8.2.2 Architectural Resources

In 1996, the SM-1 Reactor Facility (US Army Package Power Reactor; VDHR ID# 029-0193) was determined eligible for listing in the NRHP under Criterion A on the national level, with a period of significance between 1955 and 1973. Because it was less than 50 years old at the time, NRHP Criterion Consideration G (for resources less than 50 years old) applied, as the facility met the threshold for "exceptional importance" according to this criterion. The SM-1 Reactor Facility was the Army's first nuclear-powered electricity-generating station and the first water-pressurized reactor brought online in the US. The SM-1 Reactor Facility was also the first nuclear power reactor to provide electricity to a commercial power grid in the US. It was used to train military nuclear power plant operators and to perform nuclear research and development tasks. As the Army's first prototype nuclear power generating plant, the SM-1 Reactor Facility represented an important step in the use of atomic power (Friedlander, Hack, & Rosentel, 1992; Fort Belvoir, 2014).

At the time of the 1996 NRHP eligibility determination, the facility consisted of Building 372, Building 349 (warehouse), Building 350 (now Building 7350), and Building 375 (intake pier), all still standing. Additionally, the NRHP-eligible boundaries included four buildings/structures since demolished: Building 373 (sentry station), Building 376 (waste retention building), Building 384 (electronic equipment facility), and an emergency siren. A 2008 architectural survey of Fort Belvoir's 300 Area identified two additional buildings historically associated with SM-1, although not located within the NRHP-eligible boundaries: Building 371 (Lab/Test Building, built in 1957) and Building 380 (Lab/Test Building, built in 1965) (John Milner Associates, 2008). Building 371 and Building 380 are currently occupied by other Fort Belvoir tenants and neither is proposed for dismantlement as part of the Proposed Action. Facilities currently comprising the historic property are shown on **Figure 3.8-1**. The six buildings located within the SM-1 Reactor Facility APE are described in **Table 3.8-1**.

Table 3.8-1: Buildings/Structures in the Proposed Action APE

Building No.	Name	VDHR ID No.	Construction Date	Description	NRHP Status
349	Warehouse/ Storage	029-0193	Unknown, possibly ca. 1969	The construction date is based on analysis of historic aerial photography. The building is located within the SM-1 Reactor Facility's fenced area.	Non-contributing resource in NRHP-eligible US Army Package Power Reactor (1996)
350/7350	Sewage Lift Station	029-0193	1962	The structure is a one-story brick utility building with a flat roof and concrete base. It is located northwest of Building 372.	Contributing resource in NRHP-eligible US Army Package Power Reactor (1996)
371	Lab/Test Building	Not assigned	1957	Building 371 was documented and evaluated as part of the 2008 architectural survey of Fort Belvoir's 300 Area. It was recommended NRHP-eligible for its association with the SM-1 Reactor Facility; however, the SM-1 NRHP boundaries have not been expanded to include this building.	NRHP Eligible (John Milner Associates, 2008)
372	SM-1 Reactor Building	029-0193	1957	The two-story domed rectangular SM-1 plant is built of steel-frame construction, covered with corrugated metal, and sits on a concrete foundation. The building measures approximately 90 feet by 93 feet and has a flat concrete roof. A tall cylindrical vented dome extends above the roofline. The building houses electrical circuitry and reactor-related piping on the first level, with classrooms, offices, a control room, and support facilities on the second floor. The core containment unit, which is now encased in cement, extends through both levels.	Contributing resource in NRHP-eligible US Army Package Power Reactor (1996)
375	Pump House	029-0193	1962	This one-story, rectangular 12-foot by 8-foot metal structure with a large metal boom and wood planked walkway is located along the Gunston Cove shoreline adjacent to the SM-1 Reactor Facility. It is no longer in use.	Contributing resource in NRHP-eligible US Army Package Power Reactor (1996)

Table 3.8-1: Buildings/Structures in the Proposed Action APE

Building No.	Name	VDHR ID No.	Construction Date	Description	NRHP Status
380	Lab/Test Building	Not assigned	1965	Building 380 is a simple brick structure originally built as a Nuclear Power Simulator Building. The building was documented and evaluated as part of the 2008 architectural survey of Fort Belvoir's 300 Area and was recommended NRHP-eligible for its association with the SM-1 Reactor Facility; however, the SM-1 Reactor Facility NRHP boundaries have not been expanded to include this building.	NRHP Eligible (John Milner Associates, 2008)

3.8.2.3 Traditional Cultural Properties

No traditional cultural properties have been documented or are otherwise known to exist within the SM-1 APE. In accordance with Section 106, USACE consulted with federally recognized Indian tribes that may have an interest in or knowledge of traditional cultural properties at Fort Belvoir (**Section 1.7.4; Appendix B**). No tribal responses to participate in Section 106 consultation were received.

3.8.3 Evaluation of Environmental Consequences

3.8.3.1 Approach to the Analysis

Impact significance thresholds for cultural resources are presented in **Table 3.8-2**.

Table 3.8-2: Cultural Resources Impact Significance Thresholds

Impact Significance Threshold	Type of Impact	Impact Significance Threshold Definition
Less than Significant Adverse Effect	Direct Impacts	The Alternative would have a measurable effect on an NRHP-listed or eligible archaeological or architectural resource in the APE. However, the effect would be resolvable through the Section 106 consultation process.
	Indirect Impacts	The Alternative would have a measurable effect on an NRHP-listed or eligible archaeological or architectural resource outside the APE. However, the effect would be resolvable through the Section 106 consultation process.
Potentially Significant Adverse Effect	Direct Impacts	The Alternative would have a measurable effect on an NRHP-listed or eligible archaeological or architectural resource in the APE that is not resolvable through the Section 106 consultation process.
	Indirect Impacts	The Alternative would have a measurable effect on an NRHP-listed or eligible archaeological or architectural resource outside the APE that is not resolvable through the Section 106 consultation process.

3.8.3.2 No Action Alternative

Under the No Action Alternative, the Deactivated SM-1 Nuclear Reactor Facility would not be decommissioned and USACE would maintain the site in a SAFSTOR condition for the foreseeable future. The natural decay of the residual radioactivity would not reach a level low enough for the release of the facility and termination of the permit within the allotted 60-year regulatory threshold. Building 372, as well as Buildings 349, 350/7350, and 375, would continue to deteriorate over time. In the long term, the eventual dismantlement of the Deactivated SM-1 Nuclear Reactor Facility and its associated on-site structures would have a direct adverse effect on these NRHP-eligible buildings.

3.8.3.3 Proposed Action Alternative

The Proposed Action Alternative consists of the removal of all radiologically contaminated structures, equipment, and media from the SM-1 site, as needed to allow for the termination of the Decommissioning Permit and the release of the site for unrestricted use. It involves removal of M&E from Building 372, dismantlement of Building 372, and the dismantlement and removal of the other three buildings (Buildings 349, 350, and 375) on the SM-1 site.

USACE has determined that the Proposed Action Alternative would have an *Adverse Effect* under NHPA Section 106 on the NRHP-eligible SM-1 Reactor Facility (Buildings 372, 350/7350, and 375). The Proposed Action would also have an *Adverse Effect* under Section 106 on the NRHP-eligible Buildings 371 and 380 from their loss of historical significance associated with SM-1 (neither Building 371 nor Building 380 are proposed for dismantlement or other physical alteration under the Proposed Action Alternative). The SHPO concurred with USACE's determination in a letter dated 30 January 2020.

USACE, in consultation with the SHPO, ACHP, and other participating Section 106 consulting parties, has developed a MOA stipulating measures that USACE will implement to mitigate the adverse effect on the SM-1 historic property and ensure it remains less than significant. A copy of the MOA, and copies of relevant Section 106 correspondence, are included in **Appendix B**.

The Proposed Action Alternative would not affect any known NRHP-eligible archaeological properties within the archaeological APE (limits of disturbance). In addition, no traditional cultural resources are documented or otherwise known to exist on the SM-1 site. To date, no responses from federally recognized Indian tribes have been received. Thus, it is anticipated that the Proposed Action Alternative would have no effects on traditional cultural resources.

3.8.3.4 Management and/or Mitigation Measures

While no known archaeological resources exist within the APE, if such a resource is discovered during the Proposed Action Alternative, USACE would adhere to the policies and procedures for such discoveries per 36 CFR Part 800.13, *Post-review Discoveries*. Upon discovery of materials or remains during ground disturbance activities under the Alternatives, the Army would:

- immediately cease work and notify the SHPO, consulting tribes, and ACHP, as well as the Fairfax County sheriff's department if human remains are uncovered;
- ensure no unauthorized personnel access the site and no further damage to the suspected materials or remains is incurred; and,
- comply with applicable laws and regulations prior to conducting any further activity on the site.

A MOA developed by USACE in consultation with the SHPO, ACHP, Fort Belvoir, and other participating Section 106 consulting parties stipulates the following measures that USACE will implement to mitigate the Proposed Action Alternative's adverse effect on the SM-1 historic property and ensure it remains less than significant:

- USACE will produce Historic American Engineering Record (HAER) Level II documentation for the SM-1 Reactor Facility. The goal of the HAER documentation is to create public awareness of the SM-1 Reactor Facility and document the facility's operations within its historical context as a nationally significant nuclear energy resource. The written documentation will include physical descriptions of the facility, detailed discussion of its historic significance, a discussion of how the facility was operated, and a description of the decommissioning and demolition process, supported by a complete bibliography and electronic repository, including photography, videography, historic motion picture film, and relevant documents, as appropriate. The HAER Level II documentation will also include scanned and digitally enhanced copies of the available as-built drawings of Building 372 and 3-dimensional renderings of Building 372 using Light Detection and Ranging (LIDAR) scans.
- For inclusion in the HAER Level II documentation, USACE will conduct interviews with personnel closely associated with the construction, operation, and initial closure of SM-1. Interviews will be conducted, recorded, and transcribed in accordance with applicable standards.

- All field work, photography, and research necessary to produce HAER Level II documentation for the SM-1 Reactor Facility will be carried out by or under the direct supervision of architectural historians or historians who meet the appropriate *Secretary of the Interior's Professional Qualification Standards* (SOI Standards; 48 FR 44738-9, Sept. 29, 1983). All work will be conducted in accordance with *Recording Historic Structures and Sites for the Historic American Engineering Record* (48 FR 44731-34, September 29, 1983); *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation* (36 CFR Part 61); and *Secretary of the Interior's Standards for the Treatment of Historic Properties* (36 CFR Part 68).
- The participating Section 106 consulting parties for the MOA, including the SHPO, will be provided with an opportunity to review and comment on the HAER Level II documentation.
- USACE will carefully remove the commemorative plaque currently affixed to Building 372 and move it to an as-yet-undetermined facility in Virginia for restoration and display.
- In consultation with the participating Section 106 consulting parties, USACE will develop and erect a historical plaque/marker at the SM-1 site following site restoration activities to commemorate the SM-1 Reactor Facility and its national significance. USACE will also erect up to two additional plaques/markers at as-yet-undetermined, publicly accessible locations.
- Within one year of the MOA's enactment, USACE will salvage historical items from the SM-1 Reactor Facility to be placed on loan to appropriate repositories for traveling exhibits. The salvaged items may include, but are not limited to, the educational control panel, a historic scale model, and other items remaining from when Building 372 operated as a museum.
- The HAER Level II documentation will be completed within one year after the demobilization of decommissioning equipment and personnel from the SM-1 site.

3.9 Transportation and Traffic

This section discusses the local and regional vehicular transportation network on and near Fort Belvoir's South Post that would potentially be affected by the Proposed Action. The ROI for the transportation and traffic analysis consists of South Post roads between the SM-1 site and the Tulley Gate access control point (ACP) and off-post roads from Tulley Gate to Interstate 95 (I-95) approximately 2.7 miles north-northwest of South Post. These are the components of the vehicular transportation network that would most likely be used by decommissioning personnel to access the SM-1 site, and to transport debris generated by the proposed decommissioning.

3.9.1 Regulatory Setting

As applicable, waste transportation and other aspects of the proposed decommissioning would be conducted in accordance with NRC and the USDOT regulations. Federal and state regulatory requirements relevant to transportation are summarized in **Table 3.9-1**.

Table 3.9-1: Transportation – Applicable Regulations and Guidance

Guidance	Description
10 CFR Part 71	Establishes requirements for packaging, preparation for shipment, and transportation of licensed material and procedures and standards for shipping fissile material.
49 CFR Parts 171 - 177	Establishes USDOT regulations for the packaging and shipment of hazardous materials by public highway, rail, and air.
49 CFR Part 172.310, <i>Class 7 (Radioactive) Materials</i>	Specifies requirements for marking radioactive materials for transportation.
49 CFR Part 383	Establishes commercial motor vehicle driver's license requirements.
49 CFR Part 397, Subpart D	Establishes requirements for the routing of Class 7 (radioactive) material for motor carriers and drivers and State routing designations.
Department of the Army Pamphlet (DA-PAM) 385-24, <i>The Army Radiation Safety Program</i>	Establishes Army safety procedures for the use, licensing, transportation, disposal, dosimetry, accident reporting, safety design, accountability of, and radiation exposure standards for ionizing and non-ionizing radiation sources.
23 CFR Part 658.17	Limits the gross vehicle weight of federal shipments to 80,000 pounds.
Virginia Regulations Governing the Transportation of Hazardous Materials (9 VAC 20-110-121)	Requires all shippers of hazardous radioactive materials to register with the Department of Emergency Management at least 30 days prior to transportation of such materials.
Virginia Regulations Governing the Transportation of Hazardous Materials (9 VAC 20-110-122)	Requires all shippers to coordinate with local law enforcement agencies, local emergency services, local fire departments, and other local officials as requested by county or municipal authorities.

3.9.2 Existing Conditions

It is anticipated that the majority of decommissioning personnel would travel to and from the site by privately operated vehicles. Therefore, no measurable impacts on local and regional mass transit services (e.g., Metrorail, bus) or pedestrian and bicycle infrastructure would be anticipated to occur. Due to limited parking at the SM-1 site, it is anticipated that the majority of project personnel would park at the 300 Area Visitor Center located on Gunston Road just north of the 300 Area gate. From here, personnel would be shuttled to and from the project site in large vans or small buses.

3.9.2.1 On-Post Vehicular Transportation Network

Traffic volumes at ACPs and on main roads on South Post are heaviest Monday through Friday during the morning and afternoon rush hours. Backups occur frequently at Tulley Gate during the morning traffic peak due to vehicles queuing for required security identification checks and vehicle searches. At other times, however, traffic on South Post roads is relatively moderate throughout the workday and light on weekends. Heavy trucks and contractor vehicles are a frequent presence on Fort Belvoir's roads as a result of construction, demolition, and renovation projects occurring nearly continuously on the installation. Roads on Fort Belvoir are maintained by a private contractor at the direction of DPW.

Vehicular traffic accesses the 300 Area through two ACPs on Gridley Road and Putnam Road at their intersections with 23rd Street. Burbeck Road and Totten Road provide the primary means of north-south vehicular circulation through the 300 Area. Wilson Road provides access to the SM-1 site, which is approximately 0.2 mile west of the Wilson Road-Burbeck Road intersection.

All roads in the 300 Area are two lanes wide, paved and, with the exception of Totten Road, striped. Most roads have a curb and gutter. Portions of the shoulder along Totten Road are embanked with gravel or riprap. None of the intersections in the 300 Area have traffic signals, although some intersections have stop signs.

USACE evaluated road pavement conditions in the 300 Area in December 2017 to determine the suitability of the roads to support anticipated traffic that would be associated with the Proposed Action. The evaluation included analysis of the thickness of the pavement and gravel base as well as the extent of observable deterioration (e.g., cracking and potholes). Asphalt thickness was determined to vary from four to 16 inches and gravel base thickness from zero to six inches. Cracks, potholes, and other forms of degradation were identified during visual inspection of the roadways (USACE, 2018c).

3.9.2.2 Off-Post Vehicular Transportation Network

Fort Belvoir is served by a robust regional road network. However, a number of these highways and roads currently operate above design capacity, particularly during the morning and afternoon peak commuting periods. Congestion on these facilities is a daily occurrence, although not unusual when considered in a regional context. Primary roads near Fort Belvoir that would likely handle the majority of traffic associated with the Proposed Action are described below.

I-95, located northwest of Main Post, serves region-wide commuter traffic from predominantly residential counties to the south, to major employment centers in Washington, DC and Arlington County. In 2016, the northbound and southbound lanes of I-95 in the vicinity of its interchange with Fairfax County Parkway handled an annual average daily traffic (AADT) volume of 216,000 vehicles (VDOT, 2018).

US Route 1 primarily serves local trips but can serve as an alternate route to I-95 because it runs parallel to the interstate (i.e., north-south). US Route 1 provides access to I-95 approximately 5.6 miles (driving distance) southwest of Fort Belvoir. In 2016, AADT volumes on the segment of US Route 1 between Fairfax County Parkway and Mount Vernon Memorial Highway exceeded 30,000 vehicles (VDOT, 2018).

Fairfax County Parkway is a limited-access, predominantly four-lane roadway that begins at US Route 1 just west of Pohick Road and proceeds to the northwest across much of Fairfax County to terminate at Leesburg Pike (VA Route 7). It serves Fort Belvoir as the primary access to I-95. In 2016, AADT volumes on Fairfax County Parkway between US Route 1 and its interchange with I-95 ranged between 18,000 and 39,000 vehicles (VDOT, 2018).

3.9.3 Evaluation of Environmental Consequences

This section discusses short-term (decommissioning-related) and long-term (post-decommissioning) impacts on the on- and off-post vehicular transportation networks that would result from the Proposed Action. Potential effects from the transportation of waste generated by the Proposed Action are also discussed.

3.9.3.1 Approach to Analysis

Impacts on transportation and traffic are primarily addressed qualitatively and incorporate estimates of anticipated vehicle trips associated with the Proposed Action relative to baseline conditions. The analysis of impacts from transportation of LLRW generated by the decommissioning nuclear reactor facilities as presented in the NRC's decommissioning GEIS (NRC, 2002) is also incorporated by reference. Impact significance thresholds for transportation and traffic are presented in **Table 3.9-2**.

Table 3.9-2: Transportation and Traffic Impact Significance Thresholds

Impact Significance Threshold	Type of Impact	Impact Significance Threshold Definition
Less than Significant Adverse Effect	Direct Impacts	<ul style="list-style-type: none"> The Alternative would result in a small temporary increase in peak hour traffic that could cause additional delays; however, the functionality of existing roadways would not change. The Alternative would result in minor damages to pavement; however, the damage would be localized and could be repaired easily. The Alternative would expose individuals along the transport route to radiation; however, the dose would be negligible and within regulatory thresholds. The Alternative would result in a negligible risk of a traffic accident fatality.
	Indirect Impacts	<ul style="list-style-type: none"> The Alternative would create conditions that result in some or all of the effects described above.
Potentially Significant Adverse Effect	Direct Impacts	<ul style="list-style-type: none"> The Alternative would result in a large temporary increase in peak hour traffic that would cause additional delays and decrease the functionality of existing roadways. The Alternative would result in severely damaged pavement requiring extensive repairs. The Alternative would expose individuals along the transport route to enough radiation to cause health problems. The Alternative would substantially increase the risk of a traffic accident fatality occurring as a result of the project.
	Indirect Impacts	The Alternative would create conditions that result in some or all of the effects described above.

3.9.3.2 No Action Alternative

Under the No Action Alternative, the proposed decommissioning would not be implemented, and the Deactivated SM-1 Nuclear Reactor Facility would continue to be maintained in SAFSTOR condition for the foreseeable future. This would have no impacts on transportation and traffic on or in the vicinity of Fort Belvoir.

3.9.3.3 Proposed Action Alternative

3.9.3.3.1 Transportation Network

The Proposed Action Alternative would generate additional vehicle trips on and in the vicinity of Fort Belvoir. Such vehicle trips would include workers' commuting vehicles as well as heavy trucks hauling materials and equipment needed during decommissioning activities, transporting waste from the SM-1 site, and bringing fill soils to the site during restoration activities. The number of additional trips generated by workers' commuting vehicles on Fort Belvoir roads during the Proposed Action Alternative is anticipated to remain low. It is estimated that the proposed decommissioning would generate 1,150 heavy truck trips, comprising approximately 650 waste shipments from the site and 500 trips to the site to deliver clean fill soils during restoration activities.

While the total number of truck trips that would potentially be generated by the Proposed Action Alternative would be substantial, they would be distributed over the Alternative's multi-year implementation period and thus, would be relatively small in the context of existing traffic volumes handled by Fort Belvoir's road network. The transport of waste from the site would be distributed over the 5-year on-site decommissioning period, although it is anticipated that approximately 50 percent of waste shipments would occur during the middle 12 months (i.e., months 19 through 30) of the project. This would equate to an average of six to seven containers shipped from the site per week during that 12-month period. Site restoration activities are anticipated to occur over an approximately seven-month span near the end of the Alternative's implementation period.

Traffic generated by the Alternative, particularly heavy truck traffic, would have the potential to damage Fort Belvoir road surfaces and shoulders. Periodically throughout the decommissioning process and upon its completion, USACE would conduct limited road maintenance and improvements at selected locations along the designated transportation route to repair damage resulting from the increased truck traffic. Such repairs would consist of pothole filling, limited asphalt resurfacing, or similar activities that would be relatively limited in scale.

For these reasons, the Proposed Action Alternative would have short-term, less than significant impacts on the Fort Belvoir transportation network. Furthermore, no appreciable increase in traffic volumes off-post (regional) would be anticipated to occur. No long-term transportation and traffic impacts would result from the Proposed Action Alternative.

3.9.3.3.2 Waste Transportation

All waste generated by the Proposed Action Alternative would be packaged in accordance with applicable NRC and USDOT regulatory requirements and transported by licensed contractors to licensed or permitted off-post facilities for disposal or to local or regional truck-to-rail transfer locations for shipping to the ultimate disposal facility.

The transport of any commodity involves a potential for risk to transportation personnel as well as the general public. Such risk is primarily associated with transportation-related accidents (e.g., injuries or fatalities from vehicle crashes) regardless of the cargo. The transport of certain materials, such as hazardous or radioactive waste, can pose an additional risk due to the unique nature of the material itself (e.g., exposure to radiation emitted from a shipping container).

Shipping packages containing radioactive materials must contain and shield their contents during normal transport conditions in accordance with USDOT regulations (49 CFR Parts 171-177). Shipments of radioactive materials must also be below the federal gross vehicle weight limit of 80,000 pounds (40 tons); as such, packages containing radioactive materials are typically limited to approximately 48,000 pounds (24 tons) (23 CFR 658.17).

Because packages containing radioactive waste have the potential to emit radiation even when properly shielded, individuals encountering shipments of radioactive waste generated by the proposed decommissioning would have the potential to be exposed to radiation in addition to normal background radiation; such exposure, depending on duration and intensity, could increase the risk of associated health problems, including cancer. These individuals would include the transportation crew, residents living along the transport route, other drivers and passengers, and other individuals that come into contact with the package during transport (e.g., inspectors at weigh stations).

The GIES on Decommissioning of Nuclear Facilities, Supplement 1 (NUREG-0586) determined that the potential impacts from transportation activities associated with the decommissioning of much larger nuclear facilities are neither detectable nor destabilizing when conducted in compliance with applicable regulations (NRC, 2002). The transportation of LLRW and other waste generated by the Proposed Action Alternative would occur in a manner consistent with that analyzed by NRC. As such, short-term impacts on public and worker health from the transport of LLRW and other waste from the SM-1 site during the Proposed Action Alternative would be less-than-significant.

No LLRW or other waste would be generated on the SM-1 site following the implementation of the Proposed Action Alternative. Thus, there would be no long-term health impacts from waste transportation.

3.9.3.4 Management and/or Mitigation Measures

The following management measures would be implemented during the Proposed Action Alternative by USACE or the decommissioning contractor to minimize impacts on the transportation network and/or from the transport of LLRW and other waste:

- A project-specific transportation management plan would be implemented identifying approved travel routes to and from the site for decommissioning personnel and heavy trucks transporting materials, equipment, and debris.
- During spill and emergency response planning for the Proposed Action Alternative, the decommissioning contractor would notify on- and off-post emergency responders of the types of shipments that would be transported to support preparation for potential transportation-related accidents.
- In coordination with Fort Belvoir and other affected organizations, decommissioning-related traffic would be scheduled for off-peak hours to minimize roadway congestion.
- All radioactive waste and other debris generated at the SM-1 site would be packaged and shipped in accordance with a written Waste Management Plan that is consistent with NRC and USDOT regulatory requirements.

3.10 Non-Radiological Hazardous Materials and Waste, and Non-Hazardous Solid Waste

This section discusses non-radioactive hazardous materials and non-hazardous solid waste that would be generated by the Proposed Action (radioactive waste that would be generated by the Proposed Action is discussed in **Section 3.6**). The ROI for the discussion in this section is the SM-1 site and local and regional off-post disposal facilities.

3.10.1 Regulatory Setting

Hazardous materials are defined in 49 CFR 171.8 as “hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions” in 49 CFR 173. Transportation of hazardous materials is regulated by USDOT regulations within 49 CFR Parts 105-180.

Hazardous wastes are defined by RCRA in 42 USC Part 6903(5), as amended by the Hazardous and Solid Waste Amendments, as “a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (a) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (b) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.”

Regulatory requirements addressing the generation, handling, management, and disposal of non-radioactive hazardous materials and non-hazardous solid waste are presented in **Table 3.10-1**.

Table 3.10-1: Non-Radiological Hazardous Material and Solid Waste – Applicable Regulations and Guidance

Guidance/Regulation	Description
Federal	
Clean Air Act of 1970 (CAA) (42 U.S.C. Part 7401 et seq.)	Establishes NAAQS for criteria pollutants. Radionuclides associated with dismantlement of SM-1 would also be regulated under the CAA.
Resource Conservation and Recovery Act of 1976 (42 USC Part 6901 et seq.; 40 CFR Part 260-268 and 270)	Establishes “cradle-to-grave” requirements for hazardous waste from its generation through transportation, treatment, storage, and disposal.
Toxic Substances Control Act of 1978 (15 USC Part 2601 et seq.)	Addresses the production, importation, use, and disposal of specific chemicals, such as polychlorinated biphenyls (PCBs), asbestos, radon, and lead-based paint.
USEPA Asbestos Regulations (40 CFR Part 61, Subpart M; 40 CFR Part 763)	Regulations governing the use and emissions of asbestos.
40 CFR Part 273, Standards for Universal Waste Management	Establishes regulations for the management and disposal of universal waste.
OSHA Permissible Exposure Limit for mercury	Establishes a PEL for worker exposure to mercury vapor of 0.1 milligram per cubic meter (mg/m ³).
OSHA Regulations (29 CFR Part 1910)	Standards to protect workers engaged in hazardous waste operations and emergency-response activities.
US Department of Transportation Regulations (49 CFR Subchapter C – <i>Hazardous Material Regulations</i> Parts 171-180)	Regulations governing the transport of hazardous materials.
EO 13101, <i>Greening the Government through Waste Prevention, Recycling, and Federal Acquisition</i>	Strengthens and expands the Federal government’s commitment to recycling and buying recycled-content and environmentally preferable products.
Commonwealth of Virginia	
Code of Virginia Section 10.1-1400 et seq.	Virginia Waste Management Act
9 VAC 20-60	Virginia Hazardous Waste Management Regulations
9 VAC 20-81	Virginia Solid Waste Management Regulations
9 VAC 20-110	Virginia Regulations for the Transportation of Hazardous Materials
9 VAC 20-81-620	Virginia Asbestos-Containing Waste Materials Regulations
9 VAC 20-81-630	Virginia Wastes Containing Polychlorinated Biphenyls (PCBs) Regulations
US Army / Fort Belvoir	
AR 200-1, <i>Environmental Protection and Enhancement</i>	Implements federal, state, and local environmental laws and DOD policies for preserving, protecting, conserving, and restoring the quality of the environment.

Table 3.10-1: Non-Radiological Hazardous Material and Solid Waste – Applicable Regulations and Guidance

Guidance/Regulation	Description
AR 420-1, <i>Army Facilities Management</i>	Provides policies and responsibilities for conduct and management of facilities engineering, housing, fire and emergency services, and environmental support.
<i>Sustainable Management of Waste in Military Construction, Renovation, and Demolition Activities</i> , 15 August 2008	Army policy requiring that all military construction, renovation, and demolition projects include contract performance requirements for the diversion of a minimum of 50 percent of construction and demolition waste, by weight, from landfill disposal.
Fort Belvoir <i>Hazardous Waste Management and Minimization Plan</i>	Establishes policies and procedures for the storage, prevention, containment, disposal, and response to discharges of hazardous materials at Fort Belvoir.
Fort Belvoir <i>Integrated Solid Waste Management Plan</i>	Establishes policies and procedures for the collection, handling, management, and recycling or disposal of non-hazardous solid waste generated on the installation.
USACE SM-1 Reactor Facility Waste Management Plan	Establishes procedures for the handling, management, and disposal/recycling of the various forms of waste that would be generated during the Proposed Action.

3.10.2 Affected Environment

ACM, LBP, mercury, PCBs, universal waste, and microbial contaminants (i.e., mold) are present in interior and exterior building materials, equipment, and components of Building 372. Surveys of these materials were conducted to support preparation of the SM-1 *Characterization Survey Report* (USACE, 2013).

3.10.3 Evaluation of Environmental Consequences

3.10.3.1 Approach to the Analysis

This section discusses short- and long-term impacts from non-radioactive hazardous waste and non-hazardous solid waste (i.e., MSW and dismantlement wastes) that would be generated during the Proposed Action. As used throughout this section, “waste” refers to non-radioactive regulated hazardous waste that would be generated from hazardous materials present in Building 372 and on the SM-1 site; regulated hazardous waste that would be generated from hazardous materials used during decommissioning activities; and non-hazardous MSW and dismantlement waste. These types of waste are differentiated as necessary in this section. Applicable impact significance thresholds are summarized in **Table 3.10-2**.

Impacts from radioactive waste, including LLRW, are discussed in **Section 3.6**. Impacts from the transport of radioactive and non-radioactive waste (including hazardous and non-hazardous waste) generated by the Proposed Action are discussed in **Section 3.9**.

Table 3.10-2: Hazardous and Non-Hazardous Waste Impact Significance Thresholds

Impact Significance Threshold	Type of Impact	Impact Significance Threshold Definition
Less than Significant Adverse Effect	Direct Impacts	<ul style="list-style-type: none"> The Alternative would delay or inhibit the removal of non-radioactive hazardous materials and waste from the Deactivated SM-1 Nuclear Reactor Facility; however, release of the site for unrestricted use <i>would not exceed</i> five years from issuance of a decommissioning permit. The Alternative would generate non-radioactive hazardous waste and non-hazardous solid waste; however, conditions or quantities of these substances <i>would not exceed</i> the capacity of Fort Belvoir or USACE to manage them.
	Indirect Impacts	<ul style="list-style-type: none"> The Alternative would generate non-radioactive hazardous waste and non-hazardous solid waste in quantities that <i>would not exceed</i> the current or future capacities of receiving landfills and/or processing facilities.
Potentially Significant Adverse Effect	Direct Impacts	<ul style="list-style-type: none"> The Alternative would delay or inhibit the removal of non-radioactive hazardous materials and waste from the Deactivated SM-1 Nuclear Reactor Facility such that release of the site for unrestricted use <i>would exceed</i> five years from issuance of a decommissioning permit. The Alternative would generate non-radioactive hazardous waste and non-hazardous solid waste such that conditions or quantities of these substances <i>would exceed</i> the capacity of Fort Belvoir or USACE to manage them.
	Indirect Impacts	The Alternative would generate non-radioactive hazardous waste and non-hazardous solid waste in quantities that <i>would exceed</i> the current or future capacities of receiving landfills and/or processing facilities.

3.10.3.2 No Action Alternative

Under the No Action Alternative, the proposed decommissioning would not be implemented, and the Deactivated SM-1 Nuclear Reactor Facility would continue to be maintained in SAFSTOR condition for the foreseeable future. Non-radioactive hazardous materials (e.g., ACM, LBP) would remain in Building 372. No hazardous or non-hazardous solid waste would be generated from the facility.

3.10.3.3 Proposed Action Alternative

Sorting, segregation, and decontamination of waste would be performed to the extent practicable to minimize the amount of radioactive waste, universal waste, and regulated hazardous wastes requiring treatment and disposal. All wastes would be evaluated against the following hierarchy for the best technical and most cost-effective disposition path:

- Reuse/recycle (e.g., clean steel, M&E, and concrete);
- Commercial disposal at local landfill (e.g., clean dismantlement debris and M&E); or
- Commercial treatment, storage, or disposal facility for treatment and/or disposal for hazardous and/or universal wastes.

Under the Proposed Action Alternative, hazardous waste (e.g., RCRA waste or TSCA waste) would be properly packaged, removed and transported to the final disposal location in accordance with federal, state and local regulations. BMPs would be implemented to ensure none of the dismantled or removed materials are placed in areas that could impact the surrounding environment (e.g., wetland or other coastal resources). Possible hazardous materials that may be removed include PCBs (mainly in electrical cables, gaskets, grout/caulking, other electrical components, and paint), ACM (insulation materials and wallboard), LBP, mercury in electrical switches and other components, fuels, oils, lubricants, and some ozone depleting substances in refrigerants.

Additional details regarding how waste would be removed from the Deactivated SM-1 Nuclear Reactor Facility, segregated and packaged according to waste type, and shipped to a licensed disposal site are contained in the WMP (USACE, 2019c) and the DP (USACE, 2019b).

The Proposed Action Alternative would generate an estimated 4,103 yd³ of non-radioactive waste (**Table 3.10-3**). This volume would include hazardous waste debris, hazardous waste soils, and non-hazardous dismantlement waste that would be generated directly by the dismantlement of Building 372 and associated structures on the SM-1 site.

Table 3.10-3: Non-Radioactive Waste Volume Estimates

Waste Type	Building / Site Area	Type / Material	Estimated Non-Radioactive Waste Volume (yd ³)
Building Debris	Unrestricted Area	Walls, Floors, and Roof	494
	Lower Site	Structures / Debris	389
Sub-total - Building Debris			883
Concrete Debris	Unrestricted Area	Slabs and Foundation	1,172
	Restricted Area	Slab and foundation	
	VC	Walls and Slab	1,194 ¹
Sub-total - Concrete Debris			2,366
Waste Soil	Upper Site around Building 372	Soil	500
Sub-total - Waste Soil			500
M&E Waste	Unrestricted Area Municipal Waste	M&E	323
	Restricted Area	M&E	31
Sub-total - M&E Waste			354
Total Non-Radioactive Waste Volume			4,103
Sub-total – Estimated LLRW Volume (Table 3.6-3)			7,424
Total Estimated Waste Volume from Proposed Action Alternative (LLRW + Non-Radioactive)			11,527

Table 3.10-3: Non-Radioactive Waste Volume Estimates

Waste Type	Building / Site Area	Type / Material	Estimated Non-Radioactive Waste Volume (yd ³)
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Note:

1. Includes steel liner.

Source: USACE 2019c

The quantities presented in **Table 3.10-3** are estimates of waste that would be generated by the Proposed Action Alternative. These estimates are based on surveys of *in situ* materials and conditions in Building 372 and on the SM-1 site, professional knowledge and judgment of USACE and its consultants, and prior experience with similar decommissioning and dismantlement projects. Although the exact volume of waste generated under the Proposed Action Alternative would be determined during decommissioning, based on these conservative estimates, hazardous and non-hazardous waste conditions or quantities would not be anticipated to exceed the management or disposal capacities of the involved personnel and facilities. The Proposed Action Alternative would result in minor, short- and long-term, less than significant impacts from the generation of non-radiological hazardous materials and waste and non-hazardous wastes.

3.10.3.4 Management and/or Mitigation Measures

To ensure that impacts from non-radioactive hazardous materials and waste and non-hazardous waste remain less-than-significant, USACE would generate, handle, manage, store, package, characterize, transport, and dispose of all waste generated during the Alternative in accordance with written procedures and requirements set forth in applicable management plans (e.g., the WMP and DP).

3.11 Geology, Topography, and Soils

This section discusses the following geomorphological resources on and near the SM-1 site that could be affected by the Proposed Action: terrestrial geology, topography, and soils on the SM-1 site, and bathymetry and sediments in Gunston Cove where the intake pier/pump house, concrete discharge pipe, and outfall structure would be removed.

3.11.1 Regulatory Setting

Regulations and guidance applicable to geology, topography, and soils resources are summarized in **Table 3.11-1**.

Table 3.11-1: Geomorphological Resources – Applicable Regulations and Guidance

Regulation	Description
Farmland Policy and Protection Act (7 USC 4201 et seq.)	Intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses.

3.11.2 Existing Conditions

3.11.2.1 Geology

Fort Belvoir spans the eastern part of the Piedmont Province and the upper part of the Coastal Plain Province (from west to east). The Fall Line, which runs north to south through Virginia, crossing Fairfax County at

approximately the I-95 corridor, forms the transition zone between the resistant, igneous and metamorphic rock of the Piedmont and the softer, sedimentary rocks of the Coastal Plain (Fort Belvoir, 2018a).

A finger of Piedmont Upland Province bedrock extends from north to south along Accotink Creek. Piedmont Upland bedrock outcrops form the bed and adjacent slopes of the creek. Most of the more gently sloping areas to the east and west of the creek consist of unconsolidated deposits from the Coastal Plain Province (USATHAMA, 1990 in US Army Garrison Fort Belvoir, 2015).

The southern and central portions of Fort Belvoir are situated on the Coastal Plain Physiographic Province, which comprises several geologic formations including the Potomac Formation, Bacons Castle Formation, Shirley Formation, and Alluvium and Pliocene sand and gravel. These formations are characterized by unconsolidated sand, silt, and clay underlain by residual soil and weathered crystalline rocks. The Potomac Group, which makes up the majority of the Coastal Plain Physiographic Province under Fort Belvoir, is characterized by lens-shaped deposits of interbedded sand, silt, clay, and gravel, primarily of non-marine origin (USATHAMA, 1990 in US Army Garrison Fort Belvoir, 2015).

3.11.2.2 Topography

The topography of Fort Belvoir's Main Post is characterized by uplands and plateaus, lowlands, and steeply sloped terrain (Fort Belvoir, 2015). Elevations range from sea level along the Potomac River to approximately 230 feet above mean sea level near the intersection of Beulah Street and Woodlawn Road on North Post. Uplands and plateaus comprise about 40 percent of Main Post. South Post and the Southwest Area include nearly level plateaus. Lowlands on Fort Belvoir are mostly associated with the floodplains of Accotink, Pohick, and Dogue creeks and the Potomac River. Additional lowland areas are present between the shoreline and the steeply sloped terrain that surrounds the plateaus of South Post and the Southwest Area. Lowland topography is gently sloped from about 10 percent along upland fringes to almost zero adjacent to active floodplains (Fort Belvoir, 2015).

The area within the perimeter fence of the SM-1 site is characterized by terrain that rises steeply from the Gunston Cove shoreline up to terraced areas in the north central part of the site (USACE, 2019b). These areas were created through grading at the time of construction to provide level building sites. Building 372 and adjacent graded areas of the site are approximately 30 to 40 feet above sea level (USGS, 2019).

3.11.2.3 Soils

Soils characterized as "urban land" by the US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) are the predominant soils on the SM-1 site and are present in much of the site's central and southern areas (USDA NRCS, 2019). The urban land soil unit consists of soils that have been disturbed by excavation, deposition, compaction, and other human activities to such a degree that identification of individual soil layers or parent material is not possible. Soils classified as Codorus and Hatboro soils, 0 to 2 percent slopes, occasionally flooded and Sassafras-Marumsco complex, 25 to 45 percent slopes comprise the remainder of soils on the SM-1 site and occur along the western, northern, and eastern edges.

None of the soils underlying the site are considered prime or unique farmland, or farmland of statewide importance. Soils underlying the SM-1 site are moderately susceptible to erosion and their suitability to supporting the development of roads and shallow excavations are very limited. The Hatboro component of the Codorus and Hatboro soil unit is considered hydric, which is consistent with its location in the northwestern corner of the site near the Gunston Cove shoreline.

Fort Belvoir DPW issues excavation permits prior to ground-disturbing activities occurring on the installation.

3.11.2.4 Bathymetry and Sediments

Gunston Cove is a relatively shallow tidal embayment of the Potomac River. Water depths range from approximately 3.3 feet in the northern portion to approximately 7.4 feet in the center (**Figure 3.3-1**). The mean tidal range is approximately 2.1 feet (Tide Forecast, 2019). A narrow small-boat navigation channel is maintained between the dock at Whitestone Point, approximately 0.25 mile southeast of the SM-1 intake pier, and the main Potomac River navigation channel.

Substrates in Gunston Cove consist of unconsolidated bottom that is silty or sandy in character. The composition of Gunston Cove bottomlands is likely influenced primarily by sediments in discharges from Accotink and Pohick Creeks, smaller unnamed tributaries draining South Post, the Southwest Area, and Mason Neck, and overland runoff.

3.11.3 Evaluation of Environmental Consequences

3.11.3.1 Approach to the Analysis

This section discusses impacts on geology, topography, and soils resources that would potentially result from the Alternatives. Impact significance thresholds for these resources are presented in **Table 3.11-2**.

Table 3.11-2: Geomorphological Resources Impact Significance Thresholds

Impact Significance Threshold	Type of Impact	Impact Significance Threshold Definition
Less than Significant Adverse Effect	Direct Impacts	The Alternative would penetrate underlying geologic strata; alter topography; and/or disturb soils or sediments. However, such effects would be temporary, would achieve positive drainage once the Alternative has ended (in the case of topography), would not result in the damage, loss, or destruction of unique, noteworthy, or pristine geomorphological features, and/or would not result in increased sedimentation of receiving water bodies.
	Indirect Impacts	The Alternative would create conditions independent of the Proposed Action that involve the penetration of underlying geologic strata; alteration of topography; and/or disturbance of soils or sediments. However, such effects would be temporary, would achieve positive drainage (in the case of topography), would not result in the damage, loss, or destruction of unique, noteworthy, or pristine geomorphological features, and/or would not result in increased sedimentation of receiving water bodies.
Potentially Significant Adverse Effect	Direct Impacts	The Alternative would result in the permanent damage, loss, or destruction of unique, noteworthy, or pristine geomorphological features; would increase sedimentation of receiving water bodies; and/or would not achieve positive drainage (in the case of topography).
	Indirect Impacts	The Alternative would create conditions independent of the Proposed Action that would result in the permanent damage, loss, or destruction of unique, noteworthy, or pristine geomorphological features; would increase sedimentation of receiving water bodies; and/or would not achieve positive drainage (in the case of topography).

3.11.3.2 No Action Alternative

Under the No Action Alternative, USACE would continue to maintain the Deactivated SM-1 Nuclear Reactor Facility in SAFSTOR condition as it currently is. Soils with levels of radioactivity exceeding applicable regulatory thresholds would not be removed from the site. While this would be an adverse impact, no human exposure would occur because the facility would remain vacant and the site would not be redeveloped or occupied by other uses.

Impacts from radiologically contaminated soils on the site under the No Action Alternative would be less than significant. There would be no other impacts on geomorphological resources on or in the vicinity of the SM-1 site under the No Action Alternative.

3.11.3.3 Proposed Action Alternative

3.11.3.3.1 Geology

None of the activities in the Proposed Action Alternative would involve the temporary or permanent alteration or penetration of geologic strata underlying the SM-1 site. Thus, the Proposed Action Alternative would have no impacts on geology.

3.11.3.3.2 Topography

Except for the removal of above-ground buildings, structures, and pavements, it is likely that deviations in topographic conditions on the site following completion of the Proposed Action Alternative would be small relative to existing conditions. The final site grading and topography has not yet been determined; however, the site would be regraded in accordance with a soil placement plan that would be developed by USACE and its decommissioning contractor and included in the project civil design plan (**Section 2.2.6**). Following site restoration, the site would be maintained by Fort Belvoir in a permeable, vegetated condition; this would not involve ongoing alterations to site topography.

For these reasons, the Proposed Action Alternative would have short-term, less than significant impacts and no long-term impacts on topography.

3.11.3.3.3 Soils

Throughout the implementation of the Proposed Action Alternative, it is anticipated that temporary soil disturbance would occur across the majority of the 3.6-acre SM-1 site. Soil disturbances would include initial grading and site preparation, excavations of subgrade infrastructure and facility components such as building foundations, pipes, and tanks; removal of soils containing low levels of residual radiation and/or other contaminants; removal of paving materials; and grading and compacting backfilled soils during the project's restoration phase. The decommissioning contractor would obtain an excavation permit from Fort Belvoir DPW prior to beginning ground-disturbing activities on the SM-1 site.

Assuming an average excavation depth of six feet, an estimated 34,848 yd³ of soils would be disturbed during the Proposed Action Alternative. Actual excavation depths would vary considerably at particular locations on the site during the implementation of the Proposed Action Alternative. For example, the VC in Building 372 extends 18 feet below grade, while some abandoned utility lines may be six feet or less in depth. It is estimated that 6,200 yd³ of impacted soils would be removed from the site and disposed of at permitted or licensed off-post facilities, requiring an equal or greater volume of fill soils to be applied to the site.

Because the Proposed Action Alternative would disturb more than one acre of soils, the decommissioning contractor would obtain coverage under the CGP and prepare a site-specific SWPPP, E&SC plan (subject to review by Fort Belvoir DPW and approval by VDEQ, and included in the project civil design plan), and SWMP in accordance

with the requirements of Fort Belvoir's MS4 permit. Adherence to these plans and the CGP would minimize the erosion of exposed soils and minimize concentrations of sediments and other pollutants in stormwater generated on the site.

Restoration activities would return the site to a maintained permeable, vegetated condition and no continued or ongoing soil disturbance would occur. As noted in **Section 2.2.6**, USACE and its decommissioning contractor would prepare and adhere to a site-specific plan for the placement of clean soils that would be included in the project civil design plan. This plan would specify potential sources of backfill and topsoil, soil segregation requirements, necessary amendments to ensure successful establishment and viability of vegetation, and depth of topsoil.

Therefore, the Proposed Action Alternative would have short-term, less than significant impacts and no long-term impacts on soils. In the long term, the removal and disposal of soils containing low levels of residual radiological contaminants (**Section 3.6.2**) would represent a beneficial impact.

3.11.3.3.4 Bathymetry and Sediments

In the short term, the removal of the intake pier, concrete discharge pipe, and outfall structure would temporarily disturb sediments in Gunston Cove in the vicinity of those structures. USACE and its contractors would minimize disturbance of subaqueous bottomlands during in-water activities to the extent practicable. Sediment disturbance would be limited to localized areas immediately around the structures to be removed. Containment booms and sediment curtains would be used during in-water and nearshore work to prevent the migration of disturbed sediment into the water column, minimize turbidity, and ensure disturbed sediments settle near their original location. Sediment plumes generated by the proposed removals would quickly settle back to the bottom and are not anticipated to extend beyond an estimated five-acre area of Gunston Cove adjacent to the pier, pump house, concrete discharge pipe, and outfall structure. The extent and intensity of sediment disturbance would vary during removal of the structures, ensuring that not all disturbances would occur simultaneously and further minimizing temporary impacts. Adherence to the SWPPP, E&SC plan, and SWMP requirements would minimize the deposition of sediments and pollutants in Gunston Cove from runoff generated on the site.

Once the proposed work is completed, subaqueous bottomlands in the vicinity of the structures to be removed would be allowed to naturally return to a pre-disturbance condition. No additional re-contouring of bottom substrates or placement of subsurface fill is included in the Proposed Action Alternative. Thus, the Proposed Action Alternative would have short-term, less than significant impacts and no long-term impacts on bathymetry and sediments.

3.11.3.4 Management and/or Mitigation Measures

The following minimization measures would be implemented during the Proposed Action Alternative to reduce impacts on geomorphological resources:

- The decommissioning contractor would obtain an excavation permit from Fort Belvoir DPW prior to beginning ground-disturbing activities on the SM-1 site.
- USACE and the decommissioning contractor would prepare and adhere to a site-specific plan (to be included in the project civil design plan) for the placement of clean soils that would specify potential sources of backfill and topsoil, soil segregation requirements, necessary amendments to ensure successful establishment and viability of vegetation, and depth of topsoil.
- The decommissioning contractor would obtain coverage under the CGP and adhere to the requirements of a site-specific SWPPP, E&SC plan (included in the project civil design plan following review by Fort Belvoir DPW and approval by VDEQ), and SWMP to minimize the erosion of exposed soils and

corresponding concentrations of sediments and pollutants in stormwater generated on the project site and discharged to receiving water bodies.

- Containment booms and sediment curtains would be used during in-water and nearshore work to prevent the migration of disturbed sediment into the water column, minimize turbidity, and ensure disturbed sediments settle near their original location.
- To minimize or prevent continued soil erosion and corresponding sedimentation of receiving water bodies, the SM-1 site would be restored to a permeable, vegetated condition in accordance with a site-specific plan that would specify potential sources of backfill and topsoil, soil segregation requirements, necessary amendments to ensure successful establishment and viability of vegetation, and depth of topsoil.

4 Cumulative Impacts

This section analyzes the potential cumulative effects of the Proposed Action in combination with other past, present, and reasonably foreseeable actions within the same ROI. A cumulative effects analysis determines if a proposed action would be likely to result in adverse impacts when combined with other projects in the study area.

4.1 Applicable Guidance

In accordance with 40 CFR Part 1508.7, and as detailed in CEQ guidance entitled *Considering Cumulative Effects Under the National Environmental Policy Act (1997)* and *Memorandum: Guidance on the Considerations of Past Actions in Cumulative Effects Analysis (24 June 2005)*, the Army must analyze the potential cumulative effects that may occur when considering a proposed action “when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.” Each of these actions has the potential to affect resources in the same time and space as a proposed action; as such, these potential combined effects need to be analyzed.

Cumulative effects may be accrued over time and/or in conjunction with other pre-existing effects from other activities in the ROI (40 CFR Part 1508.25). Therefore, previous impacts and multiple smaller impacts should also be considered. Overall, assessing cumulative effects involves defining the scope of the other actions and their interrelationship with a proposed action to determine if they overlap in space and time.

The NEPA, CEQ Regulations, and the Army NEPA Regulations require the analysis of cumulative environmental effects of a proposed action on resources that may often be manifested only at the cumulative level, such as traffic congestion, air quality, noise, biological resources, cultural resources, socioeconomic conditions, utility system capacities, and others. Cumulative effects can result from individually minor, but collectively significant, actions occurring at the same location, over time.

4.2 Region of Influence

The ROI for the cumulative analysis primarily encompasses the SM-1 site and immediate surrounding vicinity; specifically, past, present, and reasonably foreseeable future actions within Fort Belvoir’s South Post, as Proposed Action impacts would be localized and occur primarily from dismantlement activities. For certain resources, the cumulative effects analysis examines impacts that could occur in areas outside of South Post, such as the regional airshed for air quality effects, adjacent waterways for runoff effects, and major roadways for traffic congestion on or near the installation. The temporal scope spans the five-year timeline of the Proposed Action (2020 to 2025) to encompass all decommissioning activities (site preparation, material removal, dismantlement, remediation, waste disposal and transportation, and site restoration). By 2025, the site would be fully restored and available for unrestricted use.

4.3 Past, Present, and Reasonably Foreseeable Future Projects

The cumulative analysis identifies projects likely to have the potential for contributing to cumulative effects or the Proposed Action’s incremental impact when combined with the potential impact of a past, present, or future project. These projects occur within the ROI and may affect the same resources that would be affected by the Proposed Action.

All past, present, and reasonably foreseeable future projects considered in this cumulative analysis are Army actions. Projects were identified through Army consultation and review of the previously completed Fort Belvoir RPMP EIS (June 2015).

This section presents the past, present, and reasonably foreseeable future projects considered in the cumulative analysis and their anticipated impacts on resource areas analyzed in the EA. As past projects have been assessed in the environmental baseline and are already considered in the impact analysis (**Section 3**), this cumulative analysis focuses on present and reasonably foreseeable future projects. Past projects are only considered if their long-term and operational impacts would occur to similar resource areas at the same time as the Proposed Action, contributing to cumulative impacts. Accordingly, a total of 30 present and reasonably foreseeable future projects on Fort Belvoir are considered in this cumulative analysis. These locations of these projects are shown on **Figure 4.3-1**. They are briefly summarized in **Table 4.3-1**. While detailed timeframes for most of these projects are unknown, these projects are anticipated to occur within the next ten years (2030).

4.3.1 Impacts of Present and Reasonably Foreseeable Future Projects

This section discusses the anticipated impacts of present and reasonably foreseeable future projects on the resource areas analyzed in this EA. This cumulative analysis assumes that proponents of present and reasonably foreseeable future projects are responsible for adherence to federal, state, and local regulations, and would minimize project-specific impacts to the greatest extent practicable through implementation of mitigation and/or minimization measures as well as adherence to construction BMPs and safety standards.

4.3.1.1 Water Resources

Present and reasonably foreseeable future projects are anticipated to increase impervious surface area in the ROI. At least 16 acres of new impervious surface would be developed from the proposed projects. Increased impervious surface area would increase localized storm surge flooding and alter downstream water quality. Construction sites would also be sources of soil and sediment disturbance, causing runoff into nearby waterbodies. Developers, however, are expected to implement stormwater management controls to reduce erosion and sediment transport, as well as incorporate construction BMPs and low impact development measures to reduce the potential for long-term adverse impacts on areas downstream.

Construction of future projects would also result in short-term, minor adverse impacts on groundwater. For example, deep excavations for large-scale development projects would be likely to disrupt groundwater flow. With regard to wetland impacts, the US Route 1 Intersections project could potentially impact wetlands associated with tributaries to Accotink Creek, depending on the scope of the improvements, and the actual extent of wetlands that would be determined through field delineations. Project proponents are expected to obtain coverage under applicable permits issued by USACE in accordance with the CWA and would adhere to avoidance, minimization, and compensatory mitigation to ensure that impacts on Waters of the US (WOUS) would remain minor. None of the projects considered in this cumulative analysis would be located within the 100-year floodplain.

Figure 4.3-1: Cumulative Analysis Projects

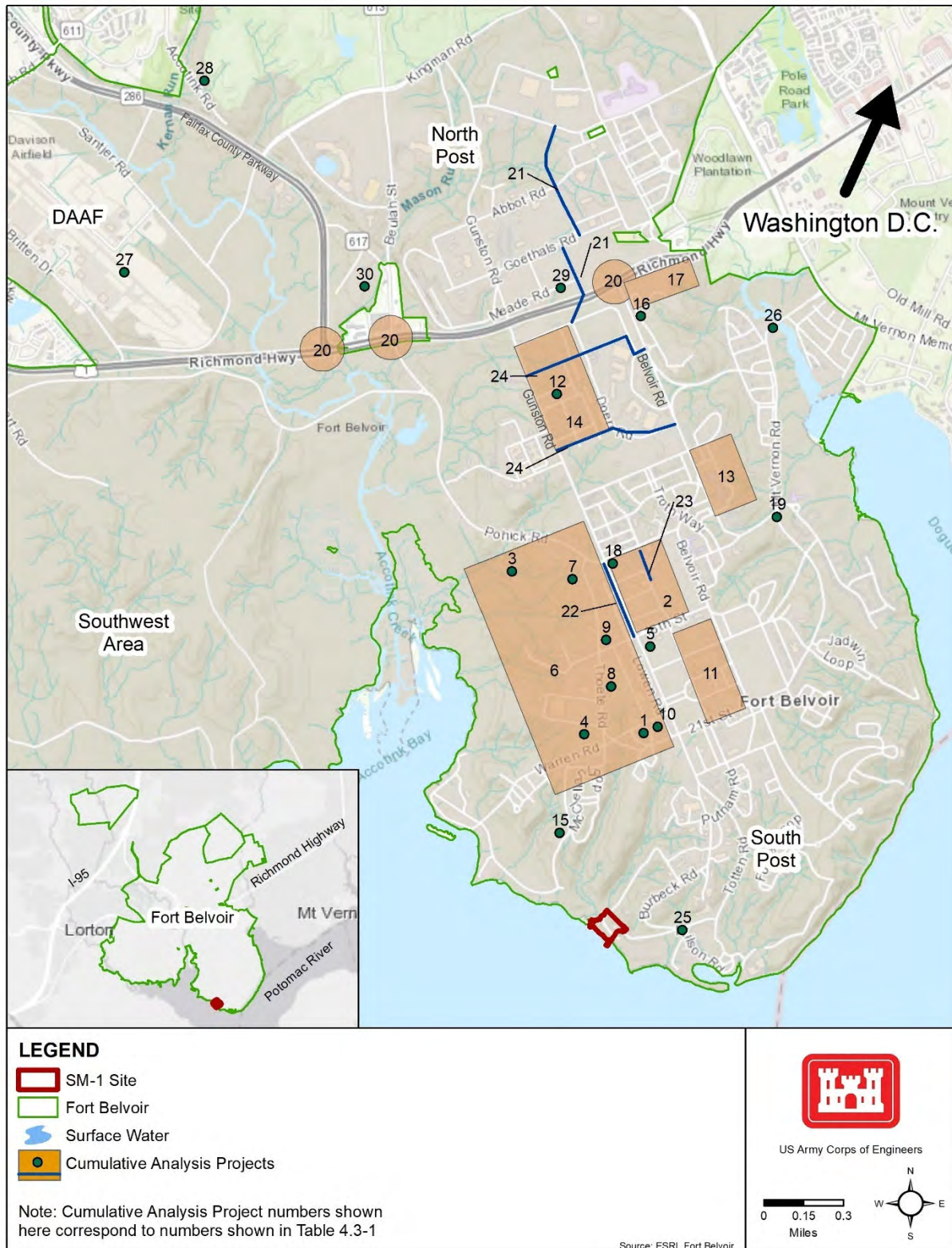


Table 4.3-1: Past, Present, and Reasonably Foreseeable Future Projects

Project No.	Name	Type	Status	Description
1	Pet Care Center	Commercial	Proposed	A 5,200-square-foot (sf) pet care center is planned near the intersection of 21st Street and Warren Road (on a disturbed triangle of land adjacent to Buildings 629 and 630). Associated site improvements include new sidewalks, service and access roads, a parking lot, exterior lighting, and stormwater management devices. This project would result in 0.2 acres of new impervious surface.
2	Town Center District	Commercial	Proposed	The Town Center District (a mixed-use district comprised of administrative, civic, retail and residential space) would be redeveloped to support higher density development and function as a community hub. The updated Town Center District would encompass 80,000 sf of space and decrease the amount of impervious surface in the area. Approximately 400 personnel would be employed following the completion of this project.
3	Regional Stormwater Management Facility	Industrial	Proposed	A regional stormwater management facility is planned on an approximately 2.9-acre site along the east side of Theote Road, north of 16th Street. The facility would provide stormwater detention/retention capacity for runoff from nearby existing and new facilities. Based on previously completed engineering and soils testing, remediation would be required before the site can be developed.
4	Retail Fuel Point	Industrial	Proposed	An unattended vehicle fueling station for military and other federal vehicles is planned near the intersection of Theote and Warren Roads. The proposed 2.78-acre site is currently wooded. Approximately 0.8 acres of new impervious surface would result from development of this project.
5	Vehicle Maintenance Shop	Industrial	Proposed	A new, general-purpose vehicle maintenance facility is planned for a site along the south side of 16th Street and east of Gunston Road. The facility would include drive-through maintenance bays, small arms maintenance areas, storage rooms, administrative space, and loading docks. The 25,565-sf facility would connect to existing utility systems serving South Post and require additional piping for potable water and a sanitary sewer line. The project would create pervious surfaces.

Table 4.3-1: Past, Present, and Reasonably Foreseeable Future Projects

Project No.	Name	Type	Status	Description
6	Industrial Area District	Industrial	Proposed	The Industrial Area District is located between the western post boundary and Gunston Road, south of Pohick Road and north of 21st Street. The district would be redeveloped as a more modern, functional, and efficient warehouse and storage district to create transition zones between heavy and light industrial uses and office and community support uses. The redeveloped area would comprise approximately 20,000 sf of space and up to 100 additional personnel would be employed after the site is redeveloped.
7	Outfall 15	Industrial	Proposed	Industrial Stormwater Outfall #0015 would be repaired and restored in order to properly discharge at a lower velocity. An updated conveyance and outfall structure would be installed to maintain or enhance watershed health, species recovery, and diversity.
8	249th Battalion HQ	Institutional	Under Construction	A new HQ complex is planned for the site of an existing recreational vehicle parking area near the intersection of Theote Road and 16th Street. Site preparations and improvements would include demolishing three buildings totaling 22,000 sf, extending utility connections, and constructing parking areas, access roads, sidewalks, site lighting, security fencing, and gates.
9	INSCOM Controlled Humidity Warehouse	Institutional	Proposed	The project, near the intersection of Theote Road and 16th Street, would provide a warehouse with a climate-controlled environment for Fort Belvoir tenants engaged in intelligence-gathering activities. The 57,116-sf facility would be built on a previously disturbed site that is primarily characterized by paved areas, small areas of maintained lawn, scattered shrubs and trees, and portions of Buildings 1144 and 1145.
10	Information Systems Facility for the Network Enterprise Center (NEC)	Institutional	Proposed	A new 75,000-sf data center is planned on a site along the north side of Warren Road and west of Gunston Road. The site is previously disturbed. Approximately 0.3 acres of impervious surface would result from this project.

Table 4.3-1: Past, Present, and Reasonably Foreseeable Future Projects

Project No.	Name	Type	Status	Description
11	Historic Core District	Institutional	Proposed	The Historic Core district is the oldest developed area on post and would be updated with new structured parking (between 16th and 18th Streets) and a new administrative building (south of 19th Street). The new facilities would total approximately 40,000 sf. Up to 300 additional personnel may be employed at the new administrative building.
12	Secure Administrative Facility	Institutional	Proposed	A 107,193-sf administrative facility is planned on a parcel east of Gunston Road, between 3rd and 5th Streets. The project consists of two separate sites, primarily comprising paved areas and office buildings. Approximately 0.35 acres of additional impervious surface would be created.
13	Administrative Campus District	Institutional	Proposed	An approximately 10-acre site in the Administrative Campus District would be redeveloped to create a high-density administrative campus. Up to 800 additional personnel may be employed on the site after construction has finished. The project would result in 1.8 acres of additional impervious surface.
14	1400 East District	Institutional	Proposed	The 1400 East District is an administrative center comprised of single and multi-tenant office buildings. Redevelopment efforts include demolition of existing buildings and parking lots, and construction of new office buildings with more parking structures. Approximately 1,330 additional personnel would work in this area.
15	Family Travel Camp Phase 2	Recreation	Proposed	A family travel camp is planned for a cleared, previously disturbed site along the west side of Morrow Road. The facility would include 15 pre-fabricated rustic cabins, a picnic shelter, and a campfire pit. Each cabin would have two bedrooms, a bathroom, kitchen space, and a living room, as well as water, sanitary sewer, electrical utilities, and vehicle parking.
16	Fisher House 2	Residential	Proposed	Fisher Houses provide free or low-cost lodging to veterans and military families receiving treatment at military medical centers. Fisher House 2 will be the second facility, built directly north of Fisher House 1. The house will be approximately 10,000 sf.

Table 4.3-1: Past, Present, and Reasonably Foreseeable Future Projects

Project No.	Name	Type	Status	Description
17	South Post Community Support District	Residential	Proposed	An approximately 12-acre site in the South Post Community Support District would be developed for medical-related and community support use. Up to 300 additional personnel would be employed in this area and approximately 3.5 acres of impervious surface would be created.
18	Transit Hub	Transportation	Proposed	A new transit transfer center would be constructed at either Pence Gate (to connect the Medical District to US Route 1) or at 12th Street and Gunston Road (to connect the Town Center to existing public transit services). The final location would be determined based on demand. Approximately 2.2 acres of impervious surface would be developed.
19	On-Post Intersection and Road Improvements	Transportation	Proposed	A variety of improvements will be implemented to reduce traffic impacts. Improvements may include new traffic signals, adjustments to existing traffic signal timing, and the addition of new entry turn lanes.
20	US Route 1 Intersections	Transportation	Proposed	Following the widening of Route 1, monitoring work would be conducted at intersections along US Route 1 at Fairfax County Parkway, Pohick Road, and Belvoir Road to determine needs for future improvements. Improvements may include adding turning lanes, extending existing lanes, or re-striping lanes.
21	US Route 1 Overpass	Transportation	Proposed	A new overpass would be constructed on US Route 1, in addition to a two-lane road connecting 1st Street and Gorgas Road. This addition would improve connections between North Post and South Post, as well as alleviate the traffic congestion concentrated on Gunston Road.
22	Gunston Road from 12th Street to 16th Street	Transportation	Proposed	Street expansion would occur for Gunston Road, from 12th Street to 16th Street. The roadway would be widened to four lanes.
23	13th Street Improvements	Transportation	Proposed	13th Street would be converted from one-way to two-way traffic and connect to 12th Street as part of the future Town Center redevelopment.

Table 4.3-1: Past, Present, and Reasonably Foreseeable Future Projects

Project No.	Name	Type	Status	Description
24	Internal Cross Streets	Transportation	Proposed	3rd Street and 6th Street would be extended to connect with north-south roads. These streets would be connected to Gunston Road on the west and Belvoir Road on the east to offer more routes for traffic. Approximately 1.7 acres of impervious surface will be created.
25	Road Repairs	Transportation	Proposed	Routine road repairs and maintenance (e.g., paving) to roads in the 300 Area are proposed to occur in FY2019.
26	Dogue Creek Bridge Renovation	Infrastructure	Proposed	The existing bridge superstructure crossing Dogue Creek, near Walker Gate, is proposed for renovation. A final EA has been prepared along with a draft FNSI.
27	Davison Army Airfield (DAAF) Area Development Plan (ADP)	Institutional	Proposed	The DAAF ADP proposes to upgrade and replace an aging, undersized, inadequate, and inefficiently laid out physical infrastructure to allow DAAF to fully support its tenants' ongoing missions and eliminate the temporary waivers under which the airfield is currently operating.
28	National Museum of the US Army (NMUSA)	Commercial	Under Construction	The NMUSA facility would include: the main museum building (3.6-acre multi-story building with exhibit halls, a theater, food and retail areas, and administrative spaces); an armored tank simulator on a 2,000-square foot pad; 1.3-acre memorial garden; 4-acre parade ground and grandstand; a 6,700-square foot amphitheater; a 3,000 feet long educational trail; and a 2,000-square-foot powder storage building. Roads, parking lots, and infrastructure improvements are also proposed for the NMUSA project.
29	Lieber Gate	Institutional	Under Construction	A new access control point, including a new gate and roadway connecting Richmond Highway to Gunston Road would provide direct access from Richmond Highway to North Post. The facility would replace the former Lieber Gate.

Table 4.3-1: Past, Present, and Reasonably Foreseeable Future Projects

Project No.	Name	Type	Status	Description
30	911th Engineering Complex	Institutional	Proposed	A new consolidated complex for the 911th Engineering Company is proposed. The 39,810-square foot building would comprise a tactical equipment maintenance facility, an administrative facility, an equipment and oil storage facility, vehicle parking, and a vehicle storage facility. The new complex would be built on an 8.5-acre site between the Fairfax County Parkway and Accotink Village. Approximately 110 added personnel are anticipated.

4.3.1.2 Air Quality

Construction of present and future projects would result in less than significant adverse impacts on air quality from the handling and transport of excavated materials that would generate direct and indirect criteria pollutant emissions, as would use of heavy-duty, diesel-powered trucks and equipment on site and traveling to and from the site. Construction activities would produce fugitive dust, while stationary equipment would generate HAP emissions. Anticipated emissions are generally typical of construction sites and would not exceed threshold levels. In the long term, commercial and industrial projects, such as the redeveloped Town Center District, NMUSA, and Vehicle Maintenance Shop, may generate emissions from building operations. Proposed road improvements may also contribute to an increase in anticipated emissions from changes in traffic patterns, although impacts would be minimized from the staggered and intermittent phasing of transportation projects as they would not all occur at the same time.

An increase in emissions during operation of present and reasonably foreseeable future projects is not expected to contribute to adverse effect on overall air quality in the regional airshed as VDEQ requires permits for stationary sources of air pollution, including major and minor sources. All projects must certify compliance with applicable requirements of VDEQ standards. Actions that require air permits would be in compliance with state air quality standards, while actions that do not require air permits would not contribute significantly to adverse air quality impacts. Project proponents would be responsible for complying with local and regional air quality standards.

4.3.1.3 Biological Resources

Present and reasonably foreseeable future projects in the ROI would disturb biological resources. Construction activities would require vegetation clearing and tree removal, resulting in loss of plant communities and vegetation resources. In areas of temporary disturbance (e.g., construction staging areas and access roads), trees and vegetation would be replaced after construction activities cease. Permanent removal of vegetation would adhere to the Fort Belvoir Tree Removal and Protection Policy, ensuring replacement of trees on the installation. The conversion of pervious to impervious surfaces for commercial development would also reduce the amount of shrubs, trees, and cover available to wildlife, as would clearing for site access and equipment staging. The majority of present and reasonably foreseeable future projects, however, take place on previously disturbed and/or already developed land.

Wildlife may be temporarily displaced by construction efforts, although the consequence would be negligible to species accustomed to changes in urban and suburban environments. To further minimize and avoid impacts, any disturbance toward sensitive species would require adherence to construction BMPs and permit conditions (e.g., seasonal restrictions and buffers).

4.3.1.4 Radiological

Present and reasonably foreseeable future projects would not produce, manage, or dispose of any radiological materials or wastes. Therefore, no adverse cumulative radiological impacts from potential contaminants, exposures, or accidents would occur.

4.3.1.5 Occupational Safety and Health

Potential adverse impacts of present and reasonably foreseeable future projects on health and safety would occur during construction. Construction activities can be sources of accidents and safety hazards, contributing to the potential for a physical injury or fatality or an exposure to a hazardous substance. In the long term, projects requiring operational maintenance, such as transportation projects requiring routine repairs, would pose an occupational risk to maintenance workers. With the adherence to standard construction BMPs, safety protocol,

and hazardous waste management plans, however, contractors would minimize any potential significant health and safety risks. Further, construction sites would be fenced and only accessible to contractors; thus, any risks to the safety of passers-by would be unlikely. Any injuries that occur from present and reasonably foreseeable future projects would not exceed the existing or future capabilities of nearby emergency services and health care centers.

4.3.1.6 Cultural Resources

Minor adverse impacts on cultural resources from ongoing and proposed projects would be anticipated from construction activities. Construction activities would potentially present visual impacts while producing residual dust, noise, and vibrations, which may affect the physical and acoustic environment of nearby historic properties during the construction periods. Construction activities, such as development of the new parking structure in the Historic Core District, could potentially present visual impacts while producing residual dust, noise, and vibrations, which may affect the physical and acoustic environment of nearby NRHP-eligible properties during the construction periods. Potential minor adverse impacts could also occur from development and excavation activities that could affect archaeological resources and unanticipated cultural discoveries. However, these activities would occur in already developed and disturbed areas and any potential historic impacts would cease once construction has ended. Potential minor adverse impacts could also occur from development and excavation activities that could affect archaeological resources and unanticipated cultural discoveries.

Per Section 106 requirements, consultation on any federal action is required to determine: (1) historic resources in the APE prior to approval; and (2) a resolution or avoidance of any potential adverse impacts. Therefore, activities that are required to comply with Section 106 would include a construction monitoring plan and other mitigation measures designed to avoid or minimize impacts on archaeological and historic resources. In addition, if impacts are unavoidable, recovery of the resources would occur prior to construction; coordination with the SHPO would be expected to mitigate adverse effects.

4.3.1.7 Transportation

Construction of planned and ongoing projects would have short-term adverse impacts on transportation and traffic in the ROI. There would be an increase in construction vehicles on the road that would add to existing traffic. Construction workforces commuting to and from construction sites would potentially cause traffic delays and interference with parking availability, as well as increase the risk for traffic-related accidents, particularly those projects requiring larger workforces such as the DAAF ADP and NMUSA projects. In addition, transportation improvements, such as Dogue Creek Bridge renovations and new roads developed as part of the NMUSA, would exacerbate congestion by requiring road closures and street realignments during widening, resurfacing, and repair efforts. As other project actions on Fort Belvoir would not occur at the same time, adverse impacts on transportation would be temporary and cease once construction efforts have ended.

Conversely, proposed transportation improvements would benefit traffic conditions in the long term by increasing roadway capacity and alleviating congestion. The Internal Cross Streets project would connect east-west roads to north-south roads in an effort to offer more routes for traffic, while the new US Route 1 Overpass would increase connectivity between North and South Posts and also minimize localized traffic concentrations. Similarly, the new Lieber Gate access control point would provide direct access from Richmond Highway to North Post. It is assumed that current and future capacity of the transportation network would be able to accommodate any increases in personnel. A variety of intersection and road improvements, such as new traffic signals, additional turn lanes, and wider roads, would improve circulation and road conditions in the ROI in the long term.

4.3.1.8 Non-Radioactive Hazardous Materials and Non-Hazardous Solid Waste

The primary adverse impact of present and reasonably foreseeable future projects on non-radioactive hazardous materials and waste include discharge, spills, and potential contamination during construction efforts, as well as encounters with unexpected hazardous materials. Any construction activities requiring ground intrusion would potentially cause subsurface disturbance of hazardous materials and contribute to the spread of contaminants (if present) into the environment, leading to runoff of contaminated soil and groundwater. Adverse impacts may also occur from the operation of several institutional and commercial projects that may generate hazardous waste (e.g., Retail Fuel Point and Vehicle Maintenance Shop). To minimize adverse impacts, it is expected that appropriate controls, as well as proper permitting and compliance, would be in place to prevent exposure and the spread of contamination; thus, short-term adverse impacts would be less-than-significant. In addition, any non-hazardous waste would be disposed of appropriately in available landfills.

4.3.1.9 Geomorphological Resources

Construction of ongoing and future projects would disturb soils, as installation of foundation piles would require extensive excavation and fill work. The process of excavating native soils for development typically results in a loss of soil structure and a mixing of horizons. While clean soils are often placed back into the excavated areas as fill, the mixing of the soils results in a long-term loss of productivity. Construction activities would also cause increased erosion and sediment runoff. Present and future projects are not anticipated to involve in-water work; thus, subaqueous bottomlands and sediment within Gunston Cove would not be affected. Site-specific E&SC plans would minimize impacts on soils. As construction would be temporary and mostly occur in previously disturbed areas, impacts from construction of present and reasonably foreseeable future projects would be minor. In the long term, there could be potential benefits from removal of contaminated soil. The Regional Stormwater Management Facility project would require remediation efforts prior to site development. Clean-up efforts from present and future projects would contribute toward cleaner and healthier soils in the ROI.

4.4 Assessment of Cumulative Impacts

The thresholds for significance of cumulative effects take into account the thresholds for significance of each resource area, as described throughout **Section 3**. Cumulative impacts are considered to be potentially significant if the Proposed Action's additional impact on the effects of past, present, and reasonably foreseeable future projects is substantial enough to measurably affect the resource area. The term "measurably" is defined as being noticeable or detectable to a reasonable person.

4.4.1 Cumulative Effects under the No Action Alternative

Under the No Action Alternative, decommissioning of the Deactivated SM-1 Nuclear Reactor Facility would not occur. SM-1 would remain in the current SAFSTOR condition for the foreseeable future. Overall site conditions would remain unchanged as no decommissioning or dismantlement activities would take place; therefore, the No Action Alternative would not result in any significant incremental effects. In conjunction with past, present, and reasonably foreseeable future projects, the No Action Alternative would result in no cumulative impacts.

4.4.2 Cumulative Effects under the Proposed Action Alternative

Based on the assessed potential incremental impacts of the Proposed Action Alternative (**Section 3**) and the anticipated effects of the present and reasonably foreseeable future activities considered in this cumulative analysis, there would be no significant adverse cumulative impacts from the Proposed Action Alternative. In general, both the Proposed Action Alternative and present and reasonably foreseeable future projects would result in similar less than significant adverse effects on all resource areas, with the exception of radiological

impacts. Minor overlapping impacts would occur primarily from construction and demolition activities, particularly affecting air quality from construction equipment use, traffic congestion from movement of construction workforces on and around Fort Belvoir, and stormwater runoff from ground disturbance; these impacts would be temporary and short-term. Potential adverse impacts would be minimized by adhering to federal, state, and local regulations; construction BMPs; permit conditions; and environmental monitoring and safety plans. When combined, the resulting cumulative impact would not be significant.

There would be no cumulative radiological impacts as the present and future projects are not anticipated to handle radiological materials, generate radiological waste, or emit radiological discharges. Thus, there would be no potential for radiological exposure or accidental release. The less-than-significant adverse radiological impacts of the Proposed Action Alternative when combined with no radiological impacts of present and future projects would result in no cumulative effect.

While the Proposed Action Alternative would result in a potentially adverse effect on cultural resources from the dismantlement and disturbance of historical properties, it would not result in potentially significant cumulative impacts when combined with present and reasonably foreseeable future projects. Decommissioning and dismantlement activities at SM-1 would have no potential to contribute to cumulative visual or acoustic impacts in the Historic Core District; cultural impacts from the Proposed Action Alternative would remain in portions of the 300 Area adjacent to or near the SM-1 site and would not interact with past, present, or reasonably foreseeable future projects. Anticipated effects of the present or future projects would not significantly affect cultural resources, especially with implementation of construction BMPs and minimization measures. In addition, the Proposed Action Alternative would minimize potentially significant effects on cultural resources to less-than-significant levels with adherence to federal and state regulations, in compliance with Section 106.

Once decommissioning and dismantlement is complete, the site would be restored to a vegetated, permeable condition. Fort Belvoir would then maintain and manage the site for the foreseeable future. Although the long-term future use of the site is not discernable, no long-term adverse cumulative impacts would be expected. Cumulative benefits to the transportation network in the ROI may result from roadway improvements and repairs. Overall, the Proposed Action Alternative would result in negligible or less-than-significant adverse cumulative impact, and minor beneficial impacts, when taken into consideration with the effects of other past, present, and future actions in the ROI.

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5 Conclusion

This EA has evaluated the potential environmental effects of USACE's proposed decommissioning and dismantlement of the Deactivated SM-1 Nuclear Reactor Facility. The Proposed Action includes site preparation; removal of facility components, on-site structures, and radiological and non-radiological materials; waste transport and disposal; site restoration, and termination of the facility's Decommissioning Permit. The Proposed Action Alternative was evaluated in addition to the No Action Alternative. Based on the analysis conducted in this EA, the Proposed Action would have no significant adverse impact, either individually or cumulatively, on the environment with adherence to mitigation and minimization measures. Implementation of minimization measures and construction BMPs would further reduce or avoid any other adverse impacts. Under Section 106 of the NHPA, the Proposed Action would have an *Adverse Effect* on the NRHP-eligible SM-1 Reactor Facility; however, USACE has developed a MOA in consultation with the SHPO, ACHP, and other participating Section 106 consulting parties that stipulates measures that USACE will implement to mitigate this adverse effect and ensure that it remains less than significant. Furthermore, the Proposed Action would comply with all federal and state regulations, guidelines, and agreements.

For these reasons, adverse impacts on resources analyzed in this EA would not meet the conditions requiring preparation of an EIS listed 32 CFR Part 651.41. The Army has determined that the Proposed Action is not an action normally requiring preparation of an EIS as defined at 32 CFR Part 651.42. A FNSI is the appropriate decision document for the Proposed Action.

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7 Distribution and Review of the Draft EA

The six-week Draft EA public review and comment period began on 20 December 2019 and ended on 31 January 2020.

7.1 Distribution of the Draft EA

Notification letters were sent to 102 agencies, individuals, and organizations announcing the availability of the Draft EA, Draft FNSI, and Draft FONPA for public review and comment. These recipients are listed in **Table A-1** in **Appendix A**. A representative copy of the notification letter is provided in **Appendix A**.

7.2 Public Notice

Consistent with NEPA and 32 CFR 989, which require public review of an EA before approval of the FNSI and implementation of the proposed action, a NOA was published in the following local newspapers and media outlets announcing the availability of the Draft EA, Draft FNSI, and Draft FONPA for public review:

- Washington Post (print and online) on 20 December 2019
- Mount Vernon Gazette (print and online) on 26 December 2019
- Fort Hunt Herald (online only) on 20 December 2019 through 31 January 2020

Copies of the NOA as it appeared in each publication are provided in **Appendix A**.

As indicated in the NOA, printed copies of the Draft EA, Draft FNSI, and Draft FONPA were made available for public review at the following local libraries:

- Fairfax County Public Library, Kingstowne Branch, 6500 Landsdowne Centre, Alexandria, VA 22315-5011
- Fairfax County Public Library, Lorton Branch, 9520 Richmond Highway, Lorton, VA, 22079-2124
- Fort Belvoir Library (on-post), 9800 Belvoir Rd, Bldg 200, Fort Belvoir, VA 22060

The NOA provided a point of contact to request a copy of the Draft EA, Draft FNSI, and Draft FOPA, and instructions on how to submit comments.

The six-week public comment period and availability of the Draft EA, Draft FNSI, and Draft FONPA for public review was also announced on USACE and Fort Belvoir social media accounts, and on the USACE project website.

7.3 Public Meetings

Three public meetings were held during the six-week Draft EA public comment period to provide members of the public with information about the Proposed Action and an opportunity to comment. Meeting details were announced in the NOA and the notification letters sent to the stakeholders listed in **Table 7.1-1**. The format for each meeting was the same: a one-hour open house/poster session followed by a formal presentation given by USACE staff and an audience question and answer session. Copies of the meeting posters and presentation are included in **Appendix A**.

At each meeting, USACE and contractor support staff were available during the open house/poster session and immediately following the presentation to informally discuss the project and answer questions from meeting attendees. A stenographer was present at each meeting to transcribe the presentation, audience questions and answers, and comments dictated by meeting attendees. Persons attending the meetings were also provided with the opportunity to submit written comments.

The locations, dates, and times of the public meetings are shown in **Table 7.3-1**.

Table 7.3-1: Draft EA Public Meeting Details

Date	Location	Time
8 January 2020	Fairfax South County Office, Room 221 8350 Richmond Highway Alexandria, VA 22309	6:30 PM – 8:30 PM
9 January 2020	Wood Theater (Bldg. 2120) 6050 Abbot Road Fort Belvoir, VA 22060	1:00 PM – 3:00 PM (afternoon meeting) 6:30 PM – 8:30 PM (evening meeting)

Due to Fort Belvoir security requirements, attendance at the on-post meetings held on 9 January 2020 was limited to those with access to the installation (e.g., DoD personnel, on-post residents, and Fort Belvoir civilian employees and contractors). The meeting held at the Fairfax South County Office on 8 January 2020 was open to the general public.

The meetings on Fort Belvoir were originally scheduled for 7 January 2020, as announced in the NOA and Draft EA notification letters. However, due to inclement weather on that date, the on-post meetings were rescheduled to 9 January 2020 at Fort Belvoir’s Wood Theater (**Table 7.3-1**). Stakeholders were notified by USACE of the date and venue change via an email sent the afternoon of 7 January 2020, and through postings on USACE social media accounts and project website. Publication of an updated NOA and mailing of updated notification letters announcing the rescheduled meetings was not possible due to the short turnaround time.

7.4 Comments on the Draft EA

Comments received on the Draft EA, and USACE’s response when applicable, are summarized in **Table 7.4-1**. Copies of the comments are provided in **Appendix A**. No comments requiring substantial revision of the EA, USACE’s Proposed Action, or the impact analysis were received during the Draft EA public comment period. Comments requiring minor revisions to the EA were addressed accordingly, as indicated in **Table 7.4-1**.

Table 7.4-1: Comments on the Draft EA

Comment No.	Commenter Name	Commenter Agency / Organization	Comment ¹	USACE Response
Public Comments²				
1	C. Tobias-Nahi	Private citizen	As homeowners adjacent to base we were never notified at purchase 10+ years ago. Will there be impacts on home values esp. if we plan to sell in the next years during the work? With children and pets would have been appreciative to know of any risk factors/considerations prior.	<p>USACE's ongoing public outreach efforts, including release of the Draft EA for public review and comment, are intended to inform on- and off-post residents of potential risks from the Proposed Action and how they will be prevented, mitigated, or minimized during the decommissioning process.</p> <p>The analysis of the Proposed Action's potential effects on property values is outside the scope of the EA. Any such analysis would be highly speculative and subject to influence from a variety of factors unrelated to the Proposed Action.</p> <p><i>No changes were made to the Final EA to address this comment.</i></p>
2	Lee Hamblin	Private citizen	<p>Was there any relationship between the operation of SM-1 and Building 7304 (Vault) and the presence of elevated tritium, Carbon-14, Cesium-137, Promethium-147, Americium-241, and Thorium-232 in the Vault? Was radiological waste from SM-1 stored in the Vault?</p> <p>SM-1 was referenced in Cabrerra's 2004 Building 7304 characterization survey report and I wonder why SM-1 was mentioned in the Cabrerra report.</p>	<p>Radioactive materials and waste associated with SM-1 were never stored at Building 7304. Building 7304 was a small, subsurface concrete storage vault located in the 300 Area near Building 363. The vault was formerly used by the US Army Soldier, Biological and Chemical Command (SBCCOM) under a license issued by the NRC (45-00953-01) to store radioactive waste generated at SBCCOM's research laboratory on Fort Belvoir. The Army prepared a decommissioning plan for Building 7304 in 2004. An EA prepared by NRC in 2005 determined that impacts associated with the decommissioning of Building 7304 were bounded by the impacts evaluated by the 1997 GEIS (NUREG-1496) (NRC, 1997) and that decommissioning would be in compliance with 10 CFR 20.1402, Radiological Criteria for Unrestricted Use (NRC, 2005). Subsequently, Building 7304 was demolished, radiologically contaminated debris were transported off Fort Belvoir for disposal at a licensed facility, and the site was remediated to meet the standards for unrestricted use.</p> <p><i>No changes were made to the Final EA to address this comment.</i></p>

Table 7.4-1: Comments on the Draft EA

Comment No.	Commenter Name	Commenter Agency / Organization	Comment ¹	USACE Response
Federal Agency Comments				
3	Barbara Rudnick, P.G.	USEPA Region III ³	[USEPA] encourage[s] [USACE] to continue working with SHPO and other consulting parties to finalize the MOA, take appropriate mitigative measures, and document this coordination prior to moving forward with the Proposed Action.	The status of Section 106 consultation between USACE, SHPO, ACHP, and other consulting parties has been updated in the Final EA. A copy of the MOA is included in Appendix B of the Final EA.
4	Barbara Rudnick, P.G.	USEPA Region III	It may be helpful to consider and present how the range of overlapping and potentially conflicting time of year restrictions for the site will be integrated into the plans and how activities may be phased to accommodate these restrictions.	The EA notes that USACE and its selected decommissioning contractor would continue to coordinate with Fort Belvoir DPW and applicable regulatory agencies to adhere to time of year restrictions and minimize adverse impacts on wildlife. USACE would maintain oversight throughout the entire decommissioning process. More specific measures are not prescribed in the EA in order to provide the selected contractor with maximum flexibility for implementing these and other aspects of the decommissioning process. <i>No changes were made to the Final EA to address this comment.</i>
5	Barbara Rudnick, P.G.	USEPA Region III	[USEPA] encourages [USACE] to explore ways to avoid potential impacts [on wetlands] prior to submitting a joint permit application. [USEPA] recommend[s] continued coordination with the USACE Regulatory Branch and applicable state regulatory agencies.	As noted in EA Section 3.3.3.3.3 , the selected decommissioning contractor would obtain authorization from applicable federal and state regulatory agencies to temporarily impact wetlands prior to conducting in-water work associated with the Proposed Action Alternative. As necessary, the decommissioning contractor would delineate wetlands that would be potentially disturbed, obtain a jurisdictional determination from USACE, and submit a joint permit application (JPA) identifying avoidance, minimization, and/or compensatory mitigation measures to receive applicable permit coverage. The selected decommissioning contractor would implement the prescribed measures accordingly during the Proposed Action. Adherence to applicable permitting requirements would minimize temporary impacts on wetlands to the extent practicable. Section 3.3.3.4 of the EA was revised to include examples of BMPs that could be used to prevent or minimize wetland

Table 7.4-1: Comments on the Draft EA

Comment No.	Commenter Name	Commenter Agency / Organization	Comment ¹	USACE Response
				impacts.
6	Barbara Rudnick, P.G.	USEPA Region III	Restoration via grading, soils management, or replanting may be needed to ensure that impacts are temporary; some vegetation management during and following construction may be needed to prevent the colonization or spread of invasive species. Best management practices to avoid the introduction and spread of invasive species in wetland areas should be evaluated.	As noted in EA Section 2.2.6 , the site would be restored to mimic existing topography and revegetated with native grasses and shrubs. EA Table ES-1 and Sections 2.2.6, 2.2.7, and 3.5.3.3.1 were revised to note that restored vegetation on the site would continue to be monitored by USACE and Fort Belvoir for 1 year following the completion of site restoration activities to ensure successful establishment and viability, and that vegetation on the site would be managed by Fort Belvoir in accordance with the installation's vegetation management policies following completion of the Proposed Action.
7	Barbara Rudnick, P.G.	USEPA Region III	[USEPA] recommend[s] that the potential spread of aquatic invasive species also be evaluated.	Table ES-1 and Section 3.5.3.3.1 of the EA were revised to note that measures to prevent or minimize impacts on SAV would be evaluated as project planning continues and implemented to the extent possible to prevent or minimize adverse impacts and the introduction or spread of aquatic invasive species.
8	Barbara Rudnick, P.G.	USEPA Region III	The EA would benefit from briefly addressing specific examples of the type of BMPs that would be employed [to minimize temporary noise impacts on water-dependent recreational users during the Proposed Action].	Table ES-1 and Section 3.3.3.4 of the EA were revised to provide examples of noise management measures/BMPs that could potentially be implemented during decommissioning activities to minimize temporary impacts on water-dependent recreational users. However, the EA will not excessively prescribe or advocate particular measures in order to provide the selected decommissioning contractor with flexibility in implementing such measures to address site-specific conditions.
9	Barbara Rudnick, P.G.	USEPA Region III	[USEPA] recommend[s] creating a specific plan for soil placement, including segregation, necessary amendments, and depth of topsoil. As part of this plan, potential sources of backfill and topsoil should be evaluated. [USEPA] suggest[s] the plan address the need for appropriate topsoil depth and amendments including organic matter to	The EA was revised to note that USACE would prepare a soil restoration plan in consultation with Fort Belvoir.

Table 7.4-1: Comments on the Draft EA

Comment No.	Commenter Name	Commenter Agency / Organization	Comment ¹	USACE Response
			assist tree transplant success, as some vegetation may require significant topsoil to survive. [USEPA] support[s] consideration of native species in the site restoration effort.	
State Agency Comments				
10	Arlene Fields Warren	Virginia Department of Health, Office of Drinking Water [VDH-ODW] ⁴	<p>VDH ODW has reviewed the above project. Below are our comments as they relate to proximity to public drinking water sources (groundwater wells, springs and surface water intakes). Potential impacts to public water distribution systems or sanitary sewage collection systems must be verified by the local utility.</p> <p>There are no public groundwater wells within a 1-mile radius of the project site.</p> <p>There are no surface water intakes located within a 5-mile radius of the project site.</p> <p>The project is not within the watershed of any public surface water intakes.</p> <p>There are no apparent impacts on public drinking water sources due to this project.</p> <p>No other comments were received.</p>	<p>These comments are noted. The Proposed Action would have no impacts on public water distribution systems or sanitary sewer collection systems, as none are located on the SM-1 site where subsurface excavation would occur.</p> <p><i>No changes were made to the Final EA to address this comment.</i></p>
11	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program ⁵	<p>Based on the review of the FCD and the comments submitted by agencies administering the enforceable policies of the Virginia CZM Program, DEQ⁵ concurs that the proposed project is consistent to the maximum extent practicable with the Virginia CZM Program provided all applicable permits and approvals are obtained as described. [Federal Consistency Concurrence]⁷</p>	<p>This comment is noted. USACE and/or its selected decommissioning contractor would obtain and adhere to the requirements of applicable federal and state permits and approvals prior to implementing the Proposed Action.</p> <p><i>No changes were made to the Final EA to address this comment.</i></p>
12	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	<p>DEQ recommends that the Corps consider the impacts of the proposed action on the advisory policies of the Virginia CZM Program. [Federal Consistency Concurrence]</p>	<p>This comment is noted. The Proposed Action would have no potential to affect coastal areas or waterfront development areas addressed by the Advisory Policies for Geographic Areas of Particular Concern, nor would it affect areas or</p>

Table 7.4-1: Comments on the Draft EA

Comment No.	Commenter Name	Commenter Agency / Organization	Comment ¹	USACE Response
				plans addressed by the Advisory Policies for Shorefront Access Planning and Protection. <i>No changes were made to the Final EA to address this comment.</i>
13	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	VMRC [Virginia Marine Resources Commission] states that should any changes to the planned work result in work performed in, or construction access through, tidal wetlands, a tidal wetlands permit will be required from the Fairfax County Wetlands Board. [1(b)]	This comment is noted. USACE would obtain and adhere to the requirements of a tidal wetlands permit from the Fairfax County Wetlands Board if determined applicable through continued project planning, coordination, and permitting processes. <i>No changes were made to the Final EA to address this comment.</i>
14	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	DEQ recommends that stream and wetland impacts be avoided to the maximum extent practicable. To minimize unavoidable impacts to wetlands and waterways, DEQ recommends the [practices listed in Section 1(c)]. [1(c)]	This comment is noted. As stated in Table ES-1 and Section 3.3.3.4 of the EA, USACE's selected decommissioning contractor would implement some or all of these measures, or similar measures, as applicable during the Proposed Action to minimize unavoidable impacts on wetland and waterways. <i>No changes were made to the Final EA to address this comment.</i>
15	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	Provided the appropriate permits or approvals are obtained if necessary and the requirements are met, the proposed project would be consistent to the maximum extent practicable with the wetlands management enforceable policy of the Virginia CZM Program. [1(d)]	This comment is noted. <i>No changes were made to the Final EA to address this comment.</i>
16	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	VMRC states that the proposed project is outside of its jurisdictional areas and will not require a permit from the agency. [2(b)]	This comment is noted. <i>No changes were made to the Final EA to address this comment.</i>
17	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	As proposed, the project would be consistent to the maximum extent practicable with the subaqueous lands management enforceable policy of the Virginia CZM Program. [2(c)]	This comment is noted. <i>No changes were made to the Final EA to address this comment.</i>

Table 7.4-1: Comments on the Draft EA

Comment No.	Commenter Name	Commenter Agency / Organization	Comment ¹	USACE Response
18	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	[The requirements listed in Items 3(c)(i) - 3(c)(iii) of the FCD concurrence letter] may be applicable to the proposed project. [3(c)]	<p>This comment is noted. As stated in Table ES-1 and Section 3.4.3.4 of the EA, USACE and its selected decommissioning contractor would adhere to these or similar requirements as applicable during implementation of the Proposed Action to prevent or minimize air quality impacts.</p> <p>No open burning would be conducted during the Proposed Action. Therefore, the requirements listed 3(c)(ii) do not apply to the Proposed Action.</p> <p><i>No changes were made to the Final EA to address this comment.</i></p>
19	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	Provided the project adheres to any applicable requirements, the project would be consistent to the maximum extent practicable with the air pollution control enforceable policy of the Virginia CZM Program. [3(d)]	<p>This comment is noted. As stated in Table ES-1 and Sections 3.3.3.3.3 and 3.3.3.4 of the EA, USACE would adhere to applicable requirements and measures to minimize RPA impacts and replant vegetation in the RPA.</p> <p><i>No changes were made to the Final EA to address this comment.</i></p>
20	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	Provided adherence to the above requirements [regarding replacement of disturbed RPA vegetation], the proposed activity would be consistent to the maximum extent practicable with the coastal lands management enforceable policy of the Virginia CZM Program. [4(d)]	<p>This comment is noted.</p> <p><i>No changes were made to the Final EA to address this comment.</i></p>
21	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	Provided the [requirements in Section 5(b)(i), <i>Erosion and Sediment Control and Stormwater Management Plans</i> and 5(b)(ii), <i>General Permit for Stormwater Discharges from Construction Activities</i> (VAR10)] are satisfied, the project would be consistent to the maximum extent practicable with the nonpoint pollution control enforceable policy of the Virginia CZM Program. [5(c)]	<p>As stated in Section 3.11.3.3.3 of the EA and under "Non-point Source Pollution Control" in the FCD, USACE's selected decommissioning contractor would obtain coverage under the CGP and prepare a site-specific stormwater pollution prevention plan, erosion and sediment control plan, and stormwater management plan.</p> <p>Generally, the Proposed Action would be implemented in a manner that would prevent or minimize the runoff of pollutants and sediments to receiving water bodies to the extent possible and in accordance with applicable regulatory requirements.</p>

Table 7.4-1: Comments on the Draft EA

Comment No.	Commenter Name	Commenter Agency / Organization	Comment ¹	USACE Response
				<i>No changes were made to the Final EA to address this comment.</i>
22	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	Evaluate the [petroleum releases identified in Section 6(b)] to determine their ability to affect the project site. [6(c)]	As applicable, USACE would address/evaluate these sites in coordination with the Fort Belvoir DPW as planning for the Proposed Action continues. <i>No changes were made to the Final EA to address this comment.</i>
23	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	DEQ encourages all projects to implement pollution prevention principles, including [6(c)-6(d)] ² : - the reduction, reuse and recycling of all solid wastes generated; and - the minimization and proper handling of generated hazardous wastes.	As stated in Section 3.10.3.3 of the EA, USACE intends to incorporate these and/or similar measures in the Proposed Action as project planning continues. <i>No changes were made to the Final EA to address this comment.</i>
24	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	- Test and dispose of any soil/sediment that is suspected of contamination (including petroleum contamination) or wastes that are generated during construction-related activities in accordance with applicable federal, state, and local laws and regulations. - All structures being demolished or removed should be checked for asbestos-containing materials (ACM) and lead-based paint (LBP) prior to demolition. If ACM and LBP are found, in addition to the federal waste-related regulations mentioned above, state regulations 9VAC20-81-640 for ACM and 9VAC20-60-261 for LBP must be followed.	Preliminary testing for ACM and LBP has been conducted in buildings on the SM-1 site and additional testing of suspected ACM and LBP prior to demolition activities is planned. USACE would identify and dispose of all hazardous wastes, including contaminated soils, construction-related wastes, and ACM and LBP, in accordance with applicable regulatory requirements. As stated in the EA, the SM-1 site would be restored to ensure concentrations of pollutants are below applicable regulatory thresholds and meet the requirements for unrestricted future use following the proposed dismantlement of SM-1. <i>No changes were made to the Final EA to address this comment.</i>
25	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	DCR [Virginia Department of Conservation and Recreation] does not anticipate that this project will adversely impact...natural heritage resources. [7(b)]	This comment is noted. <i>No changes were made to the Final EA to address this comment.</i>

Table 7.4-1: Comments on the Draft EA

Comment No.	Commenter Name	Commenter Agency / Organization	Comment ¹	USACE Response
26	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	DCR states that the proposed project will not affect any documented state-listed plants or insects. [7(c)]	This comment is noted. <i>No changes were made to the Final EA to address this comment.</i>
27	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	Contact the DCR DNH [Division of Natural Heritage] and re-submit project information and a map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized. [7(e)]	This comment is noted. USACE anticipates that the Proposed Action will not change substantially from what is described in the Draft EA. <i>No changes were made to the Final EA to address this comment.</i>
28	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	DCR recommends that Fort Belvoir contact the local floodplain administrator and comply with the community's local floodplain ordinance. [8(c)]	Fairfax County was notified of the availability of the Draft EA for review and comment during the six-week public comment period that ran from 20 December 2019 - 31 January 2020. No comments regarding elements of the Proposed Action that would occur in the 100-year floodplain were received from Fairfax County during the Draft EA public review period. As stated in Table ES-1 and Section 3.3.3.3.5 of the EA, the removal of structures associated with SM-1 from the 100-year floodplain would ultimately have a beneficial effect by allowing these areas of the floodplain to return to a pre-disturbance condition. USACE will add Dipmani Kumar, PhD, PE, CFM, Fairfax County Floodplain Administrator, to the SM-1 distribution / notification list. <i>No changes were made to the Final EA to address this comment.</i>
29	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	Projects conducted by federal agencies within the SFHA [Special Flood Hazard Area] must comply with Executive Order 11988: <i>Floodplain Management</i> . [8(d)]	As stated in the EA, USACE prepared a Finding of No Practicable Alternative (FONPA) in accordance with EO 11988 to explain its decision to implement elements of the Proposed Action in the 100-year floodplain. The Draft FONPA was made available for public review and comment concurrently with the Draft EA. As stated in the EA and FONPA, the removal of structures in the 100-year floodplain

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Comment No.	Commenter Name	Commenter Agency / Organization	Comment ¹	USACE Response
				would have a beneficial effect by allowing these areas of the floodplain to return to a pre-disturbance condition. <i>No changes were made to the Final EA to address this comment.</i>
30	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	Continued coordination with DHR on this undertaking pursuant to Section 106 of the National Historic Preservation Act, as amended, and its implementing regulation 36 CFR Part 800 is required. [10(b)]	USACE consultation with DHR under Section 106 with respect to the Proposed Action is ongoing. <i>No changes were made to the Final EA to address this comment.</i>
31	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	[When] pesticides or herbicides must be used, their use should be strictly in accordance with manufacturers' recommendations. In addition, we recommend that the [applicant] use the least toxic pesticides or herbicides effective in controlling the target species to the extent feasible. [11.]	In the event that pesticides or herbicides are used during the Proposed Action, they would be applied by licensed contractors in accordance with applicable label directs and regulatory requirements. <i>No changes were made to the Final EA to address this comment.</i>
32	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	Architectural and engineering designers should consider incorporating the energy, environmental, and sustainability concepts listed in the Leadership in Energy and Environmental Design (LEED) Green Building Rating System into the development and procurement of their projects. [12.]	This comment is not applicable to the Proposed Action, as it does not involve the construction of new, permanent facilities. <i>No changes were made to the Final EA to address this comment.</i>
33	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	[The following pollution prevention recommendations] may be helpful in constructing or operating this facility [13(a)] : <ul style="list-style-type: none"> - Consider development of an effective Environmental Management System (EMS). - Consider environmental attributes when purchasing materials. - Consider contractors' commitment to the environment when choosing contractors. - Choose sustainable materials and practices for building construction and design. 	USACE has or will incorporate these or similar measures in the Proposed Action as applicable as project planning continues. <i>No changes were made to the Final EA to address this comment.</i>

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Comment No.	Commenter Name	Commenter Agency / Organization	Comment ¹	USACE Response
34	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	DGIF has the following recommendations [14(c)]: - To best protect anadromous fishes from harm associated with instream work, ensure that such work adhere to a time-of-year restriction from February 15 through June 30 of any year.	Table ES-1 and Section 3.5.3.4 were revised to note that USACE would adhere to a time of year restriction between 15 February and 30 June to the extent practicable to prevent or minimize impacts on anadromous fish. Proposed in-water work to remove structures associated with SM-1 would be brief relative to the Proposed Action's 5-year implementation period and, in the context of Gunston Cove, would affect a relatively small area potentially providing habitat for anadromous fish. It is anticipated that the Proposed Action would have no or negligible effects on such species.
35	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	- Conduct any in-stream activities during low or no-flow conditions, using non-erodible cofferdams or turbidity curtains to isolate the construction area, blocking no more than 50% of the streamflow at any given time, stockpiling excavated material in a manner that prevents reentry into the stream, restoring original streambed and streambank contours, revegetating barren areas with native vegetation, and implementing strict erosion and sediment control measures.	As stated in Table ES-1 and Section 3.3.3.4 of the EA, turbidity curtains and/or similar measures would be used during in-water work to contain disturbed sediments and ensure they settle near their original location. Terrestrial areas would be recontoured to mimic current topography and planted with native vegetation. In-water areas would be allowed to naturally return to a pre-disturbance condition. <i>No changes were made to the Final EA to address this comment.</i>
36	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	- To minimize potential wildlife entanglements resulting from use of synthetic/plastic erosion and sediment control matting, use matting made from natural/organic materials such as coir fiber, jute, and/or burlap.	USACE will consider this recommendation as planning of the Proposed Action continues. <i>No changes were made to the Final EA to address this comment.</i>
37	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	- To minimize harm to the aquatic environment and its residents resulting from use of the Tremie method to install concrete, installation of grout bags, and traditional pouring of concrete, ensure that such activities occur only in the dry, allowing all concrete to harden and cure prior to contact with open water.	This comment is not applicable to the Proposed Action. No permanent in-water structures would be constructed under the Proposed Action. <i>No changes were made to the Final EA to address this comment.</i>

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Comment No.	Commenter Name	Commenter Agency / Organization	Comment ¹	USACE Response
38	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	<p>- Due to future maintenance costs associated with culverts, and the loss of riparian and aquatic habitat, construct stream crossings via clear-span bridges. However, if this is not possible, countersink any culverts below the streambed at least 6 inches, or the use of bottomless culverts, to allow passage of aquatic organisms.</p> <p>- Install floodplain culverts to carry bankfull discharges.</p>	<p>These comments are not applicable to the Proposed Action. No new stream crossings or culverts would be built under the Proposed Action.</p> <p><i>No changes were made to the Final EA to address this comment.</i></p>
39	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	VMRC recommends that erosion and run-off controls be in place to prevent impacts to marine fisheries.	<p>As stated in Table ES-1 and Section 3.11.3.4 of the EA, erosion and sediment controls would be implemented during the Proposed Action as applicable.</p> <p><i>No changes were made to the Final EA to address this comment.</i></p>
40	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	Assuming adherence to erosion and sediment controls during instream work and land disturbances, and placement of waste in appropriate receptacles, the project would be consistent with the fisheries management enforceable policy of the Virginia CZM Program. [14(d)]	<p>This comment is noted.</p> <p><i>No changes were made to the Final EA to address this comment.</i></p>
41	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	(1) ⁸ The project must adhere to the requirements of any DEQ permit or authorization issued pursuant to Virginia Code § 62.1-44.15:20 et seq. and 9VAC25-210 et seq. and a tidal wetlands permit if issued from the Fairfax County Wetlands Board pursuant to Virginia Code §28.2-1301 through 28.2-1320 for consistency with the wetlands management enforceable policy. A VWP Permit or approval may be required.	<p>As stated in Table ES-1 and Section 3.3.3.3.3 of the EA, USACE would obtain all applicable permits and approvals, including permits to impact wetlands, prior to implementing the Proposed Action.</p> <p><i>No changes were made to the Final EA to address this comment.</i></p>
42	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities	<p>(2) The following sections of Virginia Administrative Code may be applicable:</p> <p>- fugitive dust and emissions control (9VAC5-50-60</p>	As discussed in Section 3.4 of the EA, these and/or similar measures would be used during the Proposed Action to prevent or minimize potential air quality impacts. No open

Table 7.4-1: Comments on the Draft EA

Comment No.	Commenter Name	Commenter Agency / Organization	Comment ¹	USACE Response
		Program	et seq.); - permits for fuel-burning equipment (9VAC5-80-110 et seq.); and - open burning restrictions (9VAC5-130 et seq.).	burning would be conducted during the Proposed Action. <i>No changes were made to the Final EA to address this comment.</i>
43	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	(3) The project must be conducted in a manner that is consistent with the coastal lands management enforceable policy of the Virginia CZM Program as administered by DEQ pursuant to the Chesapeake Bay Preservation Act (Virginia Code 62.1-44.15 et seq.) and the Chesapeake Bay Preservation Area Designation and Management Regulations (9VAC25-830 et. seq.).	As stated in the FCD (Appendix D), the Proposed Action would be consistent to the maximum extent practicable with this enforceable policy. <i>No changes were made to the Final EA to address this comment.</i>
44	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	(4) This project must comply with Virginia's Erosion and Sediment Control Law (Virginia Code § 62.1-44.15:61) and Regulations (9VAC25-840-30 et seq.) and Stormwater Management Law (Virginia Code § 62.1-44.15:31) and Regulations (9VAC25-870-210 et seq.) as administered by DEQ.	As stated in Section 3.11.3.4 of the EA, the selected decommissioning contractor would obtain coverage under the CGP and adhere to the requirements of a site-specific SWPPP, E&SC plan (included in the project civil design plan following review by Fort Belvoir DPW and VDEQ approval), and SWMP to minimize the erosion of exposed soils and corresponding sedimentation and pollution of receiving water bodies. <i>No changes were made to the Final EA to address this comment.</i>
45	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	(5) The operator or owner of a construction activity involving land disturbance of equal to or greater than 1 acre is required to register for coverage under the General Permit for Discharges of Stormwater from Construction Activities and develop a project specific stormwater pollution prevention plan (SWPPP).	
46	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	(6) All solid waste, hazardous waste and hazardous materials must be managed in accordance with all applicable federal, state and local environmental regulations.	As discussed in Sections 3.6 and 3.10 of the EA, all radiological and non-radiological waste, including non-hazardous solid waste and asbestos, lead-based paint, and other hazardous substances, would be handled, removed, packaged, transported, and disposed of in accordance with all applicable federal, state, and local regulatory requirements. <i>No changes were made to the Final EA to address this</i>
			(6a) It is the responsibility of the owner or operator of a renovation or demolition activity, prior to the commencement of the renovation or demolition, to thoroughly inspect the affected part	

Table 7.4-1: Comments on the Draft EA

Comment No.	Commenter Name	Commenter Agency / Organization	Comment ¹	USACE Response
			<p>of the facility where the operation will occur for the presence of asbestos, including Category I and Category II nonfriable asbestos-containing material (as applicable). Upon classification as friable or non-friable, all asbestos-containing material shall be disposed of in accordance with the Virginia Solid Waste Management Regulations (9VAC20-81-640) and transported in accordance with the Virginia regulations governing Transportation of Hazardous Materials (9VAC20-110-10 et seq.).</p> <p>(6b) If applicable, this project must comply with the U.S. Department of Labor Occupational Safety and Health Administration (OSHA) regulations and with the Virginia Lead-Based Paint Activities Rules and Regulations.</p>	<i>comment.</i>
47	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	(7) Contact the DCR DNH (804-371-2708) to re-submit project information and a map for an update on natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.	<p>This comment is noted. The scope of the Proposed Action is not anticipated to change substantially from what is described in the Draft EA.</p> <p>No changes were made to the Final EA to address this comment.</p>
48	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	(8) Contact the local floodplain administrator for an official floodplain determination to comply with the community's local floodplain ordinance.	<p>USACE will add the Fairfax County Floodplain Administrator to the SM-1 distribution / notification list.</p> <p><i>No changes were made to the Final EA to address this comment.</i></p>
49	Bettina Rayfield	VDEQ, Environmental Impact Review and Long Range Priorities Program	(9) Continue to coordinate with DHR (Marc Holma at 804-482-6090 or marc.holma@dhr.virginia.gov) on this undertaking pursuant to Section 106 of the National Historic Preservation Act, as amended, and its implementing regulation 36 CFR Part 800.	<p>USACE consultation with DHR under Section 106 with respect to the Proposed Action is ongoing.</p> <p><i>No changes were made to the Final EA to address this comment.</i></p>
Local Government Comments				
50	Leanna O'Donnell	Fairfax County Department of Planning and	Fairfax County supports the proposed decommissioning and removal of the facility in order to allow the site to be restored to a more	<p>This comment is noted.</p> <p><i>No changes were made to the Final EA to address this</i></p>

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Comment No.	Commenter Name	Commenter Agency / Organization	Comment ¹	USACE Response
		Development	natural state.	<i>comment.</i>
51	Leanna O'Donnell	Fairfax County Department of Planning and Development	County staff appreciates the efforts to remove the contamination and recommends that all stakeholder agencies be kept aware of the decommissioning process, as it proceeds.	USACE will continue to update and inform project stakeholders, including Fairfax County, throughout the decommissioning process. Information will continue to be distributed through official mailings, printed and electronic material, and posts to relevant USACE and DoD social media accounts, as applicable. <i>No changes were made to the Final EA to address this comment.</i>
52	Leanna O'Donnell	Fairfax County Department of Planning and Development	Staff concurs with this remediation proposal [regarding application of a loamy top soil seeded with native grasses and shrubs, and adherence to Fort Belvoir Policy Memorandum #27, <i>Tree Removal and Protection</i> and RPA revegetation requirements specified in VDCR's <i>Riparian Buffers Modification and Mitigation Guidance Manual</i>].	This comment is noted. <i>No changes were made to the Final EA to address this comment.</i>
53	Leanna O'Donnell	Fairfax County Department of Planning and Development	Given the adjacency of the site to Gunston Cove, the presence of steep slopes, the required removal of nearly all surface soils and site vegetation, and the anticipated exposure of subsoils for an extended period to accommodate the required sampling for radioactive contamination, county staff recommends that a robust erosion and sediment control plan and replanting plan be developed and incorporated throughout all phases of the decommissioning process.	As noted in EA Section 3.3.3.3.4 , the selected decommissioning contractor would obtain coverage under the CGP, which requires preparation and adherence to a site-specific SWPPP, E&SC plan (included in the project civil design plan following Fort Belvoir DPW review and approval by VDEQ), and SWMP to minimize the erosion of exposed soils and corresponding sedimentation and pollution of receiving water bodies. Table ES-1 and Sections 2.2.6 and 3.5.3.3.1 of the EA were updated to note that a replanting plan would be prepared to guide site restoration activities.
54	Leanna O'Donnell	Fairfax County Department of Planning and Development	Staff recommends that the project staff consult and coordinate with the Northern Virginia Soil and Water Conservation District [SWCD] and the [Fairfax County] Department of Public Works and Environmental Services [DPW-ES] regarding mitigation procedures.	Fort Belvoir DPW and VDEQ will be USACE's primary points of contact regarding the preparation and implementation of applicable E&SC and construction stormwater management plans (the E&SC plan will be included in the project civil design plan following Fort Belvoir DPW review and approval by VDEQ). However, USACE will add the Northern Virginia SWCD and Fairfax County DPW-ES to its project stakeholder

Table 7.4-1: Comments on the Draft EA

Comment No.	Commenter Name	Commenter Agency / Organization	Comment ¹	USACE Response
				<p>distribution list; their continued comments and input on the project are invited and encouraged.</p> <p><i>No changes were made to the Final EA to address this comment.</i></p>
55	Leanna O'Donnell	Fairfax County Department of Planning and Development	Staff recommends that any mitigation plan consider the following [additional detail provided in letter dated 31 Jan. 2020; see Appendix A]: Erosion Control; Steep Slopes; Compaction; Soil Horizons; Replanting; Deer Protection; Invasive Species Control.	<p>Specific measures for erosion and sediment control, construction stormwater management, and revegetation of the SM-1 site will be incorporated in site-specific plans that will be developed by the selected decommissioning contractor with USACE oversight and Fort Belvoir DPW review/concurrence. Specific measures are not prescribed in the EA to provide the decommissioning contractor with maximum flexibility in developing such measures that respond to site-specific conditions.</p> <p><i>No changes were made to the Final EA to address this comment.</i></p>
56	Leanna O'Donnell	Fairfax County Department of Planning and Development	Staff recommends that USACE schedule a briefing before the Fairfax County Wetlands Board regarding any proposed actions affecting tidal wetlands, freshwater wetlands, and floodplains, to include project impacts and remediation measures.	<p>USACE will consider this recommendation and will contact the Fairfax County Wetlands Board to schedule a briefing if and when it is determined appropriate and necessary.</p> <p>Alternately, the Fairfax County Wetlands Board will be provided with the opportunity to review and comment on the Proposed Action during the JPA process. USACE would appear before the Board at the appropriate time during that process, as necessary.</p> <p><i>No changes were made to the Final EA to address this comment.</i></p>
57	Leanna O'Donnell	Fairfax County Department of Planning and Development	Staff recommends that decommissioning activities be coordinated with the Potomac Environmental Research and Education Center [PEREC] of George Mason University, to ensure that decommissioning activities do not conflict with research activities.	<p>USACE has informed PEREC of the Proposed Action and invited its participation in the project's NEPA and public outreach components.</p> <p><i>No changes were made to the Final EA to address this comment.</i></p>
58	Leanna O'Donnell	Fairfax County Department of Planning and	Staff encourages coordination with appropriate agencies and implementation of management or protection measures to minimize adverse impacts	<p>As noted in EA Section 3.5.3.3.2, active osprey nests on the SM-1 site would be relocated in accordance with the requirements of VDGIF's <i>Removal or Relocation of Osprey</i></p>

Table 7.4-1: Comments on the Draft EA

Comment No.	Commenter Name	Commenter Agency / Organization	Comment ¹	USACE Response
		Development	[on nesting ospreys]. In order to mitigate the impacts to osprey nests, staff recommends that Fort Belvoir staff consider the construction of alternative osprey nesting platforms in the vicinity of the existing nests and the relocation of those nests to the new platforms.	<i>Nests in Virginia: A Guideline for Landowners</i> and Fort Belvoir's Policy Memorandum #78, <i>Conservation of Migratory Birds</i> . Coordination with appropriate agencies and implementation of management or protection measures would minimize adverse impacts on nesting ospreys and ensure they remain less-than-significant. <i>No changes were made to the Final EA to address this comment.</i>
59	Leanna O'Donnell	Fairfax County Department of Planning and Development	Fairfax County Park Authority staff concurs with the Virginia Department of Historic Resources (VDHR) that site 44FX1331 is not significant or eligible for inclusion on the NRHP [see attachment to letter dated 31 January 2020 in Appendix A].	This comment is noted. <i>No changes were made to the EA to address this comment.</i>
60	Leanna O'Donnell	Fairfax County Department of Planning and Development	Fairfax County concurs with the [Section 106 mitigation] measures outlined [in letter dated 31 January 2020; see Appendix A] and looks forward to continuing Section 106 Consultation and finalizing the MOA.	This comment is noted. USACE will continue to consult with Fairfax County during development and review of the Section 106 MOA. <i>No changes were made to the Final EA to address this comment.</i>
61	Leanna O'Donnell	Fairfax County Department of Planning and Development	County staff appreciates the consideration of air quality and concurs with the proposed [minimization] measures to reduce adverse impacts.	This comment is noted. <i>No changes were made to the EA to address this comment.</i>
62	Leanna O'Donnell	Fairfax County Department of Planning and Development	County staff agrees with the finding that the transportation impacts would be less than significant. Staff requests that Fort Belvoir include the Virginia Department of Transportation, the Fairfax County Department of Transportation, and the Fairfax County Fire and Rescue Department when notifying local agencies about the movement of materials and the intended transportation routes.	USACE will add these organizations to the project stakeholder distribution list and will conduct targeted outreach during project transportation planning and/or prior to heavy hauling activities associated with the decommissioning. <i>No changes were made to the Final EA to address this comment.</i>

Notes:

1. Some comments presented in this table have been edited for clarity, grammar, and/or punctuation.

Table 7.4-1: Comments on the Draft EA

Comment No.	Commenter Name	Commenter Agency / Organization	Comment ¹	USACE Response
2.			Unedited copies of public comments received on the Draft EA are provided in Appendix A .	
3.			An unedited copy of comments on the Draft EA from USEPA Region III is provided in Appendix A .	
4.			An unedited copy of comments on the Draft EA from VDH-ODW is provided in Appendix A .	
5.			An unedited copy of comments from VDEQ on the Federal Consistency Determination and Draft EA is provided in Appendix D .	
6.			As used in this table, “DEQ” refers to the Virginia Department of Environmental Quality and is synonymous with “VDEQ.”	
7.			Bolded text in brackets following VDEQ comments 11 through 40 in this table refers to the corresponding sub-section in the “Environmental Impacts and Mitigation” section of the VDEQ FCD concurrence letter included in Appendix D .	
8.			Numbers in parentheses preceding VDEQ comments 41 through 49 in this table refer to the corresponding sub-section in the “Regulatory and Coordination Needs” section of the VDEQ FCD concurrence letter included in Appendix D .	

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8 Preparers and Reviewers

US Army Corps of Engineers

Brenda M. Barber, P.E., Project Manager

Hans Honerlah, Health Physicist

Connie Ramsey, Biologist

Carl Jeffrey Lorenz, Assistant District Counsel

Griffin Roblyer, Environmental Engineer

Kimberly Berg, Environmental Engineer

Ivanna Goldsberry, Environmental Engineer

Marisa Wetmore, Biologist

AECOM-Tidewater Joint Venture

Craig Carver (AECOM), Environmental Compliance Specialist: 10 years of experience in environmental planning and impact assessment. Virginia Commonwealth University, BA, Music; Virginia Commonwealth University, Master of Urban and Regional Planning.

Stephanie Liguori (AECOM), Environmental Scientist: 6 years of experience in environmental science and NEPA. Delaware Valley College, BS, Environmental Science.

Brian Minichino (AECOM), Environmental Scientist: 11 years of experience in environmental planning and impact assessment. Virginia Polytechnic Institute and State University, BS, Chemistry.

Larry Neal (AECOM), Senior Reviewer: More than 40 years of experience in environmental impact assessment and permitting. Emory & Henry College, BA, Biology; Old Dominion University, MS, Oceanography.

Brian Norris (AECOM), Geographic Information Science Specialist: 3 years of experience in map production, geospatial analysis, and data management. Florida State University, BS, Economics; Florida State University, MS, Geography.

Michael Robertson (AECOM), Environmental Planner/Project Manager: 15 years of experience in environmental planning and impact assessment. Virginia Tech, BS, Crop and Soil Environmental Science; University of Newcastle-upon-Tyne, MA, Environmental Studies.

Kevin Taylor (AECOM), Certified Health Physicist/Project Manager: 25 years of experience in environmental health physics and decommissioning/remediation planning. Clemson University, BS, Physics; Georgia Institute of Technology, MS, Nuclear Engineering.

Charlene Wu (AECOM), Environmental Planner: 6 years of experience in environmental planning and impact assessment. University of Maryland, BS, Environmental Science & Policy; Duke University, Master of Environmental Management.

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VOL. II – APPENDICES

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Appendix A – Public Information and Outreach

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Draft EA Distribution

Table A-1: Distribution of the Draft EA

Name	Title/Role	Affiliation	Mailing Address
Elected Officials - Federal			
Donald S. Beyer, Jr.	Representative in Congress	US House of Representatives	1119 Longworth House Office Building Washington, DC 20515
Mark R. Warner	Senator of Virginia	US Senate	703 Hart Senate office Building Washington, DC 20510
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Gerald E. Connolly	Representative in Congress	US House of Representatives	424 Cannon House Office Building Washington, DC 20515
Elected Officials - State			
Ralph Northam	Governor of Virginia	Office of the Governor	P.O. Box 1475 Richmond, VA 23218
Mark D. Sickles	State Representative	Virginia House of Delegates	P.O. Box 10628 Franconia, VA 22310
Scott A. Surovell	State Senator	Virginia Senate	P.O. Box 289 Mount Vernon, VA 22121
Elected Officials - County			
Sharon Bulova	Chairman	Fairfax County Board of Supervisors	Fairfax County Government Center 12000 Government Center Parkway, Suite 530 Fairfax, VA 22035
Dan Storck	Mount Vernon District Supervisor	Fairfax County Board of Supervisors	Mount Vernon Governmental Center 2511 Parkers Lane Mt. Vernon, VA 22306
Federal Agencies			
Rob Tomiak	Director	US Environmental Protection Agency Office of Federal Activities	Ariel Rios Building 1200 Pennsylvania Avenue, NW Mail code: 2251A Washington, DC 20460
Barbara Rudnick	NEPA Team Leader	US Environmental Protection Agency, Region 3 Office of Environmental Programs (3EA30)	1650 Arch Street Philadelphia, PA 19103-2029
John A. Bricker	State Conservationist	US Department of Agriculture Natural Resources Conservation Service	1606 Santa Rosa Road, Suite 209 Richmond, VA 23229-5014

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Name	Title/Role	Affiliation	Mailing Address
Dave Morrow	Deputy District Engineer for Program and Project Management	US Army Corps of Engineers Baltimore District	2 Hopkins Plaza Baltimore, MD 21201
Sharon Glasgow	Senior Airport Planning Specialist	Federal Aviation Administration Airport Planning and Environmental Division (APP-400)	800 Independence Avenue, SW Washington, DC 20591
Frank Smigelski	Senior Environmental Specialist	Federal Aviation Administration Airport Planning and Environmental Division (APP-400)	800 Independence Avenue, SW Washington, DC 20591
Jeffrey Breeden	Community Planner	Federal Aviation Administration Washington Airports District Office	23723 Air Freight Lane, Suite 210 Dulles, VA 20166
Amanda Ciampolillo	Regional Environmental Officer	Federal Emergency Management Agency Environmental Planning & Historic Preservation	615 Chestnut Street One Independence Mall, Sixth Floor Philadelphia, PA 19106-4404
Cindy Schulz	Supervisor	US Fish and Wildlife Service Virginia Field Office	6669 Short Lane Gloucester, VA 23061
Genevieve LaRouche	Supervisor	US Fish and Wildlife Service Chesapeake Bay Field Office	117 Admiral Cochrane Drive Annapolis, MD 21401-7307
Marcel C. Acosta	Executive Director	National Capital Planning Commission	401 9th Street, NW North Lobby, Suite 500 Washington, DC 20004
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Name	Title/Role	Affiliation	Mailing Address
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Michael Weil		National Capital Planning Commission	401 9th Street, NW North Lobby, Suite 500 Washington, DC 20004
Native American Tribes			
Neil Patterson, Jr.	Director	Tuscarora Nation Tuscarora Environmental Program	5226 E Walmore Road Lewiston, NY 14092
Lisa LaRue-Baker	Tribal Historic Preservation Officer	United Keetoowah Band of Cherokee Indians in Oklahoma	P.O. Box 746 Tahlequah, OK 74465
Caitlin Totherow	Tribal Historic Preservation Officer	Catawba Indian Nation Tribal Historic Preservation Office	1536 Tom Steven Road Rock Hill, SC 29730
Russell Townsend	Tribal Historic Preservation Officer	Eastern Band of Cherokee Indians	Qualla Boundary P.O. Box 455 Cherokee, NC 28719
Robert Gray	Chief	Pamunkey Indian Tribe	Pamunkey Indian Reservation 191 Lay Landing Road King William, VA 23086
Stephen R. Adkins	Chief	Chickahominy Indian Tribe	8200 Lott Cary Road Providence Forge, VA 23140
Gerald Stewart	Assistant Chief	Chickahominy Indian Tribe, Eastern Division	2895 Mount Pleasant Rd Providence Forge, Virginia
Frank Adams	Chief	Upper Mattaponi Tribe	P.O. Box 184 King William, VA 23086
Anne Richardson	Chief	Rappahannock Tribe	5036 Indian Neck Road Indian Neck, VA 23148
Dean Branham	Chief	Monacan Indian Nation	P.O. Box 1136 Madison Heights, VA 24572

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Name	Title/Role	Affiliation	Mailing Address
Samuel Bass	Chief	Nansemond Indian Nation	1001 Pembroke Lane Suffolk, VA 23434
State Agencies			
Helen Cuervo, P.E.	District Engineer	Virginia Department of Transportation Northern Virginia District	4975 Alliance Drive Fairfax, VA 22030
Kate Mattice	Executive Director	Northern Virginia Transportation Commission	2300 Wilson Boulevard, Suite 620 Arlington, VA 22201
René Hypes	Environmental Review Coordinator	Virginia Department of Conservation and Recreation Natural Heritage Program	600 E. Main Street, 24th Floor Richmond, VA 23219
Ray Fernald	Manager	Virginia Department of Game and Inland Fisheries Environmental Services Section	P.O. Box 90778 Richmond, VA 23228
Bettina Rayfield	Program Manager	Virginia Department of Environmental Quality Office of Environmental Impact Review	629 East Main Street P.O. Box 1105 Richmond, VA 23219
Laura McKay	Program Manager	Virginia Department of Environmental Quality Virginia Coastal Zone Management Program	629 E. Main Street P.O. Box 1105 Richmond, VA 23219
Marc E. Holma	Architectural Historian	Virginia Department of Historic Resources Office of Review and Compliance	2801 Kensington Avenue Richmond, VA 23221
Rahul Trivedi	Planning Manager	Virginia Department of Transportation	4975 Alliance Drive Fairfax, VA 22030
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Kanathur Srikanth	Director	Metropolitan Washington Council of Governments Department of Transportation Planning	777 North Capitol Street, NE, Suite 300 Washington, DC 20002
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Tom Biesiadny	Director	Fairfax County Department of Transportation	Centerpointe 1 Office Building 4050 Legato Road, Suite 400 Fairfax, VA 22033-2867
Peter F. Murphy, Jr.	Chairman	Fairfax County Planning Commission	Government Center 12000 Government Center Parkway, Suite 330 Fairfax, VA 22035
Fred R. Selden	Director	Fairfax County Department of Planning and Zoning	12055 Government Center Parkway Fairfax, VA 22035-5505
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Name	Title/Role	Affiliation	Mailing Address
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Gerald L. Gordon, Ph.D.	President and CEO	Fairfax County Economic Development Authority	8300 Boone Boulevard, Suite 450 Tysons Corner, Virginia 22182
Elizabeth Crowell	Branch Manager	Fairfax County Cultural Resources Management and Protection Branch	James Lee Center 2855 Annandale Road Fairfax, VA 22042
Linda Cornish Blank	Historic Preservation Planner and Architectural Review Board Administrator	Fairfax County Department of Planning and Zoning	12055 Government Center Parkway, Suite 730 Fairfax, VA 22035-5505
Kevin Munroe	N/A	Huntley Meadows Park Fairfax County Parks Authority	3701 Lockheed Boulevard Alexandria, VA 22306
Laura Arseneau	Historic Preservation Planner	Fairfax County Government	12055 Government Center Parkway Fairfax, VA 22035

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Name	Title/Role	Affiliation	Mailing Address
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Mary Rafferty ¹	Executive Director	Virginia Conservation Network	409 East Main Street, Suite 201 Richmond, VA 23219
Martha Wingfield ¹	Board Member	Virginia Conservation Network	409 East Main Street, Suite 201 Richmond, VA 23219
Bob Elwood ¹	President	Potomac River Association, Inc.	P.O. Box 76 Valley Lee, MD 20692
Dean Naujoks	Potomac Riverkeeper	Potomac Riverkeepers	1100 15th Street, NW, 11th Floor Washington, DC 20005
Alan Rowsome	Executive Director	The Northern Virginia Conservation Trust	4022-A Hummer Road Annandale, VA 22003
Walter C. Clarke	President	Southeast Fairfax Development Corporation	6677 Richmond Highway, Second Floor Alexandria, VA 22306
Tim Thompson	President	Fairfax County Federation of Citizens Associations	P.O. Box 3913 Merrifield, VA 22116-3913
Ken Gaffey	President	Inlet Cove Board of Directors	7035 Regional Inlet Drive Fort Belvoir, VA 22060
Joe DeCola	Executive Director	The Fairfax	9140 Belvoir Woods Pkwy Fort Belvoir, VA 22060
Hillary Clawson	President	Mason Neck Citizens Association	P.O. Box 505 Mason Neck, VA 22199
Patricia Soriano	Chapter Delegate, Political Chair, Parks and Public Lands	Mount Vernon Group, Sierra Club	5405 Barrister Place Alexandria, VA 22304
Judy Riggin	Director	Alexandria Friends Meeting at Woodlawn	8990 Woodlawn Road Fort Belvoir, VA 22060
Kathy Pohorylo	Chairman, Environment & Recreation	Mount Vernon Council of Citizens' Associations	P.O. Box 203 Mount Vernon, VA 22121-0203

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Name	Title/Role	Affiliation	Mailing Address
Cathy Ledec	President	Friends of Huntley Meadows	c/o Huntley Meadows Park 3701 Lockheed Blvd. Alexandria, VA 22306
Carl Kikuchi	President	Audubon Society of Northern Virginia	11100 Wildlife Center Drive, Suite 100 Reston, VA 20190
Hedrick Belin	President	Potomac Conservancy	8403 Colesville Road, Suite 805 Silver Spring, MD 20910
Nissa Dean	Virginia State Director	Alliance for the Chesapeake Bay	612 Hull Street, Suite 101C Richmond, VA 23224
Rebecca Leprell	Virginia Executive Director	Chesapeake Bay Foundation	Capitol Place 1108 E. Main Street, Suite 1600 Richmond, VA 23219
Sonja Caison	Chairman	Mount Vernon Lee Chamber of Commerce	Chamber of Commerce Building 6821 Richmond Highway Alexandria, VA 22306
Dale Rumberger	President	South County Federation	P.O. Box 442 Mason Neck, VA 22199-0442
Chris Soule ¹	Chairman	Lee District Association of Civic Organizations	P.O. Box 10413 Alexandria, Virginia 22310
Kris Unger	Primary Conservator	Friends of Accotink Creek	127 Poplar Road Fredericksburg, VA 22406-5022
Philip Latasa	Chronicler	Friends of Accotink Creek	127 Poplar Road Fredericksburg, VA 22406-5022
Lori Arguelles	Executive Director	Alice Ferguson Foundation	2001 Bryan Point Road Accokeek, MD 20607
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Name	Title/Role	Affiliation	Mailing Address
Paul Kohlenberger	President	Historical Society of Fairfax County, Virginia	P.O. Box 415 Fairfax, Virginia 22038
Brian Collison	Pastor	Pillar Church of Woodlawn	9001 Richmond Highway Alexandria, Virginia 22309
Fred Crawford	Representative	Pohick Episcopal Church	Frcrawford205@comcast.net
Dick Hamly	Representative	Pohick Episcopal Church	dickhamly@aol.com
Alan McCall	Representative	Pohick Episcopal Church	Photoguy53@comcast.net
Ross M. Bradford ¹	Associate General Counsel	Law Department National Trust for Historic Preservation	1785 Massachusetts Avenue, NW Washington, DC 20036
Other Interested Parties			
Charlie Harmon	N/A	Nuke Digest	nukedigest@gmail.com
Libraries			
Fort Belvoir MWR Library	N/A	Fort Belvoir MWR	9800 Belvoir Rd, Bldg. 200 Fort Belvoir, VA 22060
Kingstowne Library	N/A	Fairfax County Public Library	6500 Landsdowne Centre Alexandria, VA 22315-5011
Lorton Library	N/A	Fairfax County Public Library	9520 Richmond Highway Lorton, VA 22079-2124

Note:

1. Draft EA notification letters sent to these recipients were returned to sender by the U.S. Postal Service as undeliverable. USACE has updated the SM-1 EA mailing list accordingly.

Draft EA Agency Comments



County of Fairfax, Virginia

To protect and enrich the quality of life for the people, neighborhoods and diverse communities of Fairfax County

January 31, 2020

Brenda M. Barber, P.E.
Baltimore District Project Manager
U.S. Army Corps of Engineers, Environmental and Munitions Design Center
ATTN: CENAB-ENE-C
2 Hopkins Plaza
09-A-10 (Cube)
Baltimore, MD 21201

RE: Environmental Analysis: Draft Environmental Assessment - Fort Belvoir Deactivated
SM-1 Nuclear Reactor Facility Decommissioning and Dismantlement

Dear Ms. Barber:

This memorandum provides comments from Fairfax County regarding the Draft Environmental Assessment (EA), the Draft Finding of No Significant Impact (FONSI), and the Draft Finding of No Practicable Alternative (FONPA) for the proposed decommissioning and dismantlement of the Deactivated Stationary Medium Power Model 1 (SM-1) Nuclear Reactor Facility at United States Army Garrison Fort Belvoir (Fort Belvoir).

PROPOSED ACTION

The EA analyzes two alternatives to the Proposed Action: i) the Proposed Action Alternative, which would execute the Deactivated SM-1 Nuclear Reactor Facility Decommissioning Plan; and ii) the No Action Alternative, which would allow the continued maintenance of the Deactivated SM-1 Nuclear Reactor Facility in a safe storage condition and which would allow future Reactor Possession Permit extensions.

The Deactivated SM-1 Nuclear Reactor Facility is located on Fort Belvoir's South Post within the secured 300 Area, on an approximately 3.6-acre site along the shoreline of Gunston Cove, a tidal embayment of the Potomac River. The SM-1 site contains the reactor building, an inactive wastewater lift station, a small warehouse, a water intake pier and pump house, a concrete discharge pipe, and outfall structure. The water intake pier and pump house, concrete discharge pipe, and outfall structure are located in the 100-year floodplain and tidal wetlands associated with Gunston Cove. More importantly, Gunston Cove converges with the Potomac River less than one mile downstream (southeast) of the SM-1 site. The Potomac River discharges to the Chesapeake Bay approximately 64 miles (in a straight line) downstream from Fort Belvoir and is one of the Bay's major tributaries. Due to the proximity of these surface water features, resource protection areas (RPAs) associated with the Gunston Cove shoreline and 100-year floodplain



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A-14

Department of Planning and Development
Planning Division
12055 Government Center Parkway, Suite 730
Fairfax, Virginia 22035-5507
Phone 703-324-1380
Fax 703-653-9447
www.fairfaxcounty.gov/planning-development

cover approximately 45 percent (2.2 acres) of the 3.6 acres SM-1 site. It is also noted the SM-1 Reactor Facility has been determined eligible for listing in the National Register of Historic Places (NRHP) based on its age and exceptional historic importance.

It is staff's understanding that under the Proposed Action Alternative, the Deactivated SM-1 Nuclear Reactor Facility would be decommissioned and dismantled. All radioactive and non-radioactive materials and equipment and remnant structures, including the intake pier and pump house, concrete discharge pipe, and outfall structure, would be removed from the SM-1 site. Removal of in-water structures would require work in the 100-year floodplain and tidal wetlands associated with Gunston Cove. All radioactive and non-radioactive materials and waste associated with the site would be packaged, transported, and disposed of in accordance with applicable laws and regulations. The EA indicates that Fort Belvoir's existing road network would be used to access the SM-1 site, and to transport materials and waste off-post for disposal or recycling. Following decommissioning, the site would be restored, including the placement of clean fill soils and grading to mimic the site's current elevation and topography, and released for unrestricted use. The EA further notes that the 100-year floodplain and tidal wetlands would return to a pre-disturbance condition following the removal of the remnant in-water structures.

The EA and FONSI indicate that implementing the Proposed Action would reduce costs associated with maintaining the Deactivated SM-1 Nuclear Reactor Facility, and would allow the U.S. Army Corps of Engineers (USACE) to meet mission objectives to decommission SM-1 and terminate their possession permit. Upon its completion, the Proposed Action would transfer the responsibility for the site to Fort Belvoir. The No Action Alternative would require USACE to continue bearing the cost of maintenance and would not allow the site to be restored or returned to a natural state.

Fairfax County supports the proposed decommissioning and removal of the facility in order to allow the site to be restored to a more natural state. However, staff from multiple agencies offer the following comments:

Radiation

The Proposed Action would result in the removal of low-level radioactive waste, which would include contaminated concrete, steel, tile, utility pipes, plastic, materials and equipment, soils, and mixed waste. The majority of radioactive material is found in the Vapor Container (VC). The remaining residual contamination is contained in various secondary and waste system components and outside soils. A total of approximately 7,424 cubic yards of radioactive waste would be removed under the Proposed Action.

Staff understands that decommissioning would occur in a controlled manner to minimize both public and occupational radiation exposure. A decommissioning contractor would implement a Radiation Safety Program, an Environmental Monitoring and Control Program, and a Waste Management Program to ensure the safe removal of activated and/or contaminated components in an effort to reduce the risk of potential release to the environment. Given the extent of the contamination, nearly all of the site would be disturbed as the affected soils and building materials are removed. Sampling would occur throughout the process to ensure that the contamination has been removed. County staff appreciates the efforts to remove the

contamination and recommends that all stakeholder agencies be kept aware of the decommissioning process, as it proceeds.

Water, Soil, and Forest Resources

The intake pier, pump house, and wastewater outfall pipe are all located in tidal wetlands and waters. Thus, activities to facilitate removal must occur in tidal wetlands and the 100-year floodplain. Removal of the intake pier/pump house, concrete discharge pipe, and outfall structure would disturb approximately 1.4 acres of tidal wetlands in Gunston Cove, and 0.6-acre of freshwater wetlands immediately inland of Gunston Cove. Activities within the floodplain and wetlands would cease after all remnant structures have been removed.

The EA describes the removal of the water intake pump house and pier, which extends approximately 100 feet from the shoreline into Gunston Cove. Removal would likely require the use of a barge-mounted crane and other vessels to give the dismantlement crew and equipment access to the structure. Superstructures would be removed first, followed by the piles. The piles would be cut at the mudline and the portions below the cut would be left in place. Containment booms and sediment curtains would be used during in-water and nearshore work associated with the removal of the intake pier/pump house, concrete discharge pipe, and outfall structure to contain debris that could inadvertently enter the water column, prevent the migration of disturbed sediment into the water column, minimize turbidity, and ensure disturbed sediments settle near their original location. Disturbance of subaqueous bottomlands during in-water activities would also be minimized to the extent practicable. Spill kits would be kept nearby during all in-water and nearshore work to prevent or reduce the risk from the migration of hazardous substances into receiving water bodies, in the event that an accidental spill occurs. Staff concurs with this approach.

For the more upland areas, vegetation clearing and/or soil disturbance would be necessary to facilitate the removal of existing structures and abandoned utility lines, provide maneuvering and operational space for vehicles and equipment, and create storage and staging space for materials and containerized waste.

As part of site remediation, a loamy top soil seeded with native grasses and shrubs would be applied across the site to promote revegetation. Additionally, in accordance with Policy Memorandum #27, *Tree Removal and Protection*, Fort Belvoir requires the planting of two new trees between 1.5 and 2.5 inches diameter at breast height (dbh) for every tree or sapling 4 inches dbh or greater removed from RPAs during project-related activities. At minimum, the number of trees replanted in the RPA must equal those removed from the RPA during the project; additional trees may be planted outside the RPA to meet this requirement. Additionally, trees and shrubs less than 4 inches dbh that are removed from the RPA during the project must be replaced one-for-one within the RPA in accordance with VDCR's *Riparian Buffers Modification and Mitigation Guidance Manual*. Staff concurs with this remediation proposal.

It should be noted that, as a federal entity, Fort Belvoir is not subject to the provisions of the Fairfax County Chesapeake Bay Preservation Ordinance. As a result, Fort Belvoir does not use RPA maps produced by Fairfax County. Instead, the Army delineates the RPAs on the installation.

Although the site would be restored and maintained in a vegetated condition by Fort Belvoir, given the adjacency of the site to Gunston Cove, the presence of steep slopes, the required removal of nearly all surface soils and site vegetation, and the anticipated exposure of subsoils for an extended period to accommodate the required sampling for radioactive contamination, county staff recommends that a robust erosion and sediment control plan and replanting plan be developed and incorporated throughout all phases of the decommissioning process. Such plans are recommended to preclude the washing of sediment into the adjacent waters, to stabilize the site, and to facilitate the revegetation and regeneration of the site. Further, staff recommends that the project staff consult and coordinate with the Northern Virginia Soil and Water Conservation District and the county Department of Public Works and Environmental Services regarding mitigation procedures. Staff recommends that any mitigation plan consider the following:

- Erosion Control: In addition to straw, which should be used to provide immediate protection of exposed soil, matting and/or netting made of natural materials, such as jute or coir, should be spread across all exposed soil surfaces. Together, these materials would help dissipate the erosive energy of rainwater. At the perimeter of the site, silt fences should be erected to filter sediment from runoff before it flows off-site.
- Steep Slopes: Special erosion control provisions should be incorporated on slopes, such as earthen diversion dikes and coir “logs,” placed parallel to steep slopes and perpendicular to rainwater flows.
- Compaction: Exposed subsoils are expected to be compacted by heavy equipment. All subsoils should be decompacted prior to covering with topsoils.
- Soil Horizons: The surface of remnant subsoils should be “roughed up” to create irregular surfaces, to facilitate mixing with the topsoil fill materials, and to ultimately facilitate the growth of plant roots from the topsoils into the subsoils.
- Replanting: Planting should be accomplished through all phases of site disturbance with a combination of native forbs, grasses, shrubs, and trees to minimize exposed soil. Seed mixes and plantings should include a mixture of fast-growing annuals and cover crops for quick surface stabilization and slower-growing but longer-lived perennials for continued stabilization. While plants that require full sun would be appropriate at the beginning of the project, shade-loving species should be considered later in the process, once larger plants have started to create shade. Various species should be included in planting plans to both create vegetative coverage of the soil surface and fill in gaps below the surface through various rooting habits. Unless a new climax vegetative community is desired, the site’s existing vegetation should be used to guide the species selection.
- Deer Protection: Deer protection, such as tubes, should be used for woody plantings. Geese protection, such as a network of strings, should be used for plantings of forbs and grasses.
- Invasive Species Control: Weeding and other maintenance should be performed to prevent invasive species from overgrowing the site and outcompeting the desired native species.

Additionally, staff recommends that USACE schedule a briefing before the Fairfax County Wetlands Board regarding any proposed actions affecting tidal wetlands, freshwater wetlands, and floodplains, to include project impacts and remediation measures.

County staff notes that Gunston Cove is part of a long-term on-going aquatic monitoring program conducted by the Potomac Environmental Research and Education Center (PEREC) at

George Mason University and Fairfax County's Environmental Monitoring Branch. The study is a continuation of work which originated in 1984 at the request of the county's Environmental Quality Advisory Council and the Department of Public Works. The original study design utilized monitoring stations in Gunston Cove, the Potomac mainstem, and Dogue Creek. The same stations at Gunston Cove have been tested for more than 25 years, leading to conclusions regarding the present ecological status of the area and recommendations for future needs. Staff notes that some of the sampling locations are proximate to the water intake associated with SM-1. Staff recommends that decommissioning activities be coordinated with the Potomac Environmental Research and Education Center of George Mason University, to ensure that decommissioning activities do not conflict with research activities.

Flora and Fauna

Gunston Cove borders the SM-1 site. This cove contains shallow water with various types of submerged aquatic vegetation (SAV). SAV contributes to the health of estuary systems by providing habitat for many fish and shellfish species, food for waterfowl, erosion control, and excess nutrient absorption.

Two hundred seventy-eight (278) bird species have been documented at Fort Belvoir. Vegetation on the SM-1 site could provide habitat for any number of Fort Belvoir's resident and migrant bird species, particularly those that prefer forested and wooded areas. Additionally, active osprey (*Pandion haliaetus*) nests exist on Building 372, on the intake pier, and in other areas of the SM-1 site. Ospreys typically mate for life and return to the same nesting area each year.

The Proposed Action Alternative would alter existing wildlife habitat at the SM-1 site from proposed site preparation, dismantlement, and restoration activities. Wildlife at and near the SM-1 site would likely be disturbed by construction related noise. Wildlife species that occupy the SM-1 site are those generally tolerant of human activities and presence. These species would be expected to avoid the SM-1 site during decommissioning activities and relocate to undisturbed habitat areas in the vicinity. To prevent or minimize impacts on migratory birds known or having potential to occur on or near the SM-1 site, vegetation clearing would be prohibited between April 1 and July 15 of any year in accordance with Fort Belvoir Policy Memorandum #78, *Conservation of Migratory Birds*. Surveys for birds and/or active nests would be conducted prior to vegetation clearing if such activities could not be avoided during that time period.

The EA notes that active osprey nests (e.g., on Building 372 and the intake pier) would be relocated according to VDGIF's *Removal or Relocation of Osprey Nests in Virginia: A Guideline for Landowners* (VDGIF, 2010). In accordance with Fort Belvoir's Policy Memorandum #78, *Conservation of Migratory Birds*, the nest would be relocated during the period between September 15 and April 16. Relocation of these nests could cause potentially adverse impacts on an active osprey breeding pair.

Staff encourages coordination with appropriate agencies and implementation of management or protection measures to minimize adverse impacts. In order to mitigate the impacts to osprey nests, staff recommends that Fort Belvoir staff consider the construction of alternative osprey nesting platforms in the vicinity of the existing nests and the relocation of those nests to the new

platforms. County staff appreciates the consideration given to the species endemic to the site and the surrounding areas.

Heritage Resources

A previous archaeological survey in 1987 identified one archaeological site (44FX1331) within the project area. A subsequent survey in 2018 was conducted to determine if potentially significant archaeological resources were present. However, the archaeological survey determined that extensive ground disturbance associated with construction of SM-1 severely impacted the landform and may have destroyed much of the site's subsurface integrity. As a result, the site was determined not eligible for listing in the National Register of Historic Places (NRHP) and no further archaeological study of the SM-1 site was recommended. The State Historic Preservation Officer (SHPO) concurred with the findings and recommendations of the Phase I archaeological survey that no further archaeological work at the SM-1 site was required. Fairfax County Park Authority staff concurs with the Virginia Department of Historic Resources (VDHR) that site 44FX1331 is not significant or eligible for inclusion on the NRHP (see attachment).

In 1996, the SM-1 Reactor Facility was evaluated for listing on the NRHP. The study determined that the facility was eligible for listing in NRHP under Criterion A on the national level, with a period of significance between 1955 and 1973 (US Army Package Power Reactor; VDHR ID #029-0193). Because the facility was less than 50 years old at the time, NRHP Criterion Consideration G (for resources less than 50 years old) applied, as the facility met the threshold for "exceptional importance" according to this criterion.

SM-1 was the Army's first nuclear-powered, electricity-generating station and the first pressurized water reactor to be connected to an electrical grid in the United States. It was used to train military nuclear power plant operators and to perform nuclear research and development tasks. As the Army's first prototype nuclear power generating plant, the SM-1 Reactor Facility represented an important step in the use of atomic power. SM-1 operated from 1957 to 1973 and was deactivated between 1973 and 1974. It was placed in a safe storage configuration in 1974. The Deactivated SM-1 Nuclear Reactor Facility is maintained under Reactor Possession Permit Number SM1-I-19 issued by the US Army Nuclear and Countering Weapons of Mass Destruction Agency (USANCA). The Deactivated SM-1 Nuclear Reactor Facility has been part of a routine monitoring program that is implemented by the U.S. Army Corps of Engineers (USACE).

USACE has determined that the Proposed Action Alternative would have an adverse effect on the NRHP-eligible SM-1 Reactor Facility and Fairfax County agrees with this determination. To ensure this adverse effect remains less than significant, USACE has developed mitigation and minimization measures in consultation with VDHR, the Advisory Council on Historic Preservation (ACHP), and other consulting parties, including the Fairfax County Department of Planning and Development. These measures would be detailed in a Memorandum of Agreement (MOA) and finalized once consultation is complete. The current stipulations, although they are subject to change due to comments from consulting parties, are summarized as follows:

- USACE will produce a modified Historic American Engineering Record (HAER) for the SM-1 Reactor Facility, which will document SM-1 operations within its historical context as

a nationally significant nuclear energy resource. This documentation will include information such as location and address, owner, operational and decommissioning narratives, and architectural details, supported by a complete bibliography and electronic repository, including motion picture film, photographs, and documents, as appropriate. Due to the loss of original as-built drawings, the HAER documentation will include a 3-dimensional rendering of the facility using Light Detection and Ranging (LIDAR) scans. Fairfax County Heritage Resources has asked via Section 106 Consultation for further detail on why this level of documentation was chosen and if the National Park Service was involved in the decision, as required, and has asked for further detail on how the information will be made available to the public.

- USACE will conduct interviews with personnel who were closely associated with the construction, operation, and initial closure of the SM-1 Reactor Facility. These interviews will be conducted, recorded, and transcribed in accordance with applicable standards. In addition, research will be conducted at Fort Belvoir, and at repositories elsewhere in Virginia and Washington, DC, including review of historic photographs, training videos, aerials, maps, documents, plans, newspapers, and scientific journals. Digital images will be saved and labeled in accordance with SHPO standards for architectural surveys.
- All field work, photography, and research necessary to produce the HAER of the SM-1 Reactor Facility will be carried out by or under the direct supervision of a Secretary of the Interior-qualified architectural historian, who meets the appropriate *Secretary of the Interior's Professional Qualification Standards* (SOI Standards; 48 *Federal Register* 44738-9, Sept. 29, 1983). All work will be conducted in accordance with *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation* (36 CFR Part 61); and *Secretary of the Interior's Standards for the Treatment of Historic Properties* (36 CFR Part 68).
- USACE will provide the SHPO with a thirty (30)-day period to review and comment on the HAER documentation.
- USACE will implement other mitigation measures identified in the MOA, such as moving the commemorative plaque affixed to Building 372 to a facility for restoration and display; salvaging historical items to be placed on loan for traveling exhibits; and erecting a historical marker commemorating the SM-1 Reactor Facility.
- USACE will complete the HAER and other mitigation measures identified in the MOA within six months after completion of the decommissioning and demolition of the SM-1 Reactor Facility.

Fairfax County concurs with the measures outlined above and looks forward to continuing Section 106 Consultation and finalizing the MOA.

Air Quality, Fugitive Emissions

County staff notes that the metropolitan Washington, D.C. area is designated by the U.S. Environmental Protection Agency as a marginal non-attainment area for the 2015 eight-hour ozone standard. High ozone concentrations can adversely affect human health. These concentrations result from the interactions of oxides of nitrogen (NOx) and volatile organic compounds (VOCs) with sunlight. Major sources of NOx emissions include motor vehicles,

utilities and other stationary sources, and non-road construction vehicles. Major sources of emissions of VOCs include motor vehicles.

The EA proposes implementation of the following management measures and/or Best Management Practices to further reduce the anticipated less-than-significant, adverse effects:

- Truck beds would be covered while in transit to limit fugitive dust emissions;
- Water would be sprayed on any unpaved roads or stockpiles to limit fugitive dust emissions;
- Ultra-low sulfur diesel would be used as a fuel source where appropriate to minimize oxides of sulfur emissions;
- Clean diesel would be used in construction equipment and vehicles through the implementation of add-on control technologies such as diesel particulate filters and diesel oxidation catalysts, repowers, and/or newer and cleaner equipment. When feasible, electric-powered equipment would be used in lieu of diesel-powered equipment;
- Control measures for heavy construction equipment and vehicles, such as minimizing operating and idling time, would be implemented to limit criteria pollutant emissions; and
- Air quality permits would be obtained for the Proposed Action Alternative, as necessary, in compliance with federal, state, and local standards.

County staff appreciates the consideration of air quality and concurs with the proposed measures to reduce adverse impacts.

Transportation

The Proposed Action Alternative would generate additional vehicle trips on and in the vicinity of Fort Belvoir during the decommissioning process. Vehicle trips would include workers' commuting vehicles as well as heavy trucks hauling materials and equipment needed during decommissioning activities, transporting waste from the SM-1 site, and bringing fill soils to the site during restoration activities. The number of additional trips generated by workers' commuting vehicles on Fort Belvoir roads during the Proposed Action Alternative is anticipated to remain low. It is estimated that the proposed decommissioning would generate 1,150 heavy truck trips over the 5-year on-site decommissioning period, comprising approximately 650 waste shipments from the site and 500 trips to the site to deliver clean fill soils during restoration activities. The number of heavy truck trips equates to approximately 4.4 trips per week during the 5-year decommissioning period. However, it is anticipated that approximately 50 percent of waste shipments would occur during the middle 12 months (i.e., months 19 through 30) of the project, which equates to approximately 11 heavy truck trips per week during that 12-month period.

The EA proposes the following management measures to minimize impacts on the transportation network and/or from the transport of low-level radioactive waste and other waste:

- A project-specific transportation management plan would be implemented identifying approved travel routes to and from the site for decommissioning personnel and heavy trucks transporting materials, equipment, and debris;
- During spill and emergency response planning for the Proposed Action Alternative, the decommissioning contractor would notify on- and off-post emergency responders of the

types of shipments that would be transported to support preparation for potential transportation-related accidents;

- In coordination with Fort Belvoir and other affected organizations, decommissioning-related traffic would be scheduled for off-peak hours to minimize roadway congestion; and
- All radioactive waste and other debris generated at the SM-1 site would be packaged and shipped in accordance with a written Waste Management Plan that is consistent with Nuclear Regulatory Commission and U.S. Department of Transportation regulatory requirements.

County staff agrees with the finding that the transportation impacts would be less than significant. Staff requests that Fort Belvoir include the Virginia Department of Transportation, the Fairfax County Department of Transportation, and the Fairfax County Fire and Rescue Department when notifying local agencies about the movement of materials and the intended transportation routes.

Thank you for the opportunity to comment on this project. If you have any questions regarding these comments, please contact Joseph Gorney at 703-324-1380.

Sincerely,



Leanna O'Donnell, Director, Planning Division
Department of Planning and Development

Attachment: Fairfax County Park Authority Memorandum, dated January 15, 2020.

cc: Board of Supervisors
Bryan Hill, County Executive
Rachel Flynn, Deputy County Executive
Barbara Byron, Director, DPD
Tom Biesiadny, Director, FCDOT
Denise James, Chief, Environment & Development Review Branch, DPD
Joseph Gorney, Senior Environmental Planner, Planning Division, DPD
Catherine Torgersen, Stormwater Planning Division, DPWES
Andrea Dorlester, Fairfax County Park Authority
Nicole Brannan, Heritage Resources Planner, Planning Division, DPD
Felix M. Marini, Chief of Environmental and Natural Resources Division, Fort Belvoir

LO: JCG



ATTACHMENT

FAIRFAX COUNTY PARK AUTHORITY

M E M O R A N D U M

TO: Denise James, Chief
Environment and Development Review Branch
Department of Planning and Development

FROM: Andrea L. Dorlester, Development Review Section Chief
Park Planning Branch, PDD *ALD*

DATE: January 15, 2020

SUBJECT: EA-USACE SM 1 Reactor Facility; Fort Belvoir Deactivated Nuclear Reactor

The Park Authority staff has reviewed the project update dated December 20, 2019 for the EA-USACE SM-1 Reactor Facility; Fort Belvoir Deactivated Nuclear Reactor Environmental Assessment and has reviewed the Draft Environmental Assessment and concurs with the VDHR that site 44FX1331 is not significant nor Eligible for inclusion onto the National Register of Historic Places. Several structures, however, appear to be eligible or listed onto the National Register of Historic Places. Due to the nature of these structures, Park Authority staff recommends review by Fairfax County's Heritage Resources staff in the Department of Planning and Development.

There are no further archaeological issues and no additional archaeological work is warranted, however architectural comments may be forthcoming.

eCopy: Liz Crowell, Manager, Archaeology & Collections Branch
File Copy

-----Original Message-----

From: Rudnick, Barbara [REDACTED]
Sent: Friday, January 31, 2020 12:38 PM
To: Corporate Communication Office-NAB <CENAB-CC@usace.army.mil>
Cc: Traver, Carrie [REDACTED]
Subject: [Non-DoD Source] SM-1 Decommissioning Draft EA Comment Submission

Re: EPA comments on Deactivated Stationary Medium Power Model 1 (SM-1) Reactor Facility on Fort Belvoir in Fairfax County, Virginia

Thank you for the opportunity to review the Draft Environmental Assessment (EA or Study) for the Decommissioning and Dismantlement of the Deactivated SM-1 Nuclear Reactor Facility at U.S. Army Garrison Fort Belvoir, dated December 2019. The U.S. Army Corps of Engineers (USACE) prepared the EA to evaluate the Proposed Action of completing the decommissioning of SM - 1 to a standard that allows for release of the site for unrestricted future use. The Proposed Action would remove all radioactive and non - radioactive materials (e.g., buildings, underground utility lines, contaminated soil) from the SM - 1 site.

EPA reviewed the EA and is providing comments in accordance with the National Environmental Policy Act (NEPA) of 1969, Section 309 of the Clean Air Act and the Council on Environmental Quality regulations implementing NEPA (40 CFR 1500-1508):

The EA states that the SM-1 Reactor Facility was determined to be eligible for listing in the National Register of Historic Places and its removal is an adverse effect. The EA indicates that a Memorandum of Agreement (MOA) will be developed with the State Historic Preservation Office (SHPO) to minimize the adverse effect and ensure it remains less than significant. The current status of the MOA is unclear in the EA. We encourage you to continue working with SHPO and other consulting parties to finalize the MOA, take appropriate mitigative measures, and document this coordination prior to moving forward with the Proposed Action.

There are several overlapping time-of-year restrictions for tree clearing and other disturbances to avoid or reduce impacts to species of special concern, including impacts on the northern long-eared bat, migratory birds, and bald eagle nesting and concentration. Removal of osprey nests and in-water work also have associated time of year restrictions. It may be helpful to consider and present how the range of overlapping and potentially conflicting time of year restrictions for the site will be integrated into the plans and how activities may be phased to accommodate these restrictions.

The extent of wetlands onsite has not yet been delineated, but Section 3.3.3.3 indicates that removal of the intake pier, pump house, concrete discharge pipe, and outfall structure would disturb an estimated 1.4 acres of tidal wetlands and 0.6-acre of freshwater wetlands. We encourage you to explore ways to avoid potential impacts prior to submitting a joint permit application. As indicated, the wetlands should be delineated, the areal extent of wetland disturbance should be minimized where possible, and best management practices (BMPs) be evaluated to limit disturbances (such as mats, pads, erosion control, timing, etc.). As the extent of resources are identified, we recommend continued coordination with the USACE Regulatory Branch and applicable state regulatory agencies.

Restoration via grading, soils management, or replanting may be needed to ensure that impacts are temporary; some vegetation management during and following construction may be needed to prevent the colonization or spread of invasive species. Best management practices to avoid the introduction and spread of invasive species in wetland areas should be evaluated.

The EA notes that submerged aquatic vegetation (SAV) adjacent to the project area could be damaged or destroyed during the in-water work (removal of the concrete discharge pipe, outfall structure, and pier/pump house.) The SAV identified in the area includes both native and nonnative plants. If native SAV is disturbed, invasive species could become more prevalent; therefore, we recommend that the potential spread of aquatic invasive species also be evaluated.

The EA indicates that noise generated under the Proposed Action would result in minor, short-term, intermittent adverse impacts on water-dependent recreation in Gunston Cove, but these impacts would be minimized by the contractor implementing standard construction-related BMPs for noise control. The EA would benefit from briefly addressing specific examples of the type of BMPs that would be employed.

Site restoration would include the placement of clean fill and soils to backfill excavated areas. Given the potentially large amount of soils required to be replaced, and the need to support suitable vegetation, including trees, we recommend creating a specific plan for soil placement, including segregation, necessary amendments, and depth of topsoil. As part of this plan, potential sources of backfill and topsoil should be evaluated. We suggest the plan address the need for appropriate topsoil depth and amendments including organic matter to assist tree transplant success, as some vegetation may require significant topsoil to survive. We support consideration of native species in the site restoration effort. Please contact us if we could provide additional information.

Again, thank you for providing us with notice to review the EA. The contact for the project is Ms. Carrie Traver, traver.carrie@epa.gov. If you have any questions or would like to discuss these comments, please don't hesitate to contact me or Carrie.

Barbara Rudnick, P.G.
NEPA Program Coordinator
U.S. EPA Region III
Office of Communities, Tribes & Environmental Assessment



CLASSIFICATION: UNCLASSIFIED

-----Original Message-----

From: Warren, Arlene [REDACTED]
Sent: Tuesday, January 28, 2020 5:08 PM
To: Corporate Communication Office-NAB <CENAB-CC@usace.army.mil>

Subject: [Non-DoD Source] SM-1 Project Update

Project Name: SM-1 Project Update

Project #: N/A

UPC #: N/A

Location: Fairfax Co.

VDH – Office of Drinking Water has reviewed the above project. Below are our comments as they relate to proximity to public drinking water sources (groundwater wells, springs and surface water intakes). Potential impacts to public water distribution systems or sanitary sewage collection systems must be verified by the local utility.

There are no public groundwater wells within a 1-mile radius of the project site.

There are no surface water intakes located within a 5-mile radius of the project site.

The project is not within the watershed of any public surface water intakes.

There are no apparent impacts on public drinking water sources due to this project.

No other comments were received.

Virginia Department of Health – Office of Drinking Water appreciates the opportunity to provide comments. If you have any questions, please let me know.

Best Regards,

Arlene Fields Warren
GIS Program Support Technician
Office of Drinking Water
Virginia Department of Health
[REDACTED]

Draft EA Public Comments

-----Original Message-----

From: Lee Hamblin [REDACTED]

Sent: Wednesday, January 29, 2020 12:40 AM

To: Corporate Communication Office-NAB <CENAB-CC@usace.army.mil>

Subject: [Non-DoD Source] Comments on SM-1 Decommissioning and Building 7304 Vault

Brenda,

"CABRERA designed and performed a characterization survey of the Vault and areas outside of the Vault in the first half of 2003.

Results of the characterization survey radiological analyses indicated the presence of potentially elevated tritium, Carbon-14, Cesium-137, Promethium-147, Americium-241, and Thorium-232. Elevated levels of radioactivity were detected at the interior Vault floor, at wall storage vaults, at floor storage vaults, and the soil beneath floor storage vaults. The highest contamination exceedance of action levels encompasses Cs-137 on the Vault floor and in the soil under the floor storage vaults and also H-3 inside the wall storage vaults.

Contamination exceeding action levels outside the Vault is minimal and is concentrated on the north wall and floor just outside the Vault doorway."

Was there any relationship between the operation of SM-1 and Building

7304 (Vault) and the presence of elevated tritium, Carbon-14, Cesium-137, Promethium-147, Americium-241, and Thorium-232 in the Vault ? Was radiological waste from SM-1 stored in the Vault?

SM-1 was referenced in Cabrerra's 2004 Building 7304 characterization survey report and I wonder why SM-1 was mentioned in the Cabrerra report.

Looking forward to your response.

--

Regards,

Lee Hamblin

[REDACTED]

CLASSIFICATION: UNCLASSIFIED



Deactivated SM-1 Nuclear Reactor
Decommissioning & Dismantlement
Draft Environmental Assessment (EA)



Public Meeting – January 8, 2020

Comments will be considered in the Draft EA and become part of the public record.
Personally identifiable information will not be published.

1. Your information (optional):

Name: C. TOBIAS NATHI

Title: _____

Agency/Organization: resident

Street Address: _____

City, State, Zip: _____

E-mail Address: _____

2. Would you like to be notified when the Final EA is published? Yes ☒ No ☐

If yes, please make sure to provide a mailing address or email address.

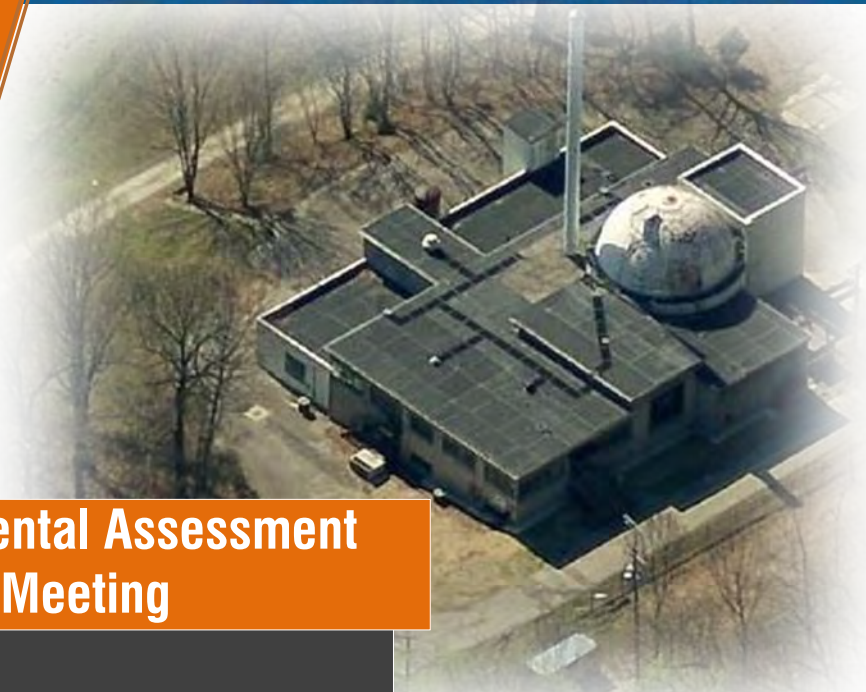
3. Please print your comments and place in the box on the comment table.

As homeowners adjacent to
base we were never notified at
purchase 10+ years ago. Will
there be impacts on home values
esp. if we plan to sell in the
next years during the work?
With children + pets would have
been appreciative to know of any
risk factors/considerations prior.

Draft EA Public Meeting Materials

WELCOME

SM-1 DECOMMISSIONING PROJECT



Schedule

Draft Environmental Assessment Public Meeting

1:00 p.m. – 2:00 p.m.

- Open House
- Meet and interact with U.S. Army Corps of Engineers and Fort Belvoir personnel

2:00 p.m. – 3:00 p.m.

- Formal Presentation
- Question & Answer Session
- Poster Availability

January 7, 2020

Public review period began on
December 20, 2019 and ends
on January 31, 2020

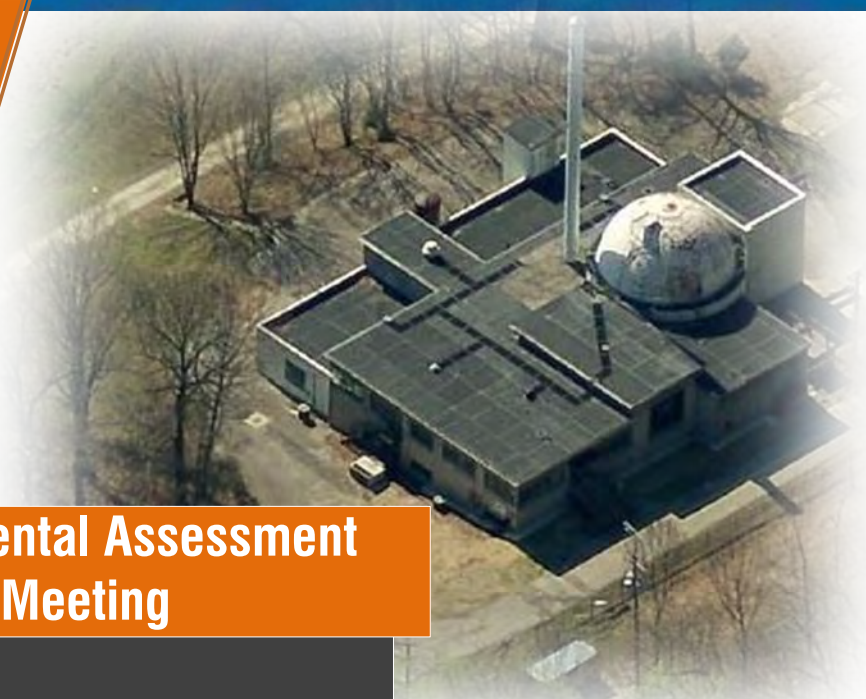


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WELCOME

SM-1 DECOMMISSIONING PROJECT



Schedule

Draft Environmental Assessment Public Meeting

6:30 p.m. – 7:30 p.m.

- Open House
- Meet and interact with U.S. Army Corps of Engineers and Fort Belvoir personnel

7:30 p.m. – 8:30 p.m.

- Formal Presentation
- Question & Answer Session
- Poster Availability

January 7, 2020

Public review period began on
December 20, 2019 and ends
on January 31, 2020

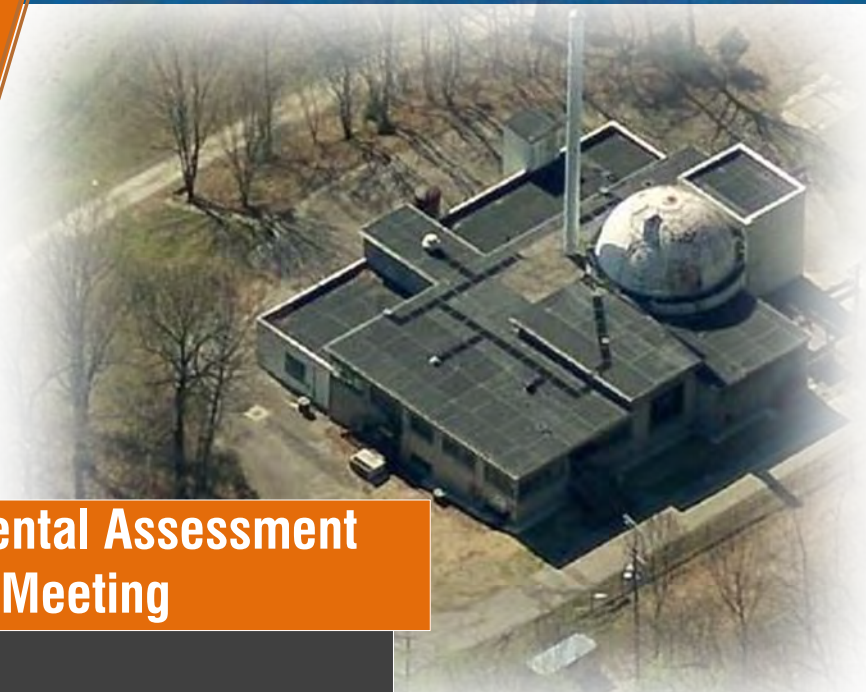


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WELCOME

SM-1 DECOMMISSIONING PROJECT



Schedule

Draft Environmental Assessment Public Meeting

6:30 p.m. – 7:30 p.m.

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- Poster Availability

January 8, 2020

Public review period began on
December 20, 2019 and ends
on January 31, 2020



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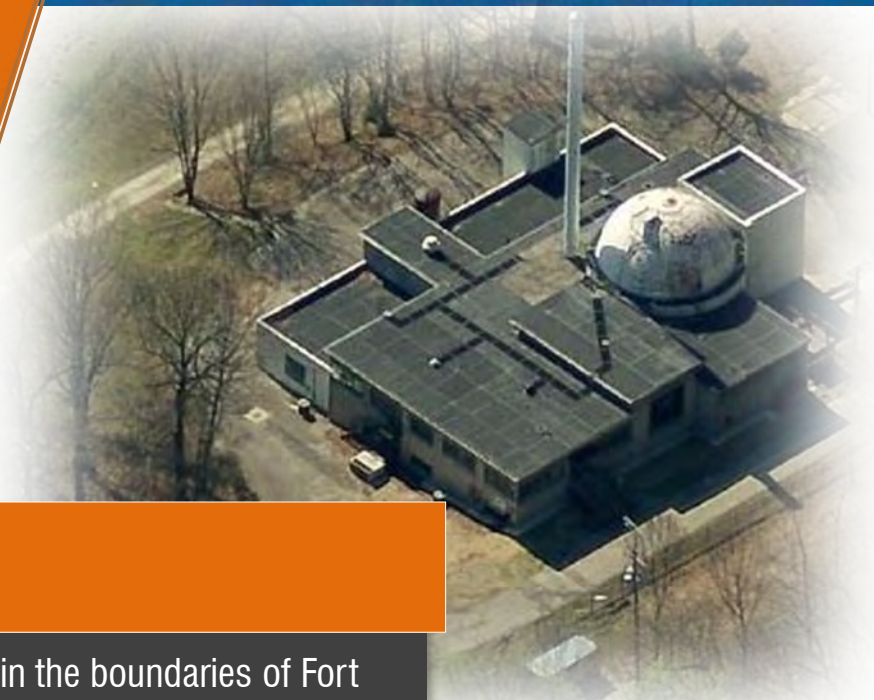
WELCOME

SM-1 DECOMMISSIONING PROJECT

Brief History

The Deactivated SM-1 Nuclear Reactor Facility is situated within the boundaries of Fort Belvoir in Fairfax County, Virginia. After construction completion in 1957, SM-1 was used to train Department of Defense (DOD) power plant operators and was capable of delivering a net 1,750 kilowatts of electrical power. It was the first nuclear power reactor to provide electricity to a commercial power grid in the United States. In 1973, SM-1 was deactivated (shut down). Deactivation included removal of the nuclear fuel and sealing of the reactor pressure vessel, decontamination of building areas to the extent possible, and off-site disposal of radioactive wastes. The site is now referred to as the Deactivated SM-1 Nuclear Reactor Facility. For more than 45 years, the site has been monitored and maintained while the accessible portions of the facility have been used as a museum and storage space.

A-34



**US Army Corps
of Engineers®**

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

- The Army has prepared a Draft Environmental Assessment (EA) to analyze this action in compliance with NEPA
- NEPA is the national charter for protection of the environment (42 U.S.C. Part 4321 et seq.)
- NEPA requires federal agencies to analyze the impacts of their proposed actions
- NEPA requires opportunities for public involvement (e.g., Draft EA public comment period, this meeting)

Resources analyzed in the Draft EA:



Water resources



Air quality



Biological resources



Radiological safety and health



Occupational safety and health



Cultural resources



Transportation and traffic



Non-radiological hazardous materials and non-hazardous solid waste



Geological resources



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DRAFT ENVIRONMENTAL ASSESSMENT ALTERNATIVES

1. PROPOSED ACTION ALTERNATIVE

Complete decommissioning and dismantlement of the Deactivated SM-1 Nuclear Reactor Facility.

This alternative includes:

- Removal of the Deactivated SM-1 Nuclear Reactor Facility and associated buildings and structures
- Removal of residual radioactive contamination exceeding regulatory levels
- Restoration of the SM-1 site to a vegetated condition and return of the site to Fort Belvoir for future use
- Termination of U.S. Army Corps of Engineers Decommissioning Permit

2. NO ACTION ALTERNATIVE

Decommissioning would not be completed and the Deactivated SM-1 Nuclear Reactor Facility would be maintained as it currently is for the foreseeable future.



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SUMMARY OF DRAFT ENVIRONMENTAL ASSESSMENT FINDINGS

- The Proposed Action would have **no significant impacts** on resources analyzed in the Draft Environmental Assessment
- Most **adverse impacts** would be **short-term and temporary**, occurring during decommissioning / dismantling activities
- The Army and/or its contractors would implement management practices and measures to minimize adverse impacts to the extent possible
- Removal of the Deactivated SM-1 Nuclear Reactor Facility would have **long-term beneficial impacts** on some resources

The National Environmental Policy Act (NEPA) process will conclude when the Army issues a Finding of No Significant Impact (FNSI).

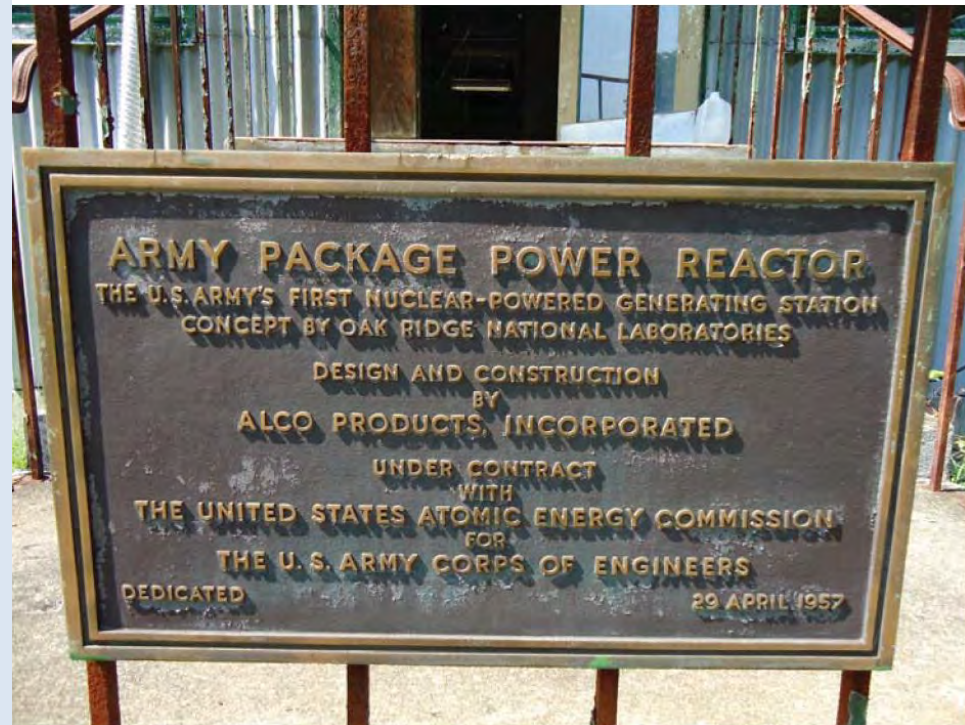


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NATIONAL HISTORIC PRESERVATION ACT – SECTION 106

- Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of their actions on properties listed, or eligible for listing, in the National Register of Historic Places
- The SM-1 Reactor Facility is eligible for listing in the National Register due to its historic significance
- Under Section 106, the Proposed Action would have an adverse effect on the SM-1 Reactor Facility
- The Army is mitigating the Section 106 adverse effect by preparing a modified Historic American Engineering Record document to record SM-1's historic significance, and will implement other measures in consultation with the Virginia Department of Historic Resources



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FLOODPLAIN MANAGEMENT

- Executive Order 11988 requires federal agencies to consider the effects of their actions on floodplains
- The former water intake pier and discharge pipe must be removed as part of the Proposed Action
- Removal of these structures will allow the shoreline to return to a natural condition, resulting in a beneficial long-term impact
- No practicable alternative exists to remove the pier and discharge pipe that would avoid disturbance of floodplains
- The Army has prepared a Draft Finding of No Practicable Alternative (FONPA) to address floodplain disturbance



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FEDERAL OVERSIGHT

- The U.S. Army Corps of Engineers will provide quality assurance over the contractor and their quality control program
- Corps of Engineers National Environmental Center of Expertise
- Army Reactor Office and Reactor Council
- Oak Ridge Associated Universities – Independent Review



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DECOMMISSIONING RISKS AND HOW WE REDUCE THEM

- **Safety is the Army's number one priority** – the safety and health of the community and our workers are paramount to the success of our project
- Trained professionals will use proven techniques and precautions to ensure the safety of the workers and the public
- To the greatest extent possible, work will be completed using appropriate engineering controls
- All wastes will be properly packaged in compliance with U.S. Department of Transportation and Nuclear Regulatory Commission requirements
- Wastes will be disposed of at licensed / permitted off-post facilities



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QUESTIONS AND HOW TO LEARN MORE

Learn more about the SM-1 Project online at:
www.nab.usace.army.mil/SM-1/

Sign up for the SM-1 stakeholder update
e-mail list by e-mailing:
CENAB-CC@usace.army.mil

Stay engaged with us online:



<https://www.facebook.com/USACEBaltimore>



[@USACEBaltimore](https://twitter.com/USACEBaltimore)



www.nab.usace.army.mil



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HOW TO COMMENT

Tonight: Fill out a comment form or dictate your comment to the stenographer

Send written comments to:

U.S. Mail: Brenda Barber, P.E.
USACE Project Manager
c/o AECOM
4840 Cox Road
Glen Allen, Virginia 23060

E-mail: cenab-cc@usace.army.mil

**Written comments must be postmarked
by January 31, 2020**



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DEACTIVATED SM-1 NUCLEAR REACTOR FACILITY DECOMMISSIONING AND DISMANTLEMENT

DRAFT ENVIRONMENTAL ASSESSMENT PUBLIC MEETING

Brenda Barber, P.E.

Hans Honerlah, CHMM

U.S. Army Corps of Engineers, Baltimore District

January 7 and 8, 2020

"The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation."



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TOPICS

- Introduction
- History of the Deactivated SM-1 Nuclear Reactor Facility
- Residual Radiation and Radiation Fundamentals
- Proposed Action
- National Environmental Policy Act (NEPA)
- Draft Environmental Assessment Findings and Conclusions
- National Historic Preservation Act Section 106
- Executive Orders (EO) 11988 and 11990
- Questions and Opportunities to Comment



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INTRODUCTION

- The U.S. Army Corps of Engineers (USACE) has made the Draft Environmental Assessment (EA), Draft Finding of No Significant Impact (FNSI), and Draft Finding of No Practicable Alternative (FONPA) available for a 6-week public review
- The 6-week public review period began on **December 20, 2019** and will end on **January 31, 2020**
- This meeting is your opportunity to learn about the Proposed Action and how to provide feedback
- You may comment orally or in writing at this meeting or submit written comments via email or U.S. Mail



Your participation in this process is highly encouraged!



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HISTORIC USE

- SM-1 provided partial power to Fort Belvoir (first reactor to power a commercial electric grid in U.S.)
- Primarily used to train nuclear operators/technicians (approximately 800 personnel trained over the 16-year lifespan)
- Served as the prototype for the rest of the reactors designed by the Army
- After deactivation, facility operated as a museum highlighting the Army Nuclear Power Program



Service members from the Army, Air Force and Navy are pictured in the control room of SM-1, which was used for training nuclear technicians from all branches.



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SM-1 TIMELINE: DETAILS



1952

DoD studies development of reactor plants

1957

SM-1 reactor startup

1973

SM-1 deactivated

2014

Corps of Engineers awards decommissioning planning contract for SM-1

- Planning is ongoing; includes EA preparation & NEPA compliance

1955

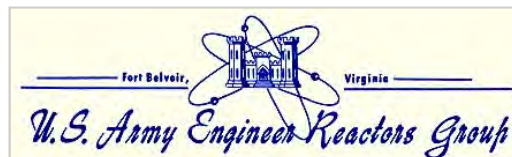
SM-1 construction begins



1973-1974

Partial decommissioning

- Remaining low-level radioactivity placed in SAFSTOR with majority of remaining radioactivity allowed to decay over the years



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1973-74 PARTIAL DECOMMISSIONING ACTIVITIES AND SAFSTOR

- Removal of the nuclear fuel
- Shipment of the radioactive waste
- Minor decontamination
- Sealing of the reactor containment vessel (which includes the Reactor Pressure Vessel, Steam Generator, Pressurizer, Reactor Coolant Pumps and primary system piping)
- Installing appropriate security, warning signs and monitoring devices
- Remaining radioactivity was contained and has been sealed in safe storage (SAFSTOR) mode for the past 40-plus years
 - Safe storage is a radiological industry practice where radioactive materials are safely stored to allow the shorter-lived radionuclides to decay
- USACE conducts quarterly environmental monitoring to ensure the site does not pose any hazards to the surrounding installation tenants, the community or the environment



Proposed Action & Environmental Assessment



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DRAFT EA ANALYZES TWO ALTERNATIVES

1 Proposed Action Alternative:

Complete decommissioning and dismantlement of the Deactivated SM-1 Nuclear Reactor Facility. This alternative includes:

- Removal of the Deactivated SM-1 Nuclear Reactor Facility and associated buildings and structures
- Removal of residual radioactive contamination exceeding regulatory levels
- Restoration of the SM-1 site to a vegetated condition and return of the site to Fort Belvoir for future use
- Termination of USACE's Decommissioning Permit

2 No Action Alternative:

Decommissioning would not be completed and the Deactivated SM-1 Nuclear Reactor Facility would be maintained as it currently is for the foreseeable future



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NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 (NEPA)

- USACE has prepared a Draft EA to analyze this action in compliance with NEPA
- NEPA is the national charter for protection of the environment (42 U.S.C. Part 4321 et seq.)
- NEPA requires federal agencies to analyze the impacts of their proposed actions
- NEPA requires opportunities for public involvement (e.g., Draft EA public comment period, this meeting)



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NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 (NEPA)

- In parallel with NEPA, federal agencies are also required to analyze the effects of their actions on:
 - Wetlands and floodplains
 - Threatened and endangered species
 - Cultural resources



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DRAFT EA ANALYZES THE FOLLOWING RESOURCES



Water resources



Air quality



Biological resources



Radiological safety and health



Occupational safety and health



Cultural resources



Transportation and traffic



Non-radiological hazardous materials
and non-hazardous solid waste



Geological resources

Resources that would not be affected by the Proposed Action are not analyzed in the Draft EA



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SUMMARY OF DRAFT EA FINDINGS

- The Proposed Action would have **no significant impacts** on resources analyzed in the Draft EA
- Most **adverse impacts** would be short-term and temporary, occur during decommissioning / dismantling activities
- The Army and/or its contractors would implement management practices and measures to minimize adverse impacts to the extent possible
- Removal of the Deactivated SM-1 Nuclear Reactor Facility would have **long-term beneficial impacts** on some resources

The NEPA process will conclude when the Army issues a Finding of No Significant Impact (FNSI).



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DRAFT EA – POTENTIAL IMPACTS



Water Resources

- Short-term adverse impacts from stormwater runoff, increased sedimentation, and/or decommissioning-related disturbances
- Adverse impacts would be minimized through adherence to appropriate management measures and practices
 - Erosion & Sediment Control Plan
 - Stormwater Pollution Prevention Plan



Most adverse impacts would occur during demolition activities and would be temporary.



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DRAFT EA – POTENTIAL IMPACTS



Water Resources (continued)

- The Proposed Action would have long-term beneficial impacts on water resources by restoring the site to a vegetated condition
- USACE has prepared a Draft FONPA in accordance with EOs 11988 and 11990 to address proposed activities affecting floodplains and wetlands



Most adverse impacts would occur during demolition activities and would be temporary.



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DRAFT EA – POTENTIAL IMPACTS



Air Quality

- Short-term adverse impacts from pollutant emissions by construction vehicles and equipment. Emissions would vary throughout the project and be comparable to similar types of construction and demolition projects
- Temporary emissions would not degrade regional air quality
- No long-term impacts



Most adverse impacts would occur during demolition activities and would be temporary.



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DRAFT EA – POTENTIAL IMPACTS



Biological Resources

- Short-term adverse impacts from clearing of vegetation and displacement of common wildlife species. Wildlife would relocate to nearby areas offering similar habitat
- Best management practices would be used to minimize impacts on vegetation and wildlife
- Long-term beneficial impacts on vegetation and wildlife from site restoration



Most adverse impacts would occur during demolition activities and would be temporary.



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DRAFT EA – POTENTIAL IMPACTS



Biological Resources (continued)

The Proposed Action:

- is not likely to adversely affect federally listed threatened and endangered terrestrial species
- may affect, but is unlikely to adversely affect federally listed fish species
- would have no effect on critical habitat



Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*)



Northern long-eared bat (*Myotis septentrionalis*)

Most adverse impacts would occur during demolition activities and would be temporary.



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DRAFT EA – POTENTIAL IMPACTS



Biological Resources (continued)

- The Proposed Action may affect, but is unlikely to adversely affect Essential Fish Habitat
- USACE has consulted with the U.S. Fish & Wildlife Service and National Marine Fisheries Service



Most adverse impacts would occur during demolition activities and would be temporary.



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DRAFT EA – POTENTIAL IMPACTS

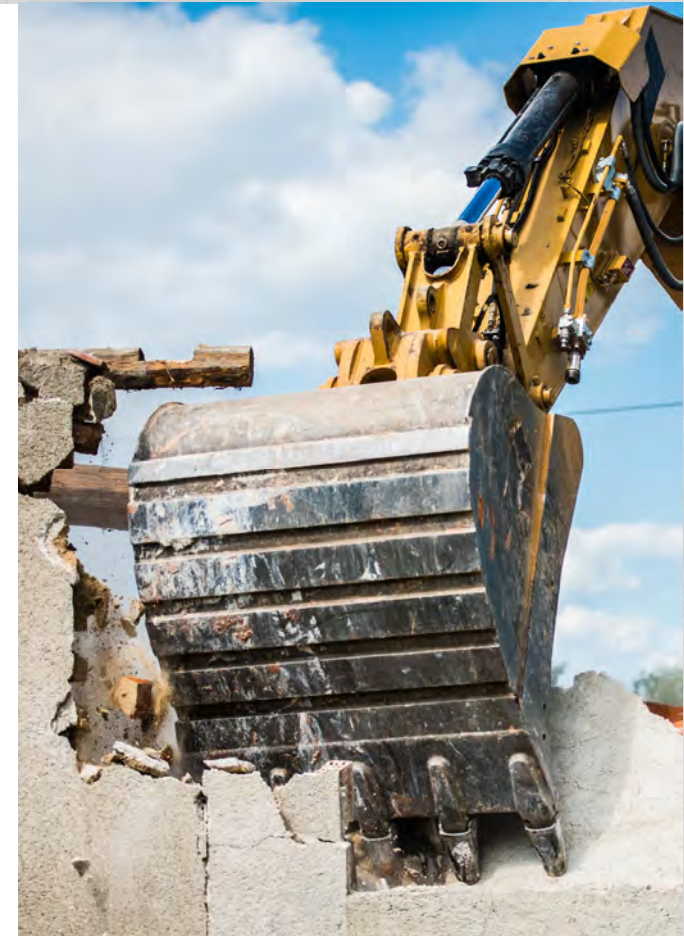


Radiological Safety and Health

Short-term adverse impacts from potential exposure to low levels of residual radiation, and the generation of debris containing low levels of residual radiation

- Current levels of radioactivity at the Deactivated SM-1 Nuclear Reactor Facility are **very low**
- Radioactive waste and debris generated by the Proposed Action would be classified as Low Level Radioactive Waste (LLRW)
- All LLRW would be packaged and transported for disposal in compliance with U.S. Department of Transportation (USDOT) and Nuclear Regulatory Commission (NRC) regulatory requirements

Most adverse impacts would occur during demolition activities and would be temporary.



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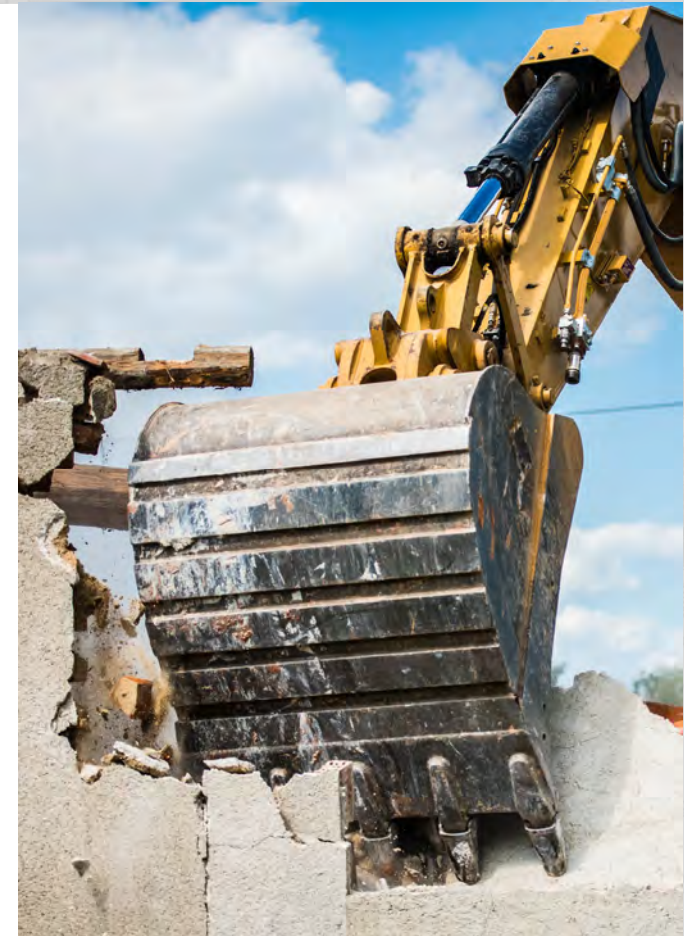


DRAFT EA – POTENTIAL IMPACTS



Radiological Safety and Health (continued)

- A **Radiation Safety Program**, an **Environmental Monitoring and Control Program**, and a **Waste Management Program** would ensure the safe removal of contaminated components and reduce the risk of release to the environment
- Appropriate monitoring of occupational radiation exposure would be provided to staff entering and working in the restricted area
- A **Waste Management Plan** (WMP) would safely guide the handling and management of LLRW
- Removal of the facility would have a long-term beneficial impact



Most adverse impacts would occur during demolition activities and would be temporary.



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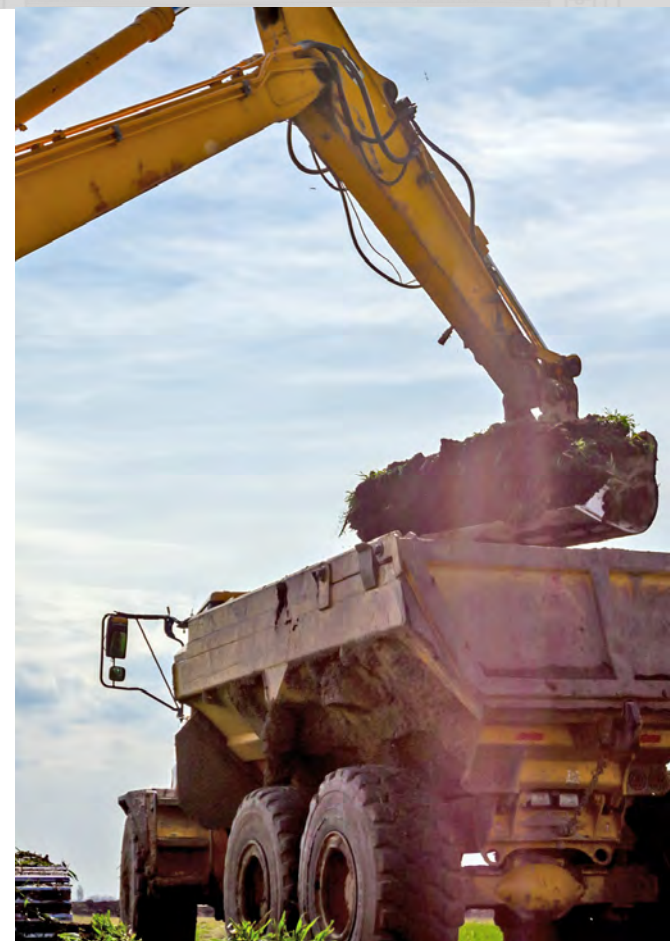
DRAFT EA – POTENTIAL IMPACTS



Occupational Safety and Health

- Short-term adverse impacts from decommissioning activities
- Long-term adverse impacts from ongoing site maintenance
- The contractor would prepare, implement, and adhere to an **Accident Prevention Plan (APP)** before performing work. The APP would be reviewed and updated throughout the project as phases and/or conditions change
 - USACE would provide continuous oversight of the APP
- USACE would enter into agreements with on- and off-post first response services and hospitals to ensure any needed support is available.

Most adverse impacts would occur during demolition activities and would be temporary.



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DRAFT EA – POTENTIAL IMPACTS



Cultural Resources

- The SM-1 Reactor Facility is eligible for listing in the National Register of Historic Places due to its historic significance
- USACE is consulting with the Virginia Department of Historic Resources to record the history and operation of SM-1
- Adherence to mitigation measures will ensure that effects on this National Register-eligible resource remain less than significant
- No effects on traditional cultural resources



Most adverse impacts would occur during demolition activities and would be temporary.



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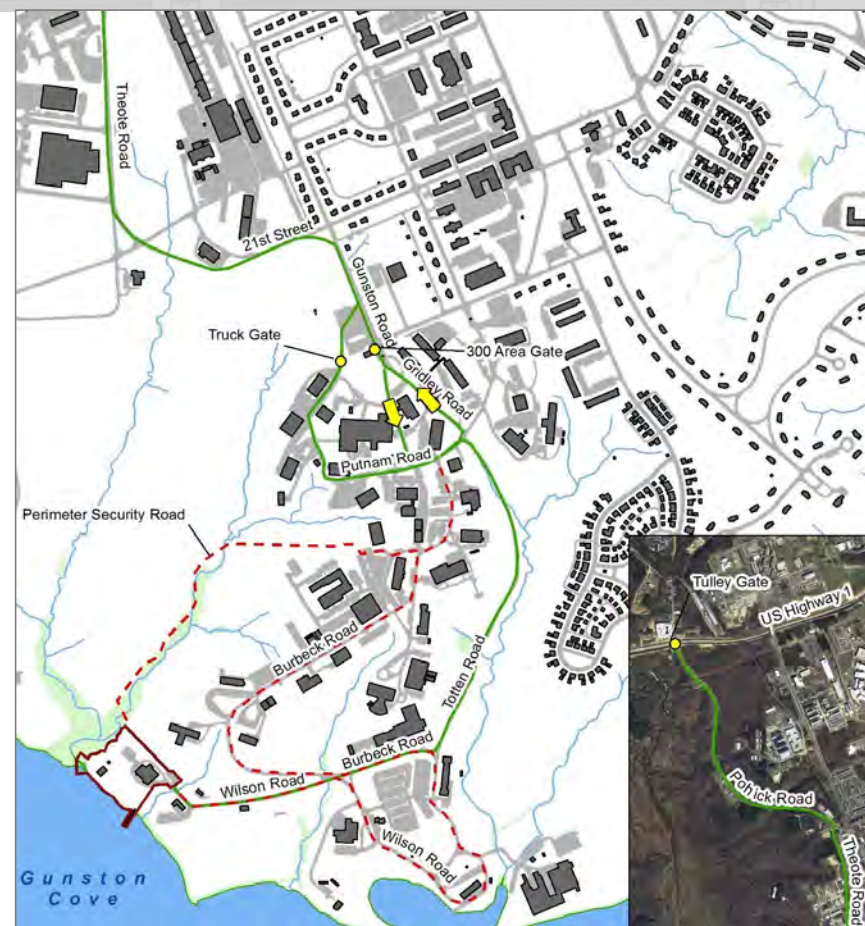


DRAFT EA – POTENTIAL IMPACTS



Transportation and Traffic

- Short-term adverse impacts on the on- and off-post transportation networks
- The Proposed Action would generate an estimated 1,150 truck trips over the 5-year project to remove debris and deliver clean fill soils during site restoration
- All debris would be packaged and transported in accordance with USDOT and NRC requirements



Most adverse impacts would occur during demolition activities and would be temporary.



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DRAFT EA – POTENTIAL IMPACTS



Non-Radiological Hazardous Materials / Non-Hazardous Solid Waste

- Short-term adverse impacts from waste generated during decommissioning activities
- All waste generated by the Proposed Action would be managed, handled responsibly
- No long-term impacts



Most adverse impacts would occur during demolition activities and would be temporary.



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DRAFT EA – POTENTIAL IMPACTS



Geology, topography, and soils

- Short-term adverse impacts on topography, soils, bathymetry, and sediments
- Long-term beneficial impacts from site restoration and removal of soils with low levels of residual contaminants



Most adverse impacts would occur during demolition activities and would be temporary.

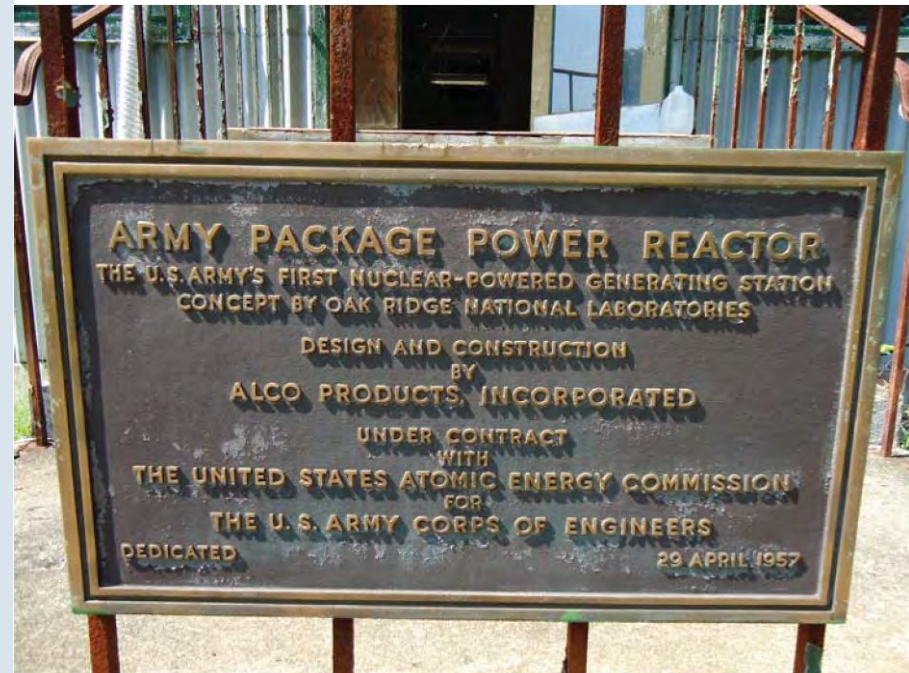


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SECTION 106

- Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to consider the effects of their actions on properties listed, or eligible for listing, in the National Register of Historic Places
- The SM-1 Reactor Facility is eligible for listing in the National Register due to its historic significance
- Under Section 106, the Proposed Action would have an adverse effect on the SM-1 Reactor Facility
- USACE is mitigating the Section 106 adverse effect by preparing a modified Historical American Engineering Record (HAER) document to record SM-1's historic significance, and will implement other measures in consultation with Virginia Department of Historic Resources (VDHR)



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FLOODPLAIN MANAGEMENT AND PROTECTION OF WETLANDS

- The former water intake pier and discharge pipe must be removed as part of the Proposed Action
- Removal of these structures will allow the shoreline to return to a natural condition, resulting in a beneficial long-term impact
- No practicable alternative exists to remove the pier and discharge pipe that would avoid disturbance of floodplains and wetlands
- USACE has prepared a Draft Finding of No Practicable Alternative (FONPA) to address floodplain disturbance



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DECOMMISSIONING RISKS AND HOW WE REDUCE THEM

- Safety is the Army's number one priority—the safety and health of the community and our workers are paramount to the success of our project
- Trained professionals will use proven techniques and precautions to ensure the safety of the workers and the public
- Work will be completed using appropriate engineering controls
- All wastes will be properly packaged in compliance with USDOT and NRC requirements
- Wastes will be disposed of at permitted off-post facilities with adequate capacity to handle and manage them



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FEDERAL OVERSIGHT



**US Army Corps
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ORAU

- U.S. Army Corps of Engineers will provide quality assurance over the contractor and their quality control program
- Corps of Engineers National Environmental Center of Expertise
- Army Reactor Office and Reactor Council
- Oak Ridge Associated Universities – Independent Review



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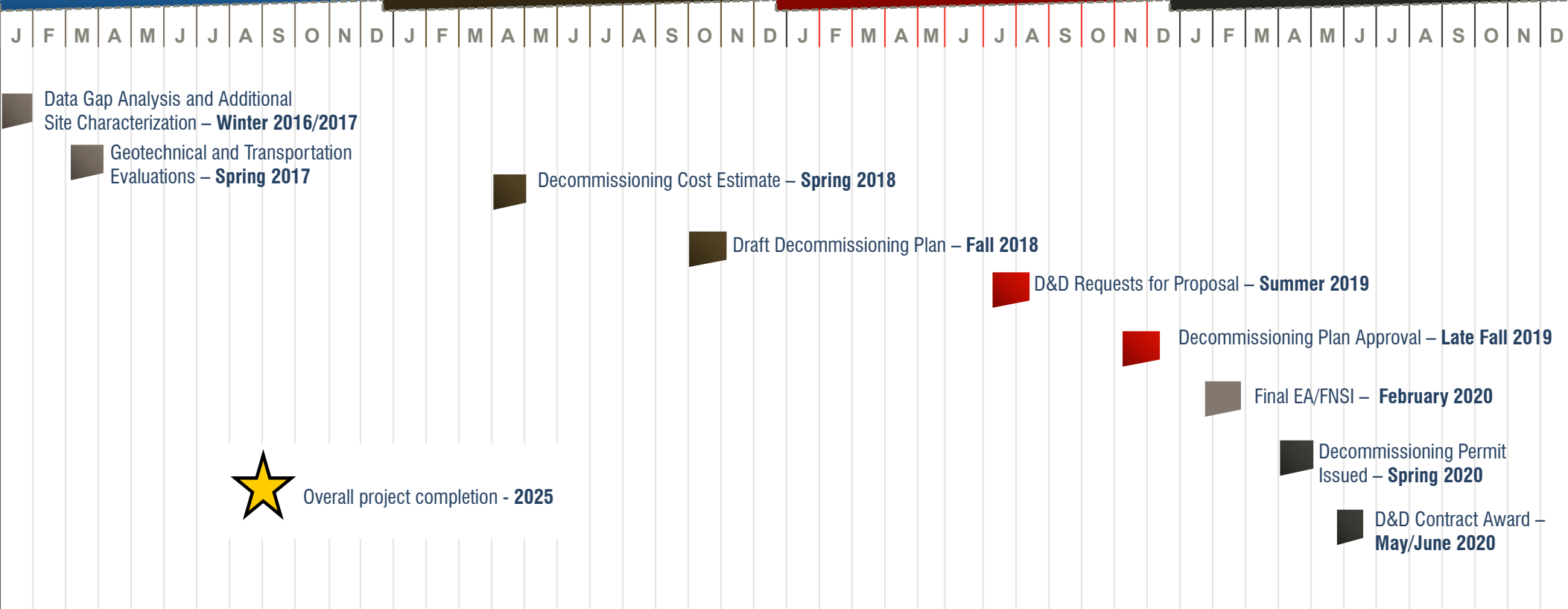
TIMELINE / SCHEDULE

2017

2018

2019

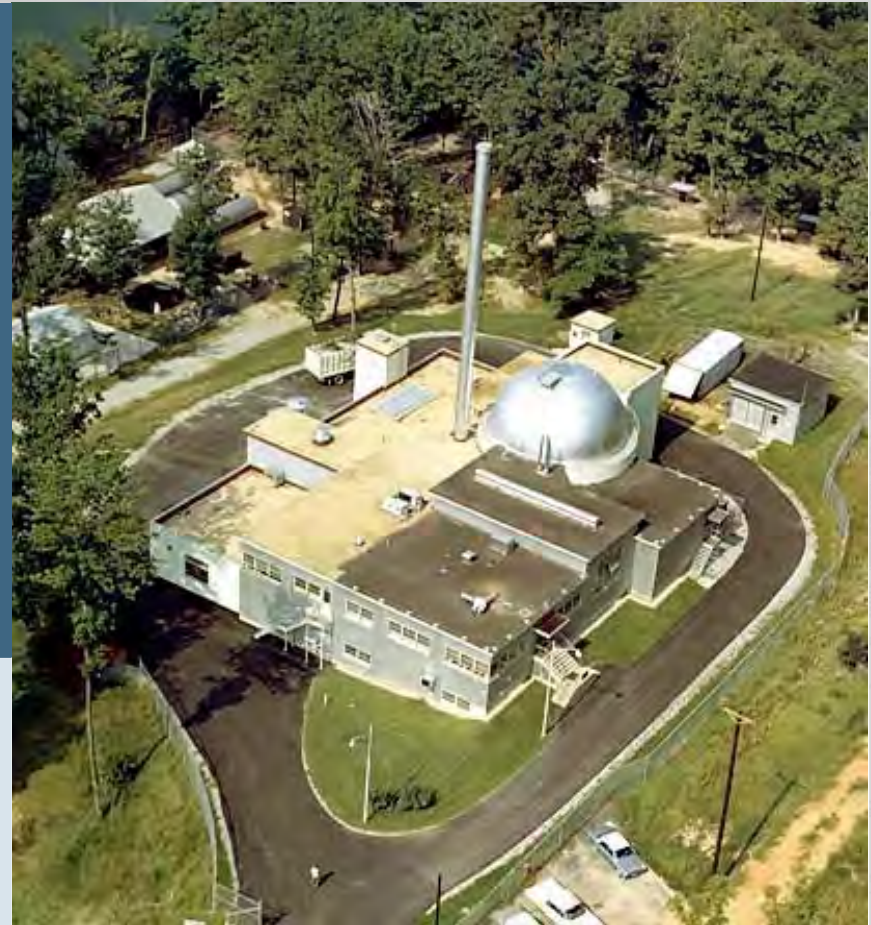
2020



QUESTIONS AND HOW TO LEARN MORE

Learn more about the SM-1 Project online at:
www.nab.usace.army.mil/SM-1/

Sign up for the SM-1 stakeholder update
e-mail list by e-mailing:
CENAB-CC@usace.army.mil



Stay engaged with us online:



<https://www.facebook.com/USACEBaltimore>



[@USACEBaltimore](https://twitter.com/USACEBaltimore)



www.nab.usace.army.mil



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HOW TO COMMENT ON THE DRAFT EA, DRAFT FNSI, AND DRAFT FONPA

Tonight: Fill out a comment form or dictate
your comment to the stenographer

Send written comments to:

U.S. Mail: Brenda Barber, P.E.
USACE Project Manager
c/o AECOM
4840 Cox Road
Glen Allen, Virginia 23060

E-mail: cenab-cc@usace.army.mil

**Written comments must be postmarked
by January 31, 2020**



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**Notice of Availability and Public Meeting for Draft EA, Draft FNSI,
and Draft FONPA**



**DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MD 21201**

20 December 2019

SUBJECT: Notice of Availability and Public Meeting for the Draft Environmental Assessment, Draft Finding of No Significant Impact, and Draft Finding of No Practicable Alternative for the Proposed Decommissioning and Dismantlement of the Deactivated SM-1 Nuclear Reactor Facility, US Army Garrison Fort Belvoir, Fairfax County, Virginia

Dear Sir or Madam:

The US Army Corps of Engineers (USACE) announces the availability of the Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FNSI) for the proposed decommissioning and dismantlement of the Deactivated Stationary Medium Power Model 1 (SM-1) Nuclear Reactor Facility at US Army Garrison Fort Belvoir in Fairfax County, Virginia for public review and comment. This notice also announces the availability of the Draft Finding of No Practicable Alternative (FONPA) in accordance with Executive Order (EO) 11988, *Floodplain Management*. This notice is being issued to all interested parties in accordance with the National Environmental Policy Act (NEPA), Council on Environmental Quality NEPA implementing regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508), and Army NEPA regulations (32 CFR Part 651).

USACE proposes to decommission the Deactivated SM-1 Nuclear Reactor Facility to a standard that allows for release of the site for unrestricted use (proposed action). Under the proposed action, USACE would implement an Army Reactor Office-approved Decommissioning Plan to safely remove, transport, and dispose of remaining structures, equipment, and media from the SM-1 site; validate that site conditions meet applicable cleanup standards; restore the site to a vegetated condition; and return the site to Fort Belvoir for future use. The Draft EA analyzes the potential environmental impacts of the proposed action and concludes that there would be no significant adverse impacts on the physical, cultural, and natural environment.

Printed copies of the Draft EA, Draft FNSI, and Draft FONPA are available for review at the following local libraries:

Fort Belvoir Library
9800 Belvoir Rd, Bldg 200
Fort Belvoir, VA 22060

Kingstowne Library
6500 Landsdowne Centre
Alexandria, VA 22315-5011

Lorton Library
9520 Richmond Highway
Lorton, VA, 22079-2124

The Draft EA, Draft FNSI, and Draft FONPA are available for view or download online or by request, as follows:

Online

www.nab.usace.army.mil/SM-1

<https://home.army.mil/belvoir/index.php/about/Garrison/directorate-public-works/environmental-division>

Compact Disc**Request by email to:**

cenab-cc@usace.army.mil

Request by mail to:

Brenda Barber, P.E.

USACE Project Manager

c/o AECOM

4840 Cox Road, Glen Allen, VA 23060

USACE invites public agencies and members of the public to participate in its decision-making process. Your comments on the proposed action and environmental review are requested. In accordance with 32 CFR Part 651.14, the Draft EA, Draft FNSI, and Draft FONPA will be available for a 6-week public review and comment period starting 20 December 2019 and ending 31 January 2020. Written comments on the Draft EA, Draft FNSI, and Draft FONPA, or requests for additional information about the proposed action and environmental review, should be sent to USACE at the email or postal mail addresses noted above.

USACE invites interested parties to attend **public meetings** for the Draft EA to learn more about the proposed action and environmental review. The public meetings will be held on January 7 and 8, 2020. Each meeting will be conducted in an open house format to include a short presentation followed by questions and answers from the audience. The public meeting schedule will be:

Tuesday, January 7, 2020 (On-Post*)

Thurman Hall, Building 247, 270 Kuhn Road, Fort Belvoir, VA 22060

(* Due to Fort Belvoir security requirements, attendance at the on-post meetings is limited to Department of Defense military and civilian personnel, Fort Belvoir residents, and Fort Belvoir contractors/civilian employees.)

- Afternoon Meeting: Open House/Poster Session 1:00 PM – 2:00 PM, Formal Presentation and Audience Questions 2:00 PM – 3:00 PM
- Evening Meeting: Open House/Poster Session 6:30 PM – 7:30 PM, Formal Presentation and Audience Questions 7:30 PM - 8:30 PM

Wednesday, January 8, 2020 (Off-Post – Open to the General Public)

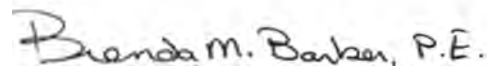
Fairfax South County Office, Room 221, 8350 Richmond Highway, Alexandria, VA 22309

- Open House/Poster Session 6:30 PM – 7:30 PM, Formal Presentation and Audience Questions 7:30 PM - 8:30 PM

Interested parties are encouraged to provide written or oral comments at the public meetings. Updates on the SM-1 Decommissioning project and public meeting are available on the USACE project website at: <https://www.nab.usace.army.mil/Missions/Environmental/SM-1/>.

Should you require special assistance due to a disability, have limited English proficiency, or have other questions or concerns about the public meeting, please contact the USACE Corporate Communication team at 410-962-2809 in advance of the event.

Sincerely,

A handwritten signature in black ink that reads "Brenda M. Barber, P.E.".

Brenda M. Barber, P.E.
Project Manager
USACE – Baltimore District



Announcements

Draft Environmental Assessment Release

The US Army Corps of Engineers (USACE), Baltimore District proposes to fully decommission and dismantle the Deactivated Stationary Medium Power Model 1 (SM-1) Reactor Facility on Fort Belvoir in Fairfax County, Virginia to a standard that allows for release of the site for unrestricted use (proposed action). Under the proposed action, USACE would implement an Army Reactor Office-approved Decommissioning Plan to safely remove, transport, and dispose of remaining structures, equipment, and media from the Deactivated SM-1 site; validate that site conditions meet applicable cleanup standards; restore the site to a vegetated condition; and return the site to Fort Belvoir for future use. Through analysis and evaluation of the proposed action's potential environmental impacts, USACE concludes that there would be no significant adverse impacts on the physical, cultural, and natural environment.

USACE has prepared a Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FNSI) regarding the proposed action as well as a Draft Finding of No Practicable Alternative (FONPA), prepared by USACE to comply with Executive Order (EO) 11988, Floodplain Management.

These documents are available online here for review and USACE is accepting comments from the public through January 31st (which includes extra time to account for the holiday time being in the middle of the comment period). Comments can be submitted via e-mail to cenab-cc@usace.army.mil or by written mail to:

Brenda Barber, P.E.
USACE Project Manager
c/o AECOM
4840 Cox Road, Glen Allen, VA 23060

Draft EA, FNSI, FONPA and associated documents:

- [Notice of Availability and Public Meeting](#)
- [Draft Environmental Assessment \(EA\)](#)
- [Draft Environmental Assessment Compiled Appendices](#)
 - [Appendix A - Public Information and Outreach](#)
 - [Appendix B - Agency Correspondence](#)
 - [Appendix C - Draft Finding of No Practicable Alternative \(FONPA\)](#)
 - [Appendix D - Federal Consistency Determination](#)
 - [Appendix E - Record of Non-Applicability \(RONA\) and Air Quality Emissions Estimates](#)
- [Draft Finding of No Significant Impact \(FNSI\)](#)

Upcoming Public Information Sessions Regarding Draft EA



Contact Information

To join our stakeholder list and receive email updates, please call or email us:

Phone: 410-962-2809
E-mail: cenab-cc@usace.army.mil

Or if you have questions, please don't hesitate to reach out to us.

Please direct any inquiries regarding contracting opportunities to Brian Richardson via email to Brian.L.Richardson@usace.army.mil.

Project Documents

This section includes the project documents to date.

[Collapse All](#) [Expand All](#)

[Documents](#)

[Project Fact Sheet](#)

[NRC EIS Executive Summary](#)

Presentations

[- Jan. 8 and 9, 2020 Draft EA Public Meeting Presentation](#)

[- Jan. 8 and 9, 2020 Draft EA Public Meetings Posters](#)

[- March 12, 2019 Public Info Session Presentation](#)

[- March 12, 2019 Public Info Session Posters](#)

[- January 28, 2019 Public Meeting Presentation](#)

[- SM-1 Decommissioning Overview for Waste Management 2018 Conference \(March 2018\)](#)

[- Contract Acquisition Approach for Industry - SM-1 and SM-1A \(March 2018\)](#)

Links of Historical Interest



On-Post Public Info Sessions January 9, 2019 Wood Theater (6050 Abbot Road) Fort Belvoir, VA Afternoon Meeting: Open House/Poster Session: 1:00PM – 2:00 PM Formal Presentation: and Audience Questions: 2:00 PM – 3:00 PM Evening Meeting: Open House/Poster Session: 6:30 PM – 7:30 PM Formal Presentation and Audience Questions: 7:30 PM - 8:30 PM	Fairfax County's South County Government Center (Room 221, 8350 Richmond Highway, Alexandria, VA 22309) Evening Meeting: Open House/Poster Session: 6:30 PM – 7:30 PM Formal Presentation and Audience Questions: 7:30 PM - 8:30 PM
Click here to download the presentation given at the meetings Click here to download the posters displayed at the meetings	

[Office of History](#)

[- Article - Pioneer in military use of nuclear power provides insight on facility...](#)

[- Video - Army Nuclear Power Program \(1963\)](#)

SM-1: January 7, 2020 Stakeholder Update

Dear Stakeholders,

Due to impending inclement weather in the Fort Belvoir area and the associated Office of Personnel Management-dictated closure of offices on post, we are postponing both on-post Deactivated SM-1 Nuclear Reactor public meetings scheduled for today, Jan. 7, and will be holding them the afternoon and evening of Thursday, Jan. 9 in Wood Theater.

We appreciate your understanding of this change. The safety of the public and our team is paramount in everything we do.

The new schedule for the on-post meetings will be as follows:

- Thursday, January 9, 2020 (On-Post*) – Wood Theater (Bldg. 2120), 6050 Abbot Road, Fort Belvoir, VA 22060

(* Due to Fort Belvoir security requirements, attendance at the on-post meetings is limited to Department of Defense military and civilian personnel, Fort Belvoir residents, and Fort Belvoir contractors/civilian employees.)

- Afternoon Meeting: Open House/Poster Session 1:00 PM – 2:00 PM, Formal Presentation and Audience Questions 2:00 PM – 3:00 PM
- Evening Meeting: Open House/Poster Session 6:30 PM – 7:30 PM, Formal Presentation and Audience Questions 7:30 PM - 8:30 PM

Tomorrow evening's off-post public meeting is not impacted by this announcement. Stakeholders that planned to attend today's on-post meetings are welcome to attend tomorrow evening's meeting. Tomorrow's meeting schedule is as follows:

- Wednesday, January 8, 2020 (Off-Post – Open to the General Public) – Gerry Hyland Government Center (formerly known as the Fairfax South County Office), Room 221, 8350 Richmond Highway, Alexandria, VA 22309

- Open House/Poster Session 6:30 PM – 7:30 PM, Formal Presentation and Audience Questions 7:30 PM - 8:30 PM

Thank you for your continued support and participation as we continue through the planning phase of the deactivated SM-1 decommissioning and dismantling.

If you have any questions, feedback or information you'd like to share with us, please feel free to e-mail or call our Corporate Communication team at 410-962-2809.



Join Our Stakeholder List

SM-1 Stakeholder List

Receive the latest updates regarding the former SM-1 Nuclear Power Plant by entering your information below to join our stakeholder list.

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SM-1 Former Nuclear Power Plant Overview

The SM-1 Former Nuclear Power Plant is located on the western shore of the Potomac River within the boundaries of Fort Belvoir in Fairfax County, Virginia. It is approximately 17 miles south by southwest from the center of Washington D.C.

The construction of the SM-1 at Fort Belvoir was completed in 1957, and it achieved its first criticality in April 1957. The SM-1 was a single-loop 10 megawatt-thermal (MWt) pressurized water reactor delivering a net 1,750 kilowatts of electrical power. It was the first nuclear power reactor to provide electricity to a commercial power grid in the United States. The SM-1 Reactor operated from April 1957 to March 1973. Fort Belvoir was home to the U.S. Army Engineer Reactors Group (USAERG), and the SM-1 was used for training the multi-service crews that would operate the various plants in the program. The reactor was stationary with a medium power range, which was between 1,000 and 10,000 kilowatt-electric (kWe).

Deactivation was performed on the SM-1 Reactor from 1973-1974, in accordance with the SM-1 Decommissioning and Conversion Plan as approved by the Army Reactor Systems Health and Safety Review Committee (ARCHS). This consisted of removal of the nuclear fuel, minor decontamination, shipment of necessary radioactive waste, sealing the pressure vessel, and installing appropriate warning signs and monitoring devices.

After the completion of the facility deactivation and conversion, a third party radiological survey by the U.S. Army Environmental Hygiene Agency verified that known areas of radioactive contamination had been decontaminated to acceptable levels or were properly controlled. The ARCHS approved the SM-1 Post-Decommissioning Environmental Monitoring Plan, which has been used to provide on-going surveillance of the decommissioned facility.

In October 1996, the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) took extensive surveys of the SM-1 and surrounding environment to determine the radiological status of the facility at that time. In 2005, a Historical Site Assessment was developed using operational records and data collected from the 1996 USACHPPM Surveys. In 2009/2010 Characterization Surveys were completed and the Report was finalized in 2013.

The Historical Site Assessment and Characterization Surveys support the decommissioning study process outlined in Army Regulation 50-7. This process is performed by USACE, at the direction of the Army Reactor Office, to better define disposal activity costs.

The decommissioning strategy that was developed in the 1970's recommended that the deactivated reactors be placed into a safe storage mode that would allow the shorter-lived radionuclides to decay. It was expected that delaying decommissioning would reduce radioactive waste volumes and worker exposures. However, subsequent studies indicated that the levels of contamination present within the reactors would not be reduced by decay sufficiently to allow for release of the facilities without significant decontamination being performed. Additionally, concern regarding the increasing cost and



US Army Corps of Engineers Baltimore District Website

USACE developed a management plan for conducting an All Hazards Assessment, which contained provisions for four phases of work to be performed. Phase I included a Historical Records Review and Disposal Alternatives Investigation. Phase II, included performing a characterization survey and decommissioning cost estimate. Phases III and IV deal with decommissioning planning, design, and execution.

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About the Baltimore District Website

The official public website of the Baltimore District, U.S. Army Corps of Engineers. For website corrections, write to cenab-pa@usace.army.mil.



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NOTICE OF AVAILABILITY AND PUBLIC MEETING DRAFT

Notice of Availability and Public Meeting

Draft Environmental Assessment, Draft Finding of No Significant Impact, and Draft Finding of No Practicable Alternative for the
Decommissioning and Dismantlement of the Deactivated SM-1 Nuclear Reactor Facility
Fort Belvoir, Fairfax County, Virginia

Proposed Action. The US Army Corps of Engineers (USACE), Baltimore District proposes to fully decommission and dismantle the Deactivated Stationary Medium Power Model 1 (SM-1) Reactor Facility on Fort Belvoir in Fairfax County, Virginia to a standard that allows for release of the site for unrestricted use (proposed action). Under the proposed action, USACE would implement an Army Reactor Office-approved Decommissioning Plan to safely remove, transport, and dispose of remaining structures, equipment, and media from the Deactivated SM-1 site; validate that site conditions meet applicable cleanup standards; restore the site to a vegetated condition; and return the site to Fort Belvoir for future use. Through analysis and evaluation of the proposed action's potential environmental impacts, USACE concludes that there would be no significant adverse impacts on the physical, cultural, and natural environment.

Public Notice. Interested parties are hereby notified that USACE has prepared a Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FNSI) regarding the proposed action. Notice is also made for a Draft Finding of No Practicable Alternative (FONPA), prepared by USACE to comply with Executive Order (EO) 11988, Floodplain Management.

Statutory Authority. This notice is being issued to all interested parties in accordance with the National Environmental Policy Act (NEPA), Council on Environmental Quality NEPA implementing regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508), and Army NEPA regulations (32 CFR Part 651).

Public Review. In accordance with 32 CFR Part 651.14, the Draft EA, Draft FNSI, and Draft FONPA will be available for a six-week public review and comment period starting December 20, 2019 and concluding on January 31, 2020. The public may submit comments on these documents during this time.

Printed copies of the Draft EA, Draft FNSI, and Draft FONPA are available for review at the following local libraries:

Fort Belvoir Library Kingstowne Library Lorton Library
9800 Belvoir Rd, Bldg 200 6500 Landsdowne Centre 9520 Richmond Highway
Fort Belvoir, VA 22060 Alexandria, VA 22315-5011 Lorton, VA, 22079-2124

The Draft EA, Draft FNSI, and Draft FONPA are available for view or download online or by request, as follows:

Online www.nab.usace.army.mil/SM-1

<https://home.army.mil/belvoir/index.php/about/Garrison/directorate-public-works/environmental-division>

Compact Disc **Request by email to:**
cenab-cc@usace.army.mil

Request by mail to:
Brenda Barber, P.E.
USACE Project Manager
c/o AECOM
4840 Cox Road, Glen Allen, VA 23060

Comments. Written comments on the Draft EA, Draft FNSI, and Draft FONPA, or requests for additional information about the proposed action and environmental review, should be sent to USACE at the email or postal mail addresses noted above.

Public Meetings. USACE invites interested parties and the local community to attend public meetings for the Draft EA to learn more about the proposed action and environmental review. The public meetings will be held on January 7 and 8, 2020. Each meeting will be conducted in an open house format to include a short presentation followed by questions and answers from the audience. In accordance with NEPA, the participation of military personnel, federal, state, and local agencies, federally recognized tribes, organizations, and individuals with an interest in the proposed action is strongly encouraged.

The public meeting schedule will be:

Tuesday, January 7, 2020 (On-Post*)

Thurman Hall, Building 247, 270 Kuhn Road, Fort Belvoir, VA 22060

(* Due to Fort Belvoir security requirements, attendance at the on-post meetings is limited to Department of Defense military and civilian personnel, Fort Belvoir residents, and Fort Belvoir contractors/civilian employees.)

- Afternoon Meeting: Open House/Poster Session 1:00 PM - 2:00 PM, Formal Presentation and Audience Questions 2:00 PM - 3:00 PM
- Evening Meeting: Open House/Poster Session 6:30 PM - 7:30 PM, Formal Presentation and Audience Questions 7:30 PM - 8:30 PM

Wednesday, January 8, 2020 (Off-Post - Open to the General Public)

Fairfax South County Office, Room 221, 8350 Richmond Highway, Alexandria, VA 22309

- Open House/Poster Session 6:30 PM - 7:30 PM, Formal Presentation and Audience Questions 7:30 PM - 8:30 PM

Interested parties are encouraged to provide written or oral comments at the meetings. Should you require special assistance due to a disability, have limited English proficiency, or have other questions or concerns about the public meeting, please contact the USACE Corporate Communication team at 410-962-2809 in advance of the event. Please note that presentations at the different sessions will all be the same and will be shared online following the meetings.

Updates regarding the Deactivated SM-1 Decommissioning project, how to join the stakeholder updates list and public meeting information are available on the USACE project website at:

www.nab.usace.army.mil/SM-1/.

Appeared in: **Washington Post** on Friday, 12/20/2019

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PROOF OF PUBLICATION

District of Columbia, ss., Personally appeared before me, a Notary Public in and for the said District, Sandra Broadstone well known to me to be ASSISTANT MANAGER BILLING of The Washington Post, a daily newspaper published in the City of Washington, District of Columbia, and making oath in due form of law that an advertisement containing the language annexed hereto was published in said newspaper on the dates mentioned in the certificate herein.

I Hereby Certify that the attached advertisement was published in The Washington Post, a daily newspaper, upon the following date(s) at a cost of \$3,415.80 and was circulated in the Washington metropolitan area.

Published 1 time(s). Date(s): 20 of December 2019

Account 2010263154

Sandra Broadstone

Witness my hand and official seal this 8th day of January 2020

My commission expires 12/31/2024



Notice of Availability and Public Meeting Draft Environmental Assessment, Draft Finding of No Significant Impact, and Draft Finding of No Practicable Alternative for the Decommissioning and Dismantlement of the Deactivated SM-1 Nuclear Reactor Facility Fort Belvoir, Fairfax County, Virginia Proposed Action. The US Army Corps of Engineers (USACE), Baltimore District proposes to fully decommission and dismantle the Deactivated Stationary Medium Power Model 1 (SM-1) Reactor Facility on Fort Belvoir in Fairfax County, Virginia to a standard that allows for release of the site for unrestricted use (proposed action). Under the proposed action, USACE would implement an Army Reactor Office-approved Decommissioning Plan to safely remove, transport, and dispose of remaining structures, equipment, and media from the Deactivated SM-1 site; validate that site conditions meet applicable cleanup standards; restore the site to a vegetated condition; and return

the site to Fort Belvoir for future use. Through analysis and evaluation of the proposed action's potential environmental impacts, USACE concludes that there would be no significant adverse impacts

on the physical, cultural, and natural environment. Public Notice. Interested parties are hereby

notified that USACE has prepared a Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FNSI) regarding the proposed action. Notice is also made for a Draft Finding of

No Practicable Alternative (FONPA), prepared by USACE to comply with Executive Order (EO) 11988, Floodplain Management. Statutory Authority. This notice is being issued to all interested parties

in accordance with the National Environmental Policy Act (NEPA), Council on Environmental Quality NEPA implementing regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508), and Army NEPA

regulations (32 CFR Part 651). Public Review. In accordance with 32 CFR Part 651.14, the Draft EA,

Draft FNSI, and Draft FONPA will be available for a six-week public review and comment period starting December 20, 2019 and concluding on January 31, 2020. The public may submit comments on these documents during this time. Printed copies of the Draft EA, Draft FNSI, and Draft FONPA are

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Kingstowne Library Lorton Library

9800 Belvoir Rd, Bldg 200
9520 Richmond Highway Fort Belvoir, VA 22060
Alexandria, VA 22315-5011
Draft

6500 Landsdowne Centre

Lorton, VA, 22079-2124 The Draft EA,

FNSI, and Draft FONPA are available for view or download online or by request, as follows:
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<https://home.army.mil/belvoir/index.php/about/Garrison/>

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cenab-cc@usace.army.mil

Request by mail to:

Brenda Barber, P.E.

USACE Project Manager

c/o AECOM

4840 Cox Road, Glen Allen, VA 23060 Comments. Written comments on the Draft

EA, Draft FNSI, and Draft FONPA, or requests for additional information about the proposed action and environmental review, should be sent to USACE at the email or postal mail addresses noted above.

Public Meetings. USACE invites interested parties and the local community to attend public meetings for the Draft EA to learn more about the proposed action and environmental review. The public meetings will be held on January 7 and 8, 2020. Each meeting will be conducted in an open house format to include a short presentation followed by questions and answers from the audience. In

accordance with NEPA, the participation of military personnel, federal, state, and local agencies,

federally recognized tribes, organizations, and individuals with an interest in the proposed action

is strongly encouraged. The public meeting schedule will be: Tuesday, January 7, 2020 (On-

Post*) Thurman Hall, Building 247, 270 Kuhn Road, Fort Belvoir, VA 22060 (* Due to Fort Belvoir security requirements, attendance at the on-post meetings is limited to Department of Defense military and civilian personnel, Fort Belvoir residents, and Fort Belvoir contractors/civilian employees.) # Afternoon Meeting: Open House/Poster Session 1:00 PM # 2:00 PM, Formal Presentation and Audience Questions 2:00 PM # 3:00 PM # Evening Meeting: Open House/Poster Session

6:30 PM # 7:30 PM, Formal Presentation and Audience Questions 7:30 PM - 8:30 PM Wednesday, January

8, 2020 (Off-Post # Open to the General Public) Fairfax South County Office, Room 221, 8350 Richmond

Highway, Alexandria, VA 22309 # Open House/Poster Session 6:30 PM # 7:30 PM, Formal Presentation and Audience Questions 7:30 PM - 8:30 PM Interested parties are encouraged to provide written or oral comments at the meetings. Should you require special assistance due to a disability, have limited English proficiency, or have other questions or concerns about the public meeting, please contact the USACE Corporate Communication team at 410-962-2809 in advance of the event. Please note

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the stakeholder updates list and public meeting information are available on the USACE project website at: www.nab.usace.army.mil/SM-1/.

CHILDREN'S

Day of the Dead Sugar Skull Painting

**T.C. WILLIAMS
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Acrylic paintings from the Day of the Dead Sugar Skull Painting unit. The students are 9th graders in Art I from T.C. Williams High School Minnie Howard. Anna Davila, Visual Arts Teacher



Lella Abarca



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Legals

Notice of Availability and Public Hearing

Draft Environmental Assessment, Draft Finding of No Significant Impact, and Draft Finding of No Practicable Alternative for the Decommissioning and Dismantlement of the Deactivated SM-1 Nuclear Reactor Facility

Fort Belvoir, Fairfax County, Virginia

Proposed Action. The US Army Corps of Engineers (USACE), Baltimore District proposes to fully decommission and dismantle the Deactivated Stationary Medium Power Model 1 (SM-1) Reactor Facility on Fort Belvoir in Fairfax County, Virginia to a standard that allows for release of the site for unrestricted use (proposed action). Under the proposed action, USACE would implement an Army Reactor Office-approved Decommissioning Plan to safely remove, transport, and dispose of remaining structures, equipment, and media from the Deactivated SM-1 site; validate that site conditions meet applicable cleanup standards; restore the site to a vegetated condition; and return the site to Fort Belvoir for future use. Through analysis and evaluation of the proposed action's potential environmental impacts, USACE concludes that there would be no significant adverse impacts on the physical, cultural, and natural environment.

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Statutory Authority. This notice is being issued to all interested parties in accordance with the National Environmental Policy Act (NEPA), Council on Environmental Quality NEPA implementing regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508), and Army NEPA regulations (32 CFR Part 651).

Public Review. In accordance with 32 CFR Part 651.14, the Draft EA, Draft FNSI, and Draft FONPA will be available for a six-week public review and comment period starting December 20, 2019 and concluding on January 31, 2020. The public may submit comments on these documents during this time. Printed copies of the Draft EA, Draft FNSI, and Draft FONPA are available for review at the following local libraries:

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USACE Project Manager
c/o AECOM
4840 Cox Road, Glen Allen, VA 23060

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Notice of Availability, Public Meeting: SM-1 Nuclear Reactor Facility Decommissioning, Dismantle

December 20, 2019 Contributor

Notice of Availability and Public Meeting

Draft Environmental Assessment, Draft Finding of No Significant Impact, and Draft Finding of No Practicable Alternative for the Decommissioning and Dismantlement of the Deactivated SM-1 Nuclear Reactor Facility, Fort Belvoir, Fairfax County, Virginia

Proposed Action. The US Army Corps of Engineers (USACE), Baltimore District proposes to fully decommission and dismantle the Deactivated Stationary Medium Power Model 1 (SM-1) Reactor Facility on Fort Belvoir in Fairfax County, Virginia to a standard that allows for release of the site for unrestricted use (proposed action). Under the proposed action, USACE would implement an Army Reactor Office-approved Decommissioning Plan to safely remove, transport, and dispose of remaining structures, equipment, and media from the Deactivated SM-1 site; validate that site conditions meet applicable cleanup standards; restore the site to a vegetated condition; and return

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Statutory Authority. This notice is being issued to all interested parties in accordance with the National Environmental Policy Act (NEPA), Council on Environmental Quality NEPA implementing regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508), and Army NEPA regulations (32 CFR Part 651).

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Alexandria, VA 22315-5011

Lorton Library
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nab.usace.army.mil/SM-1

home.army.mil/belvoir/index.php/about/Garrison/directorate-public-works/environmental-division

Compact Disc

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Request by mail to:

Brenda Barber, P.E.
USACE Project Manager
c/o AECOM
4840 Cox Road, Glen Allen, VA 23060

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Thurman Hall, Building 247, 270 Kuhn Road, Fort Belvoir, VA 22060

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Updates regarding the Deactivated SM-1 Decommissioning project, how to join the stakeholder updates list and public meeting information are available on the USACE project website at: nab.usace.army.mil/SM-1.

[Notices](#) [Fort Belvoir, SM-1, U.S. Army Corps of Engineers](#) [.permalink](#) [Edit](#)

HEART OF THE MOUNT VERNON REGION

FORT HUNT HERALD



Updated on SM-1 decommissioning, dismantlement project public meetings

□ January 8, 2020 □ Fort Hunt Herald

□

□

□

The inclement weather on Tuesday, Jan. 7, 2020, caused the U.S. Army to postpone its on-post public meeting at Fort Belvoir regarding the decommissioning and dismantlement of the local deactivated SM-1 nuclear reactor facility to Thursday, Jan. 9. But the separate, off-post Wednesday, Jan. 8, session at the Gerry Hyland Government Center on Richmond Highway will go ahead as planned.

The on-post meeting to review and comment on the SM-1 decommissioning and dismantlement project's recently released draft environmental assessment is limited to Defense Department military and civilian personnel, as well as Fort Belvoir residents, contractors and civilian employees. The rescheduled meeting will still take place at the Wood Theater (Building 2120), 6050 Abbot Road, Fort Belvoir, on Jan. 9, with an afternoon meeting from 1-3 p.m. and an evening session from 6:30 p.m. to 8:30 p.m.

"Due to impending inclement weather in the Fort Belvoir area and the associated Office of Personnel Management-dictated closure of offices on post, we are postponing both on-post deactivated SM-1 nuclear reactor public meetings scheduled for today, Jan. 7, and will instead be holding them the afternoon and evening of Thursday, Jan. 9 in the Wood Theater," the U.S. Army Corps of Engineers, Baltimore District, project manager at the environmental and munitions design center said in an email.

"We appreciate your understanding of this change. The safety of the public and our team is paramount in everything we do."

According to the project manager, the Jan. 8 off-post public meeting at Room 221 of the Gerry Hyland Government Center, 8350 Richmond Highway, Alexandria, is not impacted and will go ahead as planned.

"Stakeholders that planned to attend today's on-post meetings are welcome to attend tomorrow evening's meeting," the project manager said. "Thank you for your continued support and participation as we continue through the planning phase of the deactivated SM-1 decommissioning and dismantling."

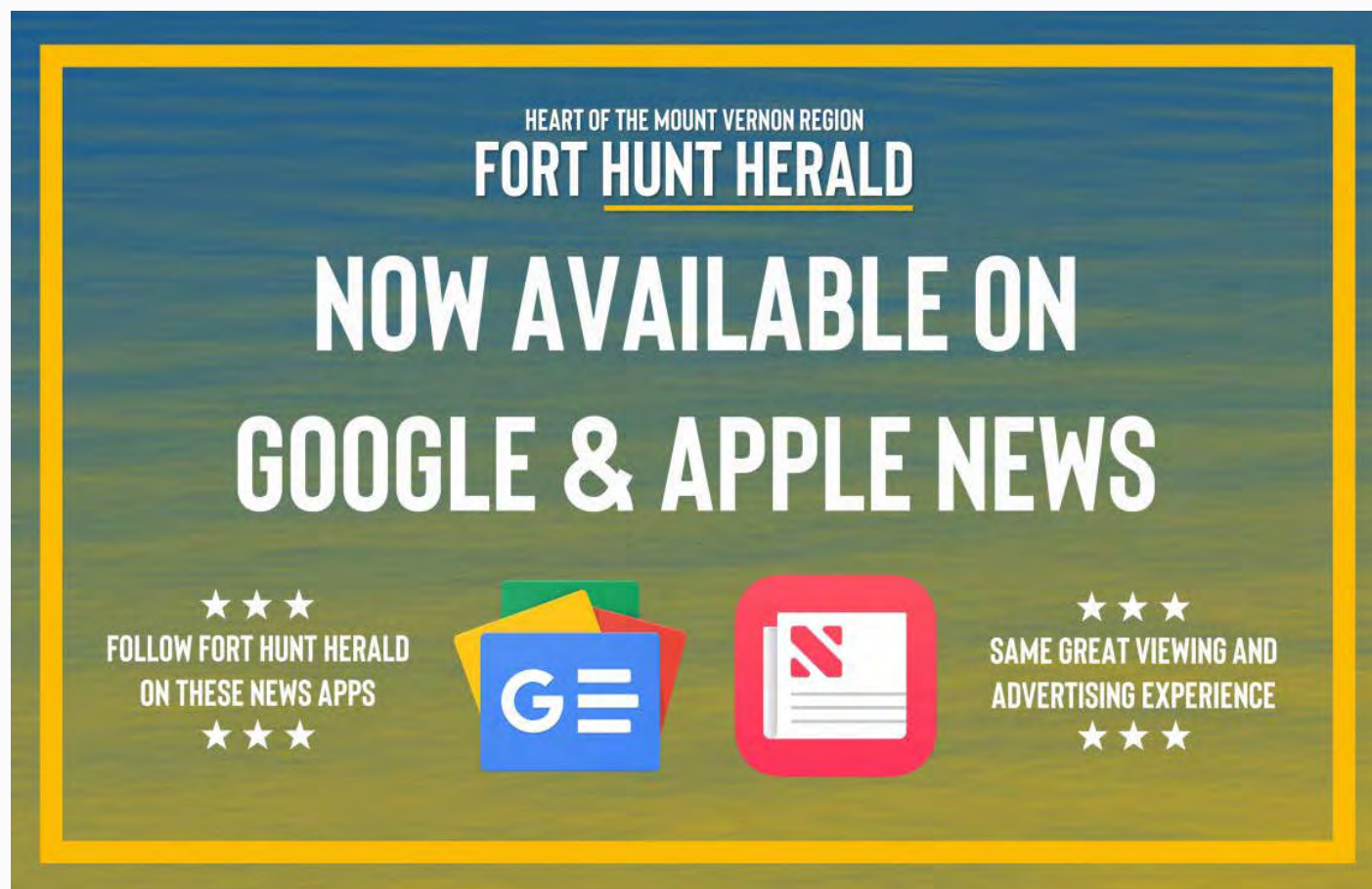
The Jan. 8 open house and poster session will take place from 6:30 p.m. to 7:30 p.m. followed by a presentation and audience question and answer session from 7:30 p.m. to 8:30 p.m.

For information about the SM-1 decommissioning and dismantling project, visit:

nab.usace.army.mil/Missions/Environmental/SM-1

In compliance with the law, stakeholders and the general public have six weeks to review and comment on the project's Draft Environmental Assessment, Draft Finding of No Significant Impact, and Draft Finding of No Practicable Alternative. That period started on Dec. 20, 2019, and concludes Jan. 31, 2020. For information, see the official notice of availability:

forhurtherald.com/notice-of-availability-public-meeting-sm-1-nuclear-reactor-facility-decommissioning-dismantle



*Visit us on **Twitter**, **Facebook**, **YouTube**, **LinkedIn**, **Apple News** and **Google News**.*

☐ Events ☐ Deactivated Nuclear Power Plant, Fairfax County, Fort Belvoir, SM-1, U.S. Army Corps of Engineers ☐ permalink

☐ **Attend West Potomac High School's girls basketball youth night on Jan. 17**

Celebrate Black History Month Feb. 9 with 'the poetry and works of Langston Hughes' ☐

Road salt overuse can harm environment



Directorate of Public Works

Many of our local streams suffer the effects of too much salt. Road salt (sodium chloride) is most commonly used to remove ice from roads, parking lots, and sidewalks. As snow and ice melt,

road salt is carried into our lakes, streams, and wetlands, where just one teaspoon can permanently pollute five gallons of water. Chloride from road salt is a major threat to water quality in Accotink Creek, the Potomac River, and other areas of the country where de-icing

occurs. Since chloride is not easily filtered from water in the natural environment, it builds up over time in the soil and water. Because of this, chloride levels in streams can remain elevated throughout the year – even in the summer.

Road salt provides benefits by preventing roadway accidents, but can also have negative impacts on the environment and drinking water sources. When large amounts of road salt get into our drinking water sources it can contaminate it so that we can't drink it. An excessive amount of salt is hard and expensive for water treatment facilities to remove.

With winter weather on its way, we will all be breaking out the road salt, so it is extremely important to control salt at the source by being strategic about when, where, and how salt is applied.

Tips for Winter Snow Removal

We can protect our drinking water resources, the environment, and local habitats by following these snow removal tips:



SHOVEL

Limit the Need for Salt

Salt works best when applied before the snow and should never be applied when rain is in the forecast. After the snow be sure to clear all snow from driveways and sidewalks before it turns into ice. Salt should only be applied after the snow is removed and only in areas needed for safety.



SPREAD

Follow Salt Application Directions

1 lb of salt fits in a 12oz coffee mug and is enough to treat 10 sidewalk squares or 20 feet of driveway. The salt also needs to be spread a few inches apart and should not be laid down in piles or clumps.



SWEEP

More Salt Does Not Mean More Melting

Excess salt does not help melt ice! If you see leftover salt on the ground after the ice melts, then you have used too much. Sweep up any leftover salt to be reused and to keep it away from our rivers and streams



STORE

Prevent Damage

Avoid storing salts outdoors to prevent direct contact with grass, plants, trees, stormwater, and even infrastructure. Salt can slow plant growth, contaminate water, produce rusting, and weaken the concrete, brick, and stone that make up our homes.

Deactivated SM-1 Nuclear Power Plant

The draft Environmental Assessment for the decommissioning of the deactivated SM-1 nuclear power plant on Fort Belvoir is available for public review and comment.

Upcoming Public Meetings

On-Post

Where: Thurman Hall (Building 247)

When: 7 JAN, 2020

Afternoon Session:

Posters/Open House - 1pm to 2pm

Formal Presentation at 2pm

Followed by Q&As and Posters

Evening Session:

Posters/Open House - 6:30pm to 7:30pm

Formal Presentation at 7:30pm

Followed by Q&As and Posters

Off-Post

Where: Fairfax County's South County

Government Center

8350 Richmond Hwy, Alexandria, Va.

When: 8 JAN, 2020

Evening Session:

Posters/Open House - 6:30pm to 7:30pm

Formal Presentation at 7:30pm

Followed by Q&As and Posters

More info, including documents for review, available online at:

www.nab.usace.army.mil/SM-1



Stakeholder Engagement Communications

Carver, Craig

From: Barber, Brenda M CIV USARMY CENAB (USA) [REDACTED]
Sent: Friday, January 03, 2020 10:51 AM
Cc: Gardner, Christopher P CIV USARMY CENAB (USA); Mitchell, Cynthia M CIV USARMY CENAB (USA); Falls, Eva E CIV (USA); Schuster, Michael J CIV USARMY CENAB (US); Honerlah, Hans B CIV USARMY CENAB (USA); Lazo, Carlos J CIV USARMY CENAB (USA); Roblyer, Griffin D K CIV USARMY CENAB (USA)
Subject: SM-1 Project Update, January 3, 2020
Importance: High

Happy New Year SM-1 Stakeholders,

Since our last stakeholder update was just before the holidays, I wanted to send a reminder that the Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FNSI) for the proposed decommissioning and dismantling of the Deactivated SM-1 Nuclear Reactor Facility at Fort Belvoir is available for public review and comment.

You can review the documents online at https://urldefense.proofpoint.com/v2/url?u=http-3A__www.nab.usace.army.mil_Missions_Environmental_SM-2D1_&d=DwlGaQ&c=TQzoP61-bYDBLzNd0XmHrw&r=llpvm9bVT1EdvFcKpRS4wpyohoTtoB6f2UJyGU6jBj8&m=I5gO4xNUBBisv2dCRAFxGGD1OnCRBlmEWEI5nhYxBz4&s=5yjtSqsBkF1Mu4ZszEGC51OBXUZxR1fpiYnt2hTg88Y&e= along with the formal public notice regarding their availability. There are also details online about next week's public meetings as well January 7 and 8. We understand the release came just before the holiday season so we went ahead and extended the traditional 30-day window for public review and comment to 6 weeks, meaning stakeholders still have through the entire month of January to provide feedback.

The U.S. Army Corps of Engineers proposes to decommission the SM - 1 facility to a standard that allows for release of the site for unrestricted use (the proposed action in the Draft EA). Under the proposed action, USACE would implement an Army Reactor Office-approved Decommissioning Plan to safely remove, transport, and dispose of remaining structures, equipment, and media from the SM-1 site; validate that site conditions meet applicable cleanup standards; restore the site to a vegetated condition; and return the site to Fort Belvoir for future use. The Draft EA analyzes the potential environmental impacts of the proposed action and concludes that there would be no significant adverse impacts on the physical, cultural, and natural environment.

The team appreciates the feedback we have already received from members of the community, both on-post and off-post, during our outreach efforts over the course of last year. We have used your feedback to inform our planning efforts and the preparing of the documents available for review.

The project team invites stakeholders to attend public meetings for the Draft EA to learn more about the proposed action and environmental review. The public meetings will be held on January 7 and 8, 2020. Each meeting will be conducted in an open house format to include a short presentation followed by questions and answers from the audience. The public meeting schedule will be:

- Tuesday, January 7, 2020 (On-Post*) - Thurman Hall, Building 247, 270 Kuhn Road, Fort Belvoir, VA 22060
(* Due to Fort Belvoir security requirements, attendance at the on-post meetings is limited to Department of Defense military and civilian personnel, Fort Belvoir residents, and Fort Belvoir contractors/civilian employees.)
 - Afternoon Meeting: Open House/Poster Session 1:00 PM – 2:00 PM, Formal Presentation and Audience Questions 2:00 PM – 3:00 PM
 - Evening Meeting: Open House/Poster Session 6:30 PM – 7:30 PM, Formal Presentation and Audience Questions 7:30 PM - 8:30 PM

- Wednesday, January 8, 2020 (Off-Post – Open to the General Public) - Fairfax South County Office, Room 221, 8350 Richmond Highway, Alexandria, VA 22309

- Open House/Poster Session 6:30 PM – 7:30 PM, Formal Presentation and Audience Questions 7:30 PM - 8:30 PM

More information about the release of the Draft EA and associated documents, public meetings and the SM-1 decommissioning effort in general can all be found on the USACE project website at:

[https://urldefense.proofpoint.com/v2/url?u=http-3A__www.nab.usace.army.mil_Missions_Environmental_SM-](https://urldefense.proofpoint.com/v2/url?u=http-3A__www.nab.usace.army.mil_Missions_Environmental_SM-2D1_&d=DwIGaQ&c=TQzoP61-)

[bYDBLzNd0XmHrw&r=llpvm9bVT1EdvFcKpRS4wpyohoTtoB6f2UJyGU6jBj8&m=I5gO4xNUBBisv2dCRAfxGGD1OnCRBlmEWEI5nhYxBz4&s=5yjsQsbKf1Mu4ZszEGC51OBXUZxR1fpiYnt2hTg88Y&e=](https://urldefense.proofpoint.com/v2/url?u=http-3A__www.nab.usace.army.mil_Missions_Environmental_SM-2D1_&d=DwIGaQ&c=TQzoP61-byDBLzNd0XmHrw&r=llpvm9bVT1EdvFcKpRS4wpyohoTtoB6f2UJyGU6jBj8&m=I5gO4xNUBBisv2dCRAfxGGD1OnCRBlmEWEI5nhYxBz4&s=5yjsQsbKf1Mu4ZszEGC51OBXUZxR1fpiYnt2hTg88Y&e=) .

Thank you all again for choosing to be a part of this process with us as we continue working through the planning phase of the decommissioning and dismantling of the deactivated SM-1. The team anticipates awarding a decommissioning contract for the work around summer 2020, with mobilization work on site beginning later in 2021.

If you have any questions, feedback or information you'd like to share with us, please feel free to e-mail me or call our Corporate Communication team at 410-962-2809.

Thanks

Brenda M. Barber, P.E.

U.S. Army Corps of Engineers - Baltimore District Project Manager - Environmental and Munitions Design Center

ATTN: CENAB-ENE-C

2 Hopkins Plaza

09-A-10 (Cube)

Baltimore, MD 21201



Carver, Craig

From: Barber, Brenda M CIV USARMY CENAB (USA) [REDACTED]
Sent: Tuesday, January 07, 2020 12:53 PM
Cc: Gardner, Christopher P CIV USARMY CENAB (USA); Mitchell, Cynthia M CIV USARMY CENAB (USA); Falls, Eva E CIV (USA); Schuster, Michael J CIV USARMY CENAB (US); Honerlah, Hans B CIV USARMY CENAB (USA); Lazo, Carlos J CIV USARMY CENAB (USA); Roblyer, Griffin D K CIV USARMY CENAB (USA)
Subject: SM-1 Project Update for January 7, 2020
Importance: High

Dear Stakeholders,

Due to impending inclement weather in the Fort Belvoir area and the associated Office of Personnel Management-dictated closure of offices on post, we are postponing both on-post Deactivated SM-1 Nuclear Reactor public meetings scheduled for today, Jan. 7, and will be holding them the afternoon and evening of Thursday, Jan. 9 in Wood Theater.

We appreciate your understanding of this change. The safety of the public and our team is paramount in everything we do.

The new schedule for the on-post meetings will be as follows:

- Thursday, January 9, 2020 (On-Post*) ? Wood Theater (Bldg. 2120), 6050 Abbot Road, Fort Belvoir, VA 22060
(* Due to Fort Belvoir security requirements, attendance at the on-post meetings is limited to Department of Defense military and civilian personnel, Fort Belvoir residents, and Fort Belvoir contractors/civilian employees.)
? Afternoon Meeting: Open House/Poster Session 1:00 PM ? 2:00 PM, Formal Presentation and Audience Questions 2:00 PM ? 3:00 PM
? Evening Meeting: Open House/Poster Session 6:30 PM ? 7:30 PM, Formal Presentation and Audience Questions 7:30 PM - 8:30 PM

Tomorrow evening's off-post public meeting is not impacted by this announcement. Stakeholders that planned to attend today's on-post meetings are welcome to attend tomorrow evening's meeting. Tomorrow's meeting schedule is as follows:

- Wednesday, January 8, 2020 (Off-Post ? Open to the General Public) ? Gerry Hyland Government Center (formerly known as the Fairfax South County Office), Room 221, 8350 Richmond Highway, Alexandria, VA 22309
? Open House/Poster Session 6:30 PM ? 7:30 PM, Formal Presentation and Audience Questions 7:30 PM - 8:30 PM

Thank you for your continued support and participation as we continue through the planning phase of the deactivated SM-1 decommissioning and dismantling.

If you have any questions, feedback or information you'd like to share with us, please feel free to e-mail or call our Corporate Communication team at 410-962-2809.

Thanks

Brenda M. Barber, P.E.
U.S. Army Corps of Engineers - Baltimore District Project Manager - Environmental and Munitions Design Center
ATTN: CENAB-ENE-C
2 Hopkins Plaza
09-A-10 (Cube)
Baltimore, MD 21201

SM-1 Project Update, January 10, 2018

Dear SM-1 Stakeholders,

Thank you for signing up to receive periodic updates regarding the ongoing efforts to decommission and dismantle the deactivated SM-1 former nuclear power plant at Fort Belvoir. This is the first of what will be several stakeholder updates that we'll be sending over the course of this project.

We are still in the early planning stages of this project, but as part of our commitment to open and transparent communication, we will be sending stakeholder updates as we reach major project milestones and especially when there are opportunities for stakeholders to interact with the project team and provide feedback.

Our first opportunity for stakeholders to meet with team members, ask questions and provide direct feedback will be later this month. We'll be hosting information sessions both on- and off-post and look forward to hearing from the community.

The project team will be on-post at Thurman Hall (Building 247) during the afternoon and evening of January 28 to discuss the project, get feedback and answer questions from interested members of the Fort Belvoir community who work and live on post. The afternoon session will consist of an open house period with information posters where the public can meet and interact with USACE and Fort Belvoir personnel working on the project from 1pm to 3pm, with a formal presentation scheduled to be given at 2pm followed by questions and answers. The evening session will begin with another open house session from 6:30pm to 7:30pm, which will be followed by a formal presentation about the SM-1's history and ongoing decommissioning planning and a subsequent question and answer session and additional poster availability from 7:30pm to 8:30pm.

The following evening, January 29, the project team will be hosting a similar information session off-post at Fairfax County's South County Government Center (8350 Richmond Hwy, Alexandria) for anyone on- or off-post interested in providing feedback and learning more about the project. The session will consist of an open house period with information posters where the public can meet and interact with USACE and Fort Belvoir personnel working on the project from 6:30pm to 7:30pm, which will be followed by a formal presentation about the SM-1's history and ongoing decommissioning planning and a subsequent question and answer session and additional poster availability from 7:30pm to 8:30pm.

Our team wants to understand any concerns the community may have as we move forward with our planning, and also provide vital project information, as well.

The SM-1 project team is also committed to a fair, open and transparent contracting process. As part of that commitment, we are hosting an Industry Day on February 8, also at Fairfax County's South County Government Center. Contractors interested in more information regarding this Industry Day, including instructions on how to RSVP, can see the full official notice on FedBizOpps.gov at <https://go.usa.gov/xEbrQ>.

As a reminder, the deactivated SM-1 former nuclear power plant on Fort Belvoir has been deactivated since the early 1970s. The U.S. Army Corps of Engineers, Baltimore District is a Regional Radiological Center of Expertise and has been designated to carry the SM-1 decommissioning and dismantlement.

Completed in 1957, the SM-1 nuclear reactor at Fort Belvoir was the first nuclear power facility in the United States to be connected to a public utility grid. Over several years, it provided power primarily to Fort Belvoir and served as a training facility for nuclear technicians from all military branches before being deactivated and partially decommissioned in the early 1970s.

The initial dismantlement and decommissioning involved the removal of a majority of the radioactivity from the site, including the removal of the nuclear fuel and control rods, decontamination work around the facility, radioactive waste removal, and the sealing of the Reactor Containment Vessel which holds the Reactor Pressure Vessel and other reactor components.

USACE is working to develop and finalize the various planning documents for the final decommissioning and dismantling of the facility.

We want to take this opportunity to emphasize that safety is the team's number one priority for this project. The safety and health of the installation, the local community and our workers are paramount to the success of our project. We will be using proven controls and precautions to address safety and other engineering details during all stages of the decommissioning of the SM-1.

Just recently, the Baltimore District's expert team safely completed the decommissioning of another one of the Army's deactivated nuclear reactors – the MH-1A on the STURGIS barge in Galveston, Texas. We are excited to build on that record of success and safety as planning moves forward for the SM-1 decommissioning and dismantlement.

As the team continues through the planning phase, we have begun initial market research to assess what companies may be able to implement this large, unique and complex project. This is just the first of many steps our team will be taking to ensure a fair, open and transparent contracting process. We anticipate issuing a draft request for proposals for a decommissioning contract in the first half of calendar year 2019 to solicit industry feedback with a formal RFP later in the year and an anticipated contract award date around the middle of calendar year 2020.

You can read more about the project and the SM-1's unique history in this feature online that is also in the current edition of Fort Belvoir's garrison newspaper, the Belvoir Eagle - <http://www.belvoireagleonline.com/>.

We have also recently launched a web site for the SM-1 project where additional information is available - www.nab.usace.army.mil/Missions/Environmental/SM-1/

And, as always, feel free to e-mail any questions or concerns you may have to Baltimore District's Corporate Communication Office at CENAB-CC@usace.army.mil.

SM-1 Industry Day Special Notice

The U.S. Army Corps of Engineers (USACE), Baltimore District, will hold an Industry Day on 8 February 2019 located at the Fairfax County's South County Government Center (Room 221). The Industry event will be hosted by USACE - Baltimore District for the purpose of discussing the plan for the Decommissioning and Disposal Activities for the SM-1 Deactivated Nuclear Power Plant Facility located at Fort Belvoir, Va. The Industry Day will be conducted in two parts, as described below:

Part I will consist of a presentation by USACE - Baltimore District in the morning from 0900-1100 hours. This presentation will focus specifically on the Decommissioning and Disposal Activities for the SM-1 Deactivated Nuclear Power Plant Facility located at Fort Belvoir, Va. Interested parties shall follow the RSVP instructions below if you are interested in attending this presentation

Part II will consist of one-on-one sessions for those companies interested in discussing alternatives, concerns, and suggestions relative to a future Request for Proposal (RFP) for this project. Sessions will be 30 minutes in length. Companies interested in participating in a one-on-one session shall notify James Greer, in their RSVP, as instructed below. The schedule for the one-on-one visits will be made available on 28 January 2019 and specific slots will be confirmed on a first come - first serve basis with all times being confirmed no later than 01 February 2019.

INFORMATION PRESENTED DURING THE ABOVE SESSIONS IS FOR PLANNING PURPOSES ONLY, DOES **NOT** CONSTITUTE AN INVITATION FOR BID OR REQUEST FOR PROPOSAL, AND IS **NOT** A COMMITMENT BY THE GOVERNMENT TO PURCHASE DESIRED SERVICES.

USACE - Baltimore District requests that parties interested in attending SM-1 Deactivated Nuclear Power Plant Decommissioning and Disposal Activities Industry Day submit company names and attendee lists no later than **2 PM EST, 25 January 2019** via e-mail to James Greer, Contract Specialist (james.a.greer@usace.army.mil). Parties are limited to no more than four attendees, including subcontractors. The subject line of the RSVP email shall be limited to: SM-1 Industry Day RSVP from (Company Name). The body of the email shall include each attendee's name, Position/Title, email address, phone number, and indicate whether they wish to participate in a one-on-one session. Parties are encouraged to submit any additional questions via email to James Greer no later than 31 January 2019, in order for the briefing to be as informative as possible. The project website with presentations can be found at: <https://www.nab.usace.army.mil/Missions/Environmental/SM-1/>

The U.S. Army Corp of Engineers (USACE) holds the right to cancel and/or change the event time, date and location for any reason up to and including the day of the event. Circumstances for cancellation and/or rescheduling may include, but are not limited to: inclement weather, event venue cancellation or rescheduling, speaker cancellation or rescheduling, and insufficient number of participants for the event. In the event that the USACE must cancel or reschedule the event, the USACE will not be responsible for costs incurred in preparation. In the event of predicted inclement weather, a decision will be made by 5pm on the prior day. If the event is cancelled, an email will be sent to all registered participants.

SM-1 Industry Day Special Notice

This Special Notice does not constitute a Request for Proposal (RFP) and is not to be construed as a commitment by the Government to issue a contract or order.

Carver, Craig

From: Barber, Brenda M CIV USARMY CENAB (US) [REDACTED]
Sent: Sunday, August 25, 2019 12:02 PM
Cc: Nappi, Rebecca (Becca) CIV USARMY CENAB (USA); Gardner, Christopher P CIV USARMY CENAB (US); Honerlah, Hans B CIV USARMY CENAB (USA); Lazo, Carlos J CIV USARMY CENAB (USA); Bonomolo, Tamara C CIV USARMY CENAB (USA)
Subject: SM-1 Project Update, August 25, 2019

Dear SM-1 Stakeholders,

The U.S. Army Corps of Engineers released the Request for Proposal (RFP) notice earlier today for the contract for the decommissioning and dismantling of the SM-1 deactivated nuclear power plant at Fort Belvoir. With the release of the RFP, the team remains on schedule to award a contract for this work in the latter half of 2020.

A site visit will be held for all potential bidders on September 16, 2019. Additional information pertaining to this RFP and how potential bidders can participate in the site visit can be found on FedBizOpps at ?
https://urldefense.proofpoint.com/v2/url?u=https-3A__www.fbo.gov_spg_USA_COE_DACA31_W912DR18R0021_listing.html&d=DwIGlw&c=TQzoP61-bYDBLzNd0XmHrw&r=Ilpvm9bVT1EdvFcKpRS4wpyohoTtoB6f2UJyGU6jBj8&m=oxjNKY55hu0M2fXl2ld0ljVSbbZliVZ2V4WVQ3npEgw&s=jOlytqaQDyqdZiAi4uVlwanZznRUUK_WK2UpIR8BNnk&e=

Additionally, the project team continues to work on the Decommissioning Planning documents, to include the Decommissioning Plan and the Environmental Assessment. The team appreciates the feedback we received from members of the community, both on-post and off-post, earlier this year. We anticipate publicly releasing the draft Environmental Assessment later this fall and having a public comment period to allow stakeholders to provide additional feedback.

Thank you all again for choosing to be a part of this process with us as we continue working through the planning phase of the decommissioning and dismantling of the deactivated SM-1.

As always, additional project information, historical photos, and previous stakeholder updates regarding the SM-1 project can be found on our website: https://urldefense.proofpoint.com/v2/url?u=http-3A__www.nab.usace.army.mil_SM-2D1_&d=DwIGlw&c=TQzoP61-bYDBLzNd0XmHrw&r=Ilpvm9bVT1EdvFcKpRS4wpyohoTtoB6f2UJyGU6jBj8&m=oxjNKY55hu0M2fXl2ld0ljVSbbZliVZ2V4WVQ3npEgw&s=MBYKxD0nN05XaUPRmW2VTEVsNXGhK6QQTOvdTD-C9Vg&e=.

If you have any questions, feedback or information you'd like to share with us, please feel free to e-mail me or call our Corporate Communication team at 410-962-2809.

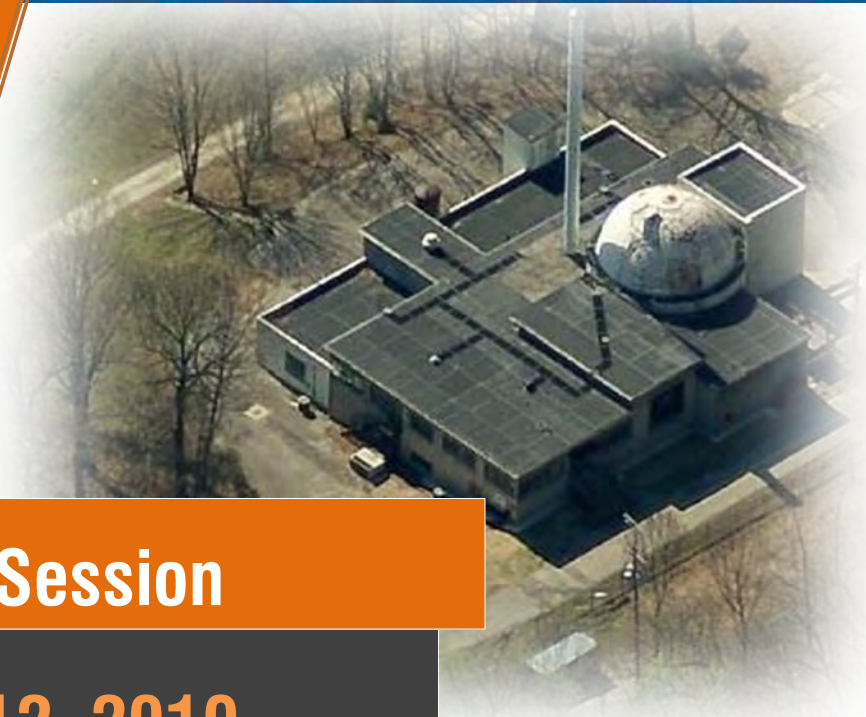
Thanks

Brenda M. Barber, P.E.
U.S. Army Corps of Engineers - Baltimore District Project Manager - Environmental and Munitions Design Center
ATTN: CENAB-ENE-C
2 Hopkins Plaza
09-A-10 (Cube)
Baltimore, MD 21201
[REDACTED]

General SM-1 Project Information Public Meetings

WELCOME

SM-1 DECOMMISSIONING PROJECT



Schedule

6:30 PM - 7:30 PM

- Open House
- Meet and interact with USACE and Fort Belvoir personnel

7:30PM - 8:30 PM

- Formal Presentation
- Q/A Session
- Poster Availability

Public Info Session

March 12, 2019

Off-Post
Fairfax County South
County Government Center
8350 Richmond Hwy,
Alexandria, VA
(Room 221)



**US Army Corps
of Engineers®**

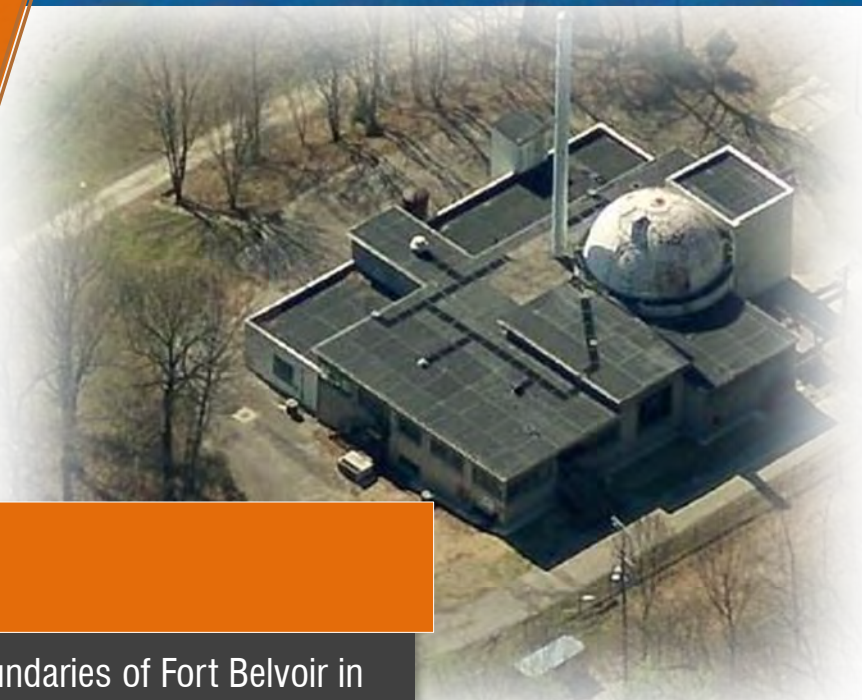
WELCOME

SM-1 DECOMMISSIONING PROJECT

Brief History

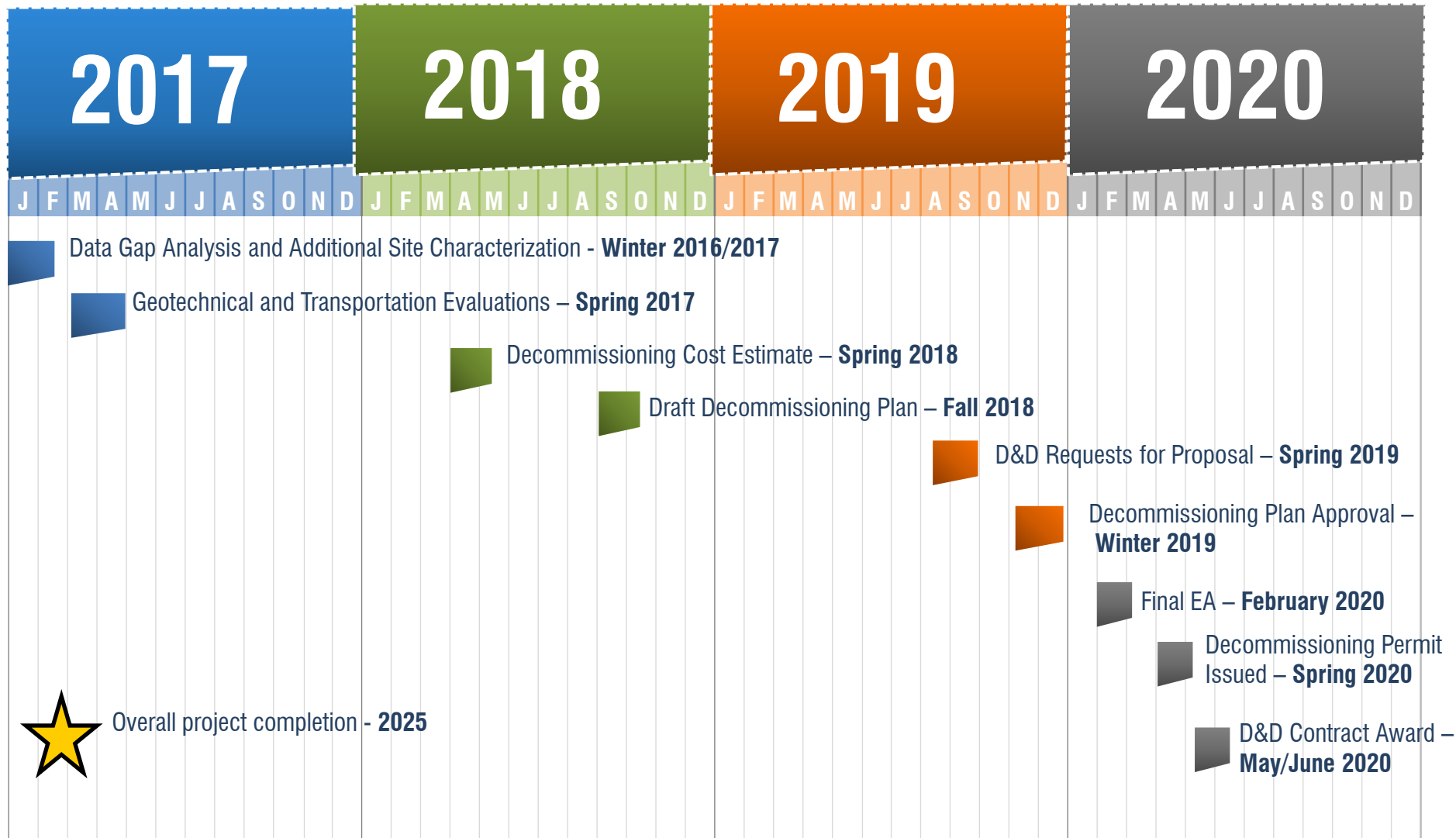
The former SM-1 nuclear power plant is situated within the boundaries of Fort Belvoir in Fairfax County, Virginia. After construction completion in 1957, the SM-1 facility was used to train U.S Army power plant operators and was capable of delivering a net 1,750 kilowatts of electrical power. It was the first nuclear power reactor to provide electricity to a commercial power grid in the United States. In 1973, the reactor facility was deactivated (shutdown) and deactivation included removal of the nuclear fuel and sealing of the reactor pressure vessel, decontamination of building areas to the extent possible, and off-site disposal of radioactive wastes. The site is now referred to as the SM-1 Deactivated Nuclear Power Plant. For more than 45 years, the site has been monitored and maintained while the accessible portions of the SM-1 facility have been used as a museum and storage space.

A-108

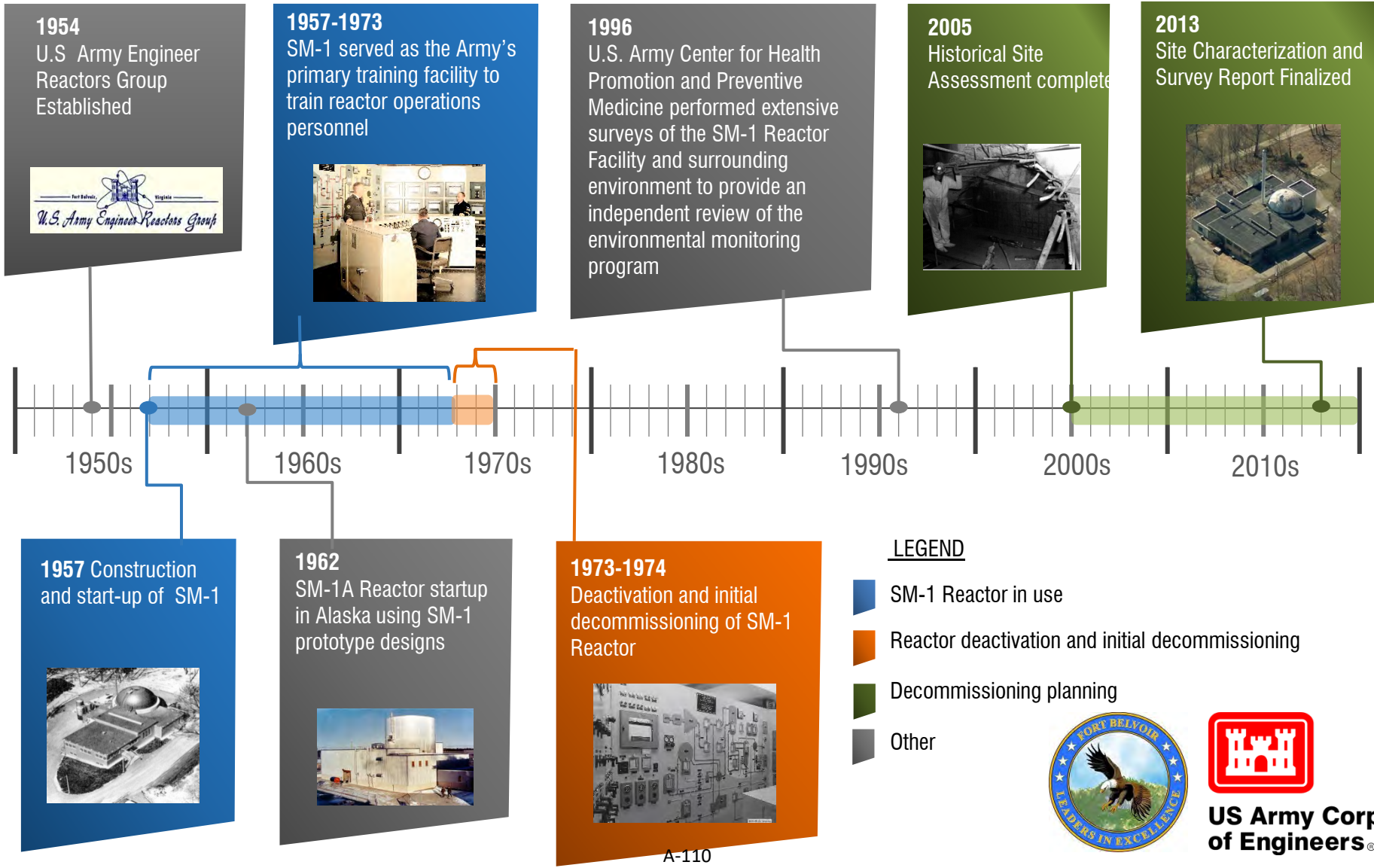


**US Army Corps
of Engineers®**

SM-1 TIMELINE/SCHEDULE



TIMELINE FOR THE SM-1 REACTOR FACILITY



WASTE SEGREGATION PROCESS

WHERE DOES IT ALL GO?



CLEAN MATERIAL & EQUIPMENT AND DEMOLITION DEBRIS FOR DISPOSAL OR RECYCLING

- ELECTRICAL DISTRIBUTION EQUIPMENT
- CONTROL ROOM CONSOLES
- BUILDING DEBRIS
 - STEEL
 - CONCRETE

>50%



TRUCKS and TRAINS TRANSPORT WASTE

<25%



<25%



LOW-LEVEL RADIOACTIVE WASTE TO A LICENSED DISPOSAL FACILITY

- **RADIOLOGICALLY ACTIVATED**
 - REACTOR PRESSURE VESSEL (RPV)
 - OTHER REACTOR COMPONENTS
- **RADIOLOGICALLY CONTAMINATED**
 - PRIMARY and SECONDARY REACTOR SYSTEMS
 - LIQUID WASTE MANAGEMENT SYSTEM
 - CONTAMINATED SOIL AND DEBRIS



HAZARDOUS WASTE FORMS TO PERMITTED LANDFILLS

- SOIL AND DEBRIS CONTAMINATED WITH VERY LOW LEVELS OF RADIOACTIVITY
- ASBESTOS INSULATION, FLOOR TILES, ADHESIVES, ETC.
- LEAD-CONTAMINATED SOILS
- UNIVERSAL WASTE (fluorescent bulbs, mercury-containing equipment, etc.)



**US Army Corps
of Engineers®**

RADIATION, RADIOACTIVITY, AND RISK

WHAT IS RADIATION?


RADIATION

- Invisible energy moving through space

NON-IONIZING RADIATION

- Light, sound, heat or infrared waves, microwaves, radio waves, low frequency power line radiation

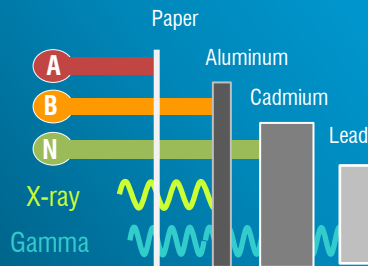
IONIZING RADIATION

- A** Alpha particles
(fast moving helium nucleus)
- B** Beta particles
(fast moving electron)
- N** Neutrons
-  Gamma, X-ray

QUANTIFYING RADIATION EXPOSURE

- REM (millirem – 1/1000 REM)
Unit of absorbed dose in the body that measures the impact of deposited energy.

DIFFERENT TYPES OF RADIATION HAVE DIFFERENT PENETRATING POWERS



WHAT IS RADIOACTIVITY?

RADIOACTIVITY

- Spontaneous emission of radiation
- Is reduced as radioactive atoms decay

RADIOACTIVE ATOMS

- Are unstable
- Change or decay until they become stable
- Give off surplus energy by emitting radiation

HALF LIFE

- The time it takes for decay to half the previous radioactivity

QUANTIFYING RADIOACTIVITY

- Disintegration per second (d/s)
- The number of atomic nuclei that decay each second

SOME HALF LIVES

5.27 years	Cobalt-60
100.1 years	Nickel-63
4.5 billion years	Uranium-238

WHAT IS RISK ASSESSMENT?

RISK ASSESSMENT

- Evaluating benefits versus risk
- Is a smoke detector worth its radiation risk?

NO ANSWER TO THE QUESTION:

- What is a safe level of radiation exposure?
- (What is a safe driving speed?)

APPROPRIATE QUESTION TO ASK IS:

- What is the risk associated with a given exposure? (What is the risk of injury for this situation and speed?)

HEALTH RISKS FROM RADIATION COMPARED WITH OTHER SITUATIONS

	Days Life Lost
Unmarried Male.....	3500
Smoke 20 cigarettes per day.....	2370
Unmarried Female.....	1600
Overweight by 20%.....	985
All accidents combined.....	435
Auto Accidents.....	200
Alcohol Consumption (U.S. averages).....	130
1000 millirem per year for 30 years, calculated.....	30
Natural background radiation calculated.....	8
Medical Diagnostic X-rays.....	6
Coffee drinker.....	6

ANNUAL RADIATION DOSES IN MILLIREM - VARIOUS EXPOSURES

5,000 mrem	US OCCUPATIONAL DOSE LIMIT
2,000 mrem	TOBACCO SMOKING
1,500 mrem	UNDERGROUND URANIUM MINES
620 mrem	AVERAGE ANNUAL RADIATION PUBLIC DOSE
200 mrem	RADON IN THE AIR
100 mrem	NUCLEAR REGULATORY COMMISSION PUBLIC DOSE LIMIT
40 mrem	FOOD AND WATER
26 mrem	TERRESTRIAL RADIATION - US AVERAGE
25 mrem	SM-1 SITE RELEASE CRITERIA
10 mrem	CHEST X-RAY
1 mrem	SM-1 MATERIAL RELEASE CRITERIA

mrem =

MILLIREM = 1/1000 REM.
UNIT OF ABSORBED DOSE IN THE BODY THAT MEASURES THE IMPACT OF DEPOSITED ENERGY

USACE COMMITMENT – SM-1

RISKS?

Safety is our number one priority. There will be minimal risk to the public as we implement this project. USACE will have a highly skilled team of engineers, scientists, and contractors dedicated to the project. SM-1's nuclear fuel was removed more than 40 years ago.

#1
PRIORITY

**PUBLIC AND
WORKER
SAFETY**

100
percent

**DEDICATION TO
PROJECT**

100
percent

**REGULATORY
COMPLIANCE**

↓
MINIMAL

**RISK TO
PUBLIC**

0
NUCLEAR
FUEL

**SM-1
REACTOR**



**US Army Corps
of Engineers®**

WELCOME

SM-1 DECOMMISSIONING PROJECT



Schedule

Public Info Session

Afternoon Session

1:00 PM - 2:00 PM

- Open House
- Meet and interact with USACE and Fort Belvoir personnel

2:00 PM - 3:00 PM

- Formal Presentation
- Q/A Session
- Poster Availability

January 28, 2019

On-Post
Thurman Hall
Building 247
Fort Belvoir, VA



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WELCOME

SM-1 DECOMMISSIONING PROJECT



Schedule

6:30 PM - 7:30 PM

- Open House
- Meet and interact with USACE and Fort Belvoir personnel

7:30PM - 8:30 PM

- Formal Presentation
- Q/A Session
- Poster Availability

Public Info Session

January 29, 2019

Off-Post
Fairfax County South
County Government Center
8350 Richmond Hwy,
Alexandria, VA
(Room 221)



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of Engineers®**

DEACTIVATED NUCLEAR POWER PLANT PROGRAM SM-1, FT BELVOIR, VA

WM2018

Session 097b US Army Corps of Engineers - Deactivated NPP Program D&D Contracting Opportunities

Brenda Barber, P.E.

Hans Honerlah, CHMM

Baltimore District, CENAB-ENE

March 2018

"The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation."

A-116



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TOPICS

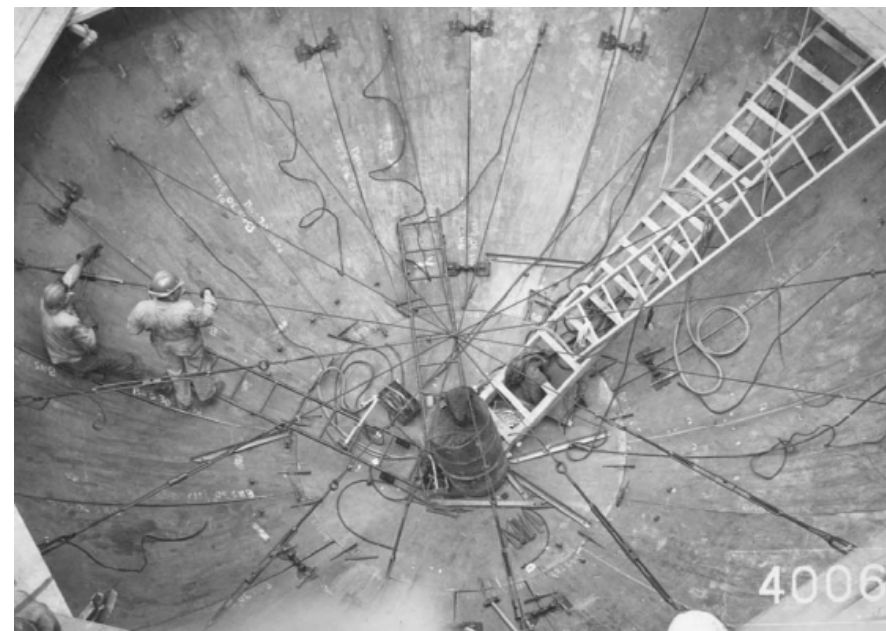
- History
- Decommissioning Planning



SM-1 TIMELINE: DETAILS

- SM-1 Reactor Startup: April 1957
 - Core II installed, June 1961
 - Core III installed, July 1968
- Last operation: March 1973
- Minimal Decommissioning: 1973 – November 1974
- USACHPPM Survey: October 1996
- Contractor Gamma Surveys: 1997 and 2009
- Core Component Activation Analysis: 2003
- Contractor Historical Site Assessment: 2003
- Contractor Characterization Survey Report: 2013
- Contractor Dap Gap Analysis: 2015
- Archeological Survey: 2016
- Supplemental Field Characterization: 2016





1956 Construction Photos



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PRE-SHUTDOWN DECOMMISSIONING ACTIVITIES

- Cleaned out Diesel Building
- Cleaned up Retention Building and Waste Facility
- Cleaned up “Hot Maintenance Area”
- Cleaned up secondary system
- Dug up old piping not in use
 - including discharge from retention sump (seal pit)
- Dug up selected “hot dirt areas”



POST-SHUTDOWN DECOMMISSIONING ACTIVITIES

- Laid up systems; generally drained of oil and filled with preservative or air dried
- Shipped absorbers, fuel, and neutron sources
- Drained and flushed primary systems, including spent fuel pit
- Cut and welded penetrations to Vapor Container
- Removed contaminated piping outside of the Vapor Container (VC), including decontamination of vent and blowdown systems
- Peeled out liner, decontaminated, welded shut spent chute, installed cover on Spent fuel pit



POST-SHUTDOWN DECOMMISSIONING ACTIVITIES

- Conducted final survey of Gunston Cove
- Cleaned and sealed VC door with chain lock system
- Filled pipe pit with concrete
- Removed Waste Facility tanks, building, and pad
- Removed Retention Building
- Removed contaminated underground piping
- Secured and posted restricted areas: Modification (MOD) area, VC, primary make-up tank room, spent fuel pit area, demineralizer room, fan loft
- Demolished Guard House (Building 373)
- Demolished Flammable Storage Building (Building 376)
- Demolished Tree House Mockup (Building A390)
- Decontaminated underground liquid radioactive waste tanks outside Training Building (Building 358) and filled them with concrete



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PRIOR CHARACTERIZATION EFFORTS TO SUPPORT DECOMMISSIONING PLANNING

- Gamma walkover surveys inside the fenced area
 - Completed in 2009; small area surveyed in 2016
- Biased and systematic soil sampling
 - Executed in 2010 and 2016
- In-plant survey to determine H-3 and alpha isotopic activity
 - Considered complete outside the VC
 - Additional samples for HTD isotopes (including H-3) collected in 2016
 - Alpha false-positive/radon analysis conducted in 2016
- Scoping surveys of buildings/sites associated with SM-1
 - Completed in 2010



PRIOR CHARACTERIZATION EFFORTS TO SUPPORT DECOMMISSIONING PLANNING

- More extensive survey of Gunston Cove sediment
 - Completed in 2010 (20 samples collected between Whitestone Pt. and discharge pipe)
- Sampling of underground pipes
 - All pipe waste and outfall pipes assumed to be contaminated
 - Geophysical surveys to verify pipes present in 2010 and 2016
 - Investigation of sewer pipes still to be planned/executed
- Soil under SM-1 to be sampled
 - Soil is assumed to be impacted and require disposal as LLRW
 - Sampling not considered to have a significant impact on cost estimates or planning efforts



DECOMMISSIONING PLANNING EFFORTS

- Decommissioning Planning is underway – anticipate completion by 2019
 - Contract was awarded in 2014
 - Scope includes:
 - review historical documents associated with the All Hazards Analysis
 - prepare planning documents that will support the Army Reactor Office issuing the USACE a decommissioning permit for the SM-1 reactor
 - comply with other relevant Federal and State requirements that will support the long term decommissioning planning
 - Ensure adherence of project activities to NRC, Army, and Federal standards and guidance , as well as, other Federal standards and guidance where relevant, and
 - coordinate with appropriate federal, state, and public parties to support issuance of decommissioning permit and other NEPA requirements.



MAJOR DECOMMISSIONING PLANNING DOCUMENTS

- Final Disposal Plan, Schedule and Cost Estimate
- Waste Management Plan
- Environmental Assessment
- Section 106 Effects Assessment and agreement document
- Decommissioning Plan



DECOMMISSIONING CHALLENGES

- Site has a small footprint and limited area for infrastructure
- Limited transportation routes off installation
- Coordination with the installation staff
- Proximity to base housing
- Proximity to the U.S. Capital



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Appendix B – Agency Correspondence

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Section 106 Consultation and
Memorandum of Agreement (MOA)

**MEMORANDUM OF AGREEMENT
BETWEEN
THE U.S. ARMY CORPS OF ENGINEERS – BALTIMORE DISTRICT,
THE VIRGINIA STATE HISTORIC PRESERVATION OFFICE,
U.S. ARMY GARRISON FORT BELVOIR
AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE DECOMMISSIONING OF
THE STATIONARY MEDIUM POWER PLANT NUMBER 1 (SM-1),
FORT BELVOIR, FAIRFAX COUNTY, VIRGINIA**

WHEREAS, the U.S. Army Corps of Engineers (hereinafter “USACE”) – Baltimore District is proposing to radiologically decommission and subsequently dismantle and demolish the deactivated Stationary Medium Power Plant Number 1 (hereinafter “SM-1”) Reactor Facility (hereinafter “undertaking”; Virginia Department of Historic Resources [hereinafter “DHR”] project file number 2015-1247), located at U.S. Army Garrison Fort Belvoir (hereinafter “Fort Belvoir”) in Fairfax County, Virginia, as shown as Attachment A to this Memorandum of Agreement (hereinafter “MOA”); and

WHEREAS, the SM-1 decommissioning is authorized by Section 91(b) of the Atomic Energy Act of 1954, as amended, which authorized the SM-1 Reactor Facility to be designed, built, and operated as part of the Army Nuclear Power Program under authority granted by the Department of Defense (hereinafter “DOD”). Section 91(b) authorizes the DOD to procure and utilize special nuclear materials in the interest of national defense and to acquire utilization facilities, i.e., reactors for military purposes. Section 110(b) of the Atomic Energy Act excludes such utilization facilities acquired by DOD from any of the licensing requirements of the Atomic Energy Act. The decommissioning is within the Atomic Energy Act authorities granted to the DOD, specifically Section 91(b) and 110(b) which give DOD the authority to regulate the radioactive materials, and is consistent with relevant guidance identified in 10 Code of Federal Regulations (C.F.R.) § 20.1402, the radiological criteria for unrestricted use; and

WHEREAS, although the SM-1 is located on Fort Belvoir’s fee title land, Army Regulation 50-7 assigns USACE the responsibility to act as the lead Army component and is the single point of contact at Headquarters Department of the Army for nuclear reactor decommissioning to ensure compliance with environmental requirements for decommissioning Army nuclear reactors, and

WHEREAS, in accordance with 36 C.F.R. § 800.2(a)(2) the Department of the Army and Fort Belvoir have designated USACE as lead federal agency for purposes of Section 106; and

WHEREAS, the decommissioning will involve the demolition and disposal of the SM-1 Reactor Facility Building (also known as Building 372), removal and disposal of the remaining primary and secondary reactor systems, and demolition and disposal of associated structures (including a warehouse, the water intake pier, and pump house); the removal and disposal of contaminated

soils; restoration of the SM-1 Reactor Facility site to green space; and the termination of the permit under which the facility is currently being maintained by USACE; and

WHEREAS, USACE determined that the decommissioning is considered an undertaking under Section 106 of the National Historic Preservation Act of 1966 (hereinafter “NHPA”), as amended, (54 U.S.C. § 306108) and its implementing regulations, *Protection of Historic Properties* (36 C.F.R. § 800) (hereinafter known collectively as “Section 106”) and is therefore subject to that act; and

WHEREAS, USACE has determined that the proposed demolition and removal of buildings, removal of site infrastructure improvements, removal of contaminated soils, and site restoration have the potential to affect historic properties (defined as listed in or eligible for listing in the National Register of Historic Places [hereinafter “NRHP”]); and

WHEREAS, USACE, as the lead federal agency responsible for compliance with Section 106, has initiated consultation with the DHR, which acts as the Virginia State Historic Preservation Office (hereinafter “SHPO”) pursuant to 36 C.F.R. § 800.14(b)(1)(iii); and

WHEREAS, by a letter to SHPO dated October 29, 2015, USACE defined the undertaking and the area of potential effect (hereinafter “APE”), in accordance with 36 C.F.R. § 800.6(d). For direct effects on above-ground resources, the APE is coterminous with the 10.76-acre area surrounding the SM-1 compound. Building 371 (Lab/Test Building, built in 1957) and Building 380 (Lab/Test Building, built in 1965) are outside the SM-1 compound but still subject to possible visual and/or cumulative effects from demolition activity (Neither Building 371 nor Building 380 is proposed for demolition). For direct effects on archaeological resources, the APE is coterminous with the boundaries of ground disturbance related to demolition, site cleanup, and staging activities (Attachment B); and

WHEREAS, in February 2018, AECOM-Tidewater Joint Venture, under contract to USACE, conducted a Phase I archaeological survey at the SM-1 Reactor Facility site and within its 1.84-hectare (4.54-acre) area of ground disturbance to determine if potentially significant archaeological resources were present; and

WHEREAS, USACE determined and the SHPO concurred in a letter dated March 21, 2018, that the one (1) previously identified archaeological resource in the APE, Site # 44FX1331, was not eligible for listing in the NRHP and that no further archaeological study of the SM-1 site was recommended; and

WHEREAS, in 1996, the U.S. Army Package Power Reactor (DHR ID# 029-0193), known by its current name as the SM-1 Reactor Facility, was determined eligible for listing in the NRHP under Criterion A on the national level with a period of significance between 1955 and 1973; and

WHEREAS, because the SM-1 Reactor Facility was less than fifty (50) years old at the time, NRHP Criteria Consideration G (for resources less than fifty [50] years old) applied, as the facility met the threshold for "exceptional importance" according to NRHP Criteria Consideration G; and

WHEREAS, due to prior demolitions, only four (4) of the eight (8) buildings/structures within the NRHP boundary of the SM-1 Reactor Facility are still extant; and

WHEREAS, these four (4) extant buildings/structures at the SM-1 Reactor Facility include Building 372 (SM-1 Reactor Building); Building 350 (Sewage Lift Station, now Building 7350); Building 349 (Warehouse/Storage Building); and Building 375 (Pump House and small pier connecting it to the shore); and

WHEREAS, in 2009, Fort Belvoir identified two (2) buildings located outside the SM-1 Reactor Facility boundary – Building 371, the Nuclear Physics Chemical Lab, and Building 380, the Nuclear Power Simulator Building – as contributing resources to the SM-1 Facility multiple property listing. The SHPO concurred with Fort Belvoir's determination (DHR File No. 2009-1868). (Neither Building 371 nor Building 380 is proposed for demolition as part of this undertaking); and

WHEREAS, in accordance with 36 C.F.R. § 800.2(c)(2) and by letters dated August 28, 2018, USACE contacted federally recognized Indian Tribes to participate in Section 106 as consulting parties for the above-described undertaking. Tribes contacted include Chickahominy Indians Eastern Division, Nansemond Indian Tribe, Rappahannock Tribe, Upper Mattaponi Indian Tribe, United Keetoowah Band of Cherokee Indians in Oklahoma, Tuscarora Nation of New York, Pamunkey Indian Tribe, Monacan Indian Nation, Catawba Indian Nation, Eastern Band of Cherokee Indians, and Chickahominy Indian Tribe; and

WHEREAS, none of the above-referenced Indian Tribes has responded to USACE's invitation to participate in Section 106 consultation; and

WHEREAS, in accordance with 36 C.F.R. § 800.2(c)(3) through (5) and § 800.3(f), USACE identified consulting parties during the Section 106 process and invited them to participate in the SM-1 decommissioning process as consulting parties (Attachment C); and

WHEREAS, the following individuals/parties have accepted USACE's invitation to participate as consulting parties, and therefore USACE has invited them to be concurring parties to this MOA: Fairfax County (VA) Department of Planning and Development; Fairfax County Architectural Review Board; Pohick Episcopal Church; and Mr. Charles Harmon, Nuke Digest; and

WHEREAS, USACE has also carefully considered the views of the public in accordance with the NHPA and the National Environmental Policy Act (hereinafter "NEPA") (42 U.S.C. § 4231 et seq.) and has held public meetings at various locations to explain the decommissioning process and solicit views from the public; and

WHEREAS, based on an Environmental Assessment conducted as part of NEPA review, USACE has determined that there is no feasible and prudent alternative to the demolition of the SM-1 Reactor Facility (Building 372) and three ancillary buildings/structures (Buildings 349, 350, and 379); and

WHEREAS, USACE has assessed possible adverse effects on historic properties within the APE in accordance with 36 C.F.R. § 800.5 and has determined that the undertaking will have an adverse effect on SM-1 Reactor Facility (Building 372) and three ancillary buildings/structures (Buildings 349, 350, and 379). The decommissioning of the SM-1 complex will also have an adverse effect on Buildings 371 and 380, as they will lose their historical significance from being associated with the SM-1 Facility; and

WHEREAS, SHPO concurred with USACE’s determination of adverse effect for the undertaking in a letter dated January 30, 2020; and

WHEREAS, USACE has carefully considered alternatives to the decommissioning and has sought to avoid, minimize, or mitigate any possible adverse effects on historic properties within the APE, from the undertaking, in accordance with 36 C.F.R. § 800.5; and

WHEREAS, on April 12, 2019, USACE held a telephone conference call meeting with the invited consulting parties to discuss measures to avoid, minimize, and resolve the adverse effects on historic properties; and

WHEREAS, in accordance with 36 CFR § 800.6(a)(1), USACE has notified the Advisory Council on Historic Preservation (hereinafter “ACHP”) of its adverse effect determination with specified documentation, and the ACHP has chosen to participate in the consultation pursuant to 36 CFR § 800.6(a)(1)(iii); and

WHEREAS, USACE has invited Fort Belvoir to be a signatory to this MOA pursuant to 36 C.F.R. § 800.6(c)(1) and Fort Belvoir has accepted; and

WHEREAS, USACE, the ACHP, the SHPO, and Fort Belvoir are therefore Signatories of this MOA pursuant to 36 C.F.R. § 800.6(c)(1) and have authority to execute, amend, or terminate this MOA; and

WHEREAS, USACE has a statutory obligation, as the federal agency, to fulfill the requirements of Section 106 and shall ensure that the measures in the following stipulations are carried out;

NOW, THEREFORE, USACE, SHPO, Fort Belvoir, and ACHP (hereinafter “Signatories”) agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effects of the undertaking on historic properties.

STIPULATIONS

USACE shall ensure the following stipulations are carried out:

I. DOCUMENTATION AND PUBLIC INTERPRETATION OF THE SM-1 REACTOR FACILITY (SHPO ID #029-0193)

- A. *Historic American Engineering Record (HAER), Level II Documentation:* HAER Level II documentation is appropriate to mitigate the adverse effect on the SM-1 Reactor Facility, a historic property eligible for listing in the NRHP at the level of national significance. USACE shall prepare, or direct to be prepared, documentation to HAER Level II standards as defined in the *Secretary of the Interior Standards and Guidelines for Architectural and Engineering Documentation*. Due to the loss of records over time, security restrictions, health and safety concerns, specifically radiation within the interior of the reactor building (Building 372), and the dangerous structural condition of the pier (Building 375), HAER Level II documentation was determined to be the appropriate level of mitigative documentation.

The HAER Level II documentation shall include the entire SM-1 Reactor Facility consisting of Buildings 372, 350, 349, 375, 371, and 380. This documentation will include information obtained from USACE's Office of History, including motion picture film, photographs, and documents, as appropriate.

1. The HAER documentation will include extensive detailed written historical and descriptive data about the facility. It will include physical descriptions of the facility, detailed discussion of the facility's historic significance, a discussion of how the facility was operated, and a description of the decommissioning and demolition process. Within six (6) months of this MOA's enactment, the draft historical narrative, omitting the detailed decommissioning and demolition sections, will be submitted to the Signatories and other consulting parties for their review and comment prior to demolition.
2. As part of the HAER Level II documentation, USACE will include scanned copies of the available, original as-built drawings of Building 372. Selected drawings will be scanned, digitally enhanced, and converted into Computer Aided Design (CAD) formatting. Selected drawings will be reproduced on vellum. USACE will also prepare additional drawings, on vellum, based on recent 3D Light Detection and

Ranging (LIDAR) scans of Building 372 to supplement the as-built drawings.

3. Due to safety restrictions, photographs with large-format negatives will document the exterior and currently accessible interior areas of Building 372. Photographs with large-format negatives will document the exterior and interior of Building 349 and Building 350. Photographs with large-format negatives will document the exterior only of Building 375, the Pump House, as the approach pier is structurally unsound and the building cannot be accessed. Photographs with large-format negatives will document the exterior only of Buildings 371 and 380, due to security restrictions, as these buildings are currently occupied. Photographs with large-format negatives will also document general views of the SM-1 Reactor Facility. Photography of the existing facility conditions will be submitted to the Signatories, and other consulting parties for their review and comment before demolition begins.
 4. During the demolition process, USACE shall document the dismantling of the facility through video and photography. Within one (1) year following the demobilization of decommissioning operations and personnel from the SM-1 Reactor Facility site, the video and photography will be compiled into a professional video with appropriate context, narration, and labeling. The video will be submitted to the Signatories and other consulting parties for their review and comment before the video is finalized. The video will be submitted to SHPO for their records as a supplemental addition to the HAER Level II documentation. USACE shall maximize the use of large format photography as much as possible. If USACE is unable to utilize large format photography, photographs shall be included as an appendix to include both old historical photos, as well as demolition photographs.
- B. USACE has notified the National Park Service (hereinafter “NPS”) and received its concurrence to prepare HAER Level II documentation of the SM-1 Reactor Facility.
- C. Upon completion, USACE will submit the draft HAER documentation to the Signatories and other consulting parties for their thirty (30) day review. USACE shall incorporate and/or respond to all submitted comments prior to submitting the documentation to the NPS-HAER office for its review and acceptance. USACE shall ensure the resulting documentation is suitable for archiving at the Library of Congress (hereinafter “LOC”), and shall follow all applicable HAER standards and guidelines. USACE will notify the Signatories and other

consulting parties of NPS-HAER acceptance of the HAER documentation for the SM-1 Reactor Facility.

- D. In addition to the LOC, USACE shall provide copies of the final documentation to SHPO, Fort Belvoir, and the USACE Office of History. USACE will identify other appropriate repositories for the documentation in consultation with the Signatories and other consulting parties. USACE shall ensure the resulting documentation is suitable for dissemination to the public with the goal of creating awareness for the historical and engineering significance of the SM-1 Reactor Facility. USACE shall provide copies of the documentation to the other consulting parties upon written request.
- E. Within one (1) year of this MOA's enactment, USACE will carefully remove the commemorative plaque currently affixed to Building 372, and move it to a facility to be restored and displayed at an as-yet-undetermined facility in Virginia. USACE will consult with the Signatories and other consulting parties regarding this action, as well as the appropriate facility for curation/display of the plaque.
- F. Within two (2) years of this MOA's enactment, a draft version of a proposed historical plaque / marker shall be distributed to the Signatories and other consulting parties. This historical plaque's / marker's design shall be agreed upon by the Signatories with input from the other consulting parties prior to installation. Within one (1) year after completion of decommissioning and demolition, USACE / Ft. Belvoir shall erect the agreed upon plaque / marker at the previous site of SM-1. Up to two (2) additional plaques / markers shall be installed at publicly accessible sites. These additional plaques / markers shall have their designs and locations agreed upon by the Signatories and consulting parties prior to installation. Upon final installation of these historical plaques / markers, USACE / Ft. Belvoir shall photograph the installed plaques / markers and distribute to all the Signatories and consulting parties.
- G. USACE shall salvage historical items from the SM-1 Reactor Facility that may be placed on loan to appropriate repositories for traveling exhibits. Within one (1) year of this MOA's enactment, USACE will develop a detailed plan for the identification, curation, storage, transportation, along with specific steps for consultation, and shall submit this plan for review and comment by the Signatories and other consulting parties.

Salvaged items will remain under the control of USACE; items shall be salvaged from SM-1 and sent to USACE, Humphreys Engineering Center (hereinafter "HECSA") in Virginia for storage or a similar facility. Once all salvaged items are compiled at HECSA, USACE will distribute a letter to the

Signatories and other consulting parties with an item inventory and location, as well as a POC to help retrieve items for future exhibits. USACE shall inform the Signatories and other consulting parties of circumstances that will prevent salvage and display of these items.

- H. Since the HAER Level II documentation will document the decommissioning process through demolition, USACE shall complete the requirements of Stipulations I.A, I.C, and I.D within twelve (12) months after completion of the decommissioning and demolition of the SM-1 Reactor Facility (currently estimated completion by 2025).
- I. Within one (1) year of this MOA's enactment, USACE will reach out to former SM-1 operators and employees and shall invite them to be interviewed about their experiences with the facility. The oral interviews will be recorded and relevant information will be incorporated into the final HAER documentation package.

II. DECOMMISSIONING AND DEMOLITION

USACE may proceed with the decommissioning and dismantling activities associated with the decommissioning of the SM-1 Reactor facility, provided that those activities do not interfere with the completion of the stipulations in this MOA.

III. PERFORMANCE STANDARDS AND REVIEW

A. Professional Qualifications

USACE will ensure all actions prescribed by this MOA that involve the identification, evaluation, analysis, recording, treatment, monitoring, or disposition of historic properties, or involve reporting or documentation of such actions in the form of reports, forms, or other records, are carried out by or under the direct supervision of a person who meets the appropriate *Secretary of the Interior's Professional Qualification Standards* (SOI Standards; 48 *Federal Register* 44738-9, Sept. 29, 1983) as an Historian or Architectural Historian.

B. Standards and Guidelines

All work performed under the provisions of this MOA shall be conducted in accordance with the following standards and guidelines, as relevant:

- 1. *Recording Historic Structures and Sites for the Historic American Engineering Record* (48 *Federal Register* 44731-34, September 29, 1983)

2. *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation* (36 C.F.R. § 61)
 3. *Secretary of the Interior's Standards for the Treatment of Historic Properties* (36 C.F.R. § 68)
- C. Review of Submitted Materials
1. The Signatories and other consulting parties agree to respond to USACE in writing to all materials submitted for their review and comment within thirty (30) days of receipt of all information.
 2. USACE shall take into account written comments it receives within the thirty (30)-day review period from the Signatories and other consulting parties.
 3. If a Signatory or other consulting party fails to respond in writing to USACE's request for review and comment, USACE may assume the non-responding party(ies) has/have no comment.
- D. Upon completion of all stipulations under this MOA, USACE shall provide the Signatories and other consulting parties a written memorandum acknowledging it has fulfilled its responsibilities under this MOA.

IV. DISPUTE RESOLUTION

Should any signatory or concurring party to this MOA object at any time to any actions proposed or the manner in which the terms of this MOA are implemented, USACE shall consult with such party to resolve the objection. If USACE determines that such objection cannot be resolved, USACE will:

- A. Forward all documentation relevant to the dispute, including USACE's proposed resolution, to the ACHP. The ACHP shall provide USACE with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, USACE shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, signatories and concurring parties, and provide them with a copy of this written response. USACE will then proceed according to its final decision
- B. If the ACHP does not provide its advice regarding the dispute within the thirty (30) day time period, USACE may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, USACE shall prepare a written response that takes into account any timely comments

regarding the dispute from the signatories and concurring parties to the MOA, and provide them and the ACHP with a copy of such written response.

- C. USACE's responsibility to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged.

V. RESOLUTION OF OBJECTIONS BY THE PUBLIC

At any time during implementation of the measures stipulated in this MOA, should any objections pertaining to any such measures or its manner of implementation be raised by any member of the public in writing, USACE shall notify the parties in this MOA and take the objection into account, consulting with the objector, and should the objector so request, consult with parties in the MOA to resolve the objection.

VI. POST-REVIEW DISCOVERIES

- A. USACE shall ensure that the following provision is included in all construction contracts: "If previously unidentified historic properties or unanticipated effects to historic properties are discovered during construction, the construction contractor shall immediately halt all activity within the immediate area of the discovery and in any adjacent areas where additional or related resources may reasonably be expected to be present, notify USACE of the discovery and implement interim measures to protect the discovery from looting and vandalism. Work in all areas not subject of the discovery may continue."
- B. Upon receipt of a notification required by the contract provision described in Stipulation VI.A, USACE shall:
 - 1. Inspect the construction site to determine the extent of the discovery and ensure that construction activities have halted; and
 - 2. Clearly mark the area of the discovery; and
 - 3. Implement additional measures, to the extent deemed necessary by USACE, in its reasonable discretion acting in good faith, to minimize the risk to the discovery from looting and vandalism; and
 - 4. Have a professional archeologist inspect the construction site to determine the extent of the discovery and provide recommendations regarding its NRHP eligibility and treatment, which shall be limited to sampling and documentation in lieu of preservation in place or full data recovery; and

5. Notify the NPS, the SHPO and other consulting parties of the discovery and describe the measures that have been implemented to comply with this Stipulation.
- C. Upon receipt of the information required in Stipulation VI.B.5, the NPS shall provide USACE, the SHPO, and other consulting parties with its assessment of the NRHP eligibility of the discovery and the measures proposed to resolve adverse effects within twenty-four (24) hours of receipt of information of the discovery. In making its evaluation, the NPS, in consultation with the SHPO, may assume the discovery to be NRHP eligible for the purposes of Section 106 pursuant to 36 CFR § 800.13(c). USACE, the SHPO and other consulting parties shall respond to the NPS's assessment within twenty-four (24) hours of receipt.
- D. The NPS shall take into account the SHPO's, and other consulting parties' recommendations on eligibility and treatment of the discovery and determine which actions, if any, are appropriate for USACE to take with regard to the discovery. The NPS shall notify and provide documentation to USACE regarding any such appropriate actions that are required within twenty-four (24) hours of receiving recommendations. USACE must comply with the required actions and provide the NPS and consulting parties with a report on the actions after completion.
- E. Data recovery activities will not extend outside the support of excavation for SM-1 Reactor facility demolition activities.
- F. Construction activities may proceed in the area of the discovery, when the NPS has determined that implementation of the actions undertaken to address the discovery pursuant to Stipulations VI, A through D are complete.

VII. HUMAN REMAINS

- A. In the event gravesites are unexpectedly discovered, USACE shall make all reasonable efforts to avoid disturbing gravesites, including those containing Native American human remains and associated funerary artifacts. USACE shall treat all human remains in a manner consistent with the ACHP's *Policy Statement Regarding Treatment of Burial Sites, Human Remains and Funerary Objects* (February 23, 2007; <http://www.achp.gov/docs/hrpolicy0207.pdf>).
- B. If removal is proposed, USACE shall apply for a permit from the SHPO for the removal of human remains in accordance with the regulations stated above. USACE shall ensure that any removed human skeletal remains and associated funerary objects encountered during the course of actions taken as a result of this undertaking shall be treated in accordance with the *Regulations Governing*

Permits for the Archaeological Removal of Human Remains (Virginia Register 390-01-02) found in the Code of Virginia (10.1-2305, et seq., Virginia Antiquities Act)

- C. USACE shall make a good faith effort to ensure that the general public is excluded from viewing any Native American burial site or associated funerary artifacts. The consulting parties shall release no photographs of any Native American burial site or associated funerary artifacts to the press or general public. The NPS shall notify the appropriate federally recognized tribe(s), and/or appropriate State-recognized tribal leaders when Native American burials, human skeletal remains, or funerary artifacts are encountered on the project, prior to any analysis or recovery.

USACE shall deliver any removed Native American human skeletal remains and associated funerary artifacts recovered to the appropriate tribe to be reinterred. The disposition of any other human skeletal remains and associated funerary artifacts shall be governed as specified in any permit issued by the SHPO or any order of the local court authorizing their removal. USACE will be responsible for all reasonable costs associated with treatment of human remains and associated funerary objects.

VIII. AMMENDMENT PROCESS

This MOA may be amended when such an amendment is agreed to in writing by all Signatories. The amendment will be effective on the date a copy signed by all of the Signatories is filed with the ACHP.

IX. TERMINATION

- A. If any Signatory to this MOA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other signatories to attempt to develop an amendment per Stipulation VIII, above. If within thirty (30) days (or another time period agreed to by all signatories) an amendment cannot be reached, any signatory may terminate the MOA upon written notification to the other signatories.
- B. Once the MOA is terminated, and prior to work continuing on the undertaking, USACE must either (a) execute an MOA pursuant to 36 CFR § 800.6 or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR § 800.7. USACE shall notify the signatories as to the course of action it will pursue.

X. DURATION

This MOA will be considered null and void if its terms are not implemented within six (6) years of the effective date. The Signatories to this MOA will consult six (6) months prior to expiration to determine if there is a need to extend or amend this MOA. Upon completion of the Stipulations set forth above, USACE will provide a letter (with attached documentation) of completion to SHPO, with a copy to the Signatories to this MOA. If SHPO concurs the Stipulations are complete within thirty (30) calendar days, USACE will notify the Signatories and Consulting Parties in writing and this MOA will expire, at which time the Signatories will have no further obligations hereunder.

XI. DEFINITIONS

- A. Unless otherwise specified herein, the term “days” means Federal business days.
- B. The term “date of this signed MOA” means the date of the last Signatory’s signature affixed thereto.

XII. IMPLEMENTATION OF MOA

This MOA may be implemented in counterparts, with a separate page for each Signatory, and USACE shall ensure that each party is provided with a complete copy. This MOA shall become effective on the date of the last Signatory’s signature.

Execution of this MOA by USACE, Fort Belvoir, SHPO, and the ACHP and implementation of its terms evidence that USACE has taken into account the effects of this undertaking on historic properties and afforded the ACHP an opportunity to comment.

MEMORANDUM OF AGREEMENT BETWEEN THE U.S. ARMY CORPS OF ENGINEERS – BALTIMORE DISTRICT, THE VIRGINIA
STATE HISTORIC PRESERVATION OFFICE, U.S. ARMY GARRISON FORT BELVOIR, AND THE ADVISORY COUNCIL ON
HISTORIC PRESERVATION REGARDING THE DECOMMISSIONING OF THE STATIONARY MEDIUM POWER PLANT NUMBER 1
(SM-1), FORT BELVOIR, FAIRFAX COUNTY, VIRGINIA

U.S. ARMY CORPS OF ENGINEERS, BALTIMORE DISTRICT

By:  Date: 08 MAY 20
John T. Litz
Colonel, U.S. Army
Commander and District Engineer

MEMORANDUM OF AGREEMENT BETWEEN THE U.S. ARMY CORPS OF ENGINEERS – BALTIMORE DISTRICT, THE VIRGINIA
STATE HISTORIC PRESERVATION OFFICE, U.S. ARMY GARRISON FORT BELVOIR, AND THE ADVISORY COUNCIL ON
HISTORIC PRESERVATION REGARDING THE DECOMMISSIONING OF THE STATIONARY MEDIUM POWER PLANT NUMBER 1
(SM-1), FORT BELVOIR, FAIRFAX COUNTY, VIRGINIA

VIRGINIA STATE HISTORIC PRESERVATION OFFICER

By: 

Julie V. Langan

Director, Department of Historic Resources

Date: 5-14-2020

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: _____ Date: _____
John M. Fowler
Executive Director

MEMORANDUM OF AGREEMENT BETWEEN THE U.S. ARMY CORPS OF ENGINEERS – BALTIMORE DISTRICT, THE VIRGINIA
STATE HISTORIC PRESERVATION OFFICE, U.S. ARMY GARRISON FORT BELVOIR, AND THE ADVISORY COUNCIL ON
HISTORIC PRESERVATION REGARDING THE DECOMMISSIONING OF THE STATIONARY MEDIUM POWER PLANT NUMBER 1
(SM-1), FORT BELVOIR, FAIRFAX COUNTY, VIRGINIA

U.S. ARMY GARRISON FORT BELVOIR

By: Michael H. Greenberg Date: 30 Apr 20
Col. Michael H. Greenberg
Garrison Commander
U.S. Army Garrison Fort Belvoir


Concurring Parties:

MEMORANDUM OF AGREEMENT BETWEEN THE U.S. ARMY CORPS OF ENGINEERS – BALTIMORE DISTRICT, THE VIRGINIA
STATE HISTORIC PRESERVATION OFFICE, U.S. ARMY GARRISON FORT BELVOIR, AND THE ADVISORY COUNCIL ON
HISTORIC PRESERVATION REGARDING THE DECOMMISSIONING OF THE STATIONARY MEDIUM POWER PLANT NUMBER 1
(SM-1), FORT BELVOIR, FAIRFAX COUNTY, VIRGINIA

FAIRFAX COUNTY DEPARTMENT OF PLANNING AND DEVELOPMENT

By: Nicole Brown Date: 4/8/20
For: Barbara Byron
Director, Fairfax County Department of Planning and Development

FAIRFAX COUNTY ARCHITECTURAL REVIEW BOARD

By:  Date: April 9, 2020
John A. Burns
Chairman, Fairfax County Architectural Review Board

MEMORANDUM OF AGREEMENT BETWEEN THE U.S. ARMY CORPS OF ENGINEERS – BALTIMORE DISTRICT, THE VIRGINIA
STATE HISTORIC PRESERVATION OFFICE, U.S. ARMY GARRISON FORT BELVOIR, AND THE ADVISORY COUNCIL ON
HISTORIC PRESERVATION REGARDING THE DECOMMISSIONING OF THE STATIONARY MEDIUM POWER PLANT NUMBER 1
(SM-1), FORT BELVOIR, FAIRFAX COUNTY, VIRGINIA

NUKE DIGEST

By: Charles D. Harmon Date: 4/8/2020
Charlie Harmon
Editor

MEMORANDUM OF AGREEMENT BETWEEN THE U.S. ARMY CORPS OF ENGINEERS – BALTIMORE DISTRICT, THE VIRGINIA
STATE HISTORIC PRESERVATION OFFICE, U.S. ARMY GARRISON FORT BEL VOIR, AND THE ADVISORY COUNCIL ON
HISTORIC PRESERVATION REGARDING THE DECOMMISSIONING OF THE STATIONARY MEDIUM POWER PLANT NUMBER 1
(SM-1), FORT BELVOIR, FAIRFAX COUNTY, VIRGINIA

POHICK EPISCOPAL CHURCH, FAIRFAX COUNTY, VIRGINIA

By: Rev Dr. Lynn P. Ronaldi Date: 4-30-20
Lynn P. Ronaldi
Priest in Charge, Pohick Episcopal Church

/

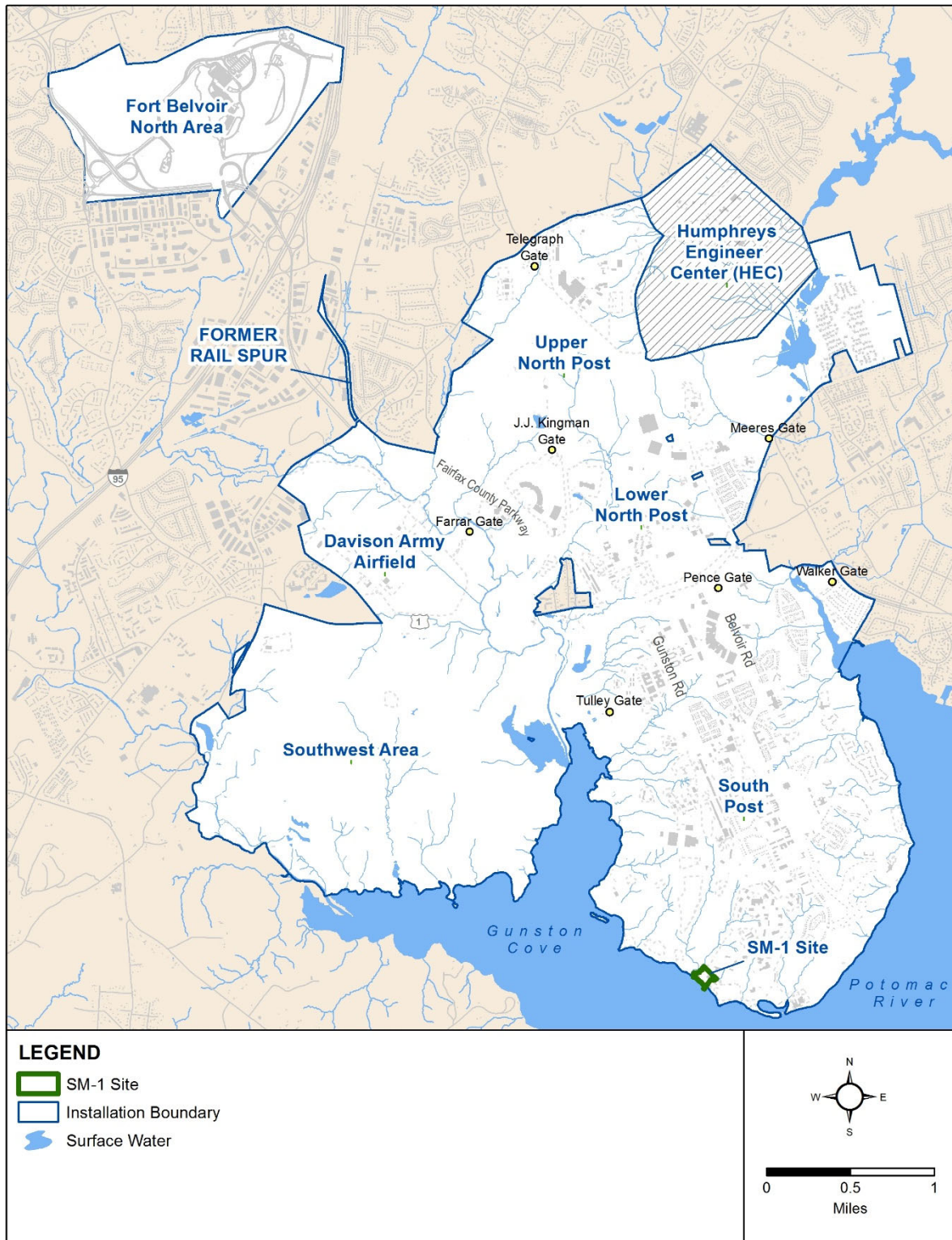
MEMORANDUM OF AGREEMENT BETWEEN THE U.S. ARMY CORPS OF ENGINEERS – BALTIMORE DISTRICT, THE VIRGINIA
STATE HISTORIC PRESERVATION OFFICE, U.S. ARMY GARRISON FORT BELVOIR, AND THE ADVISORY COUNCIL ON
HISTORIC PRESERVATION REGARDING THE DECOMMISSIONING OF THE STATIONARY MEDIUM POWER PLANT NUMBER 1
(SM-1), FORT BELVOIR, FAIRFAX COUNTY, VIRGINIA

ATTACHMENT A

LOCATION OF SM-1 REACTOR FACILITY

FORT BELVOIR, FAIRFAX COUNTY, VIRGINIA

MEMORANDUM OF AGREEMENT BETWEEN THE U.S. ARMY CORPS OF ENGINEERS – BALTIMORE DISTRICT, THE VIRGINIA STATE HISTORIC PRESERVATION OFFICE, U.S. ARMY GARRISON FORT BELVOIR, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION REGARDING THE DECOMMISSIONING OF THE STATIONARY MEDIUM POWER PLANT NUMBER 1 (SM-1), FORT BELVOIR, FAIRFAX COUNTY, VIRGINIA



Location of the SM-1 Reactor Facility (SM-1 Site) at Fort Belvoir, Virginia

MEMORANDUM OF AGREEMENT BETWEEN THE U.S. ARMY CORPS OF ENGINEERS – BALTIMORE DISTRICT, THE VIRGINIA
STATE HISTORIC PRESERVATION OFFICE, U.S. ARMY GARRISON FORT BELVOIR, AND THE ADVISORY COUNCIL ON
HISTORIC PRESERVATION REGARDING THE DECOMMISSIONING OF THE STATIONARY MEDIUM POWER PLANT NUMBER 1
(SM-1), FORT BELVOIR, FAIRFAX COUNTY, VIRGINIA

ATTACHMENT B

AREA OF POTENTIAL EFFECTS

SM-1 REACTOR FACILITY DECOMMISSIONING PROJECT

MEMORANDUM OF AGREEMENT BETWEEN THE U.S. ARMY CORPS OF ENGINEERS – BALTIMORE DISTRICT, THE VIRGINIA STATE HISTORIC PRESERVATION OFFICE, U.S. ARMY GARRISON FORT BELVOIR, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION REGARDING THE DECOMMISSIONING OF THE STATIONARY MEDIUM POWER PLANT NUMBER 1 (SM-1), FORT BELVOIR, FAIRFAX COUNTY, VIRGINIA



SM-1 Reactor Facility Decommissioning Project Area of Potential Effects, Fort Belvoir, Virginia

MEMORANDUM OF AGREEMENT BETWEEN THE U.S. ARMY CORPS OF ENGINEERS – BALTIMORE DISTRICT, THE VIRGINIA
STATE HISTORIC PRESERVATION OFFICE, U.S. ARMY GARRISON FORT BELVOIR, AND THE ADVISORY COUNCIL ON
HISTORIC PRESERVATION REGARDING THE DECOMMISSIONING OF THE STATIONARY MEDIUM POWER PLANT NUMBER 1
(SM-1), FORT BELVOIR, FAIRFAX COUNTY, VIRGINIA

ATTACHMENT C

USACE-IDENTIFIED CONSULTING PARTIES FOR SECTION 106 CONSULTATION

SM-1 DECOMMISSIONING

**USACE-Identified Potentially Interested Parties for Section 106 Consultation for the
SM-1 Reactor Facility Decommissioning, Fort Belvoir, VA**

USACE has identified the following potential consulting parties and federally recognized Indian Tribes:

Proposed Consulting Parties:

- Fairfax County Planning & Development
- Fairfax County Architectural Review Board
- Fairfax County Park Authority
- Fairfax County History Commission
- National Capital Planning Commission
- National Park Service: Potomac Heritage Scenic Trail
- Council of Virginia Archaeologists
- National Trust for Historic Preservation
- Woodlawn NHL
- Woodlawn Baptist Church
- Gunston Hall Plantation
- Woodlawn-Faith United Methodist Church
- Historical Society of Fairfax County
- Pohick Episcopal Church
- Ms. Martha Catlin (Interested Person)
- US Armed Forces Nuclear Energy Association
- American Nuclear Society
- The Nuke Digest (publication)

Federally Recognized Native American Tribes with Historic or Cultural Ties to Virginia:

- Eastern Band of Cherokee Indians
- Tuscarora Nation of New York
- United Keetoowah Band of Cherokee Indians in Oklahoma
- Catawba Indian Nation
- Pamunkey Indian Tribe
- Chickahominy Indian Tribe
- Chickahominy Indian Tribe – Eastern Division
- Upper Mattaponi Tribe
- Rappahannock Tribe
- Monacan Indian Nation
- Nansemond Indian Nation



COMMONWEALTH of VIRGINIA

Department of Historic Resources

2801 Kensington Avenue, Richmond, Virginia 23221

Matt Strickler
Secretary of Natural Resources

Julie V. Langan
Director

Tel: (804) 367-2323
Fax: (804) 367-2391
www.dhr.virginia.gov

30 January 2020

Ms Brenda M. Barber
Department of the Army
Corps of Engineers, Baltimore District
2 Hopkins Plaza
Baltimore, Maryland 21201

RE: Decommissioning of SM-1 Nuclear Reactor Facility—Effects Determination
Fort Belvoir, Fairfax County, Virginia
DHR File No. 2015-1247


Dear Ms. Barber:

The Department of Historic Resources (DHR) has received your letter of 27 January 2020 requesting our concurrence on the United States Army Corps of Engineers—Baltimore District's (Corps) adverse effect determination for the above referenced project. The undertaking involves the decommissioning of the Stationary Medium Power Plant Number 1 (SM-1) Nuclear Reactor Facility (DHR Inventory No. 029-0193) located at Fort Belvoir, Fairfax County, Virginia. The decommissioning activities will involve demolition of the Reactor Building and Stack (Building 372), Sewage Lift Station (Building 7350), Warehouse/Storage Building (Building 349), and Pump Station and small pier connecting it to shore (Building 375); removal of underground pipes and other utilities; evacuation and removal of contaminated soils; removal of paved areas and building slabs; and site restoration. As you are aware, the SM-1 Reactor Facility (Building 372) and associated buildings are eligible for listing in the National Register of Historic Places (NRHP) under Criterion A as the first water-pressurized nuclear reactor in the United States and for its role as the first prototype nuclear power plant developed as a training facility for military personnel. The DHR listed the reactor and its dependencies in the Virginia Landmarks Register.

We concur with the Corps that the planned decommissioning of the SM-1 Reactor Facility will have an adverse effect on the historic property. The DHR is in the process of reviewing on the draft Memorandum of Agreement (MOA) for the undertaking. We will forward our comments to the Corps as soon as our review of the draft MOA is complete.

If you have any questions about our comments, please contact me at [REDACTED]

Sincerely,


Marc Holma, Architectural Historian
Division of Review and Compliance

Administrative Services
10 Courthouse Ave.
Petersburg, VA 23803
Tel: (804) 862-6408
Fax: (804) 862-6196

Eastern Region Office
2801 Kensington Avenue
Richmond, VA 23221
Tel: (804) 367-2323
Fax: (804) 367-2391

Western Region Office
962 Kime Lane
Salem, VA 24153
Tel: (540) 387-5443
Fax: (540) 387-5446

Northern Region Office
5357 Main Street
PO Box 519
Stephens City, VA 22655
Tel: (540) 868-7029
Fax: (540) 868-7033

C: Ms Kate Cline, Fort Belvoir
Mr. Chris Daniel, ACHP
Mr. Jordan Tannenbaum, Fairfax County Historical Commission
Ms Laura Arseneau, Fairfax County
Ms Nicole Brannan, Fairfax County

Aimee Jorjani
Chairman

Leonard A. Forsman
Vice Chairman

John M. Fowler
Executive Director



Preserving America's Heritage

January 7, 2020

The Honorable R.D. James
Assistant Secretary for the Army for Civil Works
Office of the Assistant Secretary of the Army (Civil Works)
108 Army Pentagon
Washington, DC 20310-0108

Ref: *Decommissioning of the Stationary Medium Power Plant Number 1 (SM-1) Reactor Facility
Fairfax County, Virginia
ACHPConnect Log Number: 013997*

Dear Mr. James:

In response to the recent notification by the United States Army Corps of Engineers, the Advisory Council on Historic Preservation (ACHP) will participate in consultation to develop a Section 106 agreement document for the referenced undertaking. Our decision to participate in this consultation is based on the *Criteria for Council Involvement in Reviewing Individual Section 106 Cases*, contained within the regulations, "Protection of Historic Properties" (36 CFR Part 800) implementing Section 106 of the National Historic Preservation Act. The criteria are met for this proposed undertaking because it has substantial impacts on important historic properties and the potential for procedural problems.

Section 800.6(a)(1)(iii) of our regulations requires that we notify you, as the head of the agency, of our decision to participate in consultation. By copy of this letter, we are also notifying Ms. Brenda M. Barber, Baltimore District Project Manager, of this decision.

Our participation in this consultation will be handled by Mr. Christopher Daniel, who can be reached at [REDACTED] or via e-mail at [REDACTED]. We look forward to working with your agency and other consulting parties to reach agreement on alternatives or modifications to the undertaking that could avoid, minimize, or mitigate adverse effects on historic properties.

Sincerely,



John M. Fowler
Executive Director

ADVISORY COUNCIL ON HISTORIC PRESERVATION

401 F Street NW, Suite 308B Washington, DC 20001-2637
Phone: 202-517-0200 • Fax: 202-517-6381 • achp@achp.gov • www.achp.gov



**DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MD 21201**

April 17, 2019

Reid Nelson
Director, Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street, NW, Suite 308
Washington, DC 20001

*RE: Invitation to Participate in Section 106 Consultation for the Stationary Medium Power Plant
Number 1 (SM-1) Reactor Facility, Fort Belvoir, Fairfax County, Virginia.*

Dear Mr. Nelson:

The U.S. Army Corps of Engineers - Baltimore District (USACE) has proposed the decommissioning of the Stationary Medium Power Plant Number 1 (SM-1) Reactor Facility located at Fort Belvoir in Fairfax County, Virginia. The SM-1 Reactor Facility (Building 372), along with four secondary resources (Buildings 7350, 375, 371, and 380), was determined eligible for listing on the National Register of Historic Places (NRHP) in 1996 and is also listed on the Virginia Landmarks Register.

The proposed decommissioning is a federal "undertaking" as defined in Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulation, 36 CFR Part 800, "Protection of Historic Properties." In accordance with Section 106, USACE initiated consultation with the Virginia Department of Historic Resources (VDHR) by letter dated October 28, 2015 (Attachment A) which gives a fuller description of the undertaking, the Area of Potential Effects (APE), and the historic properties affected.

USACE's proposed action alternative consists of the removal of all radiologically contaminated structures, equipment, and media from the SM-1 site, as needed to allow for the termination of the permit under which the SM-1 Reactor Facility is currently maintained and the release of the site for unrestricted use. This action involves removal of materials and equipment from Building 372, demolition of Building 372, and the demolition and removal of the other three buildings (Buildings 349, 350, and 375) on the SM-1 Reactor Facility Site. Because USACE's Proposed Action Alternative will include the demolition and removal of buildings, removal of site infrastructure improvements, the removal of contaminated soils, and site restoration, the proposed action has the potential to affect historic properties (defined as listed in or eligible for listing in the NRHP).

In accordance with both Section 106 and with the provisions of the National Environmental Protection Act (NEPA), USACE has identified potential consulting parties that may have an interest in the proposed undertaking and its effects on historic properties. In a follow-up letter to VDHR dated August 22, 2018, USACE submitted its list of potential consulting parties (Attachment B) for the SM-1 Facility decommissioning project. As specified in 36 CFR Part 800, consulting parties may include other federal, state, regional, or local agencies as well as historical groups that may have responsibilities for historic properties.

These groups may want to review reports and findings for an undertaking within or near their jurisdiction. USACE also has identified specialized groups and organizations that may have a scientific interest in the SM-1 reactor and its history. Additionally, in accordance with 36 CFR 800.2(c)(2), USACE has identified federally recognized Native American tribes in Virginia as consulting parties who may comment on the undertaking and on any measures to mitigate possible adverse effects from the project on NRHP-eligible resources. To date, five parties/individuals (including VDHR) have accepted USACE's invitation to become consulting parties and they are copied on this communication.

In a teleconference held on April 12, 2019, USACE consulted with VDHR and other consulting parties in accordance with Section 106 with respect to its efforts to avoid or minimize any adverse effects on historic properties within the APE. The USACE has determined that its Proposed Action Alternative would have an Adverse Effect on the NRHP-eligible SM-1 Reactor Facility (Buildings #372, #350/7350, and #375) and the two associated NRHP-eligible buildings (Building #371 and #380). Measures to mitigate the adverse effect will be developed by USACE in consultation with VDHR, the Advisory Council on Historic Preservation (ACHP), and other consulting parties and will be memorialized in the form of a Memorandum of Agreement.

In accordance with 36 CFR § 800.6(a)(1), FRA is hereby inviting the ACHP to participate in further Section 106 consultation. USACE is available to meet with you or your staff to discuss both the Project and the ACHP's participation in Section 106 consultation going forward.

Sincerely,

Brenda M. Barber, P.E.
U.S. Army Corps of Engineers - Baltimore District
Project Manager - Environmental and Munitions Design Center
ATTN: CENAB-ENE-C
2 Hopkins Plaza
09-A-10 (Cube)
Baltimore, MD 21201
[REDACTED]

CC Hans Honerlah, USACE

Kevin Taylor, AECOM
Craig Carver, AECOM
Charlene Wu, AECOM
Michael Robertson, AECOM
Geoffrey Henry, AECOM

Section 106 Consulting Parties:

Marc Holma, VDHR, [REDACTED]
Christine Heacock, Department of Public Works, Fort Belvoir, [REDACTED]
Nicole Brannan, Fairfax County (VA) Department of Planning, [REDACTED]
Charlie Brannon (Nuke Digest), [REDACTED]
Fred Crawford, Primary Representative, Pohick Episcopal Church, Virginia, [REDACTED]



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MD 21201

January 25, 2019

Ms. Martha Catlin
8324 Mount Vernon Hwy.
Alexandria, VA 22309

***RE: Initiation of Section 106 Consultation and Invitation to be a Consulting Party in
SM-1 Nuclear Reactor Facility Decommissioning Planning, Fort Belvoir, Fairfax County,
Virginia***

Dear Ms. Catlin,

The U.S. Army Corps of Engineers - Baltimore District (USACE) has proposed the decommissioning of the Stationary Medium Power Plant Number 1 (SM-1) Nuclear Reactor Facility located at Fort Belvoir in Fairfax County, Virginia. The SM-1 Reactor Facility (Building 372), along with four secondary resources (Buildings 7350, 375, 371, and 380), was determined eligible for listing in the National Register of Historic Places (NRHP) in 1996. The reactor building is also listed in the Virginia Landmarks Register. These resources are shown on **Figure 1**.

The proposed decommissioning is a federal "undertaking," as defined in Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations, 36 CFR Part 800, "Protection of Historic Properties." In accordance with Section 106, USACE has initiated consultation with the Virginia Department of Historic Resources (VDHR) by letter dated October 28, 2015 (Attachment A). This letter provides a more comprehensive description of the undertaking, the Area of Potential Effects (APE), and the historic properties affected.

In accordance with both Section 106 and with the provisions of the National Environmental Policy Act (NEPA), USACE has identified potential consulting parties that may have an interest in the proposed undertaking and its effects on historic properties. In a follow-up letter to VDHR dated August 22, 2018, USACE submitted a list of potential consulting parties (Attachment B) for the **SM-1 Nuclear Reactor Facility Decommissioning** project. As specified in 36 CFR Part 800, consulting parties may include other federal, state, regional, or local agencies as well as historical groups that may have responsibilities for historic properties. These groups may want to review reports and findings for an undertaking within or near their jurisdiction. USACE also has identified specialized groups and organizations that may have a scientific interest in the SM-1 nuclear reactor facility and its history. Additionally, in accordance with 36 CFR 800.2(c)(2), USACE has identified federally recognized Indian tribes in Virginia as consulting parties that may comment

on the undertaking and on any measures to mitigate possible adverse effects resulting from the project on NRHP listed or eligible resources.

Per the requirements of the Section 106 process, USACE extends an invitation to your group to participate as a consulting party for the **SM-1 Nuclear Reactor Facility Decommissioning** project. Please notify USACE within 30 days of receipt of this letter if you have any questions or concerns about the project's effects on historic properties or if you are interested in participating in consultation as the project moves forward. USACE intends to schedule and host a meeting at a future date at the Fairfax County South County Center near Fort Belvoir to discuss the project and the Section 106 process, including assessment of any effects on historic properties from the undertaking. Pursuant to 36 CFR 800.11(e) through (g), views of the public will be included in documentation of project effects on historic properties.

Please respond at the mailing and/or email address on the above letterhead.

Sincerely,

Brenda M. Barber, P.E.

Brenda M. Barber, P.E.
U.S. Army Corps of Engineers - Baltimore District
Project Manager Environmental and Munitions Design Center

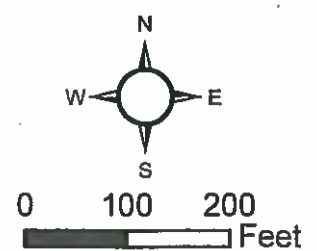
cc: Hans Honerlah, USACE – Baltimore District
Patrick Read, USACE – Baltimore District
Scott Watson, USACE – Baltimore District
Jeff Lorenz, USACE – Baltimore District
Christine Heacock, Fort Belvoir - Cultural Resources



SM-1 Reactor Facility, Fort Belvoir, Virginia

- National Register Boundary/Limits of Archaeological Investigation
- Historic Property
- Area of Potential Effects
- ### Building Number

Figure 1



Source: U.S. Army Garrison Fort Belvoir, ESRI

ATTACHMENT B

USACE has identified the following potential consulting parties and federally recognized Native American Tribes:

Proposed Consulting Parties:

- Virginia Department of Historic Resources
- Fairfax County Planning & Zoning
- Fairfax County Park Authority
- Fairfax County History Commission
- National Capital Planning Commission
- National Park Service: Potomac Heritage Scenic Trail
- Council of Virginia Archaeologists
- National Trust for Historic Preservation
- Woodlawn NHL
- Woodlawn Baptist Church
- Fairfax County Architectural Review Board
- Gunston Hall Plantation
- Woodlawn-Faith United Methodist Church
- Historical Society of Fairfax County
- Pohick Episcopal Church
- Ms. Martha Catlin (Interested Person)
- US Armed Forces Nuclear Energy Association
- American Nuclear Society
- The Nuke Digest (publication)

Federally Recognized Native American Tribes in Virginia:

- Eastern Band of Cherokee Indians
- Tuscarora Nation of New York
- United Keetowah Band of Cherokee Indians in Oklahoma
- Catawba Indian Nation
- Pamunkey Indian Tribe
- Chickahominy Indian Tribe
- Chickahominy Indian Tribe – Eastern Division
- Upper Mattaponi Tribe
- Rappahannock Tribe
- Monacan Indian Nation
- Nansemond Indian Nation



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MD 21201

August 22, 2018

Mr. Marc Holma
Architectural Historian
Project Review
Virginia Department of Historic Resources
2801 Kensington Avenue
Richmond, VA 23221

Dear Mr. Holma:

***RE: SM-1 Reactor Facility Decommissioning Planning, Fort Belvoir,
Fairfax County, VA
VDHR File No. 2015-1247***

By this letter, the U.S. Army Corps of Engineers - Baltimore District (USACE), is continuing consultation with your office regarding the proposed Stationary Medium Power Nuclear Power Reactor Prototype Number 1 (SM-1) Facility decommissioning at Fort Belvoir in Fairfax County, Virginia, in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulation, 36 CFR Part 800, "Protection of Historic Properties." The SM-1 Reactor Facility (Building 372) (VDHR ID # 029-0193) was determined eligible for listing in the National Register of Historic Places (NRHP) and is also listed in the Virginia Landmarks Register.

USACE previously has communicated with your office by letter dated October 28, 2015 to initiate Section 106 consultation and has met with your staff at VDHR headquarters in Richmond on December 2, 2015 to discuss the project and its potential to affect historic properties. The October 28, 2015 consultation letter described the undertaking (as defined by Section 106), the project purpose and need, and defined the project's Area of Potential Effect (APE).

Since the December 2, 2015 meeting with VDHR, USACE has completed several additional tasks in compliance with Section 106, which are described below:

1. Archaeology

One archaeological site, 44FX1331, was identified in 1987 during a pedestrian survey of the area by former Fairfax County Archaeologist, Michael Johnson. In February 2018, AECOM-Tidewater Joint Venture conducted a Phase I archaeological survey at the SM-1 site and its 1.84-hectare (4.54-acre) archaeological APE to determine if other potentially significant archaeological resources were present. The survey determined that extensive ground disturbances associated with construction of the SM-1 Reactor Facility severely impacted the landform and may have destroyed much of the site's subsurface integrity. As a result, the site was recommended not eligible for listing in the NRHP and no further archaeological study of the SM-1 site was recommended. The results of the survey were reported in *Phase I Archaeological Survey of the SM-1 Reactor Facility, US Army Garrison Fort Belvoir, Fairfax County, VA* (Boyd et al 2018), submitted to your office in February, 2018. By letter dated March 21, 2018, VDHR concurred with the findings and recommendations of the archaeological survey by AECOM that no further archaeology work at the SM-1 site is required (VDHR File No. 2015-1247).

2. Consulting Parties and Native American Consultation

In accordance with Section 106 and with the provisions of the National Environmental Protection Act (NEPA), USACE has identified potential consulting parties that may have an interest in the proposed undertaking and its effects on historic properties. As specified in 36 CFR Part 800, consulting parties may include other federal, state, regional, or local agencies as well as historical groups that may have responsibilities for historic properties. These groups may want to review reports and findings for an undertaking within or near their jurisdiction. USACE has also considered interested individuals' written requests to participate as consulting parties in the development of measures to avoid, minimize, and mitigate adverse effects on historic properties. Additionally, USACE has identified specialized groups and organizations that may have a scientific interest in the SM-1 reactor and its history. USACE intends to schedule and host a meeting at the Fairfax County South County Center near Fort Belvoir to discuss the project and the Section 106 process, including assessment of any effects on historic properties from the undertaking. Pursuant to 36 CFR 800.11(e) through (g), views of the public will be included in documentation of project effects on historic properties and any resulting MOAs (if required).

Additionally, in accordance with 36 CFR 800.2(c)(2), USACE has identified federally recognized Native American tribes in Virginia as consulting parties who may comment on the undertaking and on any measures to mitigate possible adverse effects from the project on NRHP-eligible resources.

To date, USACE has identified the following potential consulting parties and welcomes review and comment by your office on the following list:

Proposed Consulting Parties:

- Virginia Department of Historic Resources
- Fairfax County Planning & Zoning
- Fairfax County Park Authority
- Fairfax County History Commission
- National Capital Planning Commission
- National Park Service: Potomac Heritage Scenic Trail
- Council of Virginia Archaeologists
- National Trust for Historic Preservation
- Woodlawn NHL
- Woodlawn Baptist Church
- Fairfax County Architectural Review Board
- Gunston Hall Plantation
- Woodlawn-Faith United Methodist Church
- Historical Society of Fairfax County
- Pohick Episcopal Church
- Ms. Martha Catlin (Interested Person)
- US Armed Forces Nuclear Energy Association
- American Nuclear Society
- The Nuke Digest (publication)

Federally Recognized Native American Tribes in Virginia:

- Eastern Band of Cherokee Indians
- Tuscarora Nation of New York
- United Keetowah Band of Cherokee Indians in Oklahoma
- Catawba Indian Nation
- Pamunkey Indian Tribe
- Chickahominy Indian Tribe
- Chickahominy Indian Tribe – Eastern Division
- Upper Mattaponi Tribe
- Rappahannock Tribe
- Monacan Indian Nation
- Nansemond Indian Nation

3. *Assessment of Effects from SM-1 Decommissioning*

In accordance with Section 106, USACE has sought to identify measures to avoid or minimize adverse effects that would result from the SM-1 decommissioning process. Nuclear Regulatory Commission (NRC) regulations for decommissioning licensed nuclear facilities such as the SM-1 Reactor Facility are provided in 10 CFR Part 20 Subpart E, and Parts 30, 50, and 51. NRC does not license the SM-1 Reactor; however, the Army Reactor Office (ARO) adheres to NRC regulations to the maximum extent possible with the exception of reporting requirements to the NRC.

The NRC's 1988 *Final Generic Environmental Impact Statement of Decommissioning Nuclear Facilities* (NUREG-0586) offers the choice of three decommissioning methods:

- DECON – Soon after the nuclear facility closes, equipment, structures, and portions of the facility containing radioactive contaminants are removed or decontaminated to a level that permits release of the property and termination of the license.
- SAFSTOR – Often considered "deferred dismantling," the nuclear facility is maintained and monitored in a condition that allows the radioactivity to decay; afterwards, the plant is dismantled and the property is decontaminated to a level that permits release of the property and termination of the license.

ENTOMB – Radioactive contaminants are permanently encased on site in structurally-sound material such as concrete; the facility is maintained and monitored until the radioactivity decays to a level permitting restricted release of the property.

As required by 10 CFR 50.82(a)(3), decommissioning must be completed within 60 years of the plant ceasing operations. To date, the SM-1 Reactor has been in a SAFSTOR condition for 44 years. Recent radiological surveys and data have shown that, within the time left before the 60-year deadline is reached, natural radiological decay would not sufficiently reduce residual radioactivity to allow for release of the facility without significant decontamination being performed. Additionally, the increasing cost and decreasing availability of radioactive waste disposal facilities raise concerns about the continuing feasibility of decontamination beyond the next few years.

USACE has determined that demolition of SM-1 and the following ancillary features, along with disposal of the contaminated soil, is the only feasible and prudent alternative for decommissioning:

- Building 372, Reactor Building and Stack;
- Building 7350, Sewage Lift Station;
- Building 349, Warehouse/Storage Building (non-contributing);
- Building 375, Pump Station and small pier connecting it to the shore (non-contributing);
- Underground pipes and other unused utilities.

In compliance with Section 106, USACE applied the Criteria of Adverse Effect to the historic property (SM-1 and ancillary buildings/structures) according to § 800.5 "Assessment of adverse effects" and has determined that the undertaking will cause "physical destruction or damage to all of the property" and will therefore have an adverse effect.

USACE seeks comment from your office on USACE's efforts to date to avoid or minimize adverse effects on the historic property from the undertaking, and concurrence with USACE's determination that the proposed demolition activity at the SM-1 site is an adverse effect, as defined by Section 106. By separate letter, and in accordance with 36 CFR § 800.6(a)(1), USACE will notify the Advisory Council on Historic Preservation (ACHP) of the adverse effect determination, provide the documentation specified in 36 CFR 800.11(e), and invite them to participate in the Section 106 process. USACE will also notify each of the identified consulting parties and federally recognized tribes of the adverse effect determination and solicit their input to develop possible mitigation measures. These measures will be codified in a Memorandum of Agreement, which will be sent to your office and any signing consulting parties for concurrence and signature.

Sincerely,

Brenda M. Barber, P.E.

Brenda M. Barber, P.E.
U.S. Army Corps of Engineers - Baltimore District
Project Manager Environmental and Munitions Design Center

cc: Hans Honerlah, USACE – Baltimore District
Patrick Read, USACE – Baltimore District
Scott Watson, USACE – Baltimore District
Jeff Lorenz, USACE – Baltimore District
Christine Heacock, Fort Belvoir - Cultural Resources



**DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT CORPS OF ENGINEERS
P.O. BOX 1715
BALTIMORE, MARYLAND 21203-1715**

October 28, 2015

Mr. Marc Holma
Architectural Historian
Project Review
Virginia Department of Historic Resources
2801 Kensington Avenue
Richmond, VA 23221

Dear Mr. Holma:

Re: SM-1 Reactor Facility Decommissioning Planning, Fort Belvoir, Fairfax County, VA

This letter is to initiate consultation with your office regarding the proposed Stationary Medium Power Plant Number 1 (SM-1) Reactor Facility decommissioning at Fort Belvoir in Fairfax County, VA (Figure 1) in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulation, 36 CFR 800, "Protection of Historic Properties."

The SM-1 Reactor Facility (historically known as the U.S. Army Package Power Reactor) was built in 1957 to generate electricity for commercial use and cut back on the Department of Defense's dependency on fossil fuels (Figure 2). Additional buildings and structures were added to the compound through the 1950s, 1960s, and into 1970. The compound sits on a terrace overlooking Gunston Cove. Portions of the compound were graded and leveled in the 1950s to provide suitable sites for the buildings and structures.

The SM-1 Reactor Facility (Building 372), along with six secondary resources (Buildings 7350, 373, 375, 376, 384, and the emergency siren), was determined eligible for listing on the National Register of Historic Places (NRHP) under Criterion A because it was the first water-pressurized reactor in the U.S. and due to its role as the first prototype nuclear power plant developed as a training facility for military personnel (DHR File No. 029-193 and NRHP Nomination Form 1996). It is also listed on the Virginia Landmarks Register (VLR No. 06-19-1996). Two additional buildings, 371 and 380, were associated with the SM-1 compound, though not included in the NRHP nomination. The SM-1 Reactor Facility was shut down by 1973. Buildings 373, 376, 384, and the emergency siren structure were demolished in the late 1990s as part of a separate, independent action.

One archaeological site, 44FX1331, has been identified within the proposed project area. Site 44FX1331 was identified in 1987 during a pedestrian survey of the area by former

Fairfax County Archaeologist, Michael Johnson, Ph.D. Numerous quartz and quartzite debitage, one quartz lanceolate point, and one quartz Piscataway point were recovered, suggesting a Late Archaic to Early Woodland Period occupation in the project area. Dr. Johnson noted on the site form that the majority of the site appeared to be severely disturbed by construction; however, no subsurface testing was conducted as part of the survey. The location of the site varies slightly between the V-CRIS file, the Fairfax County site form, and the Fort Belvoir GIS system (Figure 3). The site acreage was not listed, but is estimated at approximately 3 acres (allowing for overlapping site boundaries from the different systems).

Details on the undertaking and the proposed Area of Potential Effect (APE) are provided below. A Project Review Form is also attached for your review.

Description of the Undertaking

It is anticipated that the decommissioning of the SM-1 Reactor Facility will include the demolition and removal of buildings, removal of site infrastructure improvements (e.g., roads, fence), the removal of contaminated soils, and site restoration. Some potential significant activities expected to decommission the SM-1 Reactor Facility include:

- Construction of temporary facilities and/or modification of existing facilities to support the decommissioning effort. This phase includes preparation of lay-down areas and installation of office trailers, waste storage, and sanitary facilities.
- Reconfiguration and modification of site structures and facilities as needed to support the decommissioning effort. This may include the upgrading of roads (on and off site) to facilitate hauling and transport and/or the installation of a barge slip and concrete pad to support a temporary/mobile crane.
- Interior work including decontamination or fixing of loose contamination, removal of asbestos containing materials, removal of radioactive material and equipment (M&E), and radiation surveys of clean areas.
- Modification of the Vapor Container (domed structure of Building 372) to allow removal of the reactor and other large components prior to demolition of the structure.
- Demolition of the following buildings:
 - Building 372, Reactor Building and Stack
 - Building 7350, Sewage Lift Station
 - Building 349, Warehouse/Storage Building
 - Building 375, Pump Station and small pier connecting it to the shore
- Removal of underground pipes and other unused utilities
- Excavation and removal of contaminated soils
- Removal of paved areas and building slabs
- Site restoration

Waste generated from the decommissioning will include low-level radioactive waste (e.g., soil, building materials, and M&E), non-radioactive hazardous materials, clean M&E, and building demolition waste. The wastes will go to various licensed disposal facilities

dependent upon the specific waste stream. Following demonstration that the site meets the radiological release criteria, site restoration will be performed. Stockpiled clean soil from the excavations may be used as clean fill. Clean fill may also be imported to complete backfilling of the excavated areas. Once final grade is achieved, the soil will be loamed and seeded with an approved vegetative cover.

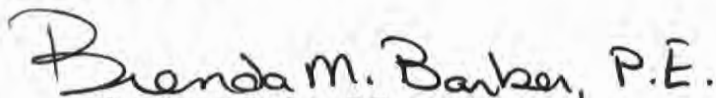
Area of Potential Effect

The total proposed APE is 10.76 acres (Figures 4 and 5). The architectural history APE for this proposed project is coterminous with the 10.76 acres surrounding the SM-1 compound and Buildings 371 and 380. The archaeological APE is coterminous with the boundaries of ground disturbance related to the demolition, site cleanup, and staging activities.

It is anticipated that the proposed decommissioning activities will have an adverse effect on the NRHP-eligible SM-1 Reactor Facility and may affect archaeological resources associated with site 44FX1331. As a result, we request a meeting with you and Mr. Gregg LaBudde to discuss the decommissioning of SM-1 and future steps to further determine the extent of, and address, these potential adverse effects.

If you need additional information, please contact me at [REDACTED] or via email at [REDACTED]

Sincerely,



Brenda M. Barber, P.E.

U.S. Army Corps of Engineers - Baltimore District

Project Manager Environmental and Munitions Design Center

cc: Hans Honerlah, U.S. Army Corps of Engineers - Baltimore District
Scott Watson, U.S. Army Corps of Engineers - Baltimore District
Alison Talbot, U.S. Army Garrison Fort Belvoir
Kevin Taylor, AECOM
Laurent Cartayrade, AECOM
Varna Boyd, AECOM

Section 7 Consultation

GARFO ESA Section 7: 2017 NLAA Program Verification Form

(Please submit a signed version of this form, together with any project plans, maps, supporting analyses, etc., to nmfs.gar.esa.section7@noaa.gov with "2017 NLAA Program" in the subject line)

Section 1: General Project Details

Application Number:	N/A		
Applicant(s):	U.S. Army Corps of Engineers - Baltimore District		
Permit Type (e.g. NWP, LOP, RGP, IP, Permit Modification):	N/A		
Anticipated project start date (e.g., 9/1/2017)	06/01/2020		
Anticipated project end date (e.g., 3/14/2018 – if there is no permit expiration date, write “N/A”)	12/31/2025		
Project Type/Category (check all that apply to entire action):			
<input type="checkbox"/>	Aquaculture (shellfish) and artificial reef creation	<input type="checkbox"/>	Transportation and development (e.g., culvert construction, bridge repair)
<input type="checkbox"/>	Routine maintenance dredging and disposal/beach nourishment	<input type="checkbox"/>	Mitigation (fish/wildlife enhancement or restoration)
<input checked="" type="checkbox"/>	Piers, ramps, floats, and other structures	<input type="checkbox"/>	Bank stabilization and dam maintenance
<input checked="" type="checkbox"/>	If other, describe project type/category: Demolition of an existing pier, pump house, and inactive wastewater discharge outfall pipe		
Project/Action Description and Purpose (<i>include town/city/state and water body where project is occurring; relevant permit conditions that aren't captured elsewhere on form</i>):			
<p>The US Army Corps of Engineers, Baltimore District (USACE) proposes to complete decommissioning and dismantlement of the Deactivated SM-1 Nuclear Reactor at Fort Belvoir in Fairfax County, Virginia (Proposed Action). SM-1 is located on Fort Belvoir's South Post adjacent to Gunston Cove, a tidal embayment of the Potomac River.</p> <p>SM-1 was deactivated in 1973 and has since been maintained in a safe storage (SAFSTOR) condition by USACE. Decommissioning and dismantlement of deactivated nuclear reactors is required within 60 years of deactivation in accordance with US Nuclear Regulatory</p>			

Type of Habitat Modified (e.g., sand, cobble, silt/mud/clay):	Area (acres):
Sand / silt	1.30
Project Latitude (e.g., 42.625884)	38.675830
Project Longitude (e.g., -70.646114)	-77.143610

Section 2: ESA-listed species and/or critical habitat in the action area:

<input checked="" type="checkbox"/>	Atlantic sturgeon (all DPSs) If not all DPSs, list which here:	<input type="checkbox"/>	Kemp's ridley sea turtle
<input checked="" type="checkbox"/>	Atlantic sturgeon critical habitat (proposed or designated) Indicate which DPS (GOM, NYB, Chesapeake Bay DPSs): Chesapeake Bay DPS	<input type="checkbox"/>	Loggerhead sea turtle (NW Atlantic DPS)
<input checked="" type="checkbox"/>	Shortnose sturgeon	<input type="checkbox"/>	Leatherback sea turtle
<input type="checkbox"/>	Atlantic salmon (GOM DPS)	<input type="checkbox"/>	North Atlantic right whale
<input type="checkbox"/>	Atlantic salmon critical habitat (GOM DPS)	<input type="checkbox"/>	North Atlantic right whale critical habitat
<input type="checkbox"/>	Green sea turtle (N. Atlantic DPS)	<input type="checkbox"/>	Fin whale

Section 3: NLAA Determination (check all applicable fields):

a) GENERAL PDC	
<input type="checkbox"/>	Yes, my project meets all of the General PDC.
<input checked="" type="checkbox"/>	No, my project does not meet all the General PDC as indicated below (please check the PDC the action does NOT comply with below, and provide justification in Section 4 of this form):
	Information for PDC 8 (if "max extent of stressor" exceeds "width of water body", PDC 8 is NOT met, and a justification in Section 4 is required to proceed with the verification form)

	Width (m) of water body in action area:	Stressor Category (stressor that extends furthest distance into water body – e.g., turbidity plume; sound pressure wave):	Max extent (m) of stressor into the water body:
	1,244.00	Sound pressure wave	328.00
<input type="checkbox"/>	1.	No work will individually or cumulatively have an adverse effect on ESA-listed species or designated critical habitat; no work will cause adverse modification or destruction to proposed critical habitat.	
<input type="checkbox"/>	2.	No work will occur in the tidally influenced portion of rivers/streams where Atlantic salmon presence is possible from April 10–November 7.	
<input type="checkbox"/>	3.	No work will occur in Atlantic or shortnose sturgeon spawning grounds as follows: i. New England: April 1–Aug. 31 ii. New York/Philadelphia: March 15–August 31 iii. Baltimore/Norfolk: March 15–July 1 and Sept. 15–Nov. 1	
<input type="checkbox"/>	4.	No work will occur in shortnose sturgeon overwintering grounds as follows: i. New England District: October 15–April 30 ii. New York/Philadelphia: Nov. 1–March 15 iii. Baltimore: Nov. 1–March 15	
<input type="checkbox"/>	5.	Within designated Atlantic salmon critical habitat, no work will affect spawning and rearing areas (PBFs 1-7).	
<input type="checkbox"/>	6.	Within proposed/designated Atlantic sturgeon critical habitat, no work will affect hard bottom substrate (e.g., rock, cobble, gravel, limestone, boulder, etc.) in low salinity waters (i.e., 0.0-0.5 parts per thousand) (PBF 1).	
<input type="checkbox"/>	7.	Work will not change temperature, water flow, salinity, or dissolved oxygen levels.	
<input type="checkbox"/>	8.	If it is possible for ESA-listed species to pass through the action area, a zone of passage with appropriate habitat for ESA-listed species (e.g., depth, water velocity, etc.) must be maintained (i.e., physical or biological stressors such as turbidity and sound pressure must not create barrier to passage).	
<input type="checkbox"/>	9.	Any work in designated North Atlantic right whale critical habitat must have no effect on the physical and biological features (PBFs).	
<input checked="" type="checkbox"/>	10.	The project will not adversely impact any submerged aquatic vegetation (SAV).	
<input type="checkbox"/>	11.	No blasting will occur.	

b) The following stressors are applicable to the action
(check all that apply – use Stressor Category Table for guidance):

<input checked="" type="checkbox"/>	Sound Pressure
<input type="checkbox"/>	Impingement/Entrapment/Capture
<input checked="" type="checkbox"/>	Turbidity/Water Quality
<input type="checkbox"/>	Entanglement

<input type="checkbox"/>	Habitat Modification
<input checked="" type="checkbox"/>	Vessel Traffic

Activity Category	Stressor Category					
	Sound Pressure	Impingement/Entrapment/Capture	Turbidity/Water Quality	Entanglement	Habitat Mod.	Vessel Traffic
Aquaculture (shellfish) and artificial reef creation	N	N	Y	Y	Y	Y
Routine maintenance dredging and disposal/beach nourishment	N	Y	Y	N	Y	Y
Piers, ramps, floats, and other structures	Y	N	Y	Y	Y	Y
Transportation and development (e.g., culvert construction, bridge repair)	Y	N	Y	N	Y	Y
Mitigation (fish/wildlife enhancement or restoration)	N	N	Y	N	Y	Y
Bank stabilization and dam maintenance	Y	N	Y	N	Y	Y

c) SOUND PRESSURE PDC					
<input checked="" type="checkbox"/>	Yes, my project meets all of the Sound Pressure PDC below.				
<input type="checkbox"/>	No, my project does not meet all the Sound Pressure PDC as indicated below (please check the PDC the action does NOT comply with below, and provide justification in Section 4 of this form):				
	Information for PDC 14 (refer to SOPs for guidance):				
	Pile material (e.g., steel pipe, timber, concrete)	Pile diameter/width (inches)	Number of piles	Installation method (e.g., impact hammer, vibratory start and then impact hammer to depth)	
a)					
b)					

	c)				
	d)				
<input type="checkbox"/>	12.	If the pile driving is occurring during a time of year when ESA-listed species may be present, and the anticipated noise is above the behavioral noise threshold of those species (please see SOPs), a 20 minute “soft start” is required to allow for animals to leave the project vicinity before sound pressure increases.			
<input type="checkbox"/>	13.	Any new pile supported structure must involve the installation of ≤ 50 piles (below MHW).			
<input type="checkbox"/>	14.	All underwater noise (pressure) is below ($<$) the physiological/injury noise threshold for ESA-listed species in the action area (if project involves steel piles, or non-steel piles > 24 -inches in diameter/width, include noise estimate with this form).			
d) IMPINGEMENT/ENTRAINMENT/CAPTURE PDC					
<input checked="" type="checkbox"/>	Yes, my project meets all of the Impingement/Entrainment/Capture PDC below.				
<input type="checkbox"/>	No, my project does not meet all the Impingement/Entrainment/Capture PDC as indicated below (please check the PDC the action does NOT comply with below, and provide justification in Section 4 of this form):				
	Information for Dredging:				
	If dredging permit/authorization includes multiple years of maintenance, include estimated number of dredging/disposal events:				
	Information for PDC 18 (refer to SOPs for guidance):				
	Mesh screen size (mm) for temporary intake:				
<input type="checkbox"/>	15.	Only mechanical, cutterhead, and low volume hopper (e.g., CURRITUCK) dredges may be used.			
<input type="checkbox"/>	16.	No new dredging in proposed or designated Atlantic sturgeon or Atlantic salmon critical habitat (maintenance dredging still must meet all other PDCs). New dredging outside Atlantic sturgeon or salmon critical habitat is limited to one time dredge events (e.g., burying a utility line) and minor (≤ 2 acres) expansions of areas already subject to maintenance dredging (e.g., marina/harbor expansion).			
<input type="checkbox"/>	17.	Work behind cofferdams, turbidity curtains, and other methods to block access of animals to dredge footprint is required when operationally feasible and ESA-listed species may be present.			
<input type="checkbox"/>	18.	Temporary intakes related to construction must be equipped with appropriate sized mesh screening (as determined by GARFO section 7 biologist and/or according to Chapter 11 of the NOAA Fisheries Anadromous Salmonid Passage Facility Design) and must not have greater than 0.5 fps intake velocities, to prevent impingement or entrainment of any ESA-listed species life stage.			
<input type="checkbox"/>	19.	No new permanent intake structures related to cooling water, or any other inflow at facilities (e.g. water treatment plants, power plants, etc.).			
e) TURBIDITY/WATER QUALITY PDC					
<input checked="" type="checkbox"/>	Yes, my project meets all of the Turbidity/Water Quality PDC below.				

<input type="checkbox"/>	No, my project does not meet all the Turbidity/Water Quality PDC as indicated below (please check the PDC the action does NOT comply with below, and provide justification in Section 4 of this form):	
<input type="checkbox"/>	20.	Work behind cofferdams, turbidity curtains, or other methods to control turbidity are required when operationally feasible and ESA-listed species may be present.
<input type="checkbox"/>	21.	In-water offshore disposal may only occur at designated disposal sites that have already been consulted on with GARFO.
<input type="checkbox"/>	22.	Any temporary discharges must meet state water quality standards; no discharges of toxic substances.
<input type="checkbox"/>	23.	Only repair of existing discharge pipes allowed; no new construction.
f) ENTANGLEMENT PDC		
<input checked="" type="checkbox"/>	Yes, my project meets all of the Entanglement PDC below.	
<input type="checkbox"/>	No, my project does not meet all the Entanglement PDC as indicated below (please check the PDC the action does NOT comply with below, and provide justification in Section 4 of this form):	
	Information for Aquaculture Projects:	
	Type of Aquaculture (e.g., cage on bottom)	Acreage
	a)	
	b)	
	c)	
<input type="checkbox"/>	24.	Shell on bottom <50 acres with maximum of 4 corner marker buoys;
<input type="checkbox"/>	25.	Cage on bottom with no loose floating lines <5 acres and minimal vertical lines (1 per string of cages, 4 corner marker buoys);
<input type="checkbox"/>	26.	Floating cages in <3 acres in waters and shallower than -10 feet MLLW with no loose lines and minimal vertical lines (1 per string of cages, 4 corner marker buoys);
<input type="checkbox"/>	27.	Floating upweller docks in >10 feet MLLW.
<input type="checkbox"/>	28.	Any in-water lines, ropes, or chains must be made of materials and installed in a manner (properly spaced) to minimize the risk of entanglement by keeping lines taut or using methods to promote rigidity (e.g., sheathed or weighted lines that do not loop or entangle).
g) HABITAT MODIFICATION PDC		
<input checked="" type="checkbox"/>	Yes, my project meets all of the Habitat Modification PDC below.	
<input type="checkbox"/>	No, my project does not meet all the Habitat Modification PDC as indicated below (please check the PDC the action does NOT comply with below, and provide justification in Section 4 of this form):	

<input type="checkbox"/>	29.	No conversion of habitat type (soft bottom to hard, or vice versa) for aquaculture or reef creation.
h) VESSEL TRAFFIC PDC		
<input checked="" type="checkbox"/>	Yes, my project meets all of the Vessel Traffic PDC below.	
<input type="checkbox"/>	No, my project does not meet all the Vessel Traffic PDC as indicated below (please check the PDC the action does NOT comply with below, and provide justification in Section 4 of this form):	
Information for PDC 33 (refer to SOPs for guidance):		
	Temporary Project Vessel Type (e.g., work barge, tug, scow, etc.)	Number of Vessels
a)	Work barge	1
b)	Barge escort	1
c)	Support boat(s)	1
	Type of Non-Commercial Vessels Added (e.g., 20' recreational motor boat – only include if there is a net increase directly/indirectly resulting from project)	Number of Vessels (if sum > 2, PDC 33 is not met and justification required in Section 4)
a)	None	
b)		
	Type of Commercial Vessels Added (only include if there is a net increase directly/indirectly resulting from project)	Number of Vessels (if > 0, PDC 33 is not met and justification required in Section 4)
a)	None	
b)		
<input type="checkbox"/>	30.	Speed limits below 10 knots for project vessels with buffers of 150 feet for all listed species (1,500 feet for right whales).
<input type="checkbox"/>	31.	While dredging, dredge buffers of 300 feet in the vicinity of any listed species (1,500 feet for right whales), with speeds of 4 knots maximum.
<input type="checkbox"/>	32.	The number of project vessels must be limited to the greatest extent possible, as appropriate to size and scale of project.
<input type="checkbox"/>	33.	The permanent net increase in vessels resulting from a project (e.g., dock/float/pier/boating facility) must not exceed two non-commercial vessels. A project must not result in the permanent net increase of any commercial vessels (e.g., a ferry terminal).

Section 4: Justification for Review under the 2017 NLAA Program

If the action is not in compliance with all of the General PDC and appropriate stressor PDC, but you can provide justification and/or special conditions to demonstrate why the project still meets the NLAA determination and is consistent with the aggregate effects considered in the programmatic consultation, you may still certify your project through the NLAA program using

this verification form. Please identify which PDC your project does not meet (e.g., PDC 9, PDC 15, PDC 22, etc.) and provide your rationale and justification for why the project is still eligible for the verification form.

To demonstrate that the project is still NLAA, you must explain why the effects on ESA-listed species or critical habitat are **insignificant** (i.e., too small to be meaningfully measured or detected) or **discountable** (i.e., extremely unlikely to occur). Please use this language in your justification.

PDC#	Justification
10.	<p>Mapped SAV species in Gunston Cove include hydrilla (<i>Hydrilla verticillata</i>) and common reed (<i>Phragmites australis</i>), which are both invasive species, water stargrass (<i>Heteranthera dubia</i>), spiny naiad (<i>Najas marina</i>), coontail (<i>Ceratophyllum demersum</i>), wild celery (<i>Vallisneria americana</i>), and southern naiad (<i>Najas guadalupensis</i>). The presence and extent of SAV adjacent to and near in-water structures associated with SM-1 is not known.</p> <p>SAV adjacent to the concrete discharge pipe, outfall structure, and pier/pump house, if present, could be damaged or destroyed during the proposed in-water activities. These</p>

Section 5: USACE Verification of Determination

<input type="checkbox"/>	In accordance with the 2017 NLAA Programmatic Consultation, the Corps has determined that the action complies with all applicable PDC and is not likely to adversely affect listed species.
<input checked="" type="checkbox"/>	In accordance with the 2017 NLAA Programmatic Consultation, the Corps has determined that the action is not likely to adversely affect listed species per the justification and/or special conditions provided in Section 4.
USACE Signature:	
Date:	
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Section 6: GARFO Concurrence

<input type="checkbox"/>	In accordance with the 2017 NLAA Program, GARFO PRD concurs with USACE's determination that the action complies with all applicable PDC and is not likely to adversely affect listed species or critical habitat.
<input checked="" type="checkbox"/>	In accordance with the 2017 NLAA Program, GARFO PRD concurs with USACE's determination that the action is not likely to adversely affect listed species or critical habitat per the justification and/or special conditions provided in Section 4.
<input type="checkbox"/>	GARFO PRD does not concur with USACE's determination that the action complies with the applicable PDC (with or without justification), and recommends an individual Section 7 consultation to be completed independent from the 2017 NLAA Program.
GARFO Signature:	
Date:	
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Carver, Craig

Subject: SM-1 Decommissioning, Fort Belvoir, VA - Signed Section 7 Programmatic NLAA Form
Attachments: final_SM-1 Reactor Decomm.pdf

From: Brian D Hopper - NOAA Federal [REDACTED]
Sent: Wednesday, March 04, 2020 3:05 PM
To: Carver, Craig [REDACTED]
Cc: Barber, Brenda M CIV USARMY CENAB (US) [REDACTED]
[REDACTED]; Roblyer, Griffin D K CIV USARMY CENAB (USA)
[REDACTED]; Taylor, Kevin (Greenville) [REDACTED]; Honerlah, Hans B CIV
USARMY CENAB (US) [REDACTED]; Ray, Diane M CIV USARMY CENAE (US)
[REDACTED]; Christine Vaccaro - NOAA Federal [REDACTED]
Subject: Re: SM-1 Decommissioning, Fort Belvoir, VA - Signed Section 7 Programmatic NLAA Form

for your records

On Wed, Mar 4, 2020 at 2:29 PM Carver, Craig [REDACTED] wrote:

Mr. Hopper,

Attached, please find the signed programmatic Section 7 NLAA form for the US Army Corps of Engineers proposed SM-1 decommissioning project at Fort Belvoir. NMFS's response or requests for additional information should be sent to all of the recipients included on this email.

Please let us know if you have any questions. Thank you for your assistance with this matter.

Craig Carver, AICP
Environmental Compliance Specialist

Southeast
[REDACTED]

AECOM
4840 Cox Road
Glen Allen, VA 23060, USA
T +1-804-515-8300
aecom.com

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--
Brian D. Hopper
Protected Resources Division
NOAA Fisheries
Greater Atlantic Regional Fisheries Office
200 Harry S Truman Parkway
Suite 460
Annapolis, MD 21401

<http://www.greateratlantic.fisheries.noaa.gov/>





United States Department of the Interior

FISH AND WILDLIFE SERVICE

Virginia Field Office
6669 Short Lane
Gloucester, VA 23061



Date: 10/15/19

Self-Certification Letter

Project Name: **SM-1 Reactor Facility Decommissioning**

Dear Applicant:

Thank you for using the U.S. Fish and Wildlife Service (Service) Virginia Ecological Services online project review process. By printing this letter in conjunction with your project review package, you are certifying that you have completed the online project review process for the project named above in accordance with all instructions provided, using the best available information to reach your conclusions. This letter, and the enclosed project review package, completes the review of your project in accordance with the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended (ESA). This letter also provides information for your project review under the National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321-4347, 83 Stat. 852), as amended. A copy of this letter and the project review package must be submitted to this office for this certification to be valid. This letter and the project review package will be maintained in our records.

The species conclusions table in the enclosed project review package summarizes your ESA conclusions. These conclusions resulted in:

- “no effect” determinations for proposed/listed species and/or proposed/designated critical habitat; and/or
- Action may affect the northern long-eared bat; however, any take that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR § 17.40(o) [as determined through the Information, Planning, and Consultation System (IPaC) northern long-eared bat assisted determination key]; and/or
- “may affect, not likely to adversely affect” determinations for proposed/listed species and/or proposed/designated critical habitat.

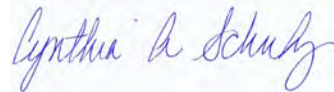
We certify that use of the online project review process in strict accordance with the instructions provided as documented in the enclosed project review package results in reaching the appropriate determinations. Therefore, we concur with the determinations described above for proposed and listed species and proposed and designated critical habitat. Additional coordination with this office is not needed.

Candidate species are not legally protected pursuant to the ESA. However, the Service encourages consideration of these species by avoiding adverse impacts to them. Please contact this office for additional coordination if your project action area contains candidate species.

Should project plans change or if additional information on the distribution of proposed or listed species, proposed or designated critical habitat becomes available, this determination may be reconsidered. This certification letter is valid for 1 year.

Information about the online project review process including instructions and use, species information, and other information regarding project reviews within Virginia is available at our website http://www.fws.gov/northeast/virginiafield/endspecies/project_reviews.html. If you have any questions, please contact Troy Andersen of this office at (804) 824-2428.

Sincerely,



Cindy Schulz
Field Supervisor
Virginia Ecological Services

Enclosures - project review package



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694 Fax: (804) 693-9032
<http://www.fws.gov/northeast/virginiafield/>

In Reply Refer To:
Consultation Code: 05E2VA00-2019-SLI-5695
Event Code: 05E2VA00-2020-E-00561
Project Name: SM-1 Reactor Facility Decommissioning

October 15, 2019

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Virginia Ecological Services Field Office

6669 Short Lane

Gloucester, VA 23061-4410

(804) 693-6694

Project Summary

Consultation Code: 05E2VA00-2019-SLI-5695

Event Code: 05E2VA00-2020-E-00561

Project Name: SM-1 Reactor Facility Decommissioning

Project Type: ** OTHER **

Project Description: The U.S. Army Corps of Engineers (USACE) is proposing to decommission the deactivated SM-1 Reactor Facility at U.S. Army Garrison Fort Belvoir, Virginia (proposed action). The proposed action would involve the demolition and disposal of the Reactor building (Building 372), removal and disposal of the remaining primary and secondary systems, and demolition and disposal of associated structures (including the water intake pier and pump house); the removal and disposal of contaminated soils; site restoration; and the termination of the permit under which the facility is currently being maintained by the U.S. Army. The proposed action would involve selected ground disturbance and tree clearing within the SM-1 facility's approximately 4-acre site on Fort Belvoir, as well as some localized subsurface disturbance in the waters of Gunston Cove adjacent to the site from the removal of an intake pipe, pier, and outfall associated with the facility.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/38.676607109490384N77.14488045921414W>



Counties: Fairfax, VA

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

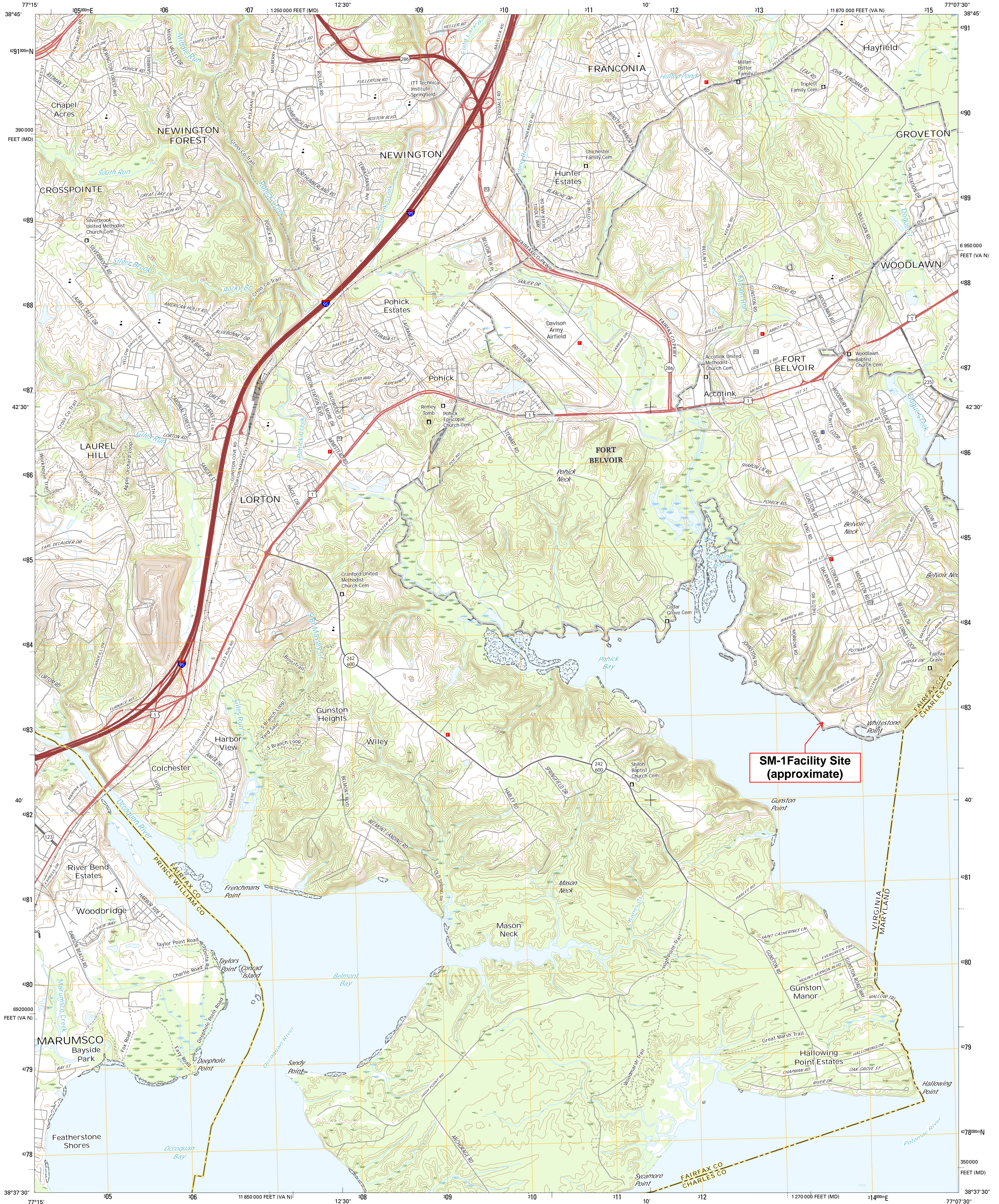
Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

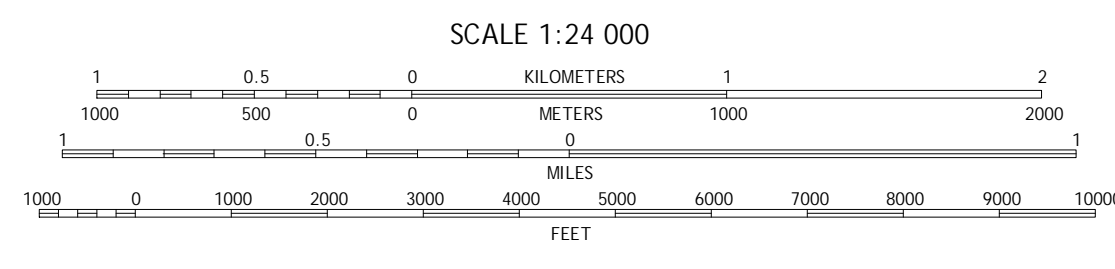
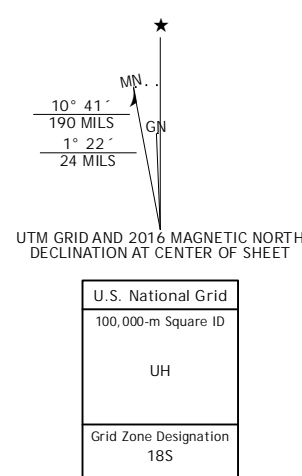
THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1000-meter grid: Universal Transverse Mercator, Zone 18S
10 000-foot ticks: Virginia Coordinate System of 1983 (north
zone), Maryland Coordinate System of 1983

This map is not a legal document. Boundaries may be
generalized for this map scale. Private lands within government
reservations may not be shown. Obtain permission before
entering private lands.

Imagery.....NAP: August 2014
Roads.....U.S. Census Bureau, 2015 - 2016
Names.....GNIS, 2016
Hydrography.....National Hydrography Dataset, 2014
Contours.....National Elevation Dataset, 2015
Boundaries.....Multiple sources: see metadata file 1972 - 2016
Wetlands.....FWS National Wetlands Inventory 1977 - 2014



This map was produced to conform with the
National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.19



ROAD CLASSIFICATION	
Expressway	Local Connector
Secondary Hwy	Local Road
Ramp	4WD
Interstate Route	US Route
	State Route

1	2	3
4	5	6
7	8	9

ADJOINING QUADRANGLES




FORT BELVOIR, VA-MD
2016



Figure 1



LEGEND

-  SM-1 Reactor Facility Site
-  Fence
-  Building Number

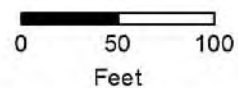
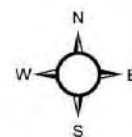


Figure 2

B-70

Table 1 – Species Conclusions Table

Project Name: SM-1 Reactor Facility Decommissioning

Date: October 15, 2019

Species / Resource Name	Conclusion	ESA Section 7 / Eagle Act Determination	Notes / Documentation
Northern long-eared bat (<i>Myotis septentrionalis</i>)	Potential habitat present and no current <u>site-specific</u> survey conducted	Not likely to adversely affect	No documented hibernaculum within 0.25 mile of the project site. No documented maternity roost trees on or within 150 feet of the project site. During the implementation of the proposed action, USACE and its contractors would adhere to management policies regarding the northern long-eared bat (NLEB) set forth in Fort Belvoir's <i>Integrated Natural Resources Management Plan</i> (INRMP), including a time of year restriction on tree clearing between April 15 and September 15 of any year to minimize impacts on potential NLEB maternity roost habitat.
Critical habitat ¹	No critical habitat present	No effect	Project would not occur in Virginia counties where critical habitat has been documented.
Notes: 1. USACE is consulting separately with NOAA Fisheries to identify potential impacts on the Atlantic sturgeon, its critical habitat, and other aquatic resources under its jurisdiction in Gunston Cove and/or the Potomac River.			



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

April 19, 2019

Ms. Brenda Barber, P.E.
Project Manager – Environmental and Munitions Design Center
U.S. Army Corps of Engineers, Baltimore District
2 Hopkins Plaza
09-A-10 (Cube)
Baltimore, MD 21201

Re: Essential Fish Habitat (EFH) consultation; SM-1 Reactor Facility Decommissioning,
U.S. Army Garrison Fort Belvoir, Fairfax County, Virginia

Dear Ms. Barber:

We have reviewed the information provided in your letter dated March 5, 2019, describing the proposed action to decommission the deactivated SM-1 Reactor Facility located at U.S. Army Garrison Fort Belvoir, Fairfax County, Virginia. The proposed action includes the demolition and disposal of the Reactor Facility (Bldg. 372) and associated infrastructure including three structures which extend into Gunston Cove, which is contiguous to the Potomac River. The three structures sited in intertidal and subtidal areas of Gunston Cove include a water outfall pipe and an approximately 105 ft. long water intake pier which supports a pump house. Gunston Cove is approximately 1,380 yds. wide at the project site.

As stated in your essential fish habitat (EFH) assessment, the Potomac River and Gunston Cove are designated as EFH for seven (7) federally managed species. The project area is also designated an anadromous fish use area by the Virginia Department of Game and Inland Fisheries (VDGIF). As you know, submerged aquatic vegetation (SAV) has been mapped at the project site by the Virginia Institute of Marine Science (VIMS) SAV monitoring program (VIMS, 2012-2017 data). The density of the SAV has been characterized as dense (70-100%) cover in most years and has been characterized as a suite of species including: *Hydrilla verticillata*, *Heteranthrea dubla*, *Najas minor*, *Najas major*, *Najas guadalupensis*, *Ceratophyllum demersum*, *Vallisneria spiralis* and *Myriophyllum spicatum*, though the most recent ground-truth survey was conducted over ten years ago (VIMS, 2007 data) and may not be indicative of the current species or species composition.

The proposed removal of the outfall pipe, pier and pump house have the potential to adversely affect EFH, SAV and the migration, spawning and nursery habitat of anadromous fish. As stated in your EFH assessment, removal of the water intake pier and pump house will be conducted using a barge-mounted crane and supporting vessels. Following removal of the superstructures, the piles will be removed in their entirety if structurally sound. If complete extraction of piles is not possible, piles may be cut off below the mudline. During deconstruction of the pier and pile removal, the use of a turbidity curtain is proposed to surround the entire work area. A turbidity



curtain will also be employed during the removal of the subaqueous portion of the water outfall pipe to prevent the migration of re-suspended sediment from the work area. This best management practice will reduce the potential direct and indirect impacts to EFH, SAV and any anadromous fish that may be present depending on the time of year construction occurs. Although the entire decommissioning of the SM-1 Reactor Facility is estimated to take five years to complete, the in-water demolition of the pier, pump house and water outfall pipe will only require approximately 45 days.

Essential Fish Habitat Conservation Recommendations

Based on the width of Gunston Cove and the proposed use of turbidity curtains during in-water construction, we agree with your determination that the proposed demolition activities will not have a substantial adverse effect on EFH, SAV or the migration, spawning or nursery habitat of anadromous fish. However, we are concerned that removal of the piles using other methods, such as jetting or dredging may have adverse impacts to EFH, SAV and other aquatic species. As a result we offer the following EFH conservation recommendation pursuant to Section 305 (b) (4) (A) of the Magnuson Stevens Fishery Conservation and Management Act (MSA):

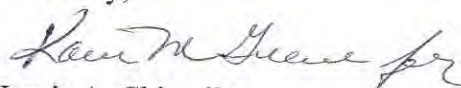
- Should extraction of piles using the barge-mounted crane become difficult or impossible, piles shall be cut below the mudline. Consultation should be reinitiated if other methods of pile removing such as jetting or dredging become necessary.

Endangered Species Act

Endangered species under the jurisdiction of NOAA Fisheries may be present in the project area. The federal action agency is responsible for determining whether the proposed action may affect these species. If you determine that the proposed action may affect a listed species, your determination of effects along with justification and a request for concurrence should be submitted to the attention of the Section 7 Coordinator, NMFS, Greater Atlantic Regional Fisheries Office, Protected Resources Division, 55 Great Republic Drive, Gloucester, MA 01930, or at nmfs.gar.esa.section7@noaa.gov. Guidance and tools to assist you in your effects determination are available on our website at: www.greateratlantic.fisheries.noaa.gov/section7. Please contact Brian Hopper of our Protected Resources Division [REDACTED] if you have any questions or to discuss your project and obligations under Section 7 of the Endangered Species Act.

Thank you for the opportunity to review the EFH assessment for the proposed decommission and demolition of the SM-1 Reactor Facility, water intake pier, pump station and water outfall pipe located on Gunston Cove. If you any questions or require additional information, please contact David O'Brien ([REDACTED]) in our Gloucester Point, VA field office.

Sincerely,



Louis A. Chiarella
Assistant Regional Administrator
for Habitat Conservation

cc: B. Hopper - PRD



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MD 21201

CENAB-ENE-C

March 5, 2019

USACE-Baltimore District

Ms. Karen Green
Mid-Atlantic Field Office Supervisor/EFH Coordinator
55 Great Republic Drive
NOAA Fisheries Service
Gloucester, Massachusetts 01930
[REDACTED]

Subject: Magnuson-Stevens Fishery Conservation and Management Act Consultation,
Environmental Assessment for the SM-1 Reactor Facility Decommissioning EA,
U.S. Army Garrison Fort Belvoir, Fairfax County, Virginia

Dear Ms. Greene,

The purpose of this letter is to solicit comments regarding the U.S. Army Corps of Engineers (USACE) Baltimore District's proposed decommissioning of the deactivated SM-1 Reactor Facility at U.S. Army Garrison Fort Belvoir (Fort Belvoir) in Fairfax County, Virginia (proposed action). USACE is preparing an Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) (42 United States Code [USC] §4321 et seq.) to analyze the potential impacts and environmental consequences associated with the decommissioning.

The proposed action would involve the demolition and disposal of the Reactor Facility (Building 372), the remaining primary and secondary systems, and associated structures; the removal and disposal of contaminated soils; site restoration; and the termination of the permit under which the facility is currently being maintained by the U.S. Army. Three structures that would be removed under the proposed action extend into Gunston Cove, a shallow embayment of the Potomac River adjacent to the SM-1 Reactor Facility: a water outfall pipe, an intake pier, and a pump house (situated on the pier). The proposed action is described in additional detail below followed by a discussion of potential Essential Fish Habitat (EFH).

The purpose of this letter is to inform your office of the project, its potential to affect EFH under the jurisdiction of your office, and to request concurrence with our determination.

Summary of Proposed Action

The SM-1 Reactor Facility is located on an approximately 5-acre parcel within Fort Belvoir's Main Post in Fairfax County, Virginia, approximately 17 miles southwest of Washington, D.C. (**Figure 1**). Gunston Cove, an embayment of the Potomac River, is located along the southwest side of the parcel and includes a water intake structure and pump house (**Figure 2**).

The proposed action consists of the removal of all radiologically contaminated structures, equipment, and media from the SM-1 Reactor Facility site, as needed, to allow for the termination of the permit under which the facility is currently maintained and the release of the site for unrestricted use. It also includes the removal of additional uncontaminated structures associated with the facility. The proposed action can be broken down into several components, as described below.

Site preparation. Preparatory activities would include the establishment of radiological controls on and around the SM-1 Reactor Facility site; the installation of temporary support facilities or modifications to existing facilities to support field activities throughout the duration of the proposed action; the removal of most vegetation from the site and some non-contaminated structures and equipment; and potential upgrades to the transportation network.

Removal of materials and equipment (M&E) from Building 372. These activities would include the removal of regulated contaminated and clean M&E from the building. Areas where surface contamination has been detected would be decontaminated to the extent practicable to allow open air demolition and minimize the amount of low-level radioactive waste (LLRW) to be transported and disposed of.

Demolition of Building 372. Demolition would occur in two sequential phases starting with structural components situated within the Unrestricted Area. This phase of demolition would include the above ground structure and removal of the remaining floor slab, foundation, and any tanks and piping still present. The resultant debris from these activities would be disposed of as clean waste. The second phase of demolition would occur within the Restricted Area and result in the removal of structures around, and including, the Vapor Container.

Demolition and removal of other structures. This component of the proposed action includes the demolition or removal of the water intake pump house and pier, a sewage pump station, and a storage warehouse. It also includes the removal of the water intake pipe to Building 372, the water discharge piping from Building 372 to the Seal Pit, the Seal Pit and associated manholes, the discharge pipe from the Seal Pit to the Outfall, and the unused sanitary sewer line associated with the sewage pump station.

Removal of the water intake pump house and pier, which extends from the shoreline to approximately 100 feet into Gunston Cove, would likely require the use of a barge-mounted crane and other vessels to give the demolition crew and equipment access to the structures. Superstructures would be removed first, followed by the piles if they are found to be structurally sound. If the piles are found to be in a condition that would not allow for complete removal, they may be cut at the mudline and the portions below the cut would be left in place. A boom/turbidity curtain would be put in place around the work area to limit turbidity increases downstream, to prevent the migration of disturbed sediment into the water column, and to ensure disturbed sediments settle near their original location. A boom/turbidity curtain would also be used to contain sediment disturbed by the removal of the underwater portion of the outfall pipe.

Soils remediation and restoration. Contaminated soils around and below Building 372 would be removed following demolition. In addition to radiological contamination, surveys have shown the presence of lead around the building, likely from the slow deterioration of lead-based paint. Soils around the underground tanks and piping are also assumed to be contaminated and would be removed along with those structures.

Waste disposal and transportation. The proposed decommissioning activities would generate large amounts of waste. All waste would be characterized, segregated, and disposed of as clean waste (no contamination, suitable for recycling or disposal at a regular landfill), LLRW, hazardous waste, or mixed waste. Disposal facilities appropriate for each category of waste would be identified and the waste would be shipped to those facilities in accordance with applicable federal and state regulations.

All waste would be transported off site by trucks, including a 53-foot trailer truck for the Reactor Pressure Vessel (RPV) cask. After leaving Fort Belvoir, the trucks would travel on public roads to either the disposal site or to a road-to-rail transfer location for rail transport to the final destination.

Safety, health, and environmental control measures. The proposed action would involve disturbing, demolishing, and moving materials, structures, and soils that are hazardous or radiologically contaminated. These materials would be handled in a controlled manner that would minimize the risk of exposure to project personnel, the general public, and the environment.

The proposed decommissioning activities would take place over an approximately 5-year time period with primary field activities starting in calendar year 2021. It is anticipated the site would be fully restored and available for unrestricted use by 2026. Work in Gunston Cove is anticipated to occur over approximately 45 days during that period.

Essential Fish Habitat

Removal of the water outfall pipe, water intake pier, and pump house has the potential to affect resources under the jurisdiction of the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries). The Magnuson-Stevens Fishery Conservation and Management Act requires Federal agencies to consult with NOAA Fisheries to address activities that may adversely affect EFH, which is defined as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” Based on a query of the NOAA EFH Mapper, designated EFH for six species has been mapped in the vicinity of the project area (**Table 1**). Mapping data for the summer flounder was not available in the EFH Mapper tool; however, the species was identified in a non-map query for the Potomac River. No Habitat Areas of Particular Concern (HAPCs) and no EFH Areas Protected from Fishing (EFHA) were identified in the proposed action area.

Table 1. EFH Species and Life Stages Potentially Found in the Project Area

Species	Egg	Larvae	Juvenile	Adult
Atlantic Herring	--	--	✓	✓
Clearnose Skate	--	--	✓	✓
Little Skate	--	--	--	✓
Red Hake	✓	✓	✓	✓
Summer Flounder	--	--	✓	✓
Windowpane Flounder	--	--	✓	
Winter Skate	--	--	--	✓

Mean salinity in the Potomac River near the SM-1 Reactor Facility ranges from approximately 0.08 parts per thousand (ppt) to 0.24 ppt depending on freshwater flows from Accotink and Pohick

Creeks and tidal influence from the Potomac River, with higher salinity during the late summer and fall seasons. Mean water temperatures range from approximately 8 degrees Celsius ($^{\circ}\text{C}$) during winter months to highs of 30°C during the summer months. Depth in Gunston Cove ranges from approximately 1.0 meter (m) in the northern region to approximately 2.25 m in the center. Given the low salinity, adult and juvenile EFH species are not expected to occur in the proposed action area, or would occur in low densities, as these species prefer high salinity zones (greater than 10 ppt) of the Chesapeake Bay and low water temperatures (below 10°C) (New England Fishery Management Council & NMFS, 2017). Water temperatures and salinity levels in Gunston Cove are also anticipated to be outside of ideal conditions for spawning and larval stages of Red Hake (below 10°C and above 0.5 ppt).

In-water activities associated with the removal of the three structures in Gunston Cove would result in demolition-related disturbances (including increased turbidity, physical disturbance, and noise/vibration) that may cause short-term adverse impacts on aquatic species and habitats. Removal activities would be temporary and localized to a small area, allowing adult and juvenile individuals to move out of affected areas. More information can be found in the *NOAA Fisheries EFH Assessment Worksheet* (see **Attachment 1**).

Conclusion

Because EFH species are unlikely to be present in the proposed action area and impacts on habitat would be short-term, any potential adverse impacts would be insignificant. Thus, USACE anticipates that the proposed action *may affect, but is unlikely to adversely affect* EFH, particularly with the implementation of best management practices (BMPs) during construction. BMPs would include the use of containment booms and turbidity barriers, erosion and sediment control and construction stormwater management measures, and seasonal restrictions, as appropriate, in accordance with permit conditions to further avoid or minimize impacts on aquatic species and habitat.

USACE requests NOAA Fisheries' review and concurrence with the effects determination stated in this letter. Please advise if there are any further actions needed to facilitate the implementation of the proposed action in a manner that avoids or minimizes adverse effects on EFH species or habitat.

Please direct any correspondence regarding this request to my attention at:

Project Manager – Environmental and Munitions Design Center
U.S. Army Corps of Engineers, Baltimore District (CENAB-ENE-C)
2 Hopkins Plaza
09-A-10 (Cube)
Baltimore, Maryland 21201

Should you require any further information concerning this project, feel free to contact me directly at [REDACTED].

Sincerely,

Brenda M. Barber, P.E.
Brenda M. Barber, P.E.

Enclosures

References:

New England Fishery Management Council & NMFS. (2017). Omnibus Essential Fish Habitat, Amendment 2, Volume 2: EFH and HAPC Designation Alternatives and Environmental Impacts. Retrieved from https://www.habitat.noaa.gov/application/efhmapper/oa2_efh_hapc.pdf#page=36.

Enclosures:

Figure 1: Project Location Map

Figure 2: Proposed Action Map

Attachment 1: EFH Assessment Worksheet

FIGURE 1





ATTACHMENT 1
NOAA FISHERIES
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
Essential Fish Habitat (EFH) Consultation Guidance
EFH ASSESSMENT WORKSHEET

Introduction:

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) mandates that federal agencies conduct an essential fish habitat (EFH) consultation with NOAA Fisheries regarding any of their actions authorized, funded, or undertaken that may adversely affect EFH. An adverse effect means any impact that reduces the quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

This worksheet has been designed to assist in determining whether a consultation is necessary and in preparing EFH assessments. This worksheet should be used as your EFH assessment or as a guideline for the development of your EFH assessment. At a minimum, all the information required to complete this worksheet should be included in your EFH assessment. If the answers in the worksheet do not fully evaluate the adverse effects to EFH, we may request additional information in order to complete the consultation.

An expanded EFH assessment may be required for more complex projects in order to fully characterize the effects of the project and the avoidance and minimization of impacts to EFH. While the EFH worksheet may be used for larger projects, the format may not be sufficient to incorporate the extent of detail required, and a separate EFH assessment may be developed. However, regardless of format, the analysis outlined in this worksheet should be included for an expanded EFH assessment, along with additional information that may be necessary. This additional information includes:

- the results of on-site inspections to evaluate the habitat and site-specific effects
- the views of recognized experts on the habitat or the species that may be affected
- a review of pertinent literature and related information
- an analysis of alternatives to the action that could avoid or minimize the adverse effects on EFH.

Your analysis of adverse effects to EFH under the MSA should focus on impacts to the habitat for all life stages of species with designated EFH, rather than individual responses of fish species. Fish habitat includes the substrate and benthic resources (e.g., submerged aquatic vegetation, shellfish beds, salt marsh wetlands), as well as the water column and prey species.

Consultation with us may also be necessary if a proposed action results in adverse impacts to other NOAA-trust resources. Part 6 of the worksheet is designed to help assess the effects of the action on other NOAA-trust resources. This helps maintain efficiency in our interagency coordination process. In addition, further consultation may be required if a proposed action impacts marine mammals or threatened and endangered species for which we are responsible. Staff from our Greater Atlantic Regional Fisheries Office, Protected Resources Division should be contacted regarding potential impacts to marine mammals or threatened and endangered species.

Instructions for Use:

Federal agencies must submit an EFH assessment to NOAA Fisheries as part of the EFH consultation. Your EFH assessment must include:

- 1) A description of the proposed action.
- 2) An analysis of the potential adverse effects of the action on EFH, and the managed species.
- 3) The federal agency's conclusions regarding the effects of the action on EFH.
- 4) Proposed mitigation if applicable.

In order for this worksheet to be considered as your EFH assessment, you must answer the questions in this worksheet fully and with as much detail as available. Give brief explanations for each answer.

Federal action agencies or the non-federal designated lead agency should submit the completed worksheet to NOAA Fisheries Greater Atlantic Regional Fisheries Office, Habitat Conservation Division (HCD) with the public notice or project application. Include project plans showing existing and proposed conditions, all waters of the U.S. on the project site, with mean low water (MLW), mean high water (MHW), high tide line (HTL), and water depths clearly marked and sensitive habitats mapped, including special aquatic sites (submerged aquatic vegetation, saltmarsh, mudflats, riffles and pools, coral reefs, and sanctuaries and refuges), hard bottom habitat areas and shellfish beds, as well as any available site photographs.

For most consultations, NOAA Fisheries has 30 days to provide EFH conservation recommendations once we receive a complete EFH assessment. Submitting all necessary information at once minimizes delays in review and keeps review timelines consistent. Delays in providing a complete EFH assessment can result in our consultation review period extending beyond the public comment period for a particular project.

The information contained on the [HCD Consultation website](#) and [NOAA's EFH Mapper](#) will assist you in completing this worksheet. Please note that the Mapper is currently being up-dated with new designations and EFH maps and text descriptions for many species are temporarily missing. When you open the Mapper, read the **WARNING** that pops up when you click on the Greater Atlantic Region. It will direct you to a document with maps and text descriptions for each of the missing New England Species and to the Mapper's [Data Inventory](#) where a data layer for all the missing species is available for downloading into GIS software. Once the Mapper is up-dated, you can do a [Location Query](#) for your project location, but until then, the only way to easily generate a list of the missing species and life stages is to use your own GIS software. Before you fill out the worksheet, we recommend that you check with the appropriate [HCD staff member](#) to ensure that your list is complete and accurate. They will be able to answer any questions that you have.

Also note that a number of new Habitat Areas of Particular Concern (HAPCs) have been designated in the Greater Atlantic Region. HAPC maps will also be added to the Mapper the next time it is up-dated. Currently, they can be viewed by following the instructions on the warning page for the region. We expect the Mapper to be fully up-dated and functional later this spring.

EFH ASSESSMENT WORKSHEET FOR FEDERAL AGENCIES (modified 3/2016)

PROJECT NAME: Environmental Assessment for the SM-1 Reactor Facility Decommissioning at U.S. Army Garrison Fort Belvoir, Fairfax County, VA

DATE: 01/31/2019

PROJECT NO.: N/A

LOCATION (Water body, county, physical address):

Gunston Cove of the Potomac River, Building 372, Fort Belvoir, Fairfax County, Virginia

PREPARER: AECOM on behalf of US Army Corps of Engineers Baltimore District

Step 1: Use [NOAA's EFH Mapper](#) to generate the list of designated EFH for federally-managed species and life stages for the geographic area of interest. Use this list as part of the initial screening process to determine if EFH for those species occurs in the vicinity of the proposed action. The list can be included as an attachment to the worksheet. Make a preliminary determination on the need to conduct an EFH consultation.

1. INITIAL CONSIDERATIONS		
EFH Designations	Yes	No
<p>Is the action located in or adjacent to EFH designated for eggs? List the species: Red Hake</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>Is the action located in or adjacent to EFH designated for larvae? List the species: Red Hake</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>Is the action located in or adjacent to EFH designated for juveniles? List the species: Atlantic Herring Clearnose Skate Red Hake Summer Flounder Windowpane Flounder</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<p>Is the action located in or adjacent to EFH designated for adults or spawning adults? List the species:</p> <p>Atlantic Herring Clearnose Skate Little Skate Red Hake Summer Flounder Windowpane Flounder Winter Skate</p>	<input checked="checked" type="checkbox"/>	<input type="checkbox"/>
<p>If you answered 'no' to all questions above, then an EFH consultation is not required - go to Section 5. If you answered 'yes' to any of the above questions, proceed to Section 2 and complete the remainder of the worksheet.</p>		

Step 2: In order to assess impacts, it is critical to know the habitat characteristics of the site before the activity is undertaken. Use existing information, to the extent possible, in answering these questions. Identify the sources of the information provided and provide as much description as available. These should not be yes or no answers. Please note that there may be circumstances in which new information must be collected to appropriately characterize the site and assess impacts. Project plans that show the location and extent of sensitive habitats, as well as water depths, the HTL, MHW and MLW should be provided.

2. SITE CHARACTERISTICS	
Site Characteristics	Description
Is the site intertidal, sub-tidal, or water column?	The site is intertidal and subtidal.
What are the sediment characteristics?	The sediment is predominantly silt, sand, and gravel substrates.
Is there submerged aquatic vegetation (SAV) at or adjacent to project site? If so describe the SAV species and spatial extent.	SAV has been mapped in the area by the Virginia Institute of Marine Science and USGS. Species identified in surveys include Hydrilla verticillata, Heteranthera dubia, Najas minor, Najas minor, Ceratophyllum demersum, Vallisneria americana, and Najas guadalupensis.
Are there wetlands present on or adjacent to the site? If so, describe the spatial extent and vegetation types.	There are wetlands adjacent to the site along drainages to the northwest of the project site. The dominant classification of wetlands is palustrine forested wetlands. The Proposed Action would not permanently adversely impact any wetlands.

Is there shellfish present at or adjacent to the project site? If so, please describe the spatial extent and species present.	No
Are there mudflats present at or adjacent to the project site? If so please describe the spatial extent.	No.
Is there rocky or cobble bottom habitat present at or adjacent to the project site? If so, please describe the spatial extent.	No
Is Habitat Area of Particular Concern (HAPC) designated at or near the site? If so for which species, what type habitat type, size, characteristics?	No.
What is the typical salinity, depth and water temperature regime/range?	Mean salinity in this section of the Potomac River ranges from approximately 0.08 ppt to 0.24 ppt depending on freshwater flows from Accolink and Pohick Creeks and tidal influence from the Potomac River, with higher salinity during the late summer and fall seasons. Mean water temperatures range from approximately 8°C to during winter months to highs of 30°C during the summer months. Depth in Gunston Cove ranges from approximately 1.0 m in the norther region to approximately 2.25 m in the center.
What is the normal frequency of site disturbance, both natural and man-made?	The SM-1 Reactor is no longer operational. As a result, the substrates and habitat around the water outfall pipe, pump house, and pier have not been disturbed for O&M purposes since the mid-1970's.
What is the area of proposed impact (work footprint & far afield)?	The water outfall pipe, pump house, and pier occupy approximately 4,200 square feet. These areas would experience direct impacts from the removal of these structures. Additional disturbance is anticipated within approximately 100 feet of each structure. In addition barge-mounted cranes/heavy equipment would operate within an approximate 8.8-acre area in the water around the structures during removal.

Step 3: This section is used to describe the anticipated impacts from the proposed action on the physical/chemical/biological environment at the project site and areas adjacent to the site that may be affected.

3. DESCRIPTION OF IMPACTS			
Impacts	Y	N	Description
Nature and duration of activity(s). Clearly describe the activities proposed and the duration of any disturbances.			The Proposed Action includes removal of a water discharge pipe, pumphouse, and pier. Removal of the water intake pump house and pier, which extends from the shoreline to approximately 100 feet into Gunston Cove, would likely require the use of a barge-mounted crane and other vessels to give the demolition crew and equipment access to the structures. Superstructures would be removed first, followed by the piles if they are found to be structurally sound. If the piles are found to be in a condition that would not allow for complete removal, they may be cut at the mudline and the portions below the cut would be left in place. A boom/turbidity curtain would be put in place around the work area to limit turbidity increases downstream, to prevent the migration of disturbed sediment into the water column, and to ensure disturbed sediments settle near their original location.
Will the benthic community be disturbed? If no, why not? If yes, describe in detail how the benthos will be impacted.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The benthic community adjacent to (within 100 feet of) the water outfall pipe, pump house, and pier would experience short-term impacts from disturbance to sediments by heavy equipment during removal. These structures occupy approximately 4,200 square feet of area. Following removal, the area would be allowed to recover naturally. In addition, the area of available benthic habitat would increase and expand to areas formerly occupied by the structures.
Will SAV be impacted? If no, why not? If yes, describe in detail how the SAV will be impacted. Consider both direct and indirect impacts. Provide details of any SAV survey conducted at the site.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SAV in the proposed project area will experience direct and indirect impacts associated with the removal of the structures. SAV adjacent to (within 100 feet of) the structures could be damaged or killed during the demolition and removal process. SAV in the 8.8-acre work area could be damaged by the movement of barge-mounted equipment in the area. Following removal, the area would be allowed to recover and additional habitat would be available in the area formerly occupied by the structures.
Will salt marsh habitat be impacted? If no, why not? If yes, describe in detail how wetlands will be impacted. What is the aerial extent of the impacts? Are the effects temporary or permanent?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	There are no salt marsh wetlands in the proposed project area.

<p>Will mudflat habitat be impacted? If no, why not? If yes, describe in detail how mudflats will be impacted. What is the aerial extent of the impacts? Are the effects temporary or permanent?</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>None present.</p>
<p>Will shellfish habitat be impacted? If so, provide in detail how the shellfish habitat will be impacted. What is the aerial extent of the impact? Provide details of any shellfish survey conducted at the site.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>None present.</p>
<p>Will hard bottom (rocky, cobble, gravel) habitat be impacted at the site? If so, provide in detail how the hard bottom will be impacted. What is the aerial extent of the impact?</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>None present.</p>
<p>Will sediments be altered and/or sedimentation rates change? If no, why not? If yes, describe how.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>Removal/demolition activities will cause a short-term localized disturbance in bottom sediments and cause a temporary increase in suspended sediment and turbidity. A boom/turbidity curtain will be used to limit the spread of suspended materials. Any adverse impacts would be temporary and less-than-significant, and further minimized through BMPs.</p>
<p>Will turbidity increase? If no, why not? If yes, describe the causes, the extent of the effects, and the duration.</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>See above.</p>

<p>Will water depth change? What are the current and proposed depths?</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>No change will occur.</p>
<p>Will contaminants be released into sediments or water column? If yes, describe the nature of the contaminants and the extent of the effects.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>No.</p>
<p>Will tidal flow, currents, or wave patterns be altered? If no, why not? If yes, describe in detail how.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>No.</p>
<p>Will water quality be altered? If no, why not? If yes, describe in detail how. If the effects are temporary, describe the duration of the impact.</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>Short-term, less-than-significant, adverse impacts to water quality from increased turbidity during demolition of structures could occur, as previously mentioned. Impacts would be temporary and further minimized through BMPs.</p>
<p>Will ambient noise levels change? If no, why not? If yes, describe in detail how. If the effects are temporary, describe the duration and degree of impact.</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>There would be short-term, less-than-significant increases to noise during demolition; however, there would be no long-term changes to noise levels. Noise levels are anticipated to be elevated intermittently during an approximately 45-day period.</p>
<p>Does the action have the potential to impact prey species of federally managed fish with EFH designations?</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>Prey species may experience temporary displacement during construction activities. However, the Proposed Action area is small in relative to the amount of habitat available to prey species. Further, long-term beneficial impacts could occur from the greater amount of habitat that will be available following demolition.</p>

Step 4: This section is used to evaluate the consequences of the proposed action on the functions and values of EFH as well as the vulnerability of the EFH species and their life stages. Identify which species (from the list generated in Step 1) will be adversely impacted from the action. Assessment of EFH impacts should be based upon the site characteristics identified in Step 2 and the nature of the impacts described within Step 3. NOAA's [EFH Mapper](#) should be used during this assessment to determine the ecological parameters/preferences associated with each species listed and the potential impact to those parameters.

4. EFH ASSESSMENT			
Functions and Values	Y	N	Describe habitat type, species and life stages to be adversely impacted
Will functions and values of EFH be impacted for:			
<u>Spawning</u> If yes, describe in detail how, and for which species. Describe how adverse effects will be avoided and minimized.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The EFH mapper indicates spawning habitat for Red Hake. However, water temperatures in Gunston Cove are anticipated to be above ideal water temperatures for spawning (water temperature below 10°C) during the peak spawning period for the species (May-November).
<u>Nursery</u> If yes, describe in detail how and for which species. Describe how adverse effects will be avoided and minimized.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The EFH mapper indicates larval fish habitat for Red Hake. However, the ideal salinity in Gunston Cove is typically below the preferred salinity for the larval life stage of this species (0.5 ppt).
<u>Forage</u> If yes, describe in detail how and for which species. Describe how adverse effects will be avoided and minimized.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The EFH mapper indicated that habitat may be present for juvenile and/or adult Atlantic herring, red hake, clearnose skate, little skate, winter skate, summer flounder, and windowpane flounder. With the implementation of BMPs to minimize impacts and the short duration of disturbance, there would be little to no adverse impact to managed fish species during foraging. Therefore, the Proposed Action may affect but is unlikely to adversely affect managed species during foraging.
<u>Shelter</u> If yes, describe in detail how and for which species. Describe how adverse effects will be avoided and minimized.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SAV and woody debris are present in the project area and could provide cover for fish species. Disturbance to cover immediately adjacent to the structures being demolished could occur during removal of structures. A boom/turbidity curtain will be used to limit the spread of suspended materials beyond the estimated 8.8-acre work area and 4,200 sq. ft. removal area. Following removal, habitat would be expected to naturally restore to pre-disturbance conditions.

<p>Will impacts be temporary or permanent? Please indicate in description box and describe the duration of the impacts.</p>			<p>Temporary impacts, such as turbidity and noise increases, would occur during demolition/removal activities of in-water structures. Impacts are anticipated to occur intermittently during an approximately 45-day period.</p>
<p>Will compensatory mitigation be used? If no, why not? Describe plans for mitigation and how this will offset impacts to EFH. Include a conceptual compensatory mitigation plan, if applicable.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>No. BMPs will be used to limit the potential for impacts during removal. Impacts to EFH will be short-term and localized. The area will revert to pre-disturbance conditions following completion of the project. In addition, a small amount of new habitat, currently occupied by the structures, will be created.</p>

Step 5: This section provides the federal agency's determination on the degree of impact to EFH from the proposed action. The EFH determination also dictates the type of EFH consultation that will be required with NOAA Fisheries.

Please note: if information provided in the worksheet is insufficient to allow NOAA Fisheries to complete the EFH consultation additional information will be requested.

5. DETERMINATION OF IMPACT

Federal Agency's EFH Determination

<p>Overall degree of adverse effects on EFH (not including compensatory mitigation) will be:</p> <p>(check the appropriate statement)</p>	<input type="checkbox"/>	<p>There is no adverse effect on EFH or no EFH is designated at the project site.</p> <p>EFH Consultation is not required.</p>
	<input checked="" type="checkbox"/>	<p>The adverse effect on EFH is not substantial. This means that the adverse effects are either no more than minimal, temporary, or that they can be alleviated with minor project modifications or conservation recommendations.</p> <p>This is a request for an abbreviated EFH consultation.</p>
	<input type="checkbox"/>	<p>The adverse effect on EFH is substantial.</p> <p>This is a request for an expanded EFH consultation.</p>

Step 6: Consultation with NOAA Fisheries may also be required if the proposed action results in adverse impacts to other NOAA-trust resources, such as anadromous fish, shellfish, crustaceans, or their habitats as part of the Fish and Wildlife Coordination Act. Some examples of other NOAA-trust resources are listed below. Inquiries regarding potential impacts to marine mammals or threatened/endangered species should be directed to NOAA Fisheries' Protected Resources Division.

6. OTHER NOAA-TRUST RESOURCES IMPACT ASSESSMENT	
Species known to occur at site (list others that may apply)	Describe habitat impact type (i.e., physical, chemical, or biological disruption of spawning and/or egg development habitat, juvenile nursery and/or adult feeding or migration habitat). Please note, impacts to federally listed species of fish, sea turtles, and marine mammals must be coordinated with the GARFO Protected Resources Division.
alewife	Potential spawning and larval cover and foraging habitat is present and could be disrupted by removal activities. The species could be present in the spring and summer.
American eel	Potential cover and foraging habitat for adult eel is present and could be disrupted by removal activities.
American shad	Potential spawning and larval cover and foraging habitat is present and could be disrupted by removal activities. The species could be present in the spring and summer.
Atlantic menhaden	Potential forage and cover habitat for juvenile menhaden is present and could be disrupted by removal activities.
blue crab	Potential nursery and juvenile habitat is present for blue crab and could be disrupted by removal activities.
blue mussel	Blue mussel is unlikely to be present given the low salinity in Gunston Cove.
blueback herring	Potential spawning and larval cover and foraging habitat is present and could be disrupted by removal activities. The species could be present in the spring and summer.

Eastern oyster	Oyster is unlikely to be present given the lack of hard substrate and low salinities in the project area.
horseshoe crab	Horseshoe crab is unlikely to be present given the low salinity in Gunston Cove.
quahog	Quahog is unlikely to be present given the low salinity in Gunston Cove.
soft-shell clams	Soft-shell clams are unlikely to be present given the low salinity in Gunston Cove.
striped bass	Striped bass eggs and larvae could occur in the project area and could be disrupted by removal activities.
other species:	N/A

Useful Links

[National Wetland Inventory Maps](#)

[EPA's National Estuaries Program](#)

[Northeast Regional Ocean Council \(NROC\) Data](#)

[Mid-Atlantic Regional Council on the Ocean \(MARCO\) Data](#)

Resources by State:

Maine

[Eelgrass maps](#)

[Maine Office of GIS Data Catalog](#)

[Casco Bay Estuary Partnership](#)

[Maine GIS Stream Habitat Viewer](#)

New Hampshire

[New Hampshire's Statewide GIS Clearinghouse, NH GRANIT](#)

[New Hampshire Coastal Viewer](#)

Massachusetts

[Eelgrass maps](#)

[MADMF Recommended Time of Year Restrictions Document](#)

[Massachusetts Bays National Estuary Program](#)

[Buzzards Bay National Estuary Program](#)

[Massachusetts Division of Marine Fisheries](#)

[Massachusetts Office of Coastal Zone Management](#)

Rhode Island

[Eelgrass maps](#)

[Narraganset Bay Estuary Program](#)

[Rhode Island Division of Marine Fisheries](#)

[Rhode Island Coastal Resources Management Council](#)

Connecticut

[Eelgrass Maps](#)

[Long Island Sound Study](#)

[CT GIS Resources](#)

[CT DEEP Office of Long Island Sound Programs and Fisheries](#)

[CT Bureau of Aquaculture Shellfish](#)

[Maps CT River Watershed Council](#)

New York

[Eelgrass report](#)

[Peconic Estuary Program](#)

[NY/NJ Harbor Estuary](#)

New Jersey

[Submerged Aquatic Vegetation mapping](#)

[Barnegat Bay Partnership](#)

Delaware

[Partnership for the Delaware Estuary](#)

[Center for Delaware Inland Bays](#)

Maryland

[Submerged Aquatic Vegetation mapping](#)

[MERLIN](#)

[Maryland Coastal Bays Program](#)

Virginia

[Submerged Aquatic Vegetation mapping](#)

Appendix C – Finding of No Practicable Alternative (FONPA)

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FINDING OF NO PRACTICABLE ALTERNATIVE FOR DECOMMISSIONING AND DISMANTLEMENT OF THE DEACTIVATED SM-1 NUCLEAR REACTOR FACILITY

US ARMY GARRISON FORT BELVOIR

FAIRFAX COUNTY, VIRGINIA

1.0 Introduction

The United States Army Corps of Engineers (USACE), Baltimore District proposes to decommission and dismantle the Deactivated SM-1 Nuclear Reactor Facility at United States (US) Army Garrison Fort Belvoir in Fairfax County, Virginia (Proposed Action). SM-1 operated from 1957 to 1973 and was deactivated between 1973 and 1974. Since deactivation, SM-1 has been maintained by USACE under a Reactor Possession Permit issued by the US Army Nuclear and Countering Weapons of Mass Destruction Agency (USANCA) with oversight from the Army Reactor Office (ARO). The Proposed Action would remove all buildings, structures, and equipment from the SM-1 site and restore the site to a standard that allows for unrestricted future use. Although SM-1 is on Fort Belvoir's fee title land, Army Regulation (AR) 50-7, *Army Reactor Program* designates USACE as the lead Army component and the single point of contact at Headquarters, Department of the Army for nuclear reactor decommissioning to ensure compliance with environmental requirements for decommissioning Army nuclear reactors.

USACE has determined that elements of the Proposed Action must occur within portions of the 100-year floodplain on Fort Belvoir. Under Executive Order (EO) 11988, *Floodplain Management*, USACE must find that there is no practicable alternative to development within the 100-year floodplain and take all practicable measures to minimize harm to or within the floodplain.

This Finding of No Practicable Alternative (FONPA) incorporates the analysis and conclusions of the April 2020 *Final Environmental Assessment for the Decommissioning and Dismantlement of the Deactivated SM-1 Nuclear Reactor Facility*. In accordance with the EO, the Draft FONPA was made available for public review and comment during the six-week Draft Environmental Assessment (EA) public review period that began on 20 December 2019 and ended on 31 January 2020.

2.0 Notice of Floodplain Involvement

EO 11988 requires federal agencies to determine whether a proposed action would occur within a floodplain and to avoid floodplains to the maximum extent possible when there is a practicable alternative. The 100-year floodplain is defined as an area adjacent to a water body that has a 1 percent or greater chance of inundation in any given year. The Deactivated SM-1 Nuclear Reactor Facility occupies a 3.6-acre site along Gunston Cove, a tidal embayment of the Potomac River (**Figure 1**). The Proposed Action includes the removal of infrastructure associated with the former operation of SM-1 in the 100-year floodplain adjacent to Gunston Cove.

Structures in the 100-year floodplain that would be removed by the Proposed Action consist of a water intake pier and pump house, and a wastewater discharge pipe (**Figure 2**). The water intake pier and pump house extend approximately 100 feet from the shoreline into Gunston Cove. The water discharge pipe extends in a northwest direction from the facility. The end of the pipe is situated in the 100-year floodplain where it previously discharged into Gunston Cove.

Activities associated with the removal of these structures in Gunston Cove would temporarily disturb floodplains, resulting in the loss or degradation of their natural functions such as water storage, infiltration, and filtration. These impacts could extend to the intrinsic value of this resource or the benefits associated with its use, such as wildlife habitat, recreation, and aesthetic enjoyment. Floodplain functions and values are also susceptible to

changes in the volume, rate, and quality of stormwater discharge, particularly as influenced by the amount of impervious surface within a watershed.

Publication of the Notice of Availability (NOA) for the Draft EA commenced the six-week public comment period. The NOA also stated that the six-week public comment period applied to comments on the Draft FONPA. No comments on the Draft FONPA were received during the public review period.

3.0 Description of the Proposed Action and Discussion of Alternatives

The Proposed Action would execute the SM-1 Decommissioning Plan (DP) approved by the Army Reactor Office (ARO). Decommissioning activities under the Proposed Action would begin with site preparation and mobilization of equipment and personnel. As space is limited at the SM-1 site, heavy equipment needed to support the Proposed Action (e.g., cranes, skid loaders, forklifts, boom lifts, excavators) would not be mobilized until needed to support planned decommissioning activities.

Initial decommissioning and dismantlement activities would focus on the safe removal of non-radioactive and radioactive materials and equipment (M&E) from the Deactivated SM-1 Nuclear Reactor Facility. Upon the removal of radioactive M&E from the SM-1 site, remnant structures and foundations would be surveyed to ensure residual radioactivity is below applicable regulatory criteria for release and then demolished. All radioactive and non-radioactive waste generated from decommissioning activities would be packaged in accordance with applicable US Department of Transportation (DOT) and Nuclear Regulatory Commission (NRC) requirements, transported in trucks by licensed contractors, and disposed of or recycled at permitted off-post facilities.

Removal of the water intake pump house and pier would likely require the use of a barge-mounted crane and other vessels to give the demolition crew and equipment access to the structure. Superstructures would be removed first, followed by the piles. To minimize disturbance of sediments and the subaqueous bottom, the piles would be cut below the mudline and the portions below the cut would be left in place.

Site restoration would be the final step in the decommissioning process. These activities would commence upon confirmation of the site's compliance with unrestricted use criteria. Temporary structures or infrastructure used to support the prior phases of the Proposed Action would be dismantled and either removed from the site or broken down for use as backfill. Clean soil stockpiled onsite would be used to backfill excavated areas; however, clean fill materials imported from other sources would also be required.

Finally, the SM-1 site would be regraded to emulate current elevation and topography. Following application of a loamy top soil, the site would be seeded with native grasses or shrubs to promote revegetation. As practicable, native trees and/or shrubs would also be replanted onsite in accordance with Fort Belvoir's Policy Memorandum #27, *Tree Removal and Protection*, to replace vegetation removed during the decommissioning process.

Alternatives Selection Criteria

The practicability of a given alternative is evaluated by considering pertinent factors such as community welfare, environmental impact, and feasibility in light of the overall purpose and need. USACE developed screening criteria to assess whether an alternative would meet its purpose and need and, therefore, could be considered reasonable. The following criteria were used to evaluate a range of reasonable alternatives:

- **Safety.** Protect public and worker safety, to the maximum extent possible, by reducing the probability of accident or injury in all phases of the decommissioning process.
- **Health.** Reduce risk to public and worker health, to the maximum extent possible, including compliance with the radiological criteria for release of the site for unrestricted use.

- **Time.** Select and implement a decommissioning approach that adheres to the 60-year post-deactivation timeframe in accordance with NRC regulations and the program objectives of USACE's Deactivated Nuclear Power Plant Program.
- **Space.** Select and implement a decommissioning option that provides adequate space to safely and efficiently perform all associated work activities.
- **Cost.** Complete the programmatic, technical, and administrative elements of decommissioning at a reasonable cost.
- **Environmental.** Avoid or minimize adverse effects on protected, beneficial, or valued environmental resources, to the maximum extent possible.

Alternatives Considered and Dismissed

USACE considered alternatives to implementing the proposed decommissioning that were subsequently eliminated through a screening process and detailed analysis. These alternatives, as summarized below, failed to meet USACE's screening criteria and would not satisfy the Proposed Action's purpose and need.

In-place decommissioning of the Deactivated SM-1 Nuclear Reactor Facility was an alternative considered and dismissed. Under this alternative, portions of SM-1 would remain intact in the long term. Only radioactive components exceeding the regulatory threshold for unrestricted use would be removed prior to demolition, while M&E with low levels of contamination would be decontaminated to preserve the equipment in place. Selection of this option would likely limit the frequency and extent of final status and confirmatory surveys, potentially leading to improper waste disposal. Such factors increase the risk and cost involved in decommissioning a nuclear reactor. Following removal of key reactor components, the main reactor facility building (Building 372) would require extensive retrofit and modernization to meet current building codes and make it suitable for future human occupancy. Further, if any reactor systems were left in place, the site would not directly support the military mission on-post, nor would the land use be consistent with Fort Belvoir's future land use plans. Therefore, this alternative was eliminated from further consideration.

Alternate transport routes within Fort Belvoir were also considered to provide access to and from the SM-1 site to conduct decommissioning activities. Factors evaluated for this purpose included, but were not limited to, public safety, traffic, roadway conditions and capacity, travel distance and time, and security. None of the alternate routes sufficiently met the varied requirements necessary to support the decommissioning of SM-1. Therefore, alternate transport routes on Fort Belvoir were eliminated.

USACE also considered utilizing a barge to transport demolition debris for disposal. Under this option, waste containers would be delivered via truck to a staging/transfer point along the existing seawall on the north side of Ponton Basin, an inlet on Fort Belvoir approximately 0.3 mile east of the SM-1 Reactor Facility. A land- or barge-based crane would then load the containers onto a moored barge for transport via the Potomac River and Chesapeake Bay to a barge-to-rail transfer facility in Norfolk, Virginia. This alternative would require dredging more than 10,000 cubic yards of spoils in Ponton Basin and portions of Gunston Cove, which would substantially increase time, cost, and impact of decommissioning SM-1 (a barge-mounted crane and associated vessels would still be required to remove the water intake pier as described above for the Proposed Action). Therefore, the barge transport option was eliminated from detailed analysis in the EA.

Alternatives Subject to Further Analysis

Based on the selection criteria, two alternatives were selected for more detailed analysis in the EA: the Proposed Action Alternative and the No Action Alternative.

No Action Alternative

The No Action Alternative would maintain the current safe storage configuration of the Deactivated SM-1 Nuclear Reactor Facility. USACE would continue to maintain the site under the existing Reactor Possession Permit until its expiration or amendment at a later date. Regular inspections and monitoring of site conditions would continue in accordance with the status quo. Under this Alternative, the natural decay of residual radioactivity would continue slowly over the long term. The No Action Alternative would not allow USACE to release SM-1 for unrestricted use in the short term; therefore, USACE program objectives would not be met as ARO would not terminate its permit for the site. While the No Action Alternative does not meet the screening criteria nor the Proposed Action's purpose and need, it is carried forward for analysis in the EA to provide a comparative baseline against which impacts of the Proposed Action Alternative could be measured, as required under the CEQ regulations (40 CFR Part 1502.14). Because it does not meet the Proposed Action's purpose and need, this alternative is not "practicable" within the meaning of EO 11988.

Proposed Action Alternative

The Proposed Action Alternative would implement the ARO-approved SM-1 Reactor Facility DP. Under this Alternative, individual reactor components would be dismantled and removed prior to demolition. To the extent practicable, contaminated radioactive components would be removed intact for disposition, and non-radioactive components verified as uncontaminated would be removed and segregated onsite for recycling or disposal, as appropriate. The Proposed Action Alternative would also excavate and remove subsurface infrastructure and any contaminated media from the SM-1 site (e.g., soils). Following dismantlement and removal of structures, components, and wastes, including the intake pier and pump house and wastewater discharge pipe, all debris would be packaged for transport by licensed contractors to permitted off-post disposal or recycling facilities. Access to and from the site for all personnel, vehicles, and equipment associated with the Proposed Action would be provided by the existing on- and off-post road network.

Following the completion of demolition activities and surveys to verify that radiation levels are below applicable standards for unrestricted release, the site would be restored and revegetated, and returned to Fort Belvoir for future use.

Impacts and Mitigation Measures

Approximately 0.5 acre of the SM-1 site is situated within the 100-year floodplain associated with Gunston Cove (**Figure 3**). The intake pier and pump house and the wastewater outfall pipe associated with SM-1 are located within the 100-year floodplain. The area of the floodplain that would be temporarily occupied and potentially impacted by equipment needed to remove these structures would be exceedingly small relative to the overall 100-year floodplain associated with Gunston Cove; thus, in-water activities would not noticeably impair the floodplain's capacity to absorb or convey floodwaters, nor would they noticeably displace floodwaters further downstream. Because there would be no noticeable displacement of floodwaters, the proposed activities would have no potential in the short term to threaten human life or property downstream of the SM-1 site. In the long term, no permanent structures would be built or operated in the 100-year floodplain under the Proposed Action Alternative. The removal of the structures would result in a long-term beneficial impact by enhancing the capacity and function of the 100-year floodplain and promoting the restoration of the Gunston Cove shoreline and subaqueous bottom to conditions resembling those that existed prior to the development of SM-1.

EO 11988 states that if the only practicable alternative requires action in a floodplain, the agency shall design or modify its action to minimize potential harm to or within the floodplain. Under the Proposed Action Alternative, best management practices (BMPs) and low impact development (LID) measures would be implemented to reduce the potential for adverse impacts on the 100-year floodplain and areas downstream. BMPs and LID measures incorporated into the Proposed Action Alternative to avoid or minimize impacts on floodplains are collectively described, as follows:

- Erosion and sediment controls during decommissioning and demolition activities would function to capture or re-direct stormwater flows for infiltration or evapotranspiration onsite.
- During removal of the intake pier/pump house structure in Gunston Cove, support piles would be cut below the mudline and the portions below the mudline would be left in place to minimize sediment and subaqueous bottom disturbance.
- Containment booms and sediment curtains would be used during in-water and nearshore work to contain debris that inadvertently enter the water, prevent the migration of disturbed sediment into the water column, minimize turbidity, and ensure disturbed sediments settle near their original location.
- As necessary, the decommissioning contractor would delineate wetlands, obtain a jurisdictional determination from USACE, and submit a JPA identifying avoidance, minimization, and/or compensatory mitigation measures to receive permit coverage pursuant to Sections 401/404 of the Clean Water Act.
- Adherence to Fort Belvoir's *Guide for Resource Protection Areas (RPAs) and Stream Buffers* dated 21 September 2016 would help to offset permanent and temporary impacts on riparian buffer zones established to preserve water quality and provide flood and erosion control on the installation. RPAs reduce the velocity and volume of storm and flood waters by encouraging their retention in the soil, allowing sediment and attached nutrients and toxins to filter out and settle.

Taken together, these and other yet to be determined BMPs and LID measures would avoid or minimize the loss of and impacts on floodplains at the SM-1 site. These measures represent all practicable measures to minimize harm to floodplains.

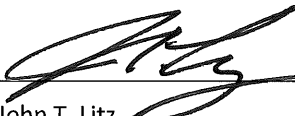
4.0 Finding

During development of the Proposed Action, USACE sought ways to avoid impacts on floodplains while still implementing the DP and adhering to applicable regulations. By necessity of the location of the intake pier, pump house, and wastewater outfall pipe, and the requirement to remove those structures to complete decommissioning and demolition of the SM-1 Reactor Facility, it was determined that avoidance of floodplains was not feasible. As such, USACE has determined there is no practicable alternative to avoiding action within floodplains on the SM-1 site during implementation of the Proposed Action.

Following a thorough evaluation of alternate plans that would satisfy the Proposed Action's purpose and need, I find that there is no practicable alternative to siting elements of the Proposed Action entirely outside of floodplains. Therefore, USACE will ensure that all practicable measures to minimize impacts to and within the floodplain environment are incorporated into the Proposed Action.

26 MAR 20

Date


COL John T. Litz
District Engineer
US Army Corps of Engineers, Baltimore District

Attachments: Figure 1: Location of the SM-1 Reactor Facility on Fort Belvoir
Figure 2: SM-1 Reactor Facility
Figure 3: Water Resources at the SM-1 Site

Figure 1: Location of the SM-1 Reactor Facility on Fort Belvoir

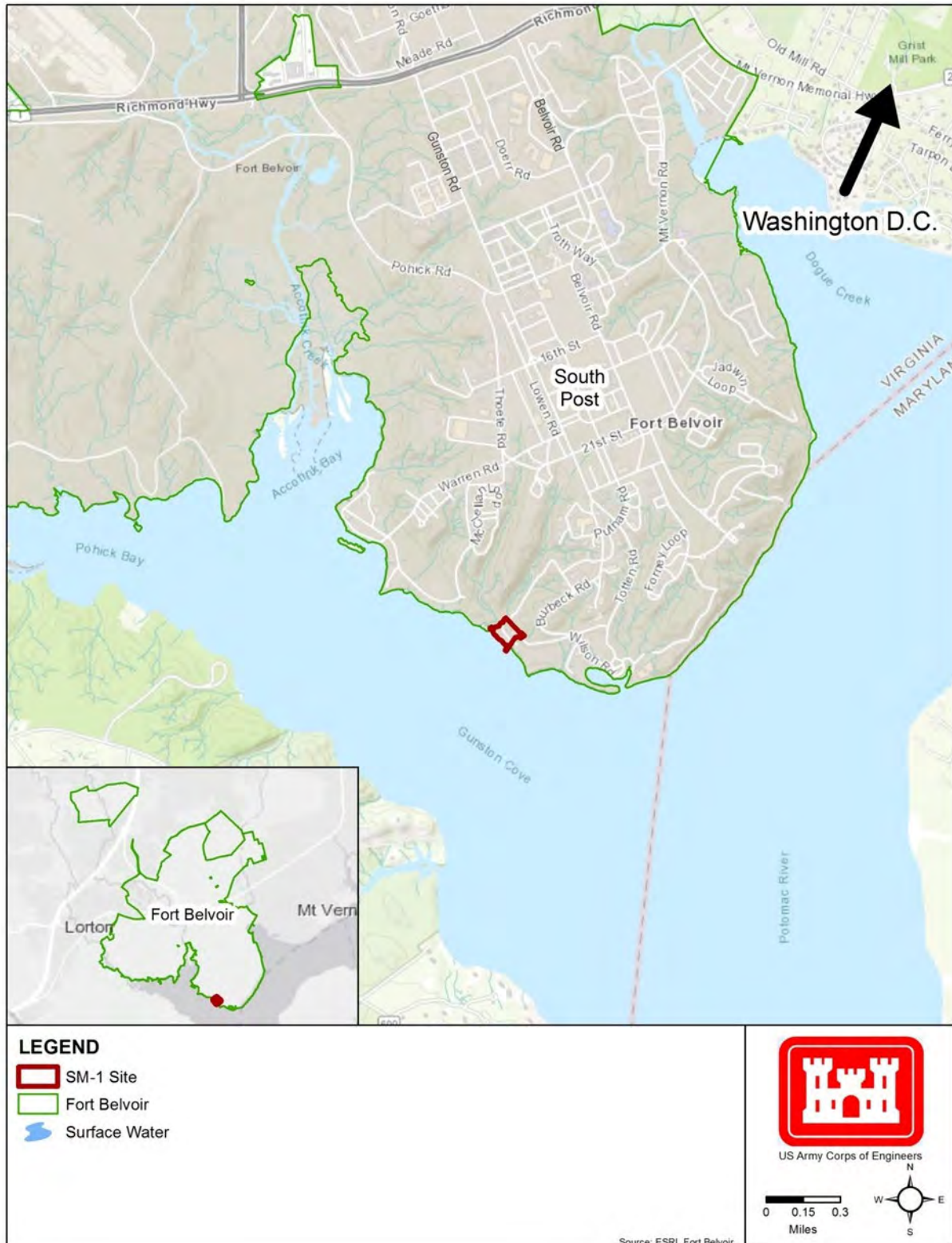


Figure 2: SM-1 Reactor Facility



Figure 3: Water Resources at the SM-1 Site



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Appendix D – Federal Consistency Determination

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VDEQ Concurrence

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COMMONWEALTH of VIRGINIA

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February 13, 2020

Ms. Brenda Barber, P.E.
U.S. Army Corps of Engineers Baltimore District
ATTN: CENAB-ENE-C
2 Hopkins Plaza/09-A-10 (Cube)
Baltimore, Maryland 21201
Sent via email: [REDACTED]

RE: U.S. Army Corps of Engineers Draft Environmental Assessment and Federal Consistency Determination: Decommissioning and Dismantlement of the Deactivated SM-1 Nuclear Reactor Facility, U.S. Army Garrison Fort Belvoir, Fairfax County (DEQ 19-157F).

Dear Ms. Barber:

The Commonwealth of Virginia has completed its review of the draft Environmental Assessment (EA), which includes a federal consistency determination (FCD), for the above-referenced project. The Department of Environmental Quality (DEQ) is responsible for coordinating Virginia's review of federal environmental documents prepared pursuant to the National Environmental Policy Act (NEPA) and responding to appropriate federal officials on behalf of the Commonwealth. DEQ is also responsible for coordinating state reviews of FCDs submitted under the Coastal Zone Management Act. The following agencies participated in this review:

Department of Environmental Quality
Department of Conservation and Recreation
Department of Game and Inland Fisheries
Department of Health
Department of Historic Resources
Marine Resources Commission

Fairfax County and the Northern Virginia Regional Commission also were invited to comment on the project.

PROJECT DESCRIPTION

The U.S. Army Corps of Engineers (Corps) Baltimore District proposes to fully decommission and dismantle the Deactivated Stationary Medium Power Model 1 (SM-1) Reactor Facility on Fort Belvoir in Fairfax County, Virginia (proposed action). Under the proposed action, the Corps would implement an Army Reactor Office-approved Decommissioning Plan to safely remove, transport, and dispose of remaining structures, equipment, and media from the Deactivated SM-1 site; validate that site conditions meet applicable cleanup standards; restore the site to a vegetated condition; and return the site to Fort Belvoir for future use.

FEDERAL CONSISTENCY PURSUANT TO THE COASTAL ZONE MANAGEMENT ACT

Pursuant to the Coastal Zone Management Act of 1972, as amended, activities both within and outside of the Commonwealth's designated coastal zone with reasonably foreseeable effects on any coastal uses or resources resulting from a Federal agency activity (15 CFR Part 930, Subpart C) must be consistent to the maximum extent practicable with Virginia's Coastal Zone Management (CZM) Program. The Virginia CZM Program consists of a network of programs administered by several agencies. DEQ coordinates the review of FCDs with agencies administering the enforceable policies of the Virginia CZM Program.

PUBLIC PARTICIPATION

In accordance with 15 CFR §930.2, a public notice with a comment period of January 10, 2020 to February 3, 2020 of this proposed action was published in OEIR's Program Newsletter and on the DEQ website. No public comments were received in response to the notice.

FEDERAL CONSISTENCY CONCURRENCE

The FCD states that the project is consistent to the maximum extent practicable with the enforceable policies of the Virginia CZM Program. The reviewing agencies that are responsible for the administration of the enforceable policies generally agree with the FCD. Based on the review of the FCD and the comments submitted by agencies administering the enforceable policies of the Virginia CZM Program, DEQ concurs that the proposed project is consistent to the maximum extent practicable with the Virginia CZM Program provided all applicable permits and approvals are obtained as described. In addition, in accordance with 15 CFR §930.39(c), DEQ recommends that the Corps consider the impacts of the proposed action on the [advisory policies](#) of the Virginia CZM Program. However, other state approvals which may apply to this project are not included in this concurrence. Therefore, the responsible agent must also ensure that

this project is constructed and operated in accordance with all applicable federal, state and local laws and regulations.

ENVIRONMENTAL IMPACTS AND MITIGATION

1. Wetlands and Water Quality. The EA (Appendix D, FCD, page 5) states that the proposed action would not involve dredging, filling, or other permanent alteration of or impacts on tidal wetlands. The Corps would submit a Joint Permit Application (JPA) for review and/or authorization from applicable regulatory agencies prior to conducting in-water activities associated with the proposed action.

1(a) Agency Jurisdiction. The State Water Control Board promulgates Virginia's water regulations covering a variety of permits to include the Virginia Pollutant Discharge Elimination System Permit regulating point source discharges to surface waters, Virginia Pollution Abatement Permit regulating sewage sludge, storage and land application of biosolids, industrial wastes (sludge and wastewater), municipal wastewater, and animal wastes, the Surface and Groundwater Withdrawal Permit, and the Virginia Water Protection (VWP) Permit regulating impacts to streams, wetlands, and other surface waters. The VWP Permit is a state permit which governs wetlands, surface water, and surface water withdrawals and impoundments. It also serves as §401 certification of the federal Clean Water Act and §404 permits for dredge and fill activities in waters of the U.S. The VWP Permit Program is under the Office of Wetlands and Stream Protection within the DEQ Division of Water Permitting. In addition to central office staff who review and issue VWP permits for transportation and water withdrawal projects, the six DEQ regional offices perform permit application reviews and issue permits for the covered activities:

- Clean Water Act, §401;
- Section 404(b)(i) Guidelines Mitigation Memorandum of Agreement (2/90);
- State Water Control Law, Virginia Code section 62.1-44.15:20 *et seq.*; and
- State Water Control Regulations, 9VAC25-210-10.

Tidal wetlands are regulated by the Virginia Marine Resources Commission (VMRC) under the authority of Virginia Code §28.2-1301 through §28.2-1320.

1(b) Requirements. The DEQ Northern Regional Office (NRO) states that a VWP permit from DEQ may be required. Upon receipt of a JPA, for the proposed surface water impacts, DEQ VWP Permit staff will review the proposed project in accordance with the VWP permit program regulations and current VWP permit program guidance.

VMRC states that should any changes to the planned work result in work performed in, or construction access through, tidal wetlands, a tidal wetlands permit will be required from the Fairfax County Wetlands Board.

1(c) Agency Recommendations. In general, DEQ recommends that stream and wetland impacts be avoided to the maximum extent practicable. To minimize unavoidable impacts to wetlands and waterways, DEQ recommends the following practices:

- Operate machinery and construction vehicles outside of stream-beds and wetlands; use synthetic mats when in-stream work is unavoidable.
- Preserve the top 12 inches of material removed from wetlands for use as wetland seed and root-stock in the excavated area.
- Design erosion and sedimentation controls in accordance with the most current edition of the *Virginia Erosion and Sediment Control Handbook*. These controls should be in place prior to clearing and grading, and maintained in good working order to minimize impacts to state waters. The controls should remain in place until the area is stabilized.
- Place heavy equipment, located in temporarily impacted wetland areas, on mats, geotextile fabric, or use other suitable measures to minimize soil disturbance, to the maximum extent practicable.
- Restore all temporarily disturbed wetland areas to pre-construction conditions and plant or seed with appropriate wetlands vegetation in accordance with the cover type (emergent, scrub-shrub or forested). The applicant should take all appropriate measures to promote revegetation of these areas. Stabilization and restoration efforts should occur immediately after the temporary disturbance of each wetland area instead of waiting until the entire project has been completed.
- Place all materials which are temporarily stockpiled in wetlands, designated for use for the immediate stabilization of wetlands, on mats or geotextile fabric in order to prevent entry in state waters. These materials should be managed in a manner that prevents leachates from entering state waters and must be entirely removed within thirty days following completion of that construction activity. The disturbed areas should be returned to their original contours, stabilized within thirty days following removal of the stockpile, and restored to the original vegetated state.
- Clearly flag or mark all non-impacted surface waters within the project or right-of-way limits that are within 50 feet of any clearing, grading or filling activities for the life of the construction activity within that area. The project proponent should notify all contractors that these marked areas are surface waters where no activities are to occur.
- Employ measures to prevent spills of fuels or lubricants into state waters.

1(d) Conclusion. Provided the appropriate permits or approvals are obtained if necessary and the requirements are met, the proposed project would be consistent to the maximum extent practicable with the wetlands management enforceable policy of the Virginia CZM Program.

2. Subaqueous Lands. The EA (Appendix D, FCD, page 4) states that the removal of the intake pier and water discharge pipe would have the potential to disturb subaqueous bottomlands in Gunston Cove. Gunston Cove is a tidal embayment of the Potomac River.

2(a) Agency Jurisdiction. The VMRC regulates encroachments in, on or over state-owned subaqueous beds as well as tidal wetlands pursuant to Virginia Code §28.2-1200 through 1400. For nontidal waterways, VMRC states that it has been the policy of the Habitat Management Division to exert jurisdiction only over the beds of perennial streams where the upstream drainage area is 5 square miles or greater. The beds of such waterways are considered public below the ordinary high water line.

2(b) Agency Findings. VMRC states that the proposed project is outside of its jurisdictional areas and will not require a permit from the agency.

2(c) Conclusion. As proposed, the project would be consistent to the maximum extent practicable with the subaqueous lands management enforceable policy of the Virginia CZM Program.

3. Air Pollution Control. The EA (Appendix D, FCD, page 6) states that dismantlement of the Deactivated SM-1 Nuclear Reactor Facility would generate increased emissions from heavy equipment, worker vehicles and fugitive dust. Adverse short-term impacts on air quality would be minimized through the use of standard best management practices such as vegetating soils that would remain exposed for extended periods and sweeping or wetting pavements.

3(a) Agency Jurisdiction. The DEQ Air Division, on behalf of the State Air Pollution Control Board, is responsible for developing regulations that implement Virginia's Air Pollution Control Law (Virginia Code §10.1-1300 *et seq.*). DEQ is charged with carrying out mandates of the state law and related regulations as well as Virginia's federal obligations under the Clean Air Act as amended in 1990. The objective is to protect and enhance public health and quality of life through control and mitigation of air pollution. The division ensures the safety and quality of air in Virginia by monitoring and analyzing air quality data, regulating sources of air pollution, and working with local, state and federal agencies to plan and implement strategies to protect Virginia's air quality. The appropriate DEQ regional office is directly responsible for the issuance of necessary permits to construct and operate all stationary sources in the region as well as monitoring emissions from these sources for compliance. As a part of this mandate, environmental impact reviews (EIRs) of projects to be undertaken in the state are also reviewed. In the case of certain projects, additional evaluation and demonstration must be made under the general conformity provisions of state and federal law.

The Air Division regulates emissions of air pollutants from industries and facilities and implements programs designed to ensure that Virginia meets national air quality standards. The most common regulations associated with projects are:

- Open burning: 9VAC5-130 *et seq.*
- Fugitive dust control: 9VAC5-50-60 *et seq.*
- Permits for fuel-burning equipment: 9VAC5-80-1100 *et seq.*

3(b) Ozone Nonattainment Area. According to the DEQ Air Division, the project site is located in an ozone nonattainment area and an emission control area for volatile organic compounds (VOCs) and oxides of nitrogen (NO_x), which are contributors to ozone pollution.

3(c) Requirements. The following requirements may be applicable to the proposed project.

3(c)(i) Fugitive Dust. During land-disturbing activities, fugitive dust must be kept to a minimum by using control methods outlined in 9VAC5-50-60 *et seq.* of the Regulations for the Control and Abatement of Air Pollution. These precautions include, but are not limited to, the following:

- Use, where possible, of water or suitable chemicals for dust control during the proposed demolition and construction operations and from material stockpiles;
- Installation and use of hoods, fans and fabric filters to enclose and vent the handling of dusty materials;
- Covering of open equipment for conveying materials; and
- Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.

3(c)(ii) Open Burning. If project activities change to include the burning of vegetative debris, this activity must meet the requirements under 9VAC5-130 *et seq.* of the regulations for open burning, and it may require a permit. The regulations provide for, but do not require, the local adoption of a model ordinance concerning open burning. Contact officials with the locality to determine what local requirements, if any, exist.

3(c)(iii) Fuel-Burning Equipment. Fuel-burning equipment (generators, compressors, etc.) or any other air-pollution-emitting equipment may be subject to registration or permitting requirements.

3(d) Conclusion. Provided the project adheres to any applicable requirements, the project would be consistent to the maximum extent practicable with the air pollution control enforceable policy of the Virginia CZM Program.

4. Coastal Lands Management. The EA (Appendix D, FCD, page 7) states that the proposed action would occur in Chesapeake Bay Resource Protection Areas (RPAs) that are recognized by Fort Belvoir. All disturbance of the RPA would be limited to the portion of the RPA within the Deactivated SM-1 Nuclear Reactor Facility perimeter. RPA disturbance during the proposed action would be mitigated through the planting of two new trees for the removal of every tree four inches in diameter and breast height (dbh) or greater in accordance with Fort Belvoir Policy Memorandum #27, *Tree Removal and Protection*. Vegetation replacement in the RPA would also adhere to the requirements of the Department of Conservation and Recreation's *Riparian Buffers Modification and Mitigation Guidance Manual*. In the long term, restoration and re-vegetation of the site following the completion of ground-disturbing activities would have a beneficial effect on RPAs in this part of Fort Belvoir. No ongoing or permanent activities with potential to disturb RPAs would be established by the proposed action.

4(a) Agency Jurisdiction. The DEQ Local Government Assistance Programs (LGAP) administers the Chesapeake Bay Preservation Act (Virginia Code §62.1-44.15:67 *et seq.*) (Bay Act) and Chesapeake Bay Preservation Area Designation and Management Regulations (9VAC25-830-10 *et seq.*). Each Tidewater locality must adopt a program based on the Chesapeake Bay Preservation Act and the Chesapeake Bay Preservation Area Designation and Management Regulations. The Act and regulations recognize local government responsibility for land use decisions and are designed to establish a framework for compliance without dictating precisely what local programs must look like. Local governments have flexibility to develop water quality preservation programs that reflect unique local characteristics and embody other community goals. Such flexibility also facilitates innovative and creative approaches in achieving program objectives. The regulations address nonpoint source pollution by identifying and protecting certain lands called Chesapeake Bay Preservation Areas. The regulations use a resource-based approach that recognizes differences between various land forms and treats them differently.

4(b) Chesapeake Bay Preservation Area. In Fairfax County, the areas protected by the Chesapeake Bay Preservation Act, as locally implemented, require conformance with performance criteria. These areas include RPAs and Resource Management Areas (RMAs) as designated by the local government. RPAs include tidal wetlands, certain non-tidal wetlands and tidal shores. RPAs also include a 100-foot vegetated buffer area located adjacent to and landward of these features and along both sides of any water body with perennial flow. RMAs, which require less stringent performance criteria, include those areas of the County not included in the RPAs.

4(c) Requirements. Under the Federal Consistency Regulations of the *Coastal Zone Management Act of 1972*, federal actions in Virginia must be conducted in a manner consistent to the maximum extent practicable with the enforceable policies of the

Virginia CZM Program. Those enforceable policies are administered through the Chesapeake Bay Preservation Act and Regulations.

Federal actions on installations located within Tidewater Virginia are required to be consistent with the performance criteria of the Regulations on lands analogous to locally designated RPAs and RMAs, as provided in 9VAC25-830-130 and 140 of the Regulations, including the requirement to minimize land disturbance (including access and staging areas), retain existing vegetation and minimize impervious cover as well as including compliance with the requirements of the *Virginia Erosion and Sediment Control Handbook*, and stormwater management criteria consistent with water quality protection provisions of the *Virginia Stormwater Management Regulations*. For land disturbance over 2,500 square feet, the project must comply with the requirements of the *Virginia Erosion and Sediment Control Handbook*.

RPA disturbance resulting from the proposed project would consist of vegetation clearing and soil excavation, fill, and compaction. Vegetation clearing and soil disturbance would be temporary and limited to that needed to complete the proposed decommissioning activities. All disturbance in the RPA would be limited to that portion of the RPA within the Deactivated SM-1 Nuclear Reactor Facility perimeter. Adherence to requirements of the CGP and associated SWPPP, ESC and SWM plans during ground-disturbing activities would minimize or prevent the erosion of exposed soils and manage the quantity and quality of stormwater generated on the site, which would be ultimately discharged to Gunston Cove and further downstream, the Potomac River and Chesapeake Bay. The extent and intensity of RPA disturbance would vary over the five-year decommissioning process and not all ground disturbance would occur simultaneously, further minimizing adverse effects.

RPA disturbance would be mitigated through the planting of two new trees for the removal of every tree four inches in diameter and breast height or greater in accordance with Fort Belvoir Policy Memorandum #27, Tree Removal and Protection. Vegetation replacement in the RPA would also adhere to the requirements of the DCR's Riparian Buffers Modification and Mitigation Guidance Manual. In the long term, restoration and re-vegetation of the site following the completion of the proposed ground-disturbing activities would have a beneficial effect on RPAs in this part of Fort Belvoir. No ongoing or permanent activities with potential to disturb RPAs would be established by the proposed action.

4(d) Conclusion. Provided adherence to the above requirements, the proposed activity would be consistent to the maximum extent practicable with the coastal lands management enforceable policy of the Virginia CZM Program.

5. Erosion and Sediment Control and Stormwater Management. According to the EA (Appendix D, FCD, page 5), the proposed action would involve more than 1 acre of

land disturbance. An erosion and sediment control plan and stormwater management plan will be prepared. The decommissioning contractor would also obtain coverage under Virginia's General Permit for Discharges of Stormwater from Construction Activities.

5(a) Agency Jurisdiction. The DEQ Office of Stormwater Management (OSM) administers the following laws and regulations governing construction activities:

- Virginia Erosion and Sediment Control Law (VESCL) (§ 62.1-44.15:51 *et seq.*) and Regulations (VESCL&R) (9VAC25-840);
- Virginia Stormwater Management Act (VSMA) (§ 62.1-44.15:24 *et seq.*);
- Virginia Stormwater Management Program (VSMP) regulation (9VAC25-870); and
- 2014 General Virginia Pollutant Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Construction Activities (9VAC25-880).

In addition, DEQ is responsible for the VSMP General Permit for Stormwater Discharges from Construction Activities related to Municipal Separate Storm Sewer Systems (MS4s) and construction activities for the control of stormwater discharges from MS4s and land disturbing activities under the Virginia Stormwater Management Program (9VAC25-890-40).

5(b) Requirements.

5(b)(i) Erosion and Sediment Control and Stormwater Management Plans. The applicant and its authorized agents conducting regulated land-disturbing activities on private and public lands in the state must comply with VESCL&R and VSMA and regulations, including coverage under the general permit for stormwater discharge from construction activities, and other applicable federal nonpoint source pollution mandates (e.g. Clean Water Act-Section 313, federal consistency under the Coastal Zone Management Act). Clearing and grading activities, installation of staging areas, parking lots, roads, buildings, utilities, borrow areas, soil stockpiles, and related land-disturbing activities that result in the total land disturbance of equal to or greater than 2,500 square feet in Chesapeake Bay Preservation Area would be regulated by *VESCL&R*. Accordingly, the applicant must prepare and implement an erosion and sediment control (ESC) plan to ensure compliance with state law and regulations. Land-disturbing activities that result in the total land disturbance of equal to or greater than 2,500 square feet in Chesapeake Bay Preservation Area would be regulated by VSMA and regulations. Accordingly, the applicant must prepare and implement a Stormwater Management (SWM) plan to ensure compliance with state law and regulations. The ESC/SWM plan is submitted to the DEQ regional office that serves the area where the project is located for review for compliance. The applicant is ultimately responsible for achieving project compliance through oversight of on-site contractors, regular field

inspection, prompt action against non-compliant sites, and other mechanisms consistent with agency policy (VESCL 62.1-44.15 *et seq.*) (Reference: VESCL 62.1-44.15 *et seq.*).

5(b)(ii) General Permit for Stormwater Discharges from Construction Activities

(VAR10). The operator or owner of a construction project involving land-disturbing activities equal to or greater than one acre is required to register for coverage under the General Permit for Discharges of Stormwater from Construction Activities and develop a project-specific SWPPP. The SWPPP must be prepared prior to submission of the registration statement for coverage under the general permit and the SWPPP must address water quality and quantity in accordance with the VSMP Permit Regulations. General information and registration forms for the General Permit are available on DEQ's website at <http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/VSMPPermits/ConstructionGeneralPermit.aspx> (Reference: VSMA 62.1-44.15 *et seq.*; VSMP Permit Regulations 9VAC 25-870-10 *et seq.*).

5(c) Conclusion. Provided the above requirements are satisfied, the project would be consistent to the maximum extent practicable with the nonpoint pollution control enforceable policy of the Virginia CZM Program.

6. Solid and Hazardous Waste Management. The EA (page 3-73) states that hazardous waste would be properly packaged, removed and transported to the final disposal location in accordance with federal, state and local regulations. Best management practices would be implemented to ensure none of the dismantled or removed materials are placed in areas that could impact the surrounding environment (e.g., wetland or other coastal resources). Possible hazardous materials that may be removed include PCBs (mainly in electrical cables, gaskets, grout/caulking, other electrical components, and paint), asbestos-containing materials (insulation materials and wallboard), lead-based paint, mercury in electrical switches and other components, fuels, oils, lubricants, and some ozone depleting substances in refrigerants.

In addition, the EA (page 2-3) states that decontamination of some surfaces would occur to meet the release criteria prior to dismantlement. Power washing, scabbling, and other methods would be employed to remove contamination from the metal and concrete surfaces. All residual solid and liquid wastes would be captured, containerized, characterized, and, as necessary, treated and disposed of at an appropriate permitted facility.

6(a) Agency Jurisdiction. On behalf of the Virginia Waste Management Board, the DEQ Division of Land Protection and Revitalization is responsible for carrying out the mandates of the Virginia Waste Management Act (Virginia Code §10.1-1400 *et seq.*), as well as meeting Virginia's federal obligations under the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response Compensation Liability Act (CERCLA), commonly known as Superfund. The DEQ Division of Land

Protection and Revitalization also administers those laws and regulations on behalf of the State Water Control Board that govern Petroleum Storage Tanks (Virginia Code §62.1-44.34:8 *et seq.*), including Aboveground Storage Tanks (9VAC25-91 *et seq.*) and Underground Storage Tanks (9VAC25-580 *et seq.* and 9VAC25-580-370 *et seq.*), also known as Virginia Tank Regulations, and § 62.1-44.34:14 *et seq.* which covers oil spills. Virginia:

- Virginia Waste Management Act, Virginia Code § 10.1-1400 *et seq.*
- Virginia Solid Waste Management Regulations, 9VAC20-81
 - (9VAC20-81-620 applies to asbestos-containing materials)
- Virginia Hazardous Waste Management Regulations, 9VAC20-60
 - (9VAC20-60-261 applies to lead-based paints)
- Virginia Regulations for the Transportation of Hazardous Materials, 9VAC20-110.

Federal:

- Resource Conservation and Recovery Act (RCRA), 42 U.S. Code sections 6901 *et seq.*
- U.S. Department of Transportation Rules for Transportation of Hazardous Materials, 49 Code of Federal Regulations, Part 107
- Applicable rules contained in Title 40, Code of Federal Regulations.

6(b) Database Search. The DEQ Division of Land Protection and Revitalization (DLPR) conducted a search (500-foot radius) of the project area of solid and hazardous waste databases (including petroleum releases) to identify waste sites in close proximity to the project area. DLPR identified two petroleum release sites within the project area which might impact the project:

- PC Number 20023029, Fort Belvoir – Building 07350, Routes 1 and 611, Telegraph and Potomac River Rds, Fort Belvoir, Virginia 22060, Release Date: 07/06/2001, Status: Closed.
- PC Number 19973110, Fort Belvoir – Building 00371, Routes 1 and 611, Telegraph and Potomac River Rds, Fort Belvoir, Virginia 22060, Release Date: 12/27/1996, Status: Closed.

6(c) Agency Recommendations. Evaluate the identified petroleum releases to determine their ability to affect the project site. DEQ encourages all projects to implement pollution prevention principles, including:

- the reduction, reuse and recycling of all solid wastes generated; and
- the minimization and proper handling of generated hazardous wastes.

6(d) Requirements.

- Test and dispose of any soil/sediment that is suspected of contamination (including petroleum contamination) or wastes that are generated during construction-related activities in accordance with applicable federal, state, and local laws and regulations.
- All structures being demolished or removed should be checked for asbestos-containing materials (ACM) and lead-based paint (LBP) prior to demolition. If ACM and LBP are found, in addition to the federal waste-related regulations mentioned above, state regulations 9VAC20-81-640 for ACM and 9VAC20-60-261 for LBP must be followed.

7. Natural Heritage Resources. The EA (page 3-36) states that project activities would have the potential to disturb and/or remove vegetation. Tree clearing would be limited to those areas necessitating clearing. During the site restoration, trees would be replanted on the site. Other disturbed areas would be reseeded with native grasses and/or shrubs to promote revegetation of the site. Therefore, impacts on terrestrial vegetation and plant communities would be short-term and less than significant.

7(a) Agency Jurisdiction.

7(a)(i) The Virginia Department of Conservation and Recreation's (DCR) Division of Natural Heritage (DNH): DNH's mission is conserving Virginia's biodiversity through inventory, protection and stewardship. The Virginia Natural Area Preserves Act (Virginia Code §10.1-209 through 217), authorized DCR to maintain a statewide database for conservation planning and project review, protect land for the conservation of biodiversity, and to protect and ecologically manage the natural heritage resources of Virginia (the habitats of rare, threatened and endangered species, significant natural communities, geologic sites, and other natural features).

7(a)(ii) The Virginia Department of Agriculture and Consumer Services (VDACS): The Endangered Plant and Insect Species Act of 1979 (Virginia Code Chapter 39 §3.1-1020 through 1030) authorizes VDACS to conserve, protect and manage endangered and threatened species of plants and insects. Under a Memorandum of Agreement established between VDACS and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species.

7(b) Agency Findings – Natural Heritage Resources and Forest Fragmentation.

The Biotics Data System documents the presence of natural heritage resources within the project boundary, including a 100-foot buffer. However, due to the scope of the activity, DCR does not anticipate that this project will adversely impact these natural heritage resources.

7(c) Agency Findings – State-listed Plant and Insect Species. DCR states that the proposed project will not affect any documented state-listed plants or insects.

7(d) Agency Findings – Natural Area Preserves. There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

7(e) Agency Recommendations. Contact the DCR DNH and re-submit project information and a map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

8. Floodplain Management. According to the EA (page 3-16), the intake pier/pump house, concrete discharge pipe, and outfall structure are in the 100-year floodplain. The EA (page 3-17) states that the removal of these structures would have beneficial impacts on the 100-year floodplain and associated functions and values by promoting the return of the Gunston Cove shoreline and subaqueous bottom to conditions resembling those that existed prior to the development of the facility.

8(a) Agency Jurisdiction. DCR is the lead coordinating agency for the Commonwealth's floodplain management program and the National Flood Insurance Program (Executive Memorandum 2-97). Pursuant to §10.1-603 of the Virginia Code and in accordance with 44 CFR section 60.12 of the National Flood Insurance Program Regulations for Floodplain Management and Flood Hazard Identification, all construction or land-disturbing activities initiated by an agency of the Commonwealth, or by its contractor, in floodplains shall be submitted to the locality and comply with the locally adopted floodplain management ordinance.

8(b) Agency Comments. The National Flood Insurance Program (NFIP) is administered by the Federal Emergency Management Agency (FEMA), and communities who elect to participate in this voluntary program manage and enforce the program on the local level through that community's local floodplain ordinance. Each local floodplain ordinance must comply with the minimum standards of the NFIP, outlined in 44 CFR 60.3; however, local communities may adopt more restrictive requirements in their local floodplain ordinance, such as regulating the 0.2% annual chance flood zone (Shaded X Zone).

All development within a Special Flood Hazard Area (SFHA), as shown on the locality's Flood Insurance Rate Map (FIRM), must be permitted and comply with the requirements of the local floodplain ordinance.

The DCR Floodplain Management Program does not have regulatory authority for projects in the SFHA. The applicant/developer must contact the local floodplain administrator for an official floodplain determination and comply with the community's local floodplain ordinance, including receiving a local permit. Failure to comply with the local floodplain ordinance could result in enforcement action from the locality.

8(c) Agency Recommendation. DCR recommends that Fort Belvoir contact the local floodplain administrator and comply with the community's local floodplain ordinance. To find community NFIP participation and local floodplain administrator contact information, use DCR's Local Floodplain Management Directory: www.dcr.virginia.gov/dam-safety-and-floodplains/floodplain-directory.

8(d) Requirement. Projects conducted by federal agencies within the SFHA must comply with Executive Order 11988: Floodplain Management.

9. Water Supply. The EA (page 3-4) states that the proposed action would install and operate temporary utilities for power and water necessary to support decommissioning activities; however, this demand would be accommodated under existing private sector contracts held by Fort Belvoir. No local service disruptions are anticipated to result from the proposed action.

9(a) Agency Jurisdiction. The Virginia Department of Health (VDH) Office of Drinking Water (ODW) reviews projects for the potential to impact public drinking water sources (groundwater wells, springs and surface water intakes). The VDH ODW administers both federal and state laws governing waterworks operation.

9(b) Agency Finding. VDH states that there are no apparent impacts to public drinking water sources due to this project.

9(c) Requirement. Potential impacts to public water distribution systems must be verified by the local utility, according to VDH.

10. Historic Resources. The EA (page 3-63) states that the proposed action would not affect traditional cultural resources.

10(a) Agency Jurisdiction. The Virginia Department of Historic Resources (DHR) conducts reviews of both federal and state projects to determine their effect on historic properties. Under the federal process, DHR is the State Historic Preservation Office, and ensures that federal undertakings – including licenses, permits, or funding – comply with Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulation at 36 CFR Part 800. Section 106 requires federal agencies to consider the effects of federal projects on properties that are listed or eligible for listing on the National Register of Historic Places.

10(b) Requirements. Continued coordination with DHR on this undertaking pursuant to Section 106 of the National Historic Preservation Act, as amended, and its implementing regulation 36 CFR Part 800 is required.

11. Pesticides and Herbicides. In general, when pesticides or herbicides must be used, their use should be strictly in accordance with manufacturers' recommendations. In addition, we recommend that the applicable use the least toxic pesticides or herbicides effective in controlling the target species to the extent feasible. For more information on pesticide or herbicide use, contact VDACS (804-371-6560).

12. Energy Conservation. Architectural and engineering designers should consider incorporating the energy, environmental, and sustainability concepts listed in the Leadership in Energy and Environmental Design (LEED) Green Building Rating System into the development and procurement of their projects.

Please contact Department of Mines, Minerals and Energy (David Spears at 434-951-6350) for additional information on energy conservation measures. For more information on the LEED rating system, visit www.leedbuilding.org.

13. Pollution Prevention. DEQ advocates that principles of pollution prevention and sustainability be used in all construction projects as well as in facility operations. Effective siting, planning, and on-site Best Management Practices (BMPs) will help to ensure that environmental impacts are minimized. However, pollution prevention and sustainability techniques also include decisions related to construction materials, design, and operational procedures that will facilitate the reduction of wastes at the source.

13(a) Recommendations. We have several pollution prevention recommendations that may be helpful in constructing or operating this facility:

- Consider development of an effective Environmental Management System (EMS). An effective EMS will ensure that the proposed facility is committed to complying with environmental regulations, reducing risk, minimizing environmental impacts, setting environmental goals, and achieving improvements in its environmental performance. DEQ offers EMS development assistance and recognizes facilities with effective Environmental Management Systems through its Virginia Environmental Excellence Program (VEEP). VEEP provides recognition, annual permit fee discounts, and the possibility for alternative compliance methods.
- Consider environmental attributes when purchasing materials. For example, the extent of recycled material content, toxicity level, and amount of packaging should be considered and can be specified in purchasing contracts.
- Consider contractors' commitment to the environment when choosing contractors. Specifications regarding raw materials and construction practices can be included in contract documents and requests for proposals.

- Choose sustainable materials and practices for building construction and design.

DEQ's Office of Pollution Prevention provides information and technical assistance relating to pollution prevention techniques and EMS. If interested, please contact DEQ (Meghann Quinn at 804-698-4021).

14. Fisheries Management. The FCD (Appendix D, FCD, page 3) states that this enforceable policy is not applicable to the proposed project.

14(a) Agency Jurisdiction. The fisheries management enforceable policy is administered by the Virginia Marine Resources Commission (VMRC) (Virginia Code § 28.2-200 to § 28.2-713) and the Department of Game and Inland Fisheries (DGIF) (Virginia Code § 29.1-100 to § 29.1-570). In addition, the Virginia Department of Health (VDH) Division of Shellfish Sanitation (DSS) is responsible for protecting the health of the consumers of molluscan shellfish and crustacea by ensuring that shellfish growing waters are properly classified for harvesting, and that molluscan shellfish and crustacea processing facilities meet sanitation standards.

14(b) Agency Finding. DGIF states that Gunston Cove, its tributaries, and the Potomac River downstream have been designated Confirmed Anadromous Fish Use Areas.

14(c) Agency Recommendation. DGIF has the following recommendations:

- To best protect anadromous fishes from harm associated with instream work, ensure that such work adhere to a time-of-year restriction from February 15 through June 30 of any year.
- Conduct any in-stream activities during low or no-flow conditions, using non-erodible cofferdams or turbidity curtains to isolate the construction area, blocking no more than 50% of the streamflow at any given time, stockpiling excavated material in a manner that prevents reentry into the stream, restoring original streambed and streambank contours, revegetating barren areas with native vegetation, and implementing strict erosion and sediment control measures.
- To minimize potential wildlife entanglements resulting from use of synthetic/plastic erosion and sediment control matting, use matting made from natural/organic materials such as coir fiber, jute, and/or burlap.
- To minimize harm to the aquatic environment and its residents resulting from use of the Tremie method to install concrete, installation of grout bags, and traditional pouring of concrete, ensure that such activities occur only in the dry, allowing all concrete to harden and cure prior to contact with open water.
- Due to future maintenance costs associated with culverts, and the loss of riparian and aquatic habitat, construct stream crossings via clear-span bridges. However,

if this is not possible, countersink any culverts below the streambed at least 6 inches, or the use of bottomless culverts, to allow passage of aquatic organisms.

- Install floodplain culverts to carry bankfull discharges.

VMRC recommends that erosion and run-off controls be in place to prevent impacts to marine fisheries.

14(d) Conclusion. Assuming adherence to erosion and sediment controls during instream work and land disturbances, and placement of waste in appropriate receptacles, the project would be consistent with the fisheries management enforceable policy of the Virginia CZM Program.

REGULATORY AND COORDINATION NEEDS

1. Wetlands and Water Quality. The project must adhere to the requirements of any DEQ permit or authorization issued pursuant to Virginia Code § 62.1-44.15:20 *et seq.* and 9VAC25-210 *et seq.* and a tidal wetlands permit if issued from the Fairfax County Wetlands Board pursuant to Virginia Code §28.2-1301 through 28.2-1320 for consistency with the wetlands management enforceable policy. A VWP Permit or approval may be required. Contact DEQ NRO (Trisha Beasley at [REDACTED]) for coordination. Submit a JPA application to VMRC (Mark Eversole at [REDACTED]) for proposed impacts to surface waters, including wetlands.

2. Air Quality. The following sections of Virginia Administrative Code may be applicable:

- fugitive dust and emissions control (9VAC5-50-60 *et seq.*);
- permits for fuel-burning equipment (9VAC5-80-110 *et seq.*); and
- open burning restrictions (9VAC5-130 *et seq.*).

Contact DEQ NRO (Justin Wilkinson at Justin.Wilkinson@deq.virginia.gov) for additional information about air quality regulations and to determine air permitting or registration needs for fuel-burning equipment.

3. Coastal Lands Management. The project must be conducted in a manner that is consistent with the coastal lands management enforceable policy of the Virginia CZM Program as administered by DEQ pursuant to the Chesapeake Bay Preservation Act (Virginia Code 62.1-44.15 *et seq.*) and the Chesapeake Bay Preservation Area Designation and Management Regulations (9VAC25-830 *et seq.*). For additional information about DEQ's comments, contact DEQ OLGP (Daniel Moore at [REDACTED]).

4. Erosion and Sediment Control and Stormwater Management. This project must comply with Virginia's Erosion and Sediment Control Law (Virginia Code § 62.1-44.15:61) and Regulations (9VAC25-840-30 *et seq.*) and Stormwater Management Law (Virginia Code § 62.1-44.15:31) and Regulations (9VAC25-870-210 *et seq.*) as administered by DEQ. Erosion and sediment control, and stormwater management requirements should be coordinated with the DEQ NRO (Kelly Vanover at [REDACTED]).

5. General Permit for Stormwater Discharges from Construction Activities (VAR10). The operator or owner of a construction activity involving land disturbance of equal to or greater than 1 acre is required to register for coverage under the General Permit for Discharges of Stormwater from Construction Activities and develop a project specific stormwater pollution prevention plan (SWPPP). Specific questions regarding the Stormwater Management Program requirements should be directed to DEQ (Holly Sepety at [REDACTED]) (Reference: VSMA §62.1-44.15 *et seq.*).

6. Solid and Hazardous Wastes. Contact DEQ NRO (Richard Doucette at 703-583-3813 or [REDACTED]) for additional information about waste management if necessary. All solid waste, hazardous waste and hazardous materials must be managed in accordance with all applicable federal, state and local environmental regulations.

6(a) Asbestos-Containing Material. It is the responsibility of the owner or operator of a renovation or demolition activity, prior to the commencement of the renovation or demolition, to thoroughly inspect the affected part of the facility where the operation will occur for the presence of asbestos, including Category I and Category II nonfriable asbestos-containing material (as applicable). Upon classification as friable or non-friable, all asbestos-containing material shall be disposed of in accordance with the Virginia Solid Waste Management Regulations (9VAC20-81-640) and transported in accordance with the Virginia regulations governing Transportation of Hazardous Materials (9VAC20-110-10 *et seq.*). Contact the DEQ Division of Land Protection and Revitalization (Carlos Martinez at [REDACTED]) and the Department of Labor and Industry (804-371- 2327) for additional information.

6(b) Lead-Based Paint. If applicable, this project must comply with the U.S. Department of Labor Occupational Safety and Health Administration (OSHA) regulations and with the Virginia Lead-Based Paint Activities Rules and Regulations. For additional information regarding these requirements, contact the Department of Professional and Occupational Regulation (804-367-8500).

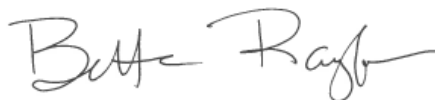
7. Natural Heritage Resources. Contact the DCR DNH (804-371-2708) to re-submit project information and a map for an update on natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

8. Floodplain Management. Contact the local floodplain administrator for an official floodplain determination to comply with the community's local floodplain ordinance. To find local floodplain administrator contact information, use DCR's Local Floodplain Management Directory: www.dcr.virginia.gov/dam-safety-and-floodplains/floodplain-directory.

9. Historic Resources. Continue to coordinate with DHR (Marc Holma at [REDACTED] or [REDACTED]) on this undertaking pursuant to Section 106 of the National Historic Preservation Act, as amended, and its implementing regulation 36 CFR Part 800.

Thank you for the opportunity to comment on this EA and FCD. The detailed comments of reviewers are attached. If you have questions, please do not hesitate to call me at [REDACTED] or Julia Wellman at [REDACTED].

Sincerely,



Bettina Rayfield, Manager
Environmental Impact Review and Long Range
Priorities Program

Enclosures

ec: Amy Ewing, DGIF
Robbie Rhur, DCR
Arlene Warren, VDH
Roger Kirchen, DHR
Tony Watkinson, VMRC
Robert Lazaro, NRVC
Bryan J. Hill, Fairfax County
Kevin Taylor, Aecom
Craig Carver, Aecom

ENVIRONMENTAL REVIEW COMMENTS APPLICABLE TO AIR QUALITY

Matthew J. Strickler
Secretary of Natural Resources

Clyde E. Cristman
Director



Rochelle Altholz
Deputy Director of
Administration and Finance

Russell W. Baxter
Deputy Director of
Dam Safety & Floodplain
Management and Soil & Water
Conservation

Thomas L. Smith
Deputy Director of Operations

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

MEMORANDUM

DATE: January 21, 2020

TO: Julia Wellman, DEQ

FROM: Roberta Rhur, Environmental Impact Review Coordinator

SUBJECT: DEQ 19-157F, Deactivated SM-1 Nuclear Reactor Facility Decommissioning and Dismantlement

Division of Natural Heritage

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

Biotics documents the presence of natural heritage resources within the project boundary including a 100ft buffer. However, due to the scope of the activity we do not anticipate that this project will adversely impact these natural heritage resources.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to Biotics. Please re-submit project information and map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from <http://vafwis.org/fwis/> or contact Ernie Aschenbach at [REDACTED] or [REDACTED].

Division of Dam Safety and Floodplain Management

Floodplain Management Program:

The National Flood Insurance Program (NFIP) is administered by the Federal Emergency Management Agency (FEMA), and communities who elect to participate in this voluntary program manage and enforce the program on the local level through that community's local floodplain ordinance. Each local floodplain

ordinance must comply with the minimum standards of the NFIP, outlined in 44 CFR 60.3; however, local communities may adopt more restrictive requirements in their local floodplain ordinance, such as regulating the 0.2% annual chance flood zone (Shaded X Zone).

All development within a Special Flood Hazard Area (SFHA), as shown on the locality's Flood Insurance Rate Map (FIRM), must be permitted and comply with the requirements of the local floodplain ordinance.

State Agency Projects Only

[Executive Order 45](#), signed by Governor Northam and effective on November 15, 2019, establishes mandatory standards for development of state-owned properties in Flood-Prone Areas, which include Special Flood Hazard Areas, Shaded X Zones, and the Sea Level Rise Inundation Area. These standards shall apply to all state agencies.

1. Development in Special Flood Hazard Areas and Shaded X Zones
 - A. All development, including buildings, on state-owned property shall comply with the locally-adopted floodplain management ordinance of the community in which the state-owned property is located and any flood-related standards identified in the Virginia Uniform Statewide Building Code.
 - B. If any state-owned property is located in a community that does not participate in the NFIP, all development, including buildings, on such state-owned property shall comply with the NFIP requirements as defined in 44 CFR §§ 60.3, 60.4, and 60.5 and any flood-related standards identified in the Virginia Uniform Statewide Building Code.
 - (1) These projects shall be submitted to the Department of General Services (DGS), for review and approval.
 - (2) DGS shall not approve any project until the State NFIP Coordinator has reviewed and approved the application for NFIP compliance.
 - (3) DGS shall provide a written determination on project requests to the applicant and the State NFIP Coordinator. The State NFIP Coordinator shall maintain all documentation associated with the project in perpetuity.
 - C. No new state-owned buildings, or buildings constructed on state-owned property, shall be constructed, reconstructed, purchased, or acquired by the Commonwealth within a Special Flood Hazard Area or Shaded X Zone in any community unless a variance is granted by the Director of DGS, as outlined in this Order.

The following definitions are from Executive Order 45:

Development for NFIP purposes is defined in 44 CFR § 59.1 as "Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials."

The Special Flood Hazard Area may also be referred to as the 1% annual chance floodplain or the 100-year floodplain, as identified on the effective Flood Insurance Rate Map and Flood Insurance Study. This includes the following flood zones: A, AO, AH, AE, A99, AR, AR/AE, AR/AO, AR/AH, AR/A, VO, VE, or V.

The Shaded X Zone may also be referred to as the 0.2% annual chance floodplain or the 500-year floodplain, as identified on the effective Flood Insurance Rate Map and Flood Insurance Study.

The Sea Level Rise Inundation Area referenced in this Order shall be mapped based on the National Oceanic and Atmospheric Administration Intermediate-High scenario curve for 2100, last updated in 2017, and is intended to denote the maximum inland boundary of anticipated sea level rise.

"State agency" shall mean all entities in the executive branch, including agencies, offices, authorities, commissions, departments, and all institutions of higher education.

“Reconstructed” means a building that has been substantially damaged or substantially improved, as defined by the NFIP and the Virginia Uniform Statewide Building Code.

Federal Agency Projects Only

Projects conducted by federal agencies within the SFHA must comply with federal Executive Order 11988: Floodplain Management.

DCR’s Floodplain Management Program does not have regulatory authority for projects in the SFHA. The applicant/developer must contact the local floodplain administrator for an official floodplain determination and comply with the community’s local floodplain ordinance, including receiving a local permit. Failure to comply with the local floodplain ordinance could result in enforcement action from the locality. For state projects, DCR recommends that compliance documentation be provided prior to the project being funded. For federal projects, the applicant/developer is encouraged reach out to the local floodplain administrator and comply with the community’s local floodplain ordinance.

To find flood zone information, use the Virginia Flood Risk Information System (VFRIS):

www.dcr.virginia.gov/vfris

To find community NFIP participation and local floodplain administrator contact information, use DCR’s Local Floodplain Management Directory: www.dcr.virginia.gov/dam-safety-and-floodplains/floodplain-directory

The remaining DCR divisions have no comments regarding the scope of this project. Thank you for the opportunity to comment.



Wellman, Julia [REDACTED]

ESSLog# 40303_19-157F_FtBelvoirNuclearReactorRemoval_DGIF_AME20200124

1 message

Ewing, Amy [REDACTED]

Fri, Jan 24, 2020 at 4:04 PM

To: Julia Wellman [REDACTED]

Cc: Stephen Reeser [REDACTED]

Julia,

We have reviewed the subject project that proposes to dismantle and remove the nuclear reactor located on the installation but which was decommissioned years ago. This will include removal of structures in Gunston Bay along with those located on land. Gunston Cove, its tributaries, and the Potomac River downstream have been designated Confirmed Anadromous Fish Use Areas. To best protect anadromous fishes from harm associated with instream work, we recommend that such work adhere to a time of year restriction from February 15 through June 30 of any year. We recommend conducting any in-stream activities during low or no-flow conditions, using non-erodible cofferdams or turbidity curtains to isolate the construction area, blocking no more than 50% of the streamflow at any given time, stockpiling excavated material in a manner that prevents reentry into the stream, restoring original streambed and streambank contours, revegetating barren areas with native vegetation, and implementing strict erosion and sediment control measures. To minimize potential wildlife entanglements resulting from use of synthetic/plastic erosion and sediment control matting, we recommend use of matting made from natural/organic materials such as coir fiber, jute, and/or burlap. To minimize harm to the aquatic environment and its residents resulting from use of the Tremie method to install concrete, installation of grout bags, and traditional pouring of concrete, we recommend that such activities occur only in the dry, allowing all concrete to harden and cure prior to contact with open water. Due to future maintenance costs associated with culverts, and the loss of riparian and aquatic habitat, we prefer stream crossings to be constructed via clear-span bridges. However, if this is not possible, we recommend countersinking any culverts below the streambed at least 6 inches, or the use of bottomless culverts, to allow passage of aquatic organisms. We also recommend the installation of floodplain culverts to carry bankfull discharges.

Assuming adherence to erosion and sediment controls during instream work and land disturbances, and placement of waste in appropriate receptacles, we find this project consistent with the Fisheries Enforceable Policies of the CZMA.

Thanks, Amy

**Amy Ewing***Environmental Services Biologist**Manager, Fish and Wildlife Information Services*

P [REDACTED]

Virginia Department of Game & Inland Fisheries*CONSERVE. CONNECT. PROTECT.*

A 7870 Villa Park Drive, P.O. Box 90778, Henrico, VA 23228

www.dgif.virginia.gov



Wellman, Julia [REDACTED]

SM-1 Nuclear Reactor decommissioning and deactivation, Fort Belvoir (DHR #2015-1247/DEQ #19-157F)

1 message

Holma, Marc [REDACTED]

Mon, Jan 6, 2020 at 3:39 PM

To: Julia Wellman [REDACTED]

Julia,

Please accept this email as DHR's official response to DEQ's request for our review and comment regarding the above referenced project. The Army Corps of Engineers and Fort Belvoir have been in consultation with DHR on this undertaking pursuant to Section 106 of the National Historic Preservation Act, as amended, and its implementing regulation 36 CFR Part 800. We anticipate these agencies will continue to consult with DHR, but request DEQ remind them to do so in its response.

Sincerely,
Marc

--

Marc Holma
Architectural Historian
Division of Review and Compliance
[REDACTED]



MEMORANDUM

TO: Julia Wellman, DEQ/EIR Environmental Program Planner

FROM: Carlos A. Martinez, Division of Land Protection & Revitalization Review Coordinator

DATE: January 13, 2020

COPIES: Sanjay Thirunagari, Division of Land Protection & Revitalization Review Manager; file

SUBJECT: Environmental Impact Review: 2020-01-13 Decommissioning and Dismantlement of the Deactivated SM-1 Nuclear Reactor Facility US Army Garrison at Fort Belvoir in Fort Belvoir, Virginia.

The Division of Land Protection & Revitalization (DLPR) has completed its review of the Army Corps of Engineers' December 27, 2019 EIR for Decommissioning and Dismantlement of the Deactivated SM-1 Nuclear Reactor Facility US Army Garrison at Fort Belvoir in Fort Belvoir, Virginia.

Solid and hazardous waste were not addressed in the submittal. The submittal did not indicate that a search of Federal or State environmental databases was conducted. DLPR staff conducted a search (500 ft. radius) of the project area of solid and hazardous waste databases (including petroleum releases) to identify waste sites in close proximity to the project area. DLPR identified two (2) petroleum release sites within the project area which might impact the project.

DLPR staff has reviewed the submittal and offers the following comments:

Hazardous Waste/RCRA Facilities – none in close proximity to the project area

CERCLA Sites – none in close proximity to the project area

Formerly Used Defense Sites (FUDS) – none in close proximity to the project area.

Solid Waste – none in close proximity to the project area

Virginia Remediation Program (VRP) – none in close proximity to the project area

Petroleum Releases – Two (2) found in close proximity to the project area.

1. ***PC Number 20023029, Fort Belvoir – Building 07350, Routes 1 and 611, Telegraph and Potomac River Rds, Fort Belvoir, Virginia 22060, Release Date: 07/06/2001, Status: Closed.***
2. ***PC Number 19973110, Fort Belvoir – Building 00371, Routes 1 and 611, Telegraph and Potomac River Rds, Fort Belvoir, Virginia 22060, Release Date: 12/27/1996, Status: Closed.***

Please note that the DEQ's Pollution Complaint (PC) cases identified should be further evaluated by the project engineer or manager to establish the exact location, nature and extent of the petroleum release and the potential to impact the proposed project. In addition, the project engineer or manager should contact the DEQ's Northern Regional Office at (703) 583-3800 (Tanks Program) for further information about the PC cases.

PROJECT SPECIFIC COMMENTS

None

GENERAL COMMENTS

Soil, Sediment, Groundwater, and Waste Management

Any soil, sediment or groundwater that is suspected of contamination or wastes that are generated must be tested and disposed of in accordance with applicable Federal, State, and local laws and regulations. Some of the applicable state laws and regulations are: Virginia Waste Management Act, Code of Virginia Section 10.1-1400 *et seq.*; Virginia Hazardous Waste Management Regulations (VHWMR) (9VAC 20-60); Virginia Solid Waste Management Regulations (VSWMR) (9VAC 20-81); Virginia Regulations for the Transportation of Hazardous Materials (9VAC 20-110). Some of the applicable Federal laws and regulations are: the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 *et seq.*, and the applicable regulations contained in Title 40 of the Code of Federal Regulations; and the U.S. Department of Transportation Rules for Transportation of Hazardous Materials, 49 CFR Part 107.

Pollution Prevention – Reuse - Recycling

Please note that DEQ encourages all construction projects and facilities to implement pollution prevention principles, including the reduction, reuse, and recycling of all solid wastes generated. All generation of hazardous wastes should be minimized and handled appropriately.

If you have any questions or need further information, please contact Carlos A. Martinez by phone at () or email ().



Wellman, Julia [REDACTED]

Re: EXPEDITED REVIEW - NEW PROJECT ACOE Decommissioning of Deactivated SM-1 Nuclear Reactor, DEQ #19-157F

1 message

Holland, Benjamin [REDACTED]

To: Julia Wellman [REDACTED]

Sat, Dec 28, 2019 at 10:05 AM

Julia - basically the standard language. They cover pretty much everything in their FCD document, so there's not many additional comments that need to be said.

Northern Regional Office comments regarding the FCD for *Decommissioning and Dismantlement of the Deactivated SM-1 Nuclear Reactor Facility, U. S. Army Garrison Fort Belvoir, DEQ #19-157F*, are as follows:

Land Protection Division – The project manager is reminded that if any solid or hazardous waste is generated/encountered during construction/demolition, including the lead and radioactive wastes alluded to in the FCD document, the project manager would follow applicable federal, state, and local regulations for their disposal.

Air Compliance/Permitting - The project manager is reminded that during the construction phases that occur with this project; the project is subject to the Fugitive Dust/Fugitive Emissions Rule 9 VAC 5-50-60 through 9 VAC 5-50-120. In addition, should any open burning or use of special incineration devices be employed in the disposal of land clearing debris during demolition and construction, the operation would be subject to the Open Burning Regulation 9 VAC 5-130-10 through 9 VAC 5-130-60 and 9 VAC 5-130-100.

Virginia Water Protection Permit (VWPP) Program – The project manager is reminded that a VWP permit from DEQ may be required should impacts to surface waters be necessary. DEQ VWP staff recommends that the avoidance and minimization of surface water impacts to the maximum extent practicable as well as coordination with the US Army Corps of Engineers. Upon receipt of a Joint Permit Application for the proposed surface water impacts, DEQ VWP Permit staff will review the proposed project in accordance with the VWP permit program regulations and current VWP permit program guidance. VWPP staff reserve the right to provide comment upon receipt of a permit application requesting authorization to impact state surface waters, and at such time that a wetland delineation has been conducted and associated jurisdiction determination made by the U.S. Army Corps of Engineers.

Erosion and Sediment Control and Storm Water Management – DEQ has regulatory authority for the Virginia Pollutant Discharge Elimination System (VPDES) programs related to municipal separate storm sewer systems (MS4s) and construction activities. Erosion and sediment control measures are addressed in local ordinances and State regulations. Additional information is available at <http://www.deq.virginia.gov/Programs/Water/StormwaterManagement.aspx>. Non-point source pollution resulting from this project should be minimized by using effective erosion and sediment control practices and structures. Consideration should also be given to using permeable paving for parking areas and walkways where appropriate, and denuded areas should be promptly revegetated following construction work. If the total land disturbance exceeds 10,000 square feet, an erosion and sediment control plan will be required. Some localities also require an E&S plan for disturbances less than 10,000 square feet. A stormwater management plan may also be required. For any land disturbing activities equal to one acre or more, you are required to apply for coverage under the VPDES General Permit for Discharges of Storm Water from Construction Activities. The Virginia Stormwater Management Permit Authority may be DEQ or the locality.

On Fri, Dec 27, 2019 at 1:42 PM Fulcher, Valerie [REDACTED] wrote:

Good a. ernoon - this is a new OEIR review request/project:

Document Type: Federal Consistency Determinaon

D-32

Project Sponsor: Army Corps of Engineers

Project Title: Decommissioning and Dismantlement of the Deactivated SM-1 Nuclear Reactor Facility, U.S. Army Garrison Fort Belvoir

Location: Fairfax County

Project Number: DEQ #19-157F

The documents are attached.

The due date for comments is **JANUARY 21, 2020**. You can send your comments either directly to JULIA WELLMAN by email ([REDACTED]), or you can send your comments by regular interagency/U.S. mail to the Department of Environmental Quality, Office of Environmental Impact Review, 1111 East Main St., Richmond, VA 23219.

NOTE: The deadline is expedited due to the federal deadline.

If you cannot meet the deadline, please notify the project coordinator prior to the comment due date. Arrangements may be made to extend the deadline for comments if possible. An agency will be considered to have no concerns if comments are not received (or contact is made) within the review period. However, it is important that agencies consistently participate in accordance with Virginia Code Section 10.1-1192.

REVIEW INSTRUCTIONS:

- A. Please review the document carefully. If the proposal has been previously reviewed (e.g. as a draft EIS or a Part 1 EIR), please consider whether your earlier comments have been adequately addressed.
- B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency (agency stationery or email) and include the project number on all correspondence.

If you have any questions, please email Julia.

Thanks!

--

Valerie A. Fulcher, CAP, OM, Environmental Program Specialist

Department of Environmental Quality

Environmental Enhancement - Office of Environmental Impact Review

1111 East Main Street

Richmond, VA 23219

[REDACTED]

[REDACTED]

[REDACTED]

<http://www.deq.virginia.gov/Programs/EnvironmentalImpactReview.aspx>

For program updates and public notices please subscribe to Constant Contact: <https://lp.constantcontact.com/su/MVcCump/EIR>

--

BENJAMIN D. HOLLAND, MPH
DEQ Regional Enforcement Specialist

VA Department of Environmental Quality
Northern Regional Office
[13901 Crown Court](#)
[Woodbridge, VA 22193](#)


Website: www.deq.virginia.gov



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Street address: 1111 East Main Street, Suite 1400, Richmond, VA 23219

Mailing address: P.O. Box 1105, Richmond, Virginia 23218

www.deq.virginia.gov

Matthew J. Strickler
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

MEMORANDUM

TO: Julia Wellman, DEQ Environmental Program Planner

FROM: Daniel Moore, DEQ Principal Environmental Planner

DATE: January 12, 2020

SUBJECT: DEQ #19-157F: US Army, Ft. Belvoir Decommissioning and Dismantlement of Deactivated SM-1 Nuclear Reactor, Fairfax County

We have reviewed the Federal Consistency Determination for the above-referenced project at Fort Belvoir in Fairfax County and offer the following comments regarding consistency with the provisions of the *Chesapeake Bay Preservation Area Designation and Management Regulations* (Regulations):

In Fairfax County, the areas protected by the Chesapeake Bay Preservation Act, as locally implemented, require conformance with performance criteria. These areas include Resource Protection Areas (RPAs) and Resource Management Areas (RMAs) as designated by the local government. RPAs include tidal wetlands, certain non-tidal wetlands and tidal shores. RPAs also include a 100-foot vegetated buffer area located adjacent to and landward of these features and along both sides of any water body with perennial flow. RMAs, which require less stringent performance criteria, include those areas of the County not included in the RPAs.

Under the Federal Consistency Regulations of the *Coastal Zone Management Act of 1972*, federal actions in Virginia must be conducted in a manner "consistent to the maximum extent practicable" with the enforceable policies of the Virginia Coastal Zone Management Program. Those enforceable policies are administered through the Chesapeake Bay Preservation Act and Regulations.

Federal actions on installations located within Tidewater Virginia are required to be consistent with the performance criteria of the Regulations on lands analogous to locally designated RPAs and RMAs, as provided in §9VAC25-830-130 and 140 of the Regulations, including the requirement to minimize land disturbance (including access and staging areas), retain existing

vegetation and minimize impervious cover as well as including compliance with the requirements of the *Virginia Erosion and Sediment Control Handbook*, and stormwater management criteria consistent with water quality protection provisions of the *Virginia Stormwater Management Regulations*.” For land disturbance over 2,500 square feet, the project must comply with the requirements of the *Virginia Erosion and Sediment Control Handbook*.

RPA disturbance resulting from the proposed project would consist of vegetation clearing and soil excavation, fill, and compaction. Vegetation clearing and soil disturbance would be temporary and limited to that needed to complete the proposed decommissioning activities. All disturbance in the RPA would be limited to that portion of the RPA within the Deactivated SM-1 Nuclear Reactor Facility perimeter. Adherence to requirements of the CGP and associated SWPPP, E&SC, and SWM plans during ground-disturbing activities would minimize or prevent the erosion of exposed soils and manage the quantity and quality of stormwater generated on the site, which would be ultimately discharged to Gunston Cove and further downstream, the Potomac River and Chesapeake Bay. The extent and intensity of RPA disturbance would vary over the five-year decommissioning process and not all ground disturbance would occur simultaneously, further minimizing adverse effects.

RPA disturbance would be mitigated through the planting of two new trees for the removal of every tree four inches in diameter and breast height (dbh) or greater in accordance with Fort Belvoir Policy Memorandum #27, Tree Removal and Protection. Vegetation replacement in the RPA would also adhere to the requirements of the Virginia Department of Conservation and Recreation’s Riparian Buffers Modification and Mitigation Guidance Manual. In the long term, restoration and re-vegetation of the site following the completion of the proposed ground-disturbing activities would have a beneficial effect on RPAs in this part of Fort Belvoir. No ongoing or permanent activities with potential to disturb RPAs would be established by the Proposed Action.

Provided adherence to the above requirements, the proposed activity would be consistent with the *Chesapeake Bay Preservation Act* and the Regulations.



Wellman, Julia [REDACTED]

Re: EXPEDITED REVIEW - NEW PROJECT ACOE Decommissioning of Deactivated SM-1 Nuclear Reactor, DEQ #19-157F

1 message

Gavan, Lawrence [REDACTED]
To: "Wellman, Julia" [REDACTED]

Tue, Jan 14, 2020 at 3:14 PM

(a) Agency Jurisdiction. The Department of Environmental Quality (DEQ) administers the *Virginia Erosion and Sediment Control Law and Regulations (VESCL&R)* and *Virginia Stormwater Management Law and Regulations (VSWML&R)*.

(b) Erosion and Sediment Control and Stormwater Management Plans. The Applicant and its authorized agents conducting regulated land-disturbing activities on private and public lands in the state must comply with *VESCL&R* and *VSWML&R*, including coverage under the general permit for stormwater discharge from construction activities, and other applicable federal nonpoint source pollution mandates (e.g. Clean Water Act-Section 313, federal consistency under the Coastal Zone Management Act). Clearing and grading activities, installation of staging areas, parking lots, roads, buildings, utilities, borrow areas, soil stockpiles, and related land-disturbing activities that result in the total land disturbance of equal to or greater than 10,000 square feet (2,500 square feet in Chesapeake Bay Preservation Area) would be regulated by *VESCL&R*. Accordingly, the Applicant must prepare and implement an erosion and sediment control (ESC) plan to ensure compliance with state law and regulations. Land-disturbing activities that result in the total land disturbance of equal to or greater than 1 acre (2,500 square feet in Chesapeake Bay Preservation Area) would be regulated by *VSWML&R*. Accordingly, the Applicant must prepare and implement a Stormwater Management (SWM) plan to ensure compliance with state law and regulations. The ESC/SWM plan is submitted to the DEQ Regional Office that serves the area where the project is located for review for compliance. The Applicant is ultimately responsible for achieving project compliance through oversight of on-site contractors, regular field inspection, prompt action against non-compliant sites, and other mechanisms consistent with agency policy. [Reference: *VESCL* 62.1-44.15 et seq.]

(c) General Permit for Stormwater Discharges from Construction Activities (VAR10). DEQ is responsible for the issuance, denial, revocation, termination and enforcement of the Virginia Stormwater Management Program (VSMP) General Permit for Stormwater Discharges from Construction Activities related to municipal separate storm sewer systems (MS4s) and construction activities for the control of stormwater discharges from MS4s and land disturbing activities under the Virginia Stormwater Management Program.

The owner or operator of projects involving land-disturbing activities of equal to or greater than 1 acre is required to register for coverage under the General Permit for Discharges of Stormwater from Construction Activities and develop a project-specific Stormwater Pollution Prevention Plan. Construction activities requiring registration also include land disturbance of less than one acre of total land area that is part of a larger common plan of development or sale if the larger common plan of development will collectively disturb equal to or greater than one acre. The SWPPP must be prepared prior to submission of the registration statement for coverage under the general permit and the SWPPP must address water quality and quantity in accordance with the *VSMP Permit Regulations*. General information and registration forms for the General Permit are available at: <http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/VSMPPPermits/ConstructionGeneralPermit.aspx>

[Reference: Virginia Stormwater Management Act 62.1-44.15 et seq.; VSMP Permit Regulations 9VAC25-880 *et seq.*]

On Fri, Dec 27, 2019 at 1:42 PM Fulcher, Valerie [REDACTED] wrote:

Good a. ernoon - this is a new OEIR review request/project:

Document Type: Federal Consistency Determinaon

Project Sponsor: Army Corps of Engineers

Project Title: Decommissioning and Dismantlement of the Deacv ated SM-1 Nuclear Reactor Facility, U. S. Army Garrison Fort Belvoir

Locaon: Fairfax County

Project Number: DEQ #19-157F

The documents are aached.

The due date for comments is JANUARY 21, 2020. You can send your comments either directly to JULIA WELLMAN by email ([REDACTED]), or you can send your comments by regular interagency/U.S. mail to the Department of Environmental Quality, Office of Environmental Impact Review, 1111 East Main St., Richmond, VA 23219.

NOTE: The deadline is expedited due to the federal deadline.

If you cannot meet the deadline, please nofy the project coordinator prior to the comment due date. Arrangements may be made to extend the deadline for comments if possible. An agency will be considered to have no concerns if comments are not received (or contact is made) within the review period. However, it is important that agencies consistently parcipate in accordance with Virginia Code Seccon 10.1-1192.

REVIEW INSTRUCTIONS:

- A. Please review the document carefully. If the proposal has been previously reviewed (e.g. as a dra EIS or a Part 1 EIR), please consider whether your earlier comments have been adequately addressed.**
- B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency (agency staonary or email) and include the project number on all correspondence.**

If you have any quesons, please email Julia.

Thanks!

--

Valerie A. Fulcher, CAP, OM, Environmental Program Specialist

Department of Environmental Quality

Environmental Enhancement - Office of Environmental Impact Review

1111 East Main Street

Richmond, VA 23219

[REDACTED]

[REDACTED]

[REDACTED]

<http://www.deq.virginia.gov/Programs/EnvironmentalImpactReview.aspx>

For program updates and public notices please subscribe to Constant Contact: <https://lp.constantcontact.com/su/MVcCump/EIR>



Wellman, Julia [REDACTED]

Fwd: EXPEDITED REVIEW - NEW PROJECT ACOE Decommissioning of Deactivated SM-1 Nuclear Reactor, DEQ #19-157F

1 message

Fulcher, Valerie [REDACTED]

Tue, Jan 14, 2020 at 1:23 PM

To: "Wellman, Julia" [REDACTED]

VDH Comments.

----- Forwarded message -----

From: **Warren, Arlene** [REDACTED]

Date: Tue, Jan 14, 2020 at 12:22 PM

Subject: Re: EXPEDITED REVIEW - NEW PROJECT ACOE Decommissioning of Deactivated SM-1 Nuclear Reactor, DEQ #19-157F

To: Fulcher, Valerie [REDACTED]

Project Name: Decommissioning and Dismantlement of the Deactivated SM-1 Nuclear Reactor Facility, U.**S. Army Garrison Fort Belvoir****Project #: 19-157 F**

UPC #: N/A

Location: Fairfax County

VDH – Office of Drinking Water has reviewed the above project. Below are our comments as they relate to proximity to **public drinking water sources** (groundwater wells, springs and surface water intakes). Potential impacts to public water distribution systems or sanitary sewage collection systems **must be verified by the local utility**.

There are no public groundwater wells within a 1-mile radius of the project site.

There are no surface water intakes located within a 5-mile radius of the project site.

The project is not within the watershed of any public surface water intakes.

There are no apparent impacts to public drinking water sources due to this project.

Virginia Department of Health – Office of Drinking Water appreciates the opportunity to provide comments. If you have any questions, please let me know.

Best Regards,

Arlene Fields Warren

GIS Program Support Technician**Office of Drinking Water****Virginia Department of Health**

109 Governor Street

Richmond, VA 23219

On Fri, Dec 27, 2019 at 1:43 PM Fulcher, Valerie [REDACTED] wrote:

Good afternoon - this is a new OEIR review request/project:

Document Type: Federal Consistency Determination

Project Sponsor: Army Corps of Engineers

Project Title: Decommissioning and Dismantlement of the Deactivated SM-1 Nuclear Reactor Facility, U.S. Army Garrison Fort Belvoir

Location: Fairfax County

Project Number: DEQ #19-157F

The documents are attached.

The due date for comments is JANUARY 21, 2020. You can send your comments either directly to JULIA WELLMAN by email ([REDACTED]), or you can send your comments by regular interagency/U.S. mail to the Department of Environmental Quality, Office of Environmental Impact Review, 1111 East Main St., Richmond, VA 23219.

NOTE: The deadline is expedited due to the federal deadline.

If you cannot meet the deadline, please notify the project coordinator prior to the comment due date. Arrangements may be made to extend the deadline for comments if possible. An agency will be considered to have no concerns if comments are not received (or contact is made) within the review period. However, it is important that agencies consistently participate in accordance with Virginia Code Section 10.1-1192.

REVIEW INSTRUCTIONS:

- A. Please review the document carefully. If the proposal has been previously reviewed (e.g. as a draft EIS or a Part 1 EIR), please consider whether your earlier comments have been adequately addressed.**
- B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency (agency stationery or email) and include the project number on all correspondence.**

If you have any questions, please email Julia.

Thanks!

--

Valerie A. Fulcher, CAP, OM, Environmental Program Specialist

Department of Environmental Quality

Environmental Enhancement - Office of Environmental Impact Review

1111 East Main Street

Richmond, VA 23219

[REDACTED]

[REDACTED]

[REDACTED]

<http://www.deq.virginia.gov/Programs/EnvironmentalImpactReview.aspx>

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Valerie A. Fulcher, CAP, OM, Environmental Program Specialist

Department of Environmental Quality

Environmental Enhancement - Office of Environmental Impact Review

1111 East Main Street

Richmond, VA 23219

[REDACTED]

[REDACTED]

[REDACTED]

<http://www.deq.virginia.gov/Programs/EnvironmentalImpactReview.aspx>

For program updates and public notices please subscribe to Constant Contact: <https://lp.constantcontact.com/su/MVcCump/EIR>



COMMONWEALTH of VIRGINIA

Marine Resources Commission
380 Fenwick Road
Bldg 96
Fort Monroe, VA 23651-1064

Matthew J. Strickler
Secretary of Natural Resources

Steven G. Bowman
Commissioner

January 2, 2020

Department of Environmental Quality
Attn: Julia Wellman
Office of Environmental Impact Review
1111 East Main St.
Richmond, VA 23219

Re: Federal Consistency Determination
Decommissioning and Dismantlement of the Deactivated
SM-1 Nuclear Reactor Facility, U. S. Army Garrison Fort
Belvoir
DEQ #19-157F

Dear Ms. Wellman:

This will respond to the request for comments regarding the Federal Consistency Determination for the Decommissioning and Dismantlement of the Deactivated SM-1 Nuclear Reactor Facility project (DEQ #19-157F), prepared by AECOM, on behalf of US Army Corps of Engineers (USACE), Baltimore District. Specifically, the USACE has proposed to safely remove, transport, and dispose of any remaining structures and equipment from the site. The project is located in Fairfax County, Virginia.

We reviewed the provided documents and found the proposed project is outside the jurisdictional areas of the Marine Resources Commission (VMRC) and will not require a permit from this agency. Should any changes to the planned work result in work performed in, or construction access through, tidal wetlands, a tidal wetlands permit will be required from the Fairfax County Wetlands Board.

Please be advised that the Virginia Marine Resources Commission (VMRC) pursuant to Chapter 12, 13, & 14 of Title 28.2 of the Code of Virginia administers permits required for submerged lands, tidal wetlands, and beaches and dunes. The VMRC administers the enforceable policies of fisheries management, subaqueous lands, tidal wetlands, and coastal primary sand dunes and beaches which comprise some of Virginia's Coastal Zone Management Program. VMRC staff has reviewed the submittal and offers the following comments:

Fisheries and Shellfish: Erosion and run-off controls should be in place to prevent any impacts to marine fisheries.

State-owned Submerged Lands: No impacts expected.

Tidal Wetlands: If the planned work results in impacts to tidal wetlands, either in, on, or through, a permit will be required from the Fairfax County Wetlands Board.

An Agency of the Natural Resources Secretariat

www.mrc.virginia.gov

Telephone (757) 247-2200 (757) 247-2292 V/TDD Information and Emergency Hotline 1-800-541-4646 V/TDD

Department of Environmental Quality
January 2, 2020
Page Two

Beaches and Coastal Primary Sand Dunes: None in close proximity to the project area.

As such, this project has no foreseeable impact on the VMRC's enforceable policies. As proposed, we have no objection to the consistency findings provided by the applicant. Should the proposed project change, a new review by this agency may be required relative to these jurisdictional areas.

If you have any questions please contact me at [REDACTED] or by email at [REDACTED]. Thank you for the opportunity to comment.

Sincerely,

A handwritten signature in dark ink, appearing to read "Mark Eversole", is written over a light gray rectangular background.

Mark Eversole
Environmental Engineer, Habitat Management

MCE/keb
HM

USACE Federal Consistency Determination

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Federal Consistency Determination
Decommissioning and Dismantlement of the Deactivated SM-1 Nuclear Reactor Facility
U.S. Army Garrison Fort Belvoir
Fairfax County, Virginia

Pursuant to Section 307 of the Coastal Zone Management Act of 1972, as amended, and 15 Code of Federal Regulations (CFR) Subpart C, this Federal Consistency Determination has been prepared for the United States Army Corps of Engineers (USACE) Baltimore District's Proposed Action to decommission and dismantle the Deactivated SM-1 Nuclear Reactor Facility at U.S. Army Garrison Fort Belvoir (Fort Belvoir) in Fairfax County, Virginia. USACE is required to determine the consistency of the Proposed Action and potential effects on Virginia's coastal resources or coastal uses with the enforceable policies of the Virginia Coastal Zone Management Program (VCP).

This consistency determination represents an analysis of the Proposed Action in light of established VCP Enforceable Policies and Programs. Submission of this consistency determination reflects the commitment of USACE to comply to the maximum extent practicable with those Enforceable Policies and Programs. The Proposed Action would be implemented in a manner consistent with the VCP. USACE has determined that the effects of the Proposed Action would be less than significant on land and water uses as well as natural resources of the Commonwealth of Virginia's coastal zone and is consistent to the maximum extent practicable with the enforceable policies of the VCP.

Background

The Deactivated SM-1 Nuclear Reactor Facility occupies an approximately five-acre site on Fort Belvoir's South Post along the shoreline of Gunston Cove, an embayment of the Potomac River (**Figures 1 and 2**). SM-1 began operation in 1957 and was deactivated in 1973. Following removal of the nuclear fuel and limited decontamination, SM-1 was placed into a safe storage (SAFSTOR) condition to allow for natural decay of residual radionuclides. U.S. Nuclear Regulatory Commission (NRC) and Army Reactor Office (ARO) regulations require nuclear facility decommissioning to be completed within 60 years of the facility's deactivation; thus, decommissioning of the Deactivated SM-1 Nuclear Reactor Facility must occur by 2033.

Proposed Action

USACE's Proposed Action is to decommission and dismantle the Deactivated SM-1 Nuclear Reactor Facility at Fort Belvoir. Decommissioning the facility consists of removing all radiologically and non-radiologically contaminated structures, equipment, and media associated with the operation of the reactor; restoration of the site to allow for unrestricted release and future use; and termination of the Army's reactor possession permit under which the facility is currently maintained. Three structures that extend into Gunston Cove would be removed under the Proposed Action: a water outfall pipe, an intake pier, and a pump house (situated on the pier).

Following the completion of decommissioning and restoration activities, the SM-1 site would be maintained as open/vegetated space. Any future development of the site would be at the discretion of Fort Belvoir and is not included in the Proposed Action.

The Proposed Action can be broken down into several components, as described below (some variability in the sequence of these activities is anticipated).

- **Site preparation.** Preparatory activities would include the establishment of radiological controls on and around the SM-1 site; the installation of temporary support facilities or modifications to existing facilities to support field activities throughout the duration of the Proposed Action; the removal of most vegetation

from the site and some non-contaminated structures and equipment; and potential upgrades and repairs to onsite roadways.

- **Removal of materials and equipment (M&E) from Building 372.** These activities would include the removal of regulated contaminated and clean M&E from the building. Areas where surface contamination has been detected would be decontaminated to the extent practicable to allow for open air dismantlement and minimize the amount of low-level radioactive waste (LLRW) to be transported and disposed of.
- **Dismantlement of Building 372.** Dismantlement would occur in two sequential phases starting with structural components in the Unrestricted Area (i.e., the area of the facility where residual radioactivity is below applicable regulatory thresholds). This phase of dismantlement would include the above ground structure and removal of the remaining floor slab, foundation, and any tanks and piping still present. The resultant debris from these activities would be disposed of as clean waste. The second phase of dismantlement would occur within the Restricted Area (i.e., the area of the facility with low levels of residual radioactivity above applicable regulatory thresholds) and result in the removal of structures around, and including, the Vapor Container (VC).
- **Dismantlement and removal of other structures.** This component includes the dismantlement or removal of the water intake pump house and pier, a sewage pump station, and a storage warehouse. It also includes the removal of the water intake pipe to Building 372, the water discharge piping from Building 372 to associated infrastructure on the site, including the water outfall pipe, and the unused sanitary sewer line associated with the sewage pump station.

Removal of the water intake pump house and pier, which extends into Gunston Cove approximately 100 feet from the shoreline, would likely require the use of a barge-mounted crane and other vessels to provide the dismantlement crew and equipment with access to the structures. Superstructures would be removed first, followed by the piles if they are determined to be structurally sound. If the piles are determined to be in a condition that would not allow for complete removal, they may be cut at the mudline and the portions below the cut would be left in place. A containment boom and turbidity curtain would be placed around the work area to prevent the migration of disturbed sediment into the water, minimize turbidity, and ensure disturbed sediments settle near their original location. A containment boom and turbidity curtain would also be used to contain sediment disturbed by the removal of the underwater portion of the outfall pipe.

- **Soil remediation and restoration.** Contaminated soils around and below Building 372 would be removed following dismantlement. In addition to radiological contamination, surveys have shown the presence of lead around the building, likely from the deterioration of lead-based paint over time. Soils around the underground tanks and piping are also assumed to be contaminated and would be removed along with those structures.
- **Waste disposal and transportation.** The Proposed Action would generate large quantities of waste. All waste would be characterized, segregated, and disposed of as clean waste (i.e., no contamination and suitable for recycling or disposal at a regular landfill), LLRW, hazardous waste, or mixed waste. Permitted off-post disposal facilities appropriate for each category of waste would be identified and the waste would be shipped to those facilities by licensed contractors in accordance with applicable federal and state regulations.

All waste would be transported off post by trucks, including a 53-foot trailer truck for the Reactor Pressure Vessel (RPV) cask, which would be the most radioactive element of the SM-1 reactor and the

most significant in terms of weight. After leaving Fort Belvoir, the trucks would travel on public roads to either the disposal site or to a road-to-rail transfer location for rail transport to the final destination.

- **Safety, health, and environmental control measures.** The Proposed Action would involve disturbing, dismantling, and moving materials, structures, and soils that are hazardous or radiologically contaminated. These materials would be handled in a controlled manner that would minimize the risk of exposure to project personnel, the general public, and the environment.

Enforceable Policies

The Commonwealth of Virginia has developed and implemented the federally approved VCP encompassing nine enforceable policies for the coastal area pertaining to:

- Fisheries management
- Subaqueous lands management
- Wetlands management
- Dunes management
- Non-point source pollution control
- Point source pollution control
- Shoreline sanitation
- Air pollution control
- Coastal lands management

A summary analysis of how the Proposed Action would affect each of the enforceable policies is presented below. This analysis is based on the more detailed analyses presented in the environmental assessment (EA) being prepared by USACE in accordance with the National Environmental Policy Act of 1969 (NEPA).

Fisheries Management

The program stresses the conservation and enhancement of finfish and shellfish resources and the promotion of commercial and recreational fisheries to maximize food production and recreational opportunities. This program is administered by the Marine Resources Commission (MRC) (Virginia Code §28.2-200 through §28.2-713) and the Department of Game and Inland Fisheries (DGIF) (Virginia Code §29.1-100 through §29.1-570).

The State Tributyltin (TBT) Regulatory Program has been added to the Fisheries Management program. The General Assembly amended the Virginia Pesticide Use and Application Act as it related to the possession, sale, or use of marine antifoulant paints containing TBT. The use of TBT in boat paint constitutes a serious threat to important marine animal species. The TBT program monitors boating activities and boat painting activities to ensure compliance with TBT regulations promulgated pursuant to the amendment. The MRC, DGIF, and Virginia Department of Agriculture and Consumer Services share enforcement responsibilities (Virginia Code §3.1-249.59 through §3.1-249.62).

Consistent to the Maximum Extent Practicable? Not Applicable (NA)

Analysis

The Proposed Action does not involve the use of TBT. In-water dismantlement activities associated with the Proposed Action would have no potential to affect finfish or shellfish resources or commercial and recreational fisheries. Therefore, this enforceable policy is not applicable.

Subaqueous Lands Management

The management program for subaqueous lands establishes conditions for granting or denying permits to use state-owned bottomlands based on considerations of potential effects on marine and fisheries resources, wetlands, adjacent or nearby properties, anticipated public and private benefits, and water quality standards established by the DEQ Water Division. The program is administered by the MRC (Virginia Code §28.2-1200 through §28.2-1213).

Consistent to the Maximum Extent Practicable? YES

Analysis

Removal of the intake pier and water discharge pipe under the Proposed Action would have the potential to disturb subaqueous bottomlands in Gunston Cove. Gunston Cove is a tidal embayment of the Potomac River. Water depths in Gunston Cove vary from approximately 1 meter (m) in the northern portion to approximately 2.25 m in the center. The mean tidal range is approximately 0.64 m.

The area where in-water work associated with the Proposed Action would occur includes the portion of Gunston Cove that contains the water outfall pipe, pump house, and water intake pier footprint (390 square meters [m²]); adjacent work areas; and the estimated extent of the turbidity plumes that would result from removal of the structures (3.6 hectares [ha]) (**Figure 2**). This area is expected to encompass all of the direct and indirect effects of the Proposed Action.

USACE and its contractors would minimize disturbance of subaqueous bottomlands during in-water activities to the extent practicable. As noted above, containment booms and sediment curtains would be used during in-water and nearshore work to prevent the migration of disturbed sediment into the water column, minimize turbidity, and ensure disturbed sediments settle near their original location.

As determined necessary through continued project planning and ongoing consultation with the Virginia Department of Environmental Quality (VDEQ) and other applicable regulatory agencies, USACE would submit a Joint Permit Application (JPA) for review and/or authorization from the Virginia Marine Resources Commission (VMRC), VDEQ, and/or the Fairfax County Local Wetlands Board (LWB) to work in the tidal waters and wetlands of Gunston Cove. Work would be conducted in accordance with the applicable requirements of permits issued by applicable regulatory agencies.

For these reasons, the Proposed Action would be consistent to the maximum extent practicable with this enforceable policy.

Wetlands Management

The purpose of the wetlands management program is to preserve tidal wetlands, prevent their despoliation, and accommodate economic development in a manner consistent with wetlands preservation.

- (i) *The tidal wetlands program is administered by the MRC (Virginia Code §28.2-1301 through §28.2-1320).*
- (ii) *The Virginia Water Protection Permit program administered by the DEQ includes protection of wetlands – both tidal and non-tidal. This program is authorized by Virginia Code § 62.1-44.15.5 and the Water Quality Certification requirements of §401 of the Clean Water Act of 1972.*

Consistent to the Maximum Extent Practicable? YES

Analysis

The Proposed Action would not involve dredging, filling, or other permanent alteration of or impacts on tidal wetlands. As noted above, USACE would submit a JPA for review and/or authorization from applicable regulatory agencies prior to conducting in-water activities associated with the Proposed Action. USACE and its contractors would limit in-water activity and disturbance to that necessary to remove structures associated with SM-1. Measures would also be implemented voluntarily as well as in accordance with applicable permit requirements to minimize temporary impacts on tidal wetlands. Following completion of the Proposed Action, tidal wetlands in Gunston Cove adjacent to the SM-1 site would naturally return to a pre-disturbance condition.

Therefore, the Proposed Action would be consistent to the maximum extent practicable with this enforceable policy.

Dunes Management

Dune protection is carried out pursuant to the Coastal Primary Sand Dune Protection Act and is intended to prevent destruction or alteration of primary dunes. This program is administered by the Marine Resources Commission (Virginia Code §28.2-1400 through §28.2-1420).

Consistent to the Maximum Extent Practicable? NA

Analysis

The Proposed Action has no potential to affect sand dunes, as none are located on or in the vicinity of the project site. Thus, this enforceable policy is not applicable.

Non-point Source Pollution Control

Virginia's Erosion and Sediment Control Law requires soil-disturbing projects to be designed to reduce soil erosion and to decrease inputs of chemical nutrients and sediments to the Chesapeake Bay, its tributaries, and other rivers and waters of the Commonwealth. This program is administered by DEQ (Virginia Code §62.1-44.15:51 et seq.).

Consistent to the Maximum Extent Practicable? YES

Analysis

The Proposed Action would involve more than 2,500 square feet of land disturbance. Therefore, as required by Fort Belvoir's Virginia Pollutant Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4), the decommissioning contractor would be required to prepare and adhere to an erosion and sediment control (E&SC) plan in accordance with 9VAC25-840-40, as well as a stormwater management (SWM) plan in accordance with 9VAC25-870-55. Because the Proposed Action would also disturb more than one acre of land, the decommissioning contractor would also obtain coverage under Virginia's General Permit for Discharges of Stormwater from Construction Activities (Construction General Permit [CGP]). Coverage under the CGP would require the contractor to submit a Registration Statement to VDEQ and prepare and adhere to a site-specific SWPPP. Adherence to the requirements of the CGP and E&SC and SWM plans would manage the quantity and quality of stormwater discharged from land-disturbing activities associated with the Proposed Action and would minimize adverse effects on water quality in receiving water bodies.

Thus, the Proposed Action would be consistent to the maximum extent practicable with this enforceable policy.

Point Source Pollution Control

The point source program is administered by the State Water Control Board pursuant to Virginia Code §62.1-44.15. Point source pollution control is accomplished through the implementation of the National Pollutant Discharge Elimination System (NPDES) permit program established pursuant to §402 of the federal Clean Water Act and administered in Virginia as the VPDES permit program. The Water Quality Certification requirements of §401 of the Clean Water Act of 1972 is administered under the Virginia Water Protection Permit program.

Consistent to the Maximum Extent Practicable? YES

Analysis

No new point source discharges of stormwater would be created as a result of the Proposed Action. The water outfall pipe at the Deactivated SM-1 Nuclear Reactor Facility that would be removed by the Proposed Action has not been active since the facility was deactivated in 1973. As determined necessary, Fort Belvoir would amend its VPDES permit following completion of the proposed decommissioning to reflect the removal of this outfall.

Therefore, the Proposed Action would be consistent to the maximum extent practicable with this enforceable policy.

Shoreline Sanitation

The purpose of this program is to regulate the installation of septic tanks, set standards concerning soil types suitable for septic tanks, and specify minimum distances that tanks must be placed away from streams, rivers, and other waters of the Commonwealth. This program is administered by the Department of Health (Virginia Code §32.1-164 through §32.1-165).

Consistent to the Maximum Extent Practicable? YES

Analysis

An inactive septic tank and associated leach field are suspected to be present immediately southwest of Building 372. If present, the septic tank would be removed during the Proposed Action in accordance with applicable state and Fort Belvoir requirements. Soils in the area of the septic tank and leach field would be replaced with clean fill soils during site restoration activities. No new septic tanks would be installed as part of the Proposed Action.

Thus, the Proposed Action would be consistent to the maximum extent practicable with this enforceable policy.

Air Pollution Control

The program implements the federal Clean Air Act to provide a legally enforceable State Implementation Plan for the attainment and maintenance of the National Ambient Air Quality Standards. This program is administered by the State Air Pollution Control Board (Virginia Code §10.1-1300 through 10.1-1320).

Consistent to the Maximum Extent Practicable? YES

Analysis

Dismantlement of the Deactivated SM-1 Nuclear Reactor Facility would generate increased emissions from heavy equipment, worker vehicles and fugitive dust. Adverse short-term impacts on air quality would be minimized through the use of standard best management practices (BMP) such as vegetating soils that would remain exposed for extended periods and sweeping or wetting pavements.

Dismantlement-related emissions would remain below thresholds for General Conformity Applicability, and no formal conformity determination is required. In the long term, the implementation of the Proposed Action would not involve the installation of new generators or boilers, nor would it result in an increase of vehicle trips to Fort

Belvoir. No new sources of emissions would be created and thus, no exceedances of applicable *de minimis* limits for criteria pollutants regulated under the Clean Air Act would occur. Short-term adverse impacts on air quality would be minor, and there would be no long-term impacts.

Therefore, the Proposed Action would be consistent to the maximum extent practicable with this enforceable policy.

Coastal Lands Management

Coastal Lands Management is a state-local cooperative program administered by DEQ's Water Division and 84 localities in Tidewater, Virginia established pursuant to the Chesapeake Bay Preservation Act (Virginia Code §§ 62.1-44.15:67 through 62.1-44.15:79) and Chesapeake Bay Preservation Area Designation and Management Regulations (Virginia Administrative Code 9 VAC 25-830-10 et seq.).

Consistent to the Maximum Extent Practicable? YES

Analysis

Consistent with the Deactivated SM-1 Nuclear Reactor Facility's location adjacent to Gunston Cove, a tidal embayment of the Potomac River, the Proposed Action would occur in Chesapeake Bay Resource Protection Areas (RPAs) recognized by Fort Belvoir. Fort Belvoir defines RPAs as vegetated buffers no less than 100 feet wide located adjacent to and landward of all tidal shores and tidal wetlands. RPAs on the installation also include 100-year floodplains and 35-foot buffers adjacent to all intermittent streams.

RPA disturbance resulting from the Proposed Action would consist of vegetation clearing and soil excavation, fill, and compaction. Vegetation clearing and soil disturbance would be temporary and limited to that needed to complete the proposed decommissioning activities. All disturbance of the RPA would be limited to the portion of the RPA within the Deactivated SM-1 Nuclear Reactor Facility perimeter.

Adherence to requirements of the CGP and associated SWPPP, E&SC, and SWM plans during ground-disturbing activities would minimize or prevent the erosion of exposed soils and manage the quantity and quality of stormwater generated on the site, which would be ultimately discharged to Gunston Cove and further downstream, the Potomac River and Chesapeake Bay. The extent and intensity of RPA disturbance would vary over the five-year decommissioning process and not all ground disturbance would occur simultaneously, further minimizing adverse effects.

RPA disturbance during the Proposed Action would be mitigated through the planting of two new trees for the removal of every tree four inches in diameter and breast height (dbh) or greater in accordance with Fort Belvoir Policy Memorandum #27, *Tree Removal and Protection*. Vegetation replacement in the RPA would also adhere to the requirements of VDCR's *Riparian Buffers Modification and Mitigation Guidance Manual*.

In the long term, restoration and re-vegetation of the site following the completion of ground-disturbing activities in the Proposed Action would have a beneficial effect on RPAs in this part of Fort Belvoir. No ongoing or permanent activities with potential to disturb RPAs would be established by the Proposed Action.

For these reasons, the Proposed Action would be consistent to the maximum extent practicable with this enforceable policy.

Figure 1

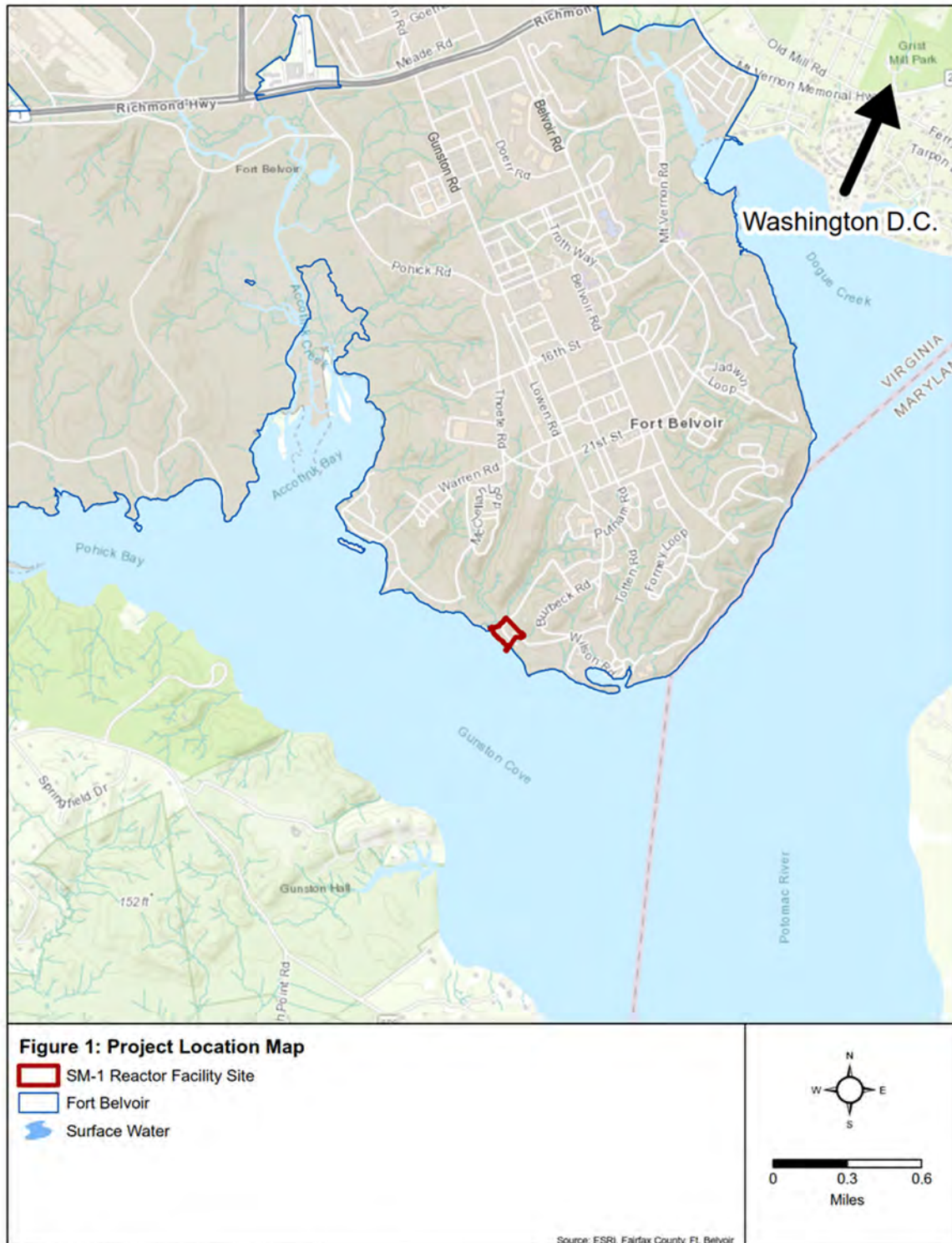
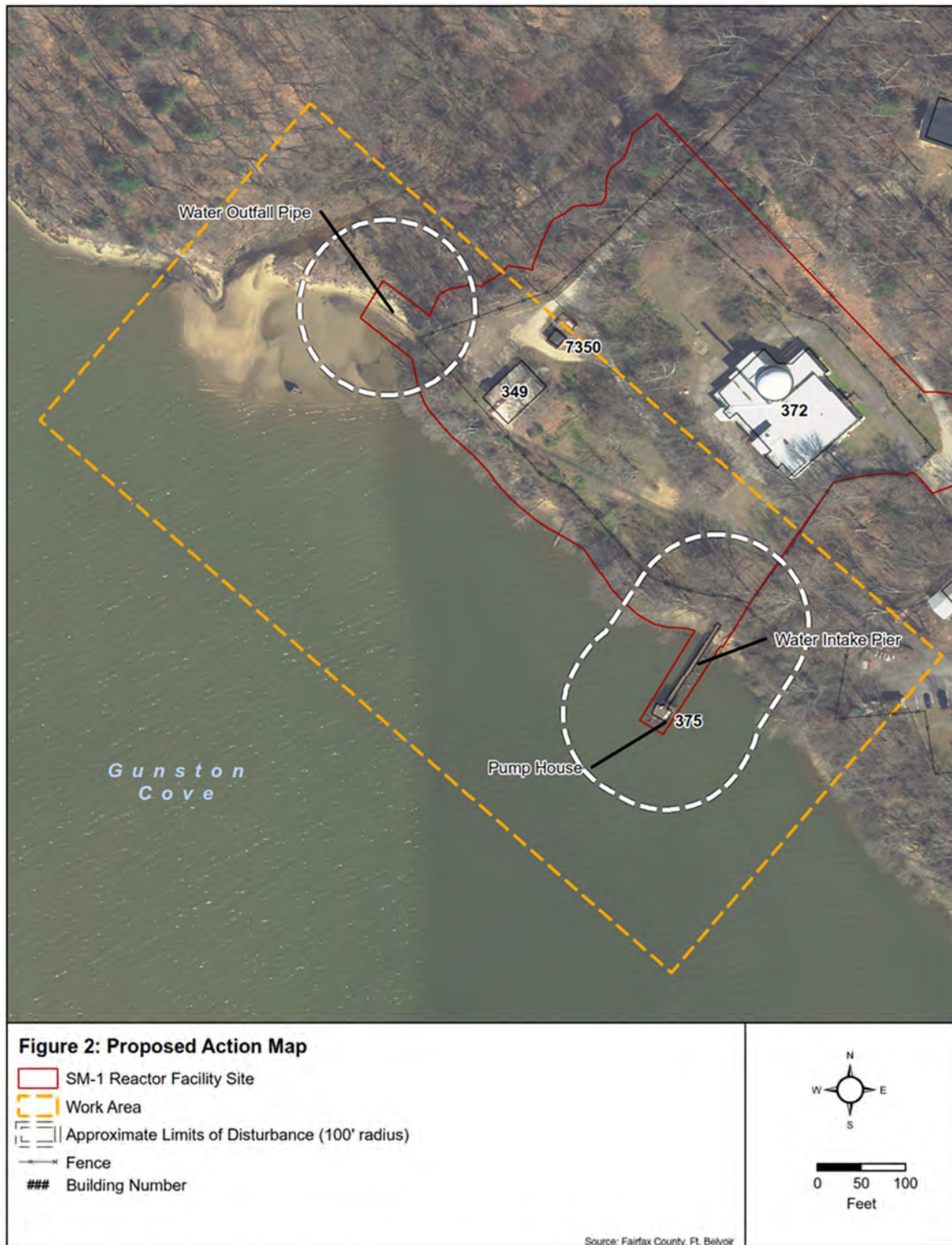


Figure 2



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Appendix E – Record of Non-Applicability (RONA) and Air Quality Emissions Estimates

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RECORD OF NON-APPLICABILITY (RONA) FOR CLEAN AIR ACT CONFORMITY

UNITED STATES ARMY CORPS OF ENGINEERS

PROPOSED DECOMMISSIONING AND DEMOLITION OF THE SM-1 REACTOR FACILITY AT FORT BELVOIR IN FAIRFAX COUNTY, VIRGINIA

Introduction

The United States Environmental Protection Agency's (USEPA's) *Determining Conformity of General Federal Actions to State or Federal Implementation Plans; Final Rule* (40 Code of Federal Regulations (CFR) Parts 51 and 93) provides the implementing guidance to document Clean Air Act (CAA) Conformity Determination requirements. The General Conformity Rule requires federal actions or federally funded actions planned to occur in a non-attainment or maintenance area to be reviewed prior to their implementation to ensure that the actions would not interfere with State's plans to meet or maintain the National Ambient Air Quality Standards (NAAQS). It is the responsibility of the federal agency to determine whether a Federal action conforms to the applicable implementation plan before the action is taken (40 CFR §51.850(a)).

Federal actions may be exempt from a formal Conformity Determination if: (1) the actions fit within one of the exemption categories or (2) their emissions do not exceed designated *de minimis* levels for criteria pollutants (40 CFR §93.153(c)). The exemption categories apply to actions that would result in no emission increase or an increase in emission that is clearly *de minimis*.

Proposed Action

Action Proponent: United States Army Corps of Engineers (USACE)

Location: Stationary Medium Power Model 1 (SM-1) Reactor Facility, United States (US) Army Garrison Fort Belvoir, Fairfax County, Virginia

Proposed Action Name: Decommissioning and Demolition of the SM-1 Reactor Facility

Proposed Action and Emission Summary: USACE maintains the SM-1 Reactor Facility in accordance with Army Regulation (AR) 50-7, *Army Reactor Program*, and Reactor Possession Permit No. SM1-1-09 issued by the US Army Nuclear and Countering Weapons of Mass Destruction Agency (USANCA). The Army Reactor Office (ARO), established by USANCA, oversees the Army Reactor Program (ARP) and designates the ARP Manager. USACE proposes to complete the decommissioning and demolition of SM-1 (Proposed Action). Prior to the removal of contaminated structures, equipment, and media from the SM-1 site, USANCA would transition the SM-1 Reactor Possession Permit Number SM1-1-09 to a Reactor Decommissioning Permit following ARO approval of a Decommissioning Plan (DP). USACE proposes to complete the decommissioning and demolition of SM-1 to a standard that allows for release of the SM-1 site for unrestricted use and terminate the ARO Reactor Decommissioning Permit (also referred to as the "Proposed Action"). The proposed decommissioning of SM-1 would occur over an approximately 5-year period from 2020 to 2025. Upon completion of the Proposed Action, the restored site would be returned to Fort Belvoir for future use.

Under USACE's Deactivated Nuclear Power Plant Program, decommissioning a nuclear reactor is required within 60 years of its deactivation to be consistent with US Nuclear Regulatory Commission (NRC) regulations (as adopted by the ARP in AR 50-7). The deactivated and defueled SM-1 Reactor Facility has been in a safe storage (SAFSTOR) condition and subject to regular inspection and monitoring for more than 46 years. Accordingly, the purpose of the

Proposed Action is to safely remove, transport, and dispose of all materials and equipment (M&E) and structures associated with the SM-1 Reactor Facility such that residual radioactivity levels meet the applicable criteria for unrestricted use. This action will eliminate any minor on-going direct or indirect emissions inherent in maintaining the present building and facilities.

The Proposed Action is needed to complete the decommissioning of the SM-1 Reactor Facility with the regulatory authority granted to DOD under the Atomic Energy Act (AEA). Additionally, implementing the Proposed Action would result in a cost savings to USACE as maintenance of the site would no longer be required. USACE maintenance of the SM-1 Reactor Facility is costly and not sustainable over the long-term. Further, the Proposed Action allows USACE to meet mission objectives to decommission their nuclear reactors and terminate their possession permit. In its current state, the SM-1 site will not support the military mission on Fort Belvoir, now or in the future.

USACE evaluated the potential direct, indirect, and cumulative physical, environmental, socioeconomic, and cultural effects of implementing the Proposed Action and reasonable alternatives to that scenario in an Environmental Assessment (EA), prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA; Title 42, United States Code [USC] Part 4321 et seq.); the NEPA-implementing regulations of the Council on Environmental Quality (CEQ) (40 CFR Parts 1500–1508); and the Army’s NEPA regulations (32 CFR Part 651, *Environmental Analysis of Army Actions*). The EA is incorporated herein by reference. Each alternative is briefly discussed below.

- **No Action Alternative.** Continue to maintain SM-1 in a SAFSTOR condition with regular inspections and monitoring.
- **Proposed Action Alternative.** Complete the decommissioning and demolition of the SM-1 to a standard that allows for release of the site for unrestricted use and termination of the ARO Reactor Decommissioning Permit.

Pursuant to the NAAQS, Fairfax County is designated by the USEPA as a marginal non-attainment area for the 2008 8-hour ozone (O₃) NAAQS. Fairfax County is located in the ozone transport region where *de minimis* levels of volatile organic compounds (VOCs) and oxides of nitrogen [NO_x] (ozone precursors) are 50 and 100 tons per year (tpy), respectively (40 CFR § 93.153). Fairfax County is currently in attainment for all other criteria pollutants (i.e., carbon monoxide [CO], sulfur dioxide [SO₂], particulate matter 2.5 micrometers or less in diameter [PM_{2.5}], PM₁₀, nitrogen dioxide [NO₂], and lead [Pb]) (USEPA, 2019). Further information regarding Fairfax County’s attainment status is provided in the EA.

The Proposed Action is subject to the General Conformity Rule because Fort Belvoir is within a nonattainment area and the Proposed Action Alternative would result in air pollutant emissions¹. All emissions generated by the Proposed Action Alternative would be temporary (i.e., only occurring during construction) and no new emissions sources would be created. Temporary activities under the Proposed Action Alternative that would generate pollutant emissions include, but are not limited to:

- Handling and transport of excavated and imported materials (i.e., soil and concrete) during construction;
- Operation of heavy-duty, diesel-powered trucks and equipment at the site during demolition;
- Operation of heavy-duty, diesel-powered trucks traveling to and from the site to dispose of or deliver materials during demolition;

¹ Under the No Action Alternative, there would be no demolition of buildings or structures at the SM-1 site and existing conditions would continue for the foreseeable future. Therefore, implementation of the No Action Alternative would not result in any changes to existing air quality. Fort Belvoir’s contribution to regional air quality would not change. Current ambient air quality trends and regional emissions would continue.

- Operation of workers' commuter vehicles traveling to and from the SM-1 site;
- Storage of excavated and imported materials in stockpiles;
- Use of unpaved areas/roads; and
- Site preparation activities (e.g., clearing, grubbing, tree removal).

In general, activities in the Proposed Action Alternative would have a temporary, less-than-significant impact on air quality. Projected Proposed Action Alternative emissions of applicable nonattainment criteria pollutants would be *de minimis*, as shown in **Table 1**. Detailed emission calculations, assumptions, and estimates for the Proposed Action Alternative are provided as **Attachment 1** to this RONA.

Table 1. Projected Proposed Action Alternative VOC and NO_x Emissions Compared to Applicable *De Minimis* Levels

Pollutant	2021 Proposed Action Alternative Emissions (tpy)	2022 Proposed Action Alternative Emissions (tpy)	2023 Proposed Action Alternative Emissions (tpy)	2024 Proposed Action Alternative Emissions (tpy)	2025 Proposed Action Alternative Emissions (tpy)	<i>De minimis</i> level (tpy)
VOCs	0.24	0.43	0.50	0.67	0.27	50
NO _x	2.39	6.48	6.73	7.69	1.74	100
Note: tpy = tons per year						

Activities in the Proposed Action Alternative would comply with applicable regulatory requirements and incorporate appropriate Best Management Practices (BMPs) (as identified in the EA) to further minimize anticipated, less-than-significant adverse effects.

In summary, despite Fort Belvoir's location in a nonattainment area, the USACE is exempt from preparing a Conformity Determination because emissions would not exceed designated *de minimis* levels for criteria pollutants. The Proposed Action would have no significant impacts on regional air quality. Additional details regarding the Proposed Action's impacts on air quality are provided in the EA. Detailed calculations are also provided as **Attachment 1** to this RONA.

Affected Air Basins: Fairfax County, VA

Date RONA prepared: 18 September 2019

Proposed Action Exemption

The Proposed Action is located within a nonattainment area; therefore, the Proposed Action is not exempt from the General Conformity Rule. However, per 40 CFR § 93.153(c), the Proposed Action qualifies as an action where emissions do not exceed designated *de minimis* levels for criteria pollutants and therefore, is consistent with one of the USEPA's exemption categories. The activities could result in temporary, less-than-significant impacts on air quality, but are not expected to change designation of the area with respect to NAAQS. Therefore, the Proposed Action is exempt from a formal Conformity Determination.

Attainment Area Status and Emission Evaluation Conclusion

Fairfax County is in a nonattainment area for 8-hour ozone. However, per 40 CFR § 93.153(c), the Proposed Action qualifies as an action where emissions do not exceed designated *de minimis* levels for criteria pollutants and

therefore, is consistent with one of the USEPA's exemption categories. The projected emissions under the Proposed Action Alternative would be temporary and substantially less than the established *de minimis* emission thresholds (see **Table 1**). Generally, impacts on air quality from the Proposed Action Alternative would be temporary and less-than-significant. Moreover, the activities would comply with applicable regulatory requirements and appropriate BMPs would be incorporated. Therefore, there would be no significant effects to air quality and a change in the designation of the area with respect to NAAQS would not be expected. USACE concludes that further formal Conformity Determination procedures are not required, resulting in this RONA.

RONA Approval

To the best of my knowledge, the information presented in this Record of Non-Applicability is correct and accurate and I concur with the finding that the Proposed Action does not require a formal Conformity Determination.

03 April 2020

DATE

Brenda M. Barber, P.E

Brenda M. Barber, P.E.

USACE Project Manager

Attachment 1: Air Quality Analysis Calculations

Projected Emissions for CY 2021
SM-1
Construction Year 1

Emission Source	Projected Emissions (tons per year)							CY 2021 (metric tons per year)
	CO	NO _x	VOC	PM ₁₀	PM _{2.5}	SO ₂	CO ₂ e	CO ₂ e
Construction Equipment Operation	1.24E+00	2.39E+00	2.36E-01	1.40E-01	1.35E-01	1.75E-01	2.55E+02	2.31E+02
POV - Construction Worker Commuting	2.49E-03	2.76E-04	2.42E-04	5.73E-06	5.18E-06	3.64E-06	2.16E-01	1.96E-01
Site Preparation - Fugitive Emissions	-	-	-	1.04E+00	1.04E+00	-	-	-
Rock/Soil Export - Fugitive Emissions	-	-	-	1.59E-04	1.59E-05	-	-	-
Concrete Export - Fugitive Emissions	-	-	-	0.00E+00	0.00E+00	-	-	-
Total	1.24	2.39	0.24	1.18	1.18	0.17	255.01	231.34

Projected Emissions for CY 2022
SM-1
Construction Year 2

Emission Source	Projected Emissions (tons per year)							CY 2022 (metric tons per year)
	CO	NO _x	VOC	PM ₁₀	PM _{2.5}	SO ₂	CO ₂ e	CO ₂ e
Construction Equipment Operation	2.21E+00	6.48E+00	4.27E-01	3.71E-01	3.58E-01	4.81E-01	6.97E+02	6.32E+02
POV - Construction Worker Commuting	4.60E-03	4.28E-04	4.20E-04	1.04E-05	8.60E-06	2.65E-06	4.20E-01	3.81E-01
Rock/Soil Export - Fugitive Emissions	-	-	-	0.00E+00	0.00E+00	-	-	-
Concrete Export - Fugitive Emissions	-	-	-	0.00E+00	0.00E+00	-	-	-
Total	2.22	6.48	0.43	0.37	0.36	0.48	697.11	632.41

Projected Emissions for CY 2023
SM-1
Construction Year 3

Emission Source	Projected Emissions (tons per year)							CY 2023 (metric tons per year)
	CO	NO _x	VOC	PM ₁₀	PM _{2.5}	SO ₂	CO ₂ e	CO ₂ e
Construction Equipment Operation	2.48E+00	6.73E+00	5.00E-01	4.15E-01	4.00E-01	4.96E-01	7.18E+02	6.52E+02
POV - Construction Worker Commuting	4.32E-03	3.68E-04	3.67E-04	9.48E-06	8.60E-06	2.65E-06	4.08E-01	3.70E-01
Rock/Soil Export - Fugitive Emissions	-	-	-	1.24E-02	1.24E-03	-	-	-
Concrete Export - Fugitive Emissions	-	-	-	1.30E-02	1.62E-03	-	-	-
Total	2.48	6.73	0.50	0.44	0.40	0.50	718.63	651.93

Projected Emissions for CY 2024
SM-1
Construction Year 4

Emission Source	Projected Emissions (tons per year)							CY 2024 (metric tons per year)
	CO	NO _x	VOC	PM ₁₀	PM _{2.5}	SO ₂	CO ₂ e	CO ₂ e
Construction Equipment Operation	3.31E+00	7.69E+00	6.72E-01	5.50E-01	5.30E-01	5.77E-01	8.34E+02	7.57E+02
POV - Construction Worker Commuting	4.07E-03	3.18E-04	3.29E-04	8.60E-06	8.60E-06	2.65E-06	3.95E-01	3.58E-01
Rock/Soil Export - Fugitive Emissions	-	-	-	2.47E-02	2.48E-03	-	-	-
Concrete Export - Fugitive Emissions	-	-	-	1.30E-02	1.62E-03	-	-	-
Total	3.31	7.69	0.67	0.59	0.53	0.58	834.85	757.36

Projected Emissions for CY 2025
SM-1
Construction Year 5

Emission Source	Projected Emissions (tons per year)							CY 2025 (metric tons per year)
	CO	NO _x	VOC	PM ₁₀	PM _{2.5}	SO ₂	CO ₂ e	CO ₂ e
Construction Equipment Operation	1.11E+00	1.74E+00	2.66E-01	1.81E-01	1.75E-01	1.20E-01	1.75E+02	1.58E+02
POV - Construction Worker Commuting	3.72E-04	2.88E-05	2.61E-05	6.94E-07	5.95E-07	2.87E-07	3.74E-02	3.39E-02
Rock/Soil Export and Import - Fugitive Emissions	-	-	-	5.35E-02	5.35E-03	-	-	-
Concrete Export - Fugitive Emissions	-	-	-	0.00E+00	0.00E+00	-	-	-
Total	1.11	1.74	0.27	0.23	0.18	0.12	174.61	158.40

Construction Equipment Projected Hours of Operation
SM-1

Equipment	Type	Average Rated HP	No. of Units	Days Per Year for Each Unit					Hours Per Year for All Units				
				CY 2021 Days	CY 2022 Days	CY 2023 Days	CY 2024 Days	CY 2025 Days	CY 2021 Hours	CY 2022 Hours	CY 2023 Hours	CY 2024 Hours	CY 2025 Hours
Asphalt paver	Diesel Pavers	130	1	21	0	0	0	0	168	0	0	0	0
Asphalt roller	Diesel Rollers	130	1	21	0	0	0	0	168	0	0	0	0
Grader	Diesel Grader	150	1	10	0	0	0	0	80	0	0	0	0
Chain saws	2 Stroke Chain Saws >6 HP	10	2	10	0	0	0	0	160	0	0	0	0
Crane 25 ton	Diesel Cranes	130	1	7	50	80	0	0	56	400	640	0	0
Crane 350 ton	Diesel Cranes	450	2	0	40	40	0	0	0	640	640	0	0
Dewatering pump, 4-in.	Diesel Pumps	50	1	0	0	0	40	0	0	0	0	320	0
Dozer	Diesel Crawler Tractor/Dozer	200	1	0	0	0	82	0	0	0	0	656	0
Dozer	Diesel Crawler Tractor/Dozer	75	1	19	0	0	0	0	152	0	0	0	0
Brush Chipper	Diesel Chippers/Stump Grinders	130	1	10	0	0	0	0	80	0	0	0	0
Excavator	Diesel Excavators	130	1	0	367	344	624	0	0	2,936	2,752	4,992	0
Backhoe	Diesel Tractors/Loaders/Backhoes	50	1	0	0	0	10	0	0	0	0	80	0
Loader, skid steer	Diesel Skid Steer Loaders	30	1	0	100	100	100	0	0	800	800	800	0
Forklift	Diesel Forklift	50	1	0	100	100	100	0	0	800	800	800	0
Roller, compactor	Diesel Rollers	80	1	0	0	0	82	0	0	0	0	656	0
Dump Truck, 20 cy (soils)	Diesel Dumpers/Tenders	500	1	0.28	0	22	44	98	2	0	175	351	781
Waste Haul Truck, 20 cy (debris)	Diesel Highway Truck	500	1	0	8	20	20	0	0	60	156	156	0
Dump Truck, 8 cy	Diesel Dumpers/Tenders	220	1	0	0	0	82	0	0	0	0	656	0
Pickup Truck	Diesel Off-highway Trucks	400	4	100	200	200	200	50	1,600	3,200	3,200	3,200	800
Pressure Washer	Diesel Pressure Washers	10	1	0	25	50	50	0	0	200	400	400	0

Assumptions:
Field construction is projected to start in mid-2021 and be completed by early 2025.
Estimated hours of construction per working day: 8
Estimated hours for pickup truck per working day: 4 Assume pickup trucks are used for the transport of tools and workers for half of the working day. Assume pickup trucks are "off" when not in use and do not idle.
Estimated equipment, average rated HP, and number of units were provided by this Proposed Project's design team.
For a conservative estimate, equipment fuel was assumed to be diesel.

Truck Trip Tables:

Anticipated Truck Trips and Material Quantity Transported

Materials	Total Quantity (tons each year)					Average Quantity per Truckload		Average No. of Trips to Export/Dispose of Total Quantity					Driving Hours to Disposal or Site		Total Hours Operated					Total Days Operated				
EXPORTS																								
	2021	2022	2023	2024	2025			2021	2022	2023	2024	2025			2021	2022	2023	2024	2025	2021	2022	2023	2024	2025
Grubbing and Clearing Debris	30	0	0	0	0	20	Tons	2	0	0	0	0	1.5	Hours	2.25	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00
Concrete	0	0	1280	1280	0	20	Tons	0	0	64	64	0	1.5	Hours	0.00	0.00	96.00	96.00	0.00	0.00	0.00	12.00	12.00	0.00
Other Demolition Materials (piping, steel, electrical, etc.)	0	806	806	806	0	20	Tons	0	40	40	40	0	1.5	Hours	0.00	60.45	60.45	60.45	0.00	0.00	7.56	7.56	7.56	0.00
Excavated Soils	0	0	2337	4673	0	20	Tons	0	0	117	234	0	1.5	Hours	0.00	0.00	175.25	350.50	0.00	0.00	0.00	21.91	43.81	0.00
TOTAL EXPORT TRUCKLOADS	30	806	4423	6759	0	-	-	2	40	221	338	0		-	2.25	60.45	331.70	506.95	0.00	0.28	7.56	41.46	63.37	0.00
IMPORTS																								
	2021	2022	2023	2024	2025			2021	2022	2023	2024	2025			2021	2022	2023	2024	2025	2021	2022	2023	2024	2025
Imported Soils and Aggregates	0	0	0	0	7077	14	Tons	-	-	-	-	506	1.5	Hours	-	-	-	-	758.25	-	-	-	-	94.78
Trees and Native Plantings	0	0	0	0	60	4	Units	-	-	-	-	15	1.5	Hours	-	-	-	-	22.50	-	-	-	-	2.81
TOTAL IMPORT TRUCKLOADS	0	0	0	0	7137	-	-	0	0	0	0	520.5		-	0.00	0.00	0.00	0.00	780.75	0.00	0.00	0.00	0.00	97.59

Assumptions:
Estimated typical hours of construction per day: 8
Estimated a total of 30 tons of grubbing and clearing debris during site preparation.
Estimated 60 tons of trees and plantings would be imported.
Exported materials are estimated to be in 20 cy waste containers on dump trucks. Clean soil is estimated to be imported in a 20 cy dump truck that is able to hold approximatly 14 cy of soil per trip.
Estimates from "Waste Transportation Assessment Final Redline 12-11-18" are in tables 1-1 to 1-4 below. (\\ARLINGTON\Arlington\DCS\Projects\ENV\60332981_SM-1_Decom\900-Work\930-979-other working documents\Task 9\405-Env-NEPA\Background Info\SM-1 Docs\DP and Related Docs)

Table 1-1, Building Debris Waste Volume Estimate

Area	Material Type	Waste Volume (Cubic Yards)	Waste Containers ^a
Unrestricted Area	Walls, Floors, and Roof	1,060	53

The total volume of backfill soil required for restoration is assumed equal to the waste soil volume from Table 1-3 (7,010 CY) and two-thirds of the concrete waste volume from Table 1-2 (67 CY).

The average commercial dump truck holds up to 14 CY. Therefore, it is possible that restoration of the SM-1 site may require trucking 400 to 500 loads of clean soil through the 300 Area to the SM-1 site. Site restoration activities are expected to take place over a period of approximately 6 months with backfill soil deliveries for at least half of that time. Therefore, during a three-month peak site restoration period, as many as 8 to 10 trucks may be delivering soil to the site per day.

Construction Equipment Air Quality Emission Factors
SM-1

Equipment	Type	Average Rated HP ¹	Loading Factors ²	Emission Factors (lb/1000 HP-hr) ²							Emission Factors (lb/hr) ³						
				CO	NOx	VOC	PM ₁₀	PM _{2.5}	SOx	CO ₂ e	CO	NOx	VOC	PM ₁₀	PM _{2.5}	SOx	CO ₂ e
Asphalt paver	Diesel Pavers	130	59%	4.76	10.72	0.9	0.88	0.84	0.84	1224	3.65E-01	8.22E-01	6.90E-02	6.75E-02	6.44E-02	6.44E-02	93.85
Asphalt roller	Diesel Rollers	130	59%	5.78	11.09	1.01	0.99	0.97	0.86	1224	4.43E-01	8.51E-01	7.75E-02	7.59E-02	7.44E-02	6.60E-02	93.85
Grader	Diesel Graders	150	59%	3.33	10.05	0.75	0.68	0.66	0.82	1195	2.95E-01	8.89E-01	6.64E-02	6.02E-02	5.84E-02	7.26E-02	105.72
Chain saws	2 Stroke Chain Saws >6 HP	10	70%	779.31	2.12	165.53	21.52	19.80	0.31	1541	5.46E+00	1.48E-02	1.16E+00	1.51E-01	1.39E-01	2.17E-03	10.79
Crane 25 ton	Diesel Cranes	130	43%	3.02	12.06	0.84	0.64	0.62	0.82	1186	1.69E-01	6.74E-01	4.70E-02	3.58E-02	3.47E-02	4.58E-02	66.28
Crane 350 ton	Diesel Cranes	450	43%	3.02	12.06	0.84	0.64	0.62	0.82	1186	5.84E-01	2.33E+00	1.63E-01	1.24E-01	1.20E-01	1.59E-01	229.45
Dewatering pump, 4-in.	Diesel Pumps	50	43%	6.92	14.09	1.76	1.37	1.32	0.88	1261	1.49E-01	3.03E-01	3.78E-02	2.95E-02	2.84E-02	1.89E-02	27.12
Dozer	Diesel Crawler Tractor/Dozer	200	59%	4.50	11.09	0.77	0.73	0.71	0.84	1199	5.31E-01	1.31E+00	9.09E-02	8.61E-02	8.38E-02	9.91E-02	141.48
Dozer	Diesel Crawler Tractor/Dozer	75	59%	4.50	11.09	0.77	0.73	0.71	0.84	1199	1.99E-01	4.91E-01	3.41E-02	3.23E-02	3.14E-02	3.72E-02	53.06
Brush Chipper	Diesel Chippers/Stump Grinders	130	43%	5.67	13.69	1.39	1.08	1.06	0.84	1226	3.17E-01	7.65E-01	7.77E-02	6.04E-02	5.93E-02	4.70E-02	68.52
Excavator	Diesel Excavators	130	59%	3.75	10.03	0.75	0.71	0.68	0.84	1204	2.88E-01	7.69E-01	5.75E-02	5.45E-02	5.22E-02	6.44E-02	92.32
Backhoe	Diesel Tractors/Loaders/Backhoes	50	21%	14.64	15.61	3.42	2.36	2.27	1.01	1473	1.54E-01	1.64E-01	3.59E-02	2.48E-02	2.38E-02	1.06E-02	15.46
Loader, skid steer	Diesel Skid Steer Loaders	30	21%	19.58	16.01	4.85	3.11	3.02	1.06	1533	1.23E-01	1.01E-01	3.06E-02	1.96E-02	1.90E-02	6.68E-03	9.66
Forklift	Diesel Forklifts	50	59%	6.50	9.97	0.90	0.90	0.88	0.88	1275	1.92E-01	2.94E-01	2.66E-02	2.66E-02	2.60E-02	2.60E-02	37.61
Roller, compactor	Diesel Rollers	80	59%	5.78	11.09	1.01	0.99	0.97	0.86	1244	2.73E-01	5.23E-01	4.77E-02	4.67E-02	4.58E-02	4.06E-02	58.70
Dump Truck, 20 cy (soils)	Diesel Dumpers/Tenders	500	21%	18.74	16.43	5.01	3.11	3.00	1.04	1513	1.97E+00	1.73E+00	5.26E-01	3.27E-01	3.15E-01	1.09E-01	158.84
Waste Haul Truck, 20 cy (debris)	Diesel Dumpers/Tenders	500	21%	18.74	16.43	5.01	3.11	3.00	1.04	1513	1.97E+00	1.73E+00	5.26E-01	3.27E-01	3.15E-01	1.09E-01	158.84
Dump Truck, 8 cy	Diesel Dumpers/Tenders	220	21%	18.74	16.43	5.01	3.11	3.00	1.04	1513	8.66E-01	7.59E-01	2.31E-01	1.44E-01	1.39E-01	4.80E-02	69.89
Pickup Truck	Diesel Off-highway Trucks	400	59%	3.66	11.27	0.64	0.57	0.55	0.82	1192	8.64E-01	2.66E+00	1.51E-01	1.35E-01	1.30E-01	1.94E-01	281.40
Pressure Washer	Diesel Pressure Washers	10	43%	6.33	14.18	1.83	1.12	1.1	0.86	1232	2.72E-02	6.10E-02	7.87E-03	4.82E-03	4.73E-03	3.70E-03	5.30

1. Average horsepower ratings were obtained from Proposed Project's design team.
2. Loading factors and emission factors from USAFCEE *Air Emissions Guide For Air Force Mobile Sources* , July 2016, Section 4 and 5.
3. Emission Factors (lbs./hr.) = (Average Rated HP X Loading Factors X Emission Factors (lbs./1000 HP-hr.)) / 1000
4. ND = No Data available

Projected Emissions for CY 2022
Construction Equipment
SM-1

Construction Equipment	Usage (hr)	Emissions (lb)						
		CO	NO _x	VOC	PM ₁₀	PM _{2.5}	SO ₂	CO ₂ e
Asphalt paver	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt roller	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grader	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chain saws	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crane 25 ton	400	67.53	269.66	18.78	14.31	13.86	18.34	26,513.82
Crane 350 ton	640	374.00	1,493.51	104.03	79.26	76.78	101.55	146,845.76
Dewatering pump, 4-in.	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dozer	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dozer	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brush Chipper	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavator	2936	844.47	2,258.67	168.89	159.89	153.13	189.16	271,062.65
Backhoe	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader, skid steer	800	98.68	80.69	24.44	15.67	15.22	5.34	7,725.72
Forklift	800	153.40	235.29	21.24	21.24	20.77	20.77	30,085.99
Roller, compactor	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dump Truck, 20 cy (soils)	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waste Haul Truck, 20 cy (debris)	60	118.95	104.29	31.80	19.74	19.04	6.60	9,601.80
Dump Truck, 8 cy	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pickup Truck	3200	2,764.03	8,511.10	483.33	430.46	415.36	619.26	900,492.93
Pressure Washer	200	5.44	12.19	1.57	0.96	0.95	0.74	1,059.83
Total Emissions	(lb./yr.):	4,426.5	12,965.4	854.1	741.5	715.1	961.8	1,393,388.5
Total Emissions	(tpy)	2.21	6.48	0.43	0.37	0.36	0.48	696.69
Total Emissions	(Metric Tons/yr.)							632.03

Projected Emissions for CY 2023
Construction Equipment
SM-1

Construction Equipment	Usage (hr)	Emissions (lb)						
		CO	NO _x	VOC	PM ₁₀	PM _{2.5}	SO ₂	CO ₂ e
Asphalt paver	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt roller	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grader	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chain saws	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crane 25 ton	640	108.04	431.46	30.05	22.90	22.18	29.34	42,422.11
Crane 350 ton	640	374.00	1,493.51	104.03	79.26	76.78	101.55	146,845.76
Dewatering pump, 4-in.	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dozer	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dozer	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brush Chipper	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavator	2752	791.54	2,117.12	158.31	149.87	143.53	177.31	254,075.07
Backhoe	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader, skid steer	800	98.68	80.69	24.44	15.67	15.22	5.34	7,725.72
Forklift	800	153.40	235.29	21.24	21.24	20.77	20.77	30,085.99
Roller, compactor	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dump Truck, 20 cy (soils)	175	344.84	302.33	92.19	57.23	55.20	19.14	27,836.49
Waste Haul Truck, 20 cy (debris)	156	307.85	269.90	82.30	51.09	49.28	17.08	24,850.32
Dump Truck, 8 cy	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pickup Truck	3200	2,764.03	8,511.10	483.33	430.46	415.36	619.26	900,492.93
Pressure Washer	400	10.89	24.39	3.15	1.93	1.89	1.48	2,119.66
Total Emissions	(lb./yr.):	4,953.3	13,465.8	999.0	829.6	800.2	991.3	1,436,454.0
Total Emissions	(tpy)	2.48	6.73	0.50	0.41	0.40	0.50	718.23
Total Emissions	(Metric Tons/yr.)							651.56

Projected Emissions for CY 2024
Construction Equipment
SM-1

Construction Equipment	Usage (hr)	Emissions (lb)						
		CO	NO _x	VOC	PM ₁₀	PM _{2.5}	SO ₂	CO ₂ e
Asphalt paver	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt roller	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grader	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chain saws	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crane 25 ton	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crane 350 ton	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dewatering pump, 4-in.	320	47.61	96.94	12.11	9.43	9.08	6.05	8,677.81
Dozer	656	348.34	858.45	59.60	56.51	54.96	65.02	92,812.19
Dozer	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brush Chipper	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavator	4992	1,435.82	3,840.35	287.16	271.85	260.36	321.62	460,880.36
Backhoe	80	12.30	13.11	2.87	1.98	1.91	0.85	1,237.13
Loader, skid steer	800	98.68	80.69	24.44	15.67	15.22	5.34	7,725.72
Forklift	800	153.40	235.29	21.24	21.24	20.77	20.77	30,085.99
Roller, compactor	656	178.97	343.38	31.27	30.65	30.03	26.63	38,508.00
Dump Truck, 20 cy (soils)	351	689.68	604.67	184.38	114.46	110.41	38.27	55,672.98
Waste Haul Truck, 20 cy (debris)	156	307.85	269.90	82.30	51.09	49.28	17.08	24,850.32
Dump Truck, 8 cy	656	567.96	497.95	151.84	94.26	90.92	31.52	45,847.22
Pickup Truck	3200	2,764.03	8,511.10	483.33	430.46	415.36	619.26	900,492.93
Pressure Washer	400	10.89	24.39	3.15	1.93	1.89	1.48	2,119.66
Total Emissions	(lb./yr.):	6,615.5	15,376.2	1,343.7	1,099.5	1,060.2	1,153.9	1,668,910.3
Total Emissions	(tpy)	3.31	7.69	0.67	0.55	0.53	0.58	834.46
Total Emissions	(Metric Tons/yr.)							757.00

Projected Emissions for CY 2025
Construction Equipment
SM-1

Construction Equipment	Usage (hr)	Emissions (lb)						
		CO	NO _x	VOC	PM ₁₀	PM _{2.5}	SO ₂	CO ₂ e
Asphalt paver	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt roller	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grader	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chain saws	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crane 25 ton	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crane 350 ton	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dewatering pump, 4-in.	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dozer	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dozer	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brush Chipper	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavator	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backhoe	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader, skid steer	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forklift	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Roller, compactor	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dump Truck, 20 cy (soils)	781	1,536.28	1,346.91	410.71	254.95	245.94	85.26	124,013.35
Waste Haul Truck, 20 cy (debris)	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dump Truck, 8 cy	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pickup Truck	800	691.01	2,127.78	120.83	107.62	103.84	154.82	225,123.23
Pressure Washer	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emissions	(lb./yr.):	2,227.3	3,474.7	531.5	362.6	349.8	240.1	349,136.6
Total Emissions	(tpy)	1.11	1.74	0.27	0.18	0.17	0.12	174.57
Total Emissions	(Metric Tons/yr.)							158.37

Projected Emissions for CY 2021 to 2025
Construction Worker POV
SM-1

					Emission Factor (lbs/mile)							Emissions (lbs/year)						
Year (Analysis Year)	Type	No. of POVs	No. of commuting days	Miles per day	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	CO _{2e}	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	CO _{2e}
2021 (2016)	light-duty diesel tucks	5	130.5	40	9.24E-04	1.28E-02	1.41E-03	1.10E-05	1.76E-05	1.54E-05	1.18E+00	9.24E-02	1.28E+00	1.41E-01	1.10E-03	1.76E-03	1.54E-03	117.61
	light-duty gas passenger	20	130.5	40	9.77E-04	9.27E-03	1.03E-03	1.54E-05	2.43E-05	2.20E-05	7.88E-01	3.91E-01	3.71E+00	4.11E-01	6.17E-03	9.70E-03	8.82E-03	315.12
	Total 2021 POV Emission (tpy)											2.42E-04	2.49E-03	2.76E-04	3.64E-06	5.73E-06	5.18E-06	2.16E-01
2022 (2017)	light-duty diesel tucks	5	261	40	8.05E-04	1.17E-02	1.23E-03	8.82E-06	1.54E-05	1.54E-05	1.12E+00	1.61E-01	2.35E+00	2.45E-01	1.76E-03	3.09E-03	3.09E-03	224.25
	light-duty gas passenger	20	261	40	8.49E-04	8.57E-03	7.63E-04	4.41E-06	2.20E-05	1.76E-05	7.70E-01	6.79E-01	6.86E+00	6.10E-01	3.53E-03	1.76E-02	1.41E-02	616.33
	Total 2022 POV Emission (tpy)											4.20E-04	4.60E-03	4.28E-04	2.65E-06	1.04E-05	8.60E-06	4.20E-01
2023 (2018)	light-duty diesel tucks	5	261	40	6.92E-04	1.09E-02	1.08E-03	8.82E-06	1.54E-05	1.54E-05	1.07E+00	1.38E-01	2.19E+00	2.16E-01	1.76E-03	3.09E-03	3.09E-03	213.96
	light-duty gas passenger	20	261	40	7.45E-04	8.08E-03	6.50E-04	4.41E-06	1.98E-05	1.76E-05	7.52E-01	5.96E-01	6.46E+00	5.20E-01	3.53E-03	1.59E-02	1.41E-02	601.47
	Total 2023 POV Emission (tpy)											3.67E-04	4.32E-03	3.68E-04	2.65E-06	9.48E-06	8.60E-06	4.08E-01
2024 (2019)	light-duty diesel tucks	5	261	40	6.11E-04	1.02E-02	9.46E-04	8.82E-06	1.54E-05	1.54E-05	1.02E+00	1.22E-01	2.03E+00	1.89E-01	1.76E-03	3.09E-03	3.09E-03	204.58
	light-duty gas passenger	20	261	40	6.70E-04	7.63E-03	5.58E-04	4.41E-06	1.76E-05	1.54E-05	7.32E-01	5.36E-01	6.10E+00	4.46E-01	3.53E-03	1.41E-02	1.23E-02	585.67
	Total 2024 POV Emission (tpy)											3.29E-04	4.07E-03	3.18E-04	2.65E-06	8.60E-06	7.72E-06	3.95E-01
2025 (2020)	light-duty diesel tucks	1	261	40	5.42E-04	9.54E-03	8.36E-04	8.82E-06	1.54E-05	1.32E-05	9.80E-01	2.17E-02	3.81E-01	3.34E-02	3.53E-04	6.17E-04	5.29E-04	39.20
	light-duty gas passenger	5	65.25	40	6.08E-04	7.24E-03	4.83E-04	4.41E-06	1.54E-05	1.32E-05	7.11E-01	3.04E-02	3.62E-01	2.41E-02	2.20E-04	7.72E-04	6.61E-04	35.56
	Total 2024 POV Emission (tpy)											2.61E-05	3.72E-04	2.88E-05	2.87E-07	6.94E-07	5.95E-07	3.74E-02

Working days/year = 261
g to lbs conversion = 453.592

Assumptions:

To provide conservative estimates, it was assumed no POVs would be new models. Therefore, emisson factors from 5-years prior were used.
Assumed an estimated 25 vehicles (5 diesel trucks and 20 gasoline passenger) would commute to the work site each working day, except in 2025 when the number of required workers decreases.
Assumed workers commute to site 5 days/week for 261 days/year. Assume the workers commute every working day in 2022-2024. Based on predicted constrction start and end dates, assume they commute for six months in 2021 and three months in 2025.
Assumed workers are traveling from home locations that are local and an estimated 20 miles away.
Emission factors are from the 2016 and 2018 USAFCEE *Air Emissions Guide For Air Force Mobile Sources* (Section 5, July 2016 and Section 5, August 2018). Emission factors provided in grams/mile were divided by the conversion factor for pounds/mile.

Fugitive Dust Emissions (Site Preparation)
SM-1

CY 2021

Description:

Square feet of land disturbed:	156,800
Total acres of land disturbed:	3.6
Assumed number of 8-hr days:	29
Assumed equivalent acres/day:	0.124

Equation for Fugitive Dust Emissions (PM₁₀)¹

$$E_{PM10} \text{ (lb./yr.)} = 20 \text{ lb/acre-day} * \text{Total Acres Disturbed} * \text{Number of 8-Hour Days}$$

Calculation

$$E_{PM10} \text{ (lb./yr.)} = 20 * 3.6 \text{ acres} * 29 \text{ days}$$

$$E_{PM10} = 2087.78 \text{ lb./yr.}$$

$$1.04E+00 \text{ tpy}$$

Assumptions:

¹Emission factors and methodology from USAFCEE *Air Emissions Guide For Air Force Transitory Sources* (Section 4, August 2018).

Note: Assume PM= PM₁₀=PM_{2.5}

Fugitive Dust Emissions - Rock/Soil Export in CY 2021 SM-1

Input Parameters:

Soil moved during exporting =	30	cy
Soil moved during exporting =	49	tons (1.62 tons/cy)
Mean wind speed =	9.0	mph (Wilmington, DE)
Material silt content =	6.4	(Mean, Table 13.2.2-1, Page 13.2.2-3)
Material moisture content =	14	(Mean, Table 13.2.4, Page 13.2.4-2)

Emissions from rock/soil handling and storage piles (USEPA AP-42, Eq. 1, Section 13.2.4, January 1995)

EF = $k (0.0032) [U/5]^{1.3} / (M/2)^{1.4}$	3.34E-04 lbs./ton	PM
	1.58E-04 lbs./ton	PM₁₀
	2.39E-05 lbs./ton	PM_{2.5}

where:

EF = emission factor, lbs./ton

U = mean wind speed, miles/hr. (mph)

M = material moisture content (%)

Therefore, total emissions from rock/soil handling and storage =

EF * tons/yr. of rock/soil loading/unloading				
0.02 lbs./yr.	8.10E-06 tons/yr.	PM	E1	
0.01 lbs./yr.	3.83E-06 tons/yr.	PM₁₀	E1	
0.00 lbs./yr.	5.80E-07 tons/yr.	PM_{2.5}	E1	

Assume fugitive dust from stockpiles is controlled using water sprays.

Assume 90% control efficiency from water spray.

Therefore, actual controlled emissions from rock/soil handling and storage =

uncontrolled emissions * 0.1			
8.10E-07 tons/yr.	PM	E2	
3.83E-07 tons/yr.	PM₁₀	E2	
5.80E-08 tons/yr.	PM_{2.5}	E2	

Emissions from driving dump trucks on unpaved areas (USEPA AP-42, Eqs. 1a and 2, Section 13.2.2, November 2006)

EF = $[k(s/12)^a (W/3)^b] [(365-p)/365]$	6.52 lbs./VMT/truck	PM
	1.76 lbs./VMT/truck	PM₁₀
	0.18 lbs./VMT/truck	PM_{2.5}

where:

k = particle size multiplier = 4.9 lb./VMT (PM), 1.5 lb./VMT (PM₁₀) and 0.15 lb./VMT (PM_{2.5})

s = material silt content (%)

W = Weight of the vehicle (tons) = 40 tons

p = Number of days when precipitation was greater than 0.01 inches = 130 (Figure 13.2.2-1)

a = 0.7 for PM, 0.90 for PM₁₀, and 0.9 for PM_{2.5} (Table 13.2.2-2, Page 13.2.2-5)

b = 0.45 for PM, PM₁₀, and PM_{2.5} (Table 13.2.2-2, Page 13.2.2-5)

VMT = vehicle miles travelled by loaded & unloaded trucks on unpaved roads

VMT = ((cy/year of excavated soil)/(truck load))*(average distance traveled each way)

VMT = ((30 cy/yr.) / (20 cy/truck))*(120 miles/round trip*1% miles/unpaved roads)

VMT = 1.8 VMT/yr.

Therefore, total emissions from driving dump trucks on unpaved areas =

EF * VMT			
12 lbs./yr.	5.87E-03 tons/yr.	PM	
3 lbs./yr.	1.58E-03 tons/yr.	PM₁₀	
0 lbs./yr.	1.58E-04 tons/yr.	PM_{2.5}	

Fugitive Dust Emissions - Rock/Soil Export in CY 2021 (Continued) **SM-1**

Assume fugitive dust from unpaved roads is controlled using water sprays.

Assume 90% control efficiency from water spray.

Therefore, actual controlled emissions from driving dump trucks on unpaved areas =

uncontrolled emissions * 0.1

5.87E-04 tons/yr.	PM	E2
1.58E-04 tons/yr.	PM₁₀	E2
1.58E-05 tons/yr.	PM_{2.5}	E2

Total annual fugitive emissions from soil removal (tons/yr.) =

=E1+E2

5.87E-04 tons/yr.	PM
1.59E-04 tons/yr.	PM₁₀
1.59E-05 tons/yr.	PM_{2.5}

Fugitive Dust Emissions - Rock/Soil Export in CY 2022 SM-1

Input Parameters:

Soil moved during exporting =	-	cy	
Soil moved during exporting =	-	tons	(1.62 tons/cy)
Mean wind speed =	9.0 mph	(Wilmington, DE)	
Material silt content =	6.4	(Mean, Table 13.2.2-1, Page 13.2.2-3)	
Material moisture content =	14	(Mean, Table 13.2.4, Page 13.2.4-2)	

Emissions from rock/soil handling and storage piles (USEPA AP-42, Eq. 1, Section 13.2.4, January 1995)

EF = $k (0.0032) [U/5]^{1.3} / (M/2)^{1.4}$	3.34E-04 lbs./ton	PM
	1.58E-04 lbs./ton	PM₁₀
	2.39E-05 lbs./ton	PM_{2.5}

where:

EF = emission factor, lbs./ton

U = mean wind speed, miles/hr. (mph)

M = material moisture content (%)

Therefore, total emissions from rock/soil handling and storage =

EF * tons/yr. of rock/soil loading/unloading				
- lbs./yr.	0.00E+00 tons/yr.	PM	E1	
- lbs./yr.	0.00E+00 tons/yr.	PM₁₀	E1	
- lbs./yr.	0.00E+00 tons/yr.	PM_{2.5}	E1	

Assume fugitive dust from stockpiles is controlled using water sprays.

Assume 90% control efficiency from water spray.

Therefore, actual controlled emissions from rock/soil handling and storage =

uncontrolled emissions * 0.1			
0.00E+00 tons/yr.	PM	E2	
0.00E+00 tons/yr.	PM₁₀	E2	
0.00E+00 tons/yr.	PM_{2.5}	E2	

Emissions from driving dump trucks on unpaved areas (USEPA AP-42, Eqs. 1a and 2, Section 13.2.2, November 2000)

EF = $[k(s/12)^a (W/3)^b] [(365-p)/365]$	6.52 lbs./VMT/truck	PM
	1.76 lbs./VMT/truck	PM₁₀
	0.18 lbs./VMT/truck	PM_{2.5}

where:

k = particle size multiplier = 4.9 lb./VMT (PM), 1.5 lb./VMT (PM₁₀) and 0.15 lb./VMT (PM_{2.5})

s = material silt content (%)

W = Weight of the vehicle (tons) = 40 tons

p = Number of days when precipitation was greater than 0.01 inches = 130 (Figure 13.2.2-1)

a = 0.7 for PM, 0.90 for PM₁₀, and 0.9 for PM_{2.5} (Table 13.2.2-2, Page 13.2.2-5)

b = 0.45 for PM, PM₁₀, and PM_{2.5} (Table 13.2.2-2, Page 13.2.2-5)

VMT = vehicle miles travelled by loaded & unloaded trucks on unpaved roads

VMT = ((cy/year of excavated soil)/(truck load))*(average distance traveled each way)

VMT = ((0 cy/yr.) / (20 cy/truck))*(120 miles/round trip*1% miles/unpaved roads)

VMT = 0 VMT/yr.

Therefore, total emissions from driving dump trucks on unpaved areas =

EF * VMT			
- lbs./yr.	0.00E+00 tons/yr.	PM	
- lbs./yr.	0.00E+00 tons/yr.	PM₁₀	
- lbs./yr.	0.00E+00 tons/yr.	PM_{2.5}	

Fugitive Dust Emissions - Rock/Soil Export in CY 2022 (Continued) **SM-1**

Assume fugitive dust from unpaved roads is controlled using water sprays.

Assume 90% control efficiency from water spray.

Therefore, actual controlled emissions from driving dump trucks on unpaved areas =

uncontrolled emissions * 0.1

0.00E+00 tons/yr.	PM	E2
0.00E+00 tons/yr.	PM₁₀	E2
0.00E+00 tons/yr.	PM_{2.5}	E2

Total annual fugitive emissions from soil removal (tons/yr.) =

=E1+E2

0.00E+00 tons/yr.	PM
0.00E+00 tons/yr.	PM₁₀
0.00E+00 tons/yr.	PM_{2.5}

Fugitive Dust Emissions - Rock/Soil Export in CY 2023 SM-1

Input Parameters:

Soil moved during exporting =	2,337	cy	
Soil moved during exporting =	3,785	tons	(1.62 tons/cy)
Mean wind speed =	9.0	mph	(Wilmington, DE)
Material silt content =	6.4	(Mean, Table 13.2.2-1, Page 13.2.2-3)	
Material moisture content =	14	(Mean, Table 13.2.4, Page 13.2.4-2)	

Emissions from rock/soil handling and storage piles (USEPA AP-42, Eq. 1, Section 13.2.4, January 1995)

EF = $k (0.0032) [U/5]^{1.3} / (M/2)^{1.4}$	3.34E-04	lbs./ton	PM
	1.58E-04	lbs./ton	PM ₁₀
	2.39E-05	lbs./ton	PM _{2.5}

where:

EF = emission factor, lbs./ton

U = mean wind speed, miles/hr. (mph)

M = material moisture content (%)

Therefore, total emissions from rock/soil handling and storage =

EF * tons/yr. of rock/soil loading/unloading				
1.26	lbs./yr.	6.31E-04	tons/yr.	PM E1
0.60	lbs./yr.	2.99E-04	tons/yr.	PM ₁₀ E1
0.09	lbs./yr.	4.52E-05	tons/yr.	PM _{2.5} E1

Assume fugitive dust from stockpiles is controlled using water sprays.

Assume 90% control efficiency from water spray.

Therefore, actual controlled emissions from rock/soil handling and storage =

uncontrolled emissions * 0.1			
6.31E-05	tons/yr.	PM	E2
2.99E-05	tons/yr.	PM10	E2
4.52E-06	tons/yr.	PM2.5	E2

Emissions from driving dump trucks on unpaved areas (USEPA AP-42, Eqs. 1a and 2, Section 13.2.2, November 2006)

EF = $[k(s/12)^a (W/3)^b] / [(365-p)/365]$	6.52	lbs./VMT/truck	PM
	1.76	lbs./VMT/truck	PM ₁₀
	0.18	lbs./VMT/truck	PM _{2.5}

where:

k = particle size multiplier = 4.9 lb./VMT (PM), 1.5 lb./VMT (PM₁₀) and 0.15 lb./VMT (PM_{2.5})

s = material silt content (%)

W = Weight of the vehicle (tons) = 40 tons

p = Number of days when precipitation was greater than 0.01 inches = 130 (Figure 13.2.2-1)

a = 0.7 for PM, 0.90 for PM₁₀, and 0.9 for PM_{2.5} (Table 13.2.2-2, Page 13.2.2-5)

b = 0.45 for PM, PM₁₀, and PM_{2.5} (Table 13.2.2-2, Page 13.2.2-5)

VMT = vehicle miles travelled by loaded & unloaded trucks on unpaved roads

VMT = ((cy/year of excavated soil)/(truck load))*(average distance traveled each way)

VMT = ((2,337 cy/yr.) / (20 cy/truck))*(120 miles/round trip*1% miles/unpaved roads)

VMT = 140.22 VMT/yr.

Therefore, total emissions from driving dump trucks on unpaved areas =

EF *VMT			
914	lbs./yr.	4.57E-01	tons/yr. PM
247	lbs./yr.	1.23E-01	tons/yr. PM ₁₀
25	lbs./yr.	1.23E-02	tons/yr. PM _{2.5}

Fugitive Dust Emissions - Rock/Soil Export in CY 2023 (Continued) **SM-1**

Assume fugitive dust from unpaved roads is controlled using water sprays.

Assume 90% control efficiency from water spray.

Therefore, actual controlled emissions from driving dump trucks on unpaved areas =

uncontrolled emissions * 0.1

4.57E-02 tons/yr.	PM	E2
1.23E-02 tons/yr.	PM₁₀	E2
1.23E-03 tons/yr.	PM_{2.5}	E2

Total annual fugitive emissions from soil removal (tons/yr.) =

=E1+E2

4.58E-02 tons/yr.	PM
1.24E-02 tons/yr.	PM₁₀
1.24E-03 tons/yr.	PM_{2.5}

Fugitive Dust Emissions - Rock/Soil Export in CY 2024 SM-1

Input Parameters:

Soil moved during exporting =	4,673	cy
Soil moved during exporting =	7,571	tons (1.62 tons/cy)
Mean wind speed =	9.0	mph (Wilmington, DE)
Material silt content =	6.4	(Mean, Table 13.2.2-1, Page 13.2.2-3)
Material moisture content =	14	(Mean, Table 13.2.4, Page 13.2.4-2)

Emissions from rock/soil handling and storage piles (USEPA AP-42, Eq. 1, Section 13.2.4, January 1995)

EF = $k (0.0032) [U/5]^{1.3} / (M/2)^{1.4}$	3.34E-04	lbs./ton	PM
	1.58E-04	lbs./ton	PM ₁₀
	2.39E-05	lbs./ton	PM _{2.5}

where:

EF = emission factor, lbs./ton

U = mean wind speed, miles/hr. (mph)

M = material moisture content (%)

Therefore, total emissions from rock/soil handling and storage =

EF * tons/yr. of rock/soil loading/unloading				
2.52	lbs./yr.	1.26E-03	tons/yr.	PM E1
1.19	lbs./yr.	5.97E-04	tons/yr.	PM ₁₀ E1
0.18	lbs./yr.	9.04E-05	tons/yr.	PM _{2.5} E1

Assume fugitive dust from stockpiles is controlled using water sprays.

Assume 90% control efficiency from water spray.

Therefore, actual controlled emissions from rock/soil handling and storage =

uncontrolled emissions * 0.1				
1.26E-04	tons/yr.	PM	E2	
5.97E-05	tons/yr.	PM ₁₀	E2	
9.04E-06	tons/yr.	PM _{2.5}	E2	

Emissions from driving dump trucks on unpaved areas (USEPA AP-42, Eqs. 1a and 2, Section 13.2.2, November 2006)

EF = $[k(s/12)^a (W/3)^b] / [(365-p)/365]$	6.52	lbs./VMT/truck	PM
	1.76	lbs./VMT/truck	PM ₁₀
	0.18	lbs./VMT/truck	PM _{2.5}

where:

k = particle size multiplier = 4.9 lb./VMT (PM), 1.5 lb./VMT (PM₁₀) and 0.15 lb./VMT (PM_{2.5})

s = material silt content (%)

W = Weight of the vehicle (tons) = 40 tons

p = Number of days when precipitation was greater than 0.01 inches = 130 (Figure 13.2.2-1)

a = 0.7 for PM, 0.90 for PM₁₀, and 0.9 for PM_{2.5} (Table 13.2.2-2, Page 13.2.2-5)

b = 0.45 for PM, PM₁₀, and PM_{2.5} (Table 13.2.2-2, Page 13.2.2-5)

VMT = vehicle miles travelled by loaded & unloaded trucks on unpaved roads

VMT = ((cy/year of excavated soil)/(truck load))*(average distance traveled each way)

VMT = ((4,673 cy/yr.) / (20 cy/truck))*(120 miles/round trip*1% miles/unpaved roads)

VMT = 280.38 VMT/yr.

Therefore, total emissions from driving dump trucks on unpaved areas =

EF * VMT				
1,827	lbs./yr.	9.14E-01	tons/yr.	PM
493	lbs./yr.	2.47E-01	tons/yr.	PM ₁₀
49	lbs./yr.	2.47E-02	tons/yr.	PM _{2.5}

Fugitive Dust Emissions - Rock/Soil Export in CY 2024 (Continued) **SM-1**

Assume fugitive dust from unpaved roads is controlled using water sprays.

Assume 90% control efficiency from water spray.

Therefore, actual controlled emissions from driving dump trucks on unpaved areas =

uncontrolled emissions * 0.1

9.14E-02 tons/yr.	PM	E2
2.47E-02 tons/yr.	PM₁₀	E2
2.47E-03 tons/yr.	PM_{2.5}	E2

Total annual fugitive emissions from soil removal (tons/yr.) =

=E1+E2

9.15E-02 tons/yr.	PM
2.47E-02 tons/yr.	PM₁₀
2.48E-03 tons/yr.	PM_{2.5}

Fugitive Dust Emissions - Rock/Soil Import in CY 2025 SM-1

Input Parameters:

Soil moved during importing =	7,077	cy	
Soil moved during importing =	11,465	tons	(1.62 tons/cy)
Mean wind speed =	9.0	mph	(Wilmington, DE)
Material silt content =	6.4	(Mean, Table 13.2.2-1, Page 13.2.2-3)	
Material moisture content =	14	(Mean, Table 13.2.4, Page 13.2.4-2)	

Emissions from rock/soil handling and storage piles (USEPA AP-42, Eq. 1, Section 13.2.4, January 1995)

EF = $k (0.0032) [U/5]^{1.3} / (M/2)^{1.4}$	3.34E-04	lbs./ton	PM
	1.58E-04	lbs./ton	PM ₁₀
	2.39E-05	lbs./ton	PM _{2.5}

where:

EF = emission factor, lbs./ton

U = mean wind speed, miles/hr. (mph)

M = material moisture content (%)

Therefore, total emissions from rock/soil handling and storage =

EF * tons/yr. of rock/soil loading/unloading				
3.82	lbs./yr.	1.91E-03	tons/yr.	PM E1
1.81	lbs./yr.	9.04E-04	tons/yr.	PM ₁₀ E1
0.27	lbs./yr.	1.37E-04	tons/yr.	PM _{2.5} E1

Assume fugitive dust from stockpiles is controlled using water sprays.

Assume 90% control efficiency from water spray.

Therefore, actual controlled emissions from rock/soil handling and storage =

uncontrolled emissions * 0.1			
1.91E-04	tons/yr.	PM	E2
9.04E-05	tons/yr.	PM ₁₀	E2
1.37E-05	tons/yr.	PM _{2.5}	E2

Emissions from driving dump trucks on unpaved areas (USEPA AP-42, Eqs. 1a and 2, Section 13.2.2, November 2006)

EF = $[k(s/12)^a (W/3)^b] / [(365-p)/365]$	6.52	lbs./VMT/truck	PM
	1.76	lbs./VMT/truck	PM ₁₀
	0.18	lbs./VMT/truck	PM _{2.5}

where:

k = particle size multiplier = 4.9 lb./VMT (PM), 1.5 lb./VMT (PM₁₀) and 0.15 lb./VMT (PM_{2.5})

s = material silt content (%)

W = Weight of the vehicle (tons) = 40 tons

p = Number of days when precipitation was greater than 0.01 inches = 130 (Figure 13.2.2-1)

a = 0.7 for PM, 0.90 for PM₁₀, and 0.9 for PM_{2.5} (Table 13.2.2-2, Page 13.2.2-5)

b = 0.45 for PM, PM₁₀, and PM_{2.5} (Table 13.2.2-2, Page 13.2.2-5)

VMT = vehicle miles travelled by loaded & unloaded trucks on unpaved roads

VMT = ((cy/year of excavated soil)/(truck load))*(average distance traveled each way)

VMT = ((7,077 cy/yr.) / (14 cy/truck))*(120 miles/round trip*1% miles/unpaved roads)

VMT = 606.6 VMT/yr.

Therefore, total emissions from driving dump trucks on unpaved areas =

EF *VMT			
3,954	lbs./yr.	1.98E+00	tons/yr. PM
1,067	lbs./yr.	5.34E-01	tons/yr. PM ₁₀
107	lbs./yr.	5.34E-02	tons/yr. PM _{2.5}

Fugitive Dust Emissions - Rock/Soil Import in CY 2025 (Continued)

SM-1

Assume fugitive dust from unpaved roads is controlled using water sprays.

Assume 90% control efficiency from water spray.

Therefore, actual controlled emissions from driving dump trucks on unpaved areas =

uncontrolled emissions * 0.1

1.98E-01 tons/yr.	PM	E2
5.34E-02 tons/yr.	PM ₁₀	E2
5.34E-03 tons/yr.	PM _{2.5}	E2

Total annual fugitive emissions from soil removal and imported backfill (tons/yr.) =

=E1+E2

1.98E-01 tons/yr.	PM
5.35E-02 tons/yr.	PM ₁₀
5.35E-03 tons/yr.	PM _{2.5}

Fugitive Dust Emissions - Concrete Export CY 2021 SM-1

Input Parameters:

Concrete moved during export =	-	cy	
Concrete moved during export =	-	tons	(1.62 tons/cy)
Mean wind speed =	9.0 mph	(Wilmington, DE)	
Material silt content =	6.4	(Mean, Table 13.2.2-1, Page 13.2.2-3)	
Material moisture content =	0.2	(Mean, Table 13.2.4, Page 13.2.4-2)	

Emissions from concrete handling and storage piles (USEPA AP-42, Eq. 1, Section 13.2.4, January 1995)

$EF = k (0.0032) [U/5]^{1.3} / (M/2)^{1.4}$	1.28E-01 lbs./ton	PM	
	6.04E-02 lbs./ton	PM₁₀	
	9.15E-03 lbs./ton	PM_{2.5}	

where:

EF = emission factor, lbs./ton

U = mean wind speed, miles/hr. (mph)

M = material moisture content (%)

Therefore, total emissions from concrete handling and storage =

EF * tons/yr. of concrete loading/unloading				
-	lbs./yr.	0.00E+00 tons/yr.	PM	E1
-	lbs./yr.	0.00E+00 tons/yr.	PM₁₀	E1
-	lbs./yr.	0.00E+00 tons/yr.	PM_{2.5}	E1

Assume fugitive dust from stockpiles is controlled using water sprays.

Assume 90% control efficiency from water spray.

Therefore, actual controlled emissions from concrete handling and storage =

uncontrolled emissions * 0.1				
	0.00E+00 tons/yr.	PM	E2	
	0.00E+00 tons/yr.	PM₁₀	E2	
	0.00E+00 tons/yr.	PM_{2.5}	E2	

Emissions from driving dump trucks on unpaved areas (USEPA AP-42, Eqs. 1a and 2, Section 13.2.2, November 2006)

$EF = [k(s/12)^a (W/3)^b] / [(365-p)/365]$	6.52 lbs./VMT/truck	PM	
	1.76 lbs./VMT/truck	PM₁₀	
	0.18 lbs./VMT/truck	PM_{2.5}	

where:

k = particle size multiplier = 4.9 lb./VMT (PM), 1.5 lb./VMT (PM₁₀) and 0.15 lb./VMT (PM_{2.5})

s = material silt content (%)

W = Weight of the vehicle (tons) = 40 tons

p = Number of days when precipitation was greater than 0.01 inches = 130 (Figure 13.2.2-1)

a = 0.7 for PM, 0.90 for PM₁₀, and 0.9 for PM_{2.5} (Table 13.2.2-2, Page 13.2.2-5)

b = 0.45 for PM, PM₁₀, and PM_{2.5} (Table 13.2.2-2, Page 13.2.2-5)

VMT = vehicle miles travelled by loaded & unloaded trucks on unpaved roads

VMT = ((cy/yr. of concrete/(truck load))*(average distance traveled each way)

VMT = ((0 cy/yr.) / (20 cy/truck))*(120 miles/round trip*1% miles/unpaved roads)

VMT = 0 VMT/yr.

Therefore, total emissions from driving dump trucks on unpaved areas =

EF *VMT				
-	lbs./yr.	0.00E+00 tons/yr.	PM	
-	lbs./yr.	0.00E+00 tons/yr.	PM₁₀	
-	lbs./yr.	0.00E+00 tons/yr.	PM_{2.5}	

Fugitive Dust Emissions - Concrete Export CY 2021 (Continued) **SM-1**

Assume fugitive dust from unpaved roads is controlled using water sprays.

Assume 90% control efficiency from water spray.

Therefore, actual controlled emissions from driving dump trucks on unpaved areas =

uncontrolled emissions * 0.1

0.00E+00 tons/yr.	PM	E2
0.00E+00 tons/yr.	PM₁₀	E2
0.00E+00 tons/yr.	PM_{2.5}	E2

Total annual fugitive emissions from concrete demolition and import (tons/yr.) =

=E1+E2

0.00E+00 tons/yr.	PM
0.00E+00 tons/yr.	PM₁₀
0.00E+00 tons/yr.	PM_{2.5}

Fugitive Dust Emissions - Concrete Export in CY 2022 SM-1

Input Parameters:

Concrete moved during export =	-	cy	
Concrete moved during export =	-	tons	(1.62 tons/cy)
Mean wind speed =	9.0	mph	(Wilmington, DE)
Material silt content =	6.4	(Mean, Table 13.2.2-1, Page 13.2.2-3)	
Material moisture content =	0.2	(Mean, Table 13.2.4, Page 13.2.4-2)	

Emissions from concrete handling and storage piles (USEPA AP-42, Eq. 1, Section 13.2.4, January 1995)

EF = $k (0.0032) [U/5]^{1.3} / (M/2)^{1.4}$	1.28E-01 lbs./ton	PM
	6.04E-02 lbs./ton	PM₁₀
	9.15E-03 lbs./ton	PM_{2.5}

where:

EF = emission factor, lbs./ton

U = mean wind speed, miles/hr. (mph)

M = material moisture content (%)

Therefore, total emissions from concrete handling and storage =

EF * tons/yr. of concrete loading/unloading				
-	lbs./yr.	0.00E+00 tons/yr.	PM	E1
-	lbs./yr.	0.00E+00 tons/yr.	PM₁₀	E1
-	lbs./yr.	0.00E+00 tons/yr.	PM_{2.5}	E1

Assume fugitive dust from stockpiles is controlled using water sprays.

Assume 90% control efficiency from water spray.

Therefore, actual controlled emissions from concrete handling and storage =

uncontrolled emissions * 0.1			
0.00E+00 tons/yr.	PM	E2	
0.00E+00 tons/yr.	PM₁₀	E2	
0.00E+00 tons/yr.	PM_{2.5}	E2	

Emissions from driving dump trucks on unpaved areas (USEPA AP-42, Eqs. 1a and 2, Section 13.2.2, November 2006)

EF = $[k(s/12)^a (W/3)^b] / [(365-p)/365]$	6.52 lbs./VMT/truck	PM
	1.76 lbs./VMT/truck	PM₁₀
	0.18 lbs./VMT/truck	PM_{2.5}

where:

k = particle size multiplier = 4.9 lb./VMT (PM), 1.5 lb./VMT (PM₁₀) and 0.15 lb./VMT (PM_{2.5})

s = material silt content (%)

W = Weight of the vehicle (tons) = 40 tons

p = Number of days when precipitation was greater than 0.01 inches = 130 (Figure 13.2.2-1)

a = 0.7 for PM, 0.90 for PM₁₀, and 0.9 for PM_{2.5} (Table 13.2.2-2, Page 13.2.2-5)

b = 0.45 for PM, PM₁₀, and PM_{2.5} (Table 13.2.2-2, Page 13.2.2-5)

VMT = vehicle miles travelled by loaded & unloaded trucks on unpaved roads

VMT = ((cy/yr. of concrete/(truck load))*(average distance traveled each way)

VMT = ((0 cy/yr.) / (20 cy/truck))*(120 miles/round trip*1% miles/unpaved roads)

VMT = 0 VMT/yr.

Therefore, total emissions from driving dump trucks on unpaved areas =

EF *VMT			
-	lbs./yr.	0.00E+00 tons/yr.	PM
-	lbs./yr.	0.00E+00 tons/yr.	PM₁₀
-	lbs./yr.	0.00E+00 tons/yr.	PM_{2.5}

Fugitive Dust Emissions - Concrete Export in CY 2022 (Continued) **SM-1**

Assume fugitive dust from unpaved roads is controlled using water sprays.

Assume 90% control efficiency from water spray.

Therefore, actual controlled emissions from driving dump trucks on unpaved areas =

uncontrolled emissions * 0.1

0.00E+00 tons/yr.	PM	E2
0.00E+00 tons/yr.	PM₁₀	E2
0.00E+00 tons/yr.	PM_{2.5}	E2

Total annual fugitive emissions from concrete demolition (tons/yr.) =

=E1+E2

0.00E+00 tons/yr.	PM
0.00E+00 tons/yr.	PM₁₀
0.00E+00 tons/yr.	PM_{2.5}

Fugitive Dust Emissions - Concrete Export in CY 2023 SM-1

Input Parameters:

Concrete moved during export =	1,280	cy
Concrete moved during export =	2,074	tons (1.62 tons/cy)
Mean wind speed =	9.0	mph (Wilmington, DE)
Material silt content =	6.4	(Mean, Table 13.2.2-1, Page 13.2.2-3)
Material moisture content =	0.2	(Mean, Table 13.2.4, Page 13.2.4-2)

Emissions from concrete handling and storage piles (USEPA AP-42, Eq. 1, Section 13.2.4, January 1995)

EF = $k (0.0032) [U/5]^{1.3} / (M/2)^{1.4}$	1.28E-01 lbs./ton	PM
	6.04E-02 lbs./ton	PM₁₀
	9.15E-03 lbs./ton	PM_{2.5}

where:

EF = emission factor, lbs./ton

U = mean wind speed, miles/hr. (mph)

M = material moisture content (%)

Therefore, total emissions from concrete handling and storage =

EF * tons/yr. of concrete loading/unloading				
264.83 lbs./yr.	1.32E-01 tons/yr.	PM	E1	
125.26 lbs./yr.	6.26E-02 tons/yr.	PM₁₀	E1	
18.97 lbs./yr.	9.48E-03 tons/yr.	PM_{2.5}	E1	

Assume fugitive dust from stockpiles is controlled using water sprays.

Assume 90% control efficiency from water spray.

Therefore, actual controlled emissions from concrete handling and storage =

uncontrolled emissions * 0.1			
1.32E-02 tons/yr.	PM	E2	
6.26E-03 tons/yr.	PM₁₀	E2	
9.48E-04 tons/yr.	PM_{2.5}	E2	

Emissions from driving dump trucks on unpaved areas (USEPA AP-42, Eqs. 1a and 2, Section 13.2.2, November 2006)

EF = $[k(s/12)^a (W/3)^b] / [(365-p)/365]$	6.52 lbs./VMT/truck	PM
	1.76 lbs./VMT/truck	PM₁₀
	0.18 lbs./VMT/truck	PM_{2.5}

where:

k = particle size multiplier = 4.9 lb./VMT (PM), 1.5 lb./VMT (PM₁₀) and 0.15 lb./VMT (PM_{2.5})

s = material silt content (%)

W = Weight of the vehicle (tons) = 40 tons

p = Number of days when precipitation was greater than 0.01 inches = 130 (Figure 13.2.2-1)

a = 0.7 for PM, 0.90 for PM₁₀, and 0.9 for PM_{2.5} (Table 13.2.2-2, Page 13.2.2-5)

b = 0.45 for PM, PM₁₀, and PM_{2.5} (Table 13.2.2-2, Page 13.2.2-5)

VMT = vehicle miles travelled by loaded & unloaded trucks on unpaved roads

VMT = ((cy/yr. of concrete/(truck load))*(average distance traveled each way)

VMT = ((1,280 cy/yr.) / (20 cy/truck))*(120 miles/round trip*1% miles/unpaved roads)

VMT = 76.8 VMT/yr.

Therefore, total emissions from driving dump trucks on unpaved areas =

EF *VMT			
501 lbs./yr.	2.50E-01 tons/yr.	PM	
135 lbs./yr.	6.76E-02 tons/yr.	PM₁₀	
14 lbs./yr.	6.76E-03 tons/yr.	PM_{2.5}	

Fugitive Dust Emissions - Concrete Export in CY 2023 (Continued) **SM-1**

Assume fugitive dust from unpaved roads is controlled using water sprays.

Assume 90% control efficiency from water spray

Therefore, actual controlled emissions from driving dump trucks on unpaved areas =

uncontrolled emissions * 0.1

2.50E-02 tons/yr.	PM	E2
6.76E-03 tons/yr.	PM₁₀	E2
6.76E-04 tons/yr.	PM_{2.5}	E2

Total annual fugitive emissions from concrete demolition (tons/yr.) =

=E1+E2

3.83E-02 tons/yr.	PM
1.30E-02 tons/yr.	PM₁₀
1.62E-03 tons/yr.	PM_{2.5}

Fugitive Dust Emissions - Concrete Export in CY 2024 SM-1

Input Parameters:

Concrete moved during export =	1,280	cy	
Concrete moved during export =	2,074	tons	(1.62 tons/cy)
Mean wind speed =	9.0	mph	(Wilmington, DE)
Material silt content =	6.4	(Mean, Table 13.2.2-1, Page 13.2.2-3)	
Material moisture content =	0.2	(Mean, Table 13.2.4, Page 13.2.4-2)	

Emissions from concrete handling and storage piles (USEPA AP-42, Eq. 1, Section 13.2.4, January 1995)

EF = $k (0.0032) [U/5]^{1.3} / (M/2)^{1.4}$	1.28E-01	lbs./ton	PM
	6.04E-02	lbs./ton	PM ₁₀
	9.15E-03	lbs./ton	PM _{2.5}

where:

EF = emission factor, lbs./ton

U = mean wind speed, miles/hr. (mph)

M = material moisture content (%)

Therefore, total emissions from concrete handling and storage =

EF * tons/yr. of concrete loading/unloading				
264.83	lbs./yr.	0.132	tons/yr.	PM E1
125.26	lbs./yr.	0.063	tons/yr.	PM ₁₀ E1
18.97	lbs./yr.	0.0095	tons/yr.	PM _{2.5} E1

Assume fugitive dust from stockpiles is controlled using water sprays.

Assume 90% control efficiency from water spray.

Therefore, actual controlled emissions from concrete handling and storage =

uncontrolled emissions * 0.1			
1.32E-02	tons/yr.	PM	E2
6.26E-03	tons/yr.	PM ₁₀	E2
9.48E-04	tons/yr.	PM _{2.5}	E2

Emissions from driving dump trucks on unpaved areas (USEPA AP-42, Eqs. 1a and 2, Section 13.2.2, November 2006)

EF = $[k(s/12)^a (W/3)^b] / [(365-p)/365]$	6.52	lbs./VMT/truck	PM
	1.76	lbs./VMT/truck	PM ₁₀
	0.18	lbs./VMT/truck	PM _{2.5}

where:

k = particle size multiplier = 4.9 lb./VMT (PM), 1.5 lb./VMT (PM₁₀) and 0.15 lb./VMT (PM_{2.5})

s = material silt content (%)

W = Weight of the vehicle (tons) = 40 tons

p = Number of days when precipitation was greater than 0.01 inches = 130 (Figure 13.2.2-1)

a = 0.7 for PM, 0.90 for PM₁₀, and 0.9 for PM_{2.5} (Table 13.2.2-2, Page 13.2.2-5)

b = 0.45 for PM, PM₁₀, and PM_{2.5} (Table 13.2.2-2, Page 13.2.2-5)

VMT = vehicle miles travelled by loaded & unloaded trucks on unpaved roads

VMT = ((cy/yr. of concrete/(truck load))*(average distance traveled each way)

VMT = ((1,280 cy/yr.) / (20 cy/truck))*(120 miles/round trip*1% miles/unpaved roads)

VMT = 76.8 VMT/yr.

Therefore, total emissions from driving dump trucks on unpaved areas =

EF *VMT			
501	lbs./yr.	2.50E-01	tons/yr. PM
135	lbs./yr.	6.76E-02	tons/yr. PM ₁₀
14	lbs./yr.	6.76E-03	tons/yr. PM _{2.5}

Fugitive Dust Emissions - Concrete Export in CY 2024 (Continued) **SM-1**

Assume fugitive dust from unpaved roads is controlled using water sprays.

Assume 90% control efficiency from water spray

Therefore, actual controlled emissions from driving dump trucks on unpaved areas =

uncontrolled emissions * 0.1

2.50E-02 tons/yr.	PM	E2
6.76E-03 tons/yr.	PM₁₀	E2
6.76E-04 tons/yr.	PM_{2.5}	E2

Total annual fugitive emissions from concrete export (tons/yr.) =

=E1+E2

3.83E-02 tons/yr.	PM
1.30E-02 tons/yr.	PM₁₀
1.62E-03 tons/yr.	PM_{2.5}

Fugitive Dust Emissions - Concrete Export in CY 2025 SM-1

Input Parameters:

Concrete moved during export =	-	cy	
Concrete moved during export =	-	tons	(1.62 tons/cy)
Mean wind speed =	9.0 mph	(Wilmington, DE)	
Material silt content =	6.4	(Mean, Table 13.2.2-1, Page 13.2.2-3)	
Material moisture content =	0.2	(Mean, Table 13.2.4, Page 13.2.4-2)	

Emissions from concrete handling and storage piles (USEPA AP-42, Eq. 1, Section 13.2.4, January 1995)

EF = $k (0.0032) [U/5]^{1.3} / (M/2)^{1.4}$	1.28E-01 lbs./ton	PM
	6.04E-02 lbs./ton	PM₁₀
	9.15E-03 lbs./ton	PM_{2.5}

where:

EF = emission factor, lbs./ton

U = mean wind speed, miles/hr. (mph)

M = material moisture content (%)

Therefore, total emissions from concrete handling and storage =

EF * tons/yr. of concrete loading/unloading

- lbs./yr.	0.000 tons/yr.	PM	E1
- lbs./yr.	0.000 tons/yr.	PM₁₀	E1
- lbs./yr.	0.0000 tons/yr.	PM_{2.5}	E1

Assume fugitive dust from stockpiles is controlled using water sprays.

Assume 90% control efficiency from water spray.

Therefore, actual controlled emissions from concrete handling and storage =

uncontrolled emissions * 0.1

0.00E+00 tons/yr.	PM	E2
0.00E+00 tons/yr.	PM₁₀	E2
0.00E+00 tons/yr.	PM_{2.5}	E2

Emissions from driving dump trucks on unpaved areas (USEPA AP-42, Eqs. 1a and 2, Section 13.2.2, November 2006)

EF = $[k(s/12)^a (W/3)^b] / [(365-p)/365]$	6.52 lbs./VMT/truck	PM
	1.76 lbs./VMT/truck	PM₁₀
	0.18 lbs./VMT/truck	PM_{2.5}

where:

k = particle size multiplier = 4.9 lb./VMT (PM), 1.5 lb./VMT (PM₁₀) and 0.15 lb./VMT (PM_{2.5})

s = material silt content (%)

W = Weight of the vehicle (tons) = 40 tons

p = Number of days when precipitation was greater than 0.01 inches = 130 (Figure 13.2.2-1)

a = 0.7 for PM, 0.90 for PM₁₀, and 0.9 for PM_{2.5} (Table 13.2.2-2, Page 13.2.2-5)

b = 0.45 for PM, PM₁₀, and PM_{2.5} (Table 13.2.2-2, Page 13.2.2-5)

VMT = vehicle miles travelled by loaded & unloaded trucks on unpaved roads

VMT = ((cy/yr. of concrete/(truck load))*(average distance traveled each way)

VMT = ((0 cy/yr.) / (20 cy/truck))*(120 miles/round trip*1% miles/unpaved roads)

VMT = 0 VMT/yr.

Therefore, total emissions from driving dump trucks on unpaved areas =

EF * VMT

- lbs./yr.	0.00E+00 tons/yr.	PM
- lbs./yr.	0.00E+00 tons/yr.	PM₁₀
- lbs./yr.	0.00E+00 tons/yr.	PM_{2.5}

Fugitive Dust Emissions - Concrete Export in CY 2025 (Continued)
SM-1

Assume fugitive dust from unpaved roads is controlled using water sprays.
Assume 90% control efficiency from water spray

Therefore, actual controlled emissions from driving dump trucks on unpaved areas =
uncontrolled emissions * 0.1

0.00E+00 tons/yr.	PM	E2
0.00E+00 tons/yr.	PM ₁₀	E2
0.00E+00 tons/yr.	PM _{2.5}	E2

Total annual fugitive emissions from concrete export (tons/yr.) =
=E1+E2

0.00E+00 tons/yr.	PM
0.00E+00 tons/yr.	PM ₁₀
0.00E+00 tons/yr.	PM _{2.5}